

FEASIBILITY STUDY  
FOR A NEW MIDDLE SCHOOL AT  
1426 N QUINCY STREET

PREPARED FOR ARLINGTON PUBLIC SCHOOLS

DRAFT

JANUARY 21, 2014

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## EXECUTIVE SUMMARY

Arlington Public Schools retained Quinn Evans Architects to prepare a conceptual feasibility study for constructing a new Middle School adjacent to Washington-Lee High School. The new Middle School would replace the existing Education Center building and Brown Planetarium. The Planetarium would be relocated into new facility within the proposed Middle School structure. Ed Center facilities would be relocated to another building not addressed in the study. Existing parking and driveways would also be relocated or modified to accommodate the new Middle School building.

The number and type of spaces (space program) proposed for the new Middle School has been based largely on Kenmore Middle School. A few significant program elements, notably the full theatre provided at Kenmore, have been eliminated to avoid duplication with facilities in Washington-Lee High School. A few other space program elements, notably the Planetarium, have been added. The program is intended to accommodate twelve hundred (1,200) students at full capacity.

All concepts assume the demolition of the Ed Center and Planetarium and the re-purposing of the site at the northeast corner of the block occupied by Washington-Lee High School bounded by Washington Boulevard, North Quincy and Stafford Streets, and I-66. Initial concepts also considered alternatives which incorporate some or all of the existing soccer field with the proviso that a soccer field will be incorporated into the completed project. Initial studies included a range of scenarios. After analysis of these initial concepts, two alternative plans were developed to illustrate significantly different approaches, each with advantages. The first (Concept A – Tower Scheme), restricts the new building footprint within the Ed Center / Planetarium site. The second (Concept B – Field Scheme), also incorporates the soccer field site.

The Tower Scheme proposes a six story building. Due to the site's topography, the lower two floors fall below the ground floor level of Washington-Lee, but gradually emerge as the site falls away to the northeast. The proposed school's main entrance is oriented to this corner. The lower levels are occupied by common-use program elements, including the gymnasium,

planetarium, black-box theatre, visual and performing arts, and the administrative and health suites. The proposed Middle School frames a plaza at the ground floor level of Washington-Lee. The plaza serves as the entry court for students arriving by bus and also patrons of the Natatorium located in Washington-Lee. The cafeteria, media center, student activity spaces, and community facilities are located on the plaza level. Above are three floors of classrooms and other core academic facilities organized around a central atrium.

The Field Scheme proposes a more typical three story Middle School arrangement with larger, double-height spaces like the gymnasium, cafeteria, and performing arts rehearsal rooms, located at one end and classrooms, administrative offices, and other single-height spaces stacked into three floors at the other end. To accommodate the significantly larger building footprint, the Field Scheme occupies both the northeast corner of the block and the existing soccer field site. The soccer field is replaced with a regulation artificial turf field constructed on the roof of the proposed Middle School. The large footprint of the rooftop field presents a challenge for daylighting spaces below. Spaces are arrayed around a large central atrium. Primary classrooms, and other spaces routinely occupied for long periods of the day, are located at the perimeter with direct access to daylight. Spaces that are occupied by students for shorter periods, like science labs, are oriented into the atrium. The northern portion of the atrium extends beyond the soccer field, allowing direct daylight to penetrate deep into the building's interior.

The feasibility study also addresses alternative approaches to vehicular access and parking. In both final schemes, the access drive that currently connects Stafford and Quincy Streets has been rerouted to the north edge of the site. This clears the drive out of the center of the block, pushing vehicular traffic to the perimeter. Parking presents both policy and design challenges. Hundreds of parking spaces are currently provided for Washington-Lee faculty, staff, and students, patrons of the Natatorium and other after-hours activities at the school. Even with the demolition of the Ed Center, the construction of a Middle School presents another significant parking requirement. Alternatives address the allocation of parking spaces in the I-66

parking structure, on-site parking, and potential structured parking constructed as part of the Middle School project.

A concept-level cost model was prepared for both the Tower and Field Schemes and the alternative parking solutions.

# GOALS AND OBJECTIVES

## Goals

- The primary goal for this study is to address the capacity shortfall in the Arlington Public Schools system at the middle school level. However, given a consistent increase in enrollment, the school should be able to function as either an elementary school or a high school, too.
- The standard of quality for the school shall be consistent with the expectations, mission, and values of Arlington Public Schools, and those of the Arlington Community.

## Objectives

### Building Planning

- New Middle School for 1200 students on the site of the Arlington Education Center.
- Possibility to build initial school for 900 students with future phase for an additional 300 students.
- In order to provide optimal use of natural light in the classrooms, core classrooms and rooms that require natural lighting should be oriented to face south. Spaces where natural light is not necessary or presents a liability, should be oriented to face north.
- Underground parking shall be designed in a way that it could be removed from the design without affecting the school design.
- Education Specification should follow that of Kenmore Middle School with modifications to reflect increased capacity target and relevant current trends in the school design.

### Site Planning

- No net loss in field space.
- Segregate visitor vehicular circulation from bus circulation.
- Pedestrian circulation should cross bus and vehicular circulation as little as possible. Where they do cross, pedestrian safety shall be the highest priority.
- Loading should be readily accessible from North Quincy Street or from a primary vehicular thoroughfare through the site. Locations with the least intersection with pedestrian circulation should be prioritized. Visibility of the loading area should be hidden from view or adequately screened.



### MISSION

Arlington Public Schools instills a love of learning in its students and prepares them to be responsible and productive global citizens.

### VISION

Arlington Public Schools is a diverse and inclusive school community, committed to academic excellence and integrity. We provide instruction in a caring, safe and healthy learning environment, responsive to each student, in collaboration with families and the community.

### CORE VALUES

Excellence

Arlington Public Schools fosters excellence in our students and staff.

Integrity

We expect our students and staff to act in an honest, ethical and respectful manner.

Diversity

We value all students, staff and families in our diverse, inclusive school community.

Collaboration

We support relationships among students, staff, families and the community that ensure effective communication and promote opportunities to benefit our students.

Accountability

We take responsibility for our progress through transparent evaluation of student success, staff quality and management of the community's resources.

Sustainability

We practice stewardship of economic and environmental resources, meeting our current needs without compromising the ability of future generations to meet their needs.



## METHODOLOGY

This study was conducted by Quinn Evans Architects, their consultants, and members of the Arlington Public Schools Department of Design and Construction Services. The consultant team includes Gordon, Inc., a civil engineering firm, and R. W. Brown and Associates, a construction cost consultant.

The intent of this study is to explore options for the construction of a new middle school at the Education Center Site. Site and building planning were conducted to a concept level. The plans are meant to identify general locations and sizes of the educational program for a 1,200 student school. An estimate of probable construction cost was conducted using the conceptual site plan, building plans and sections.

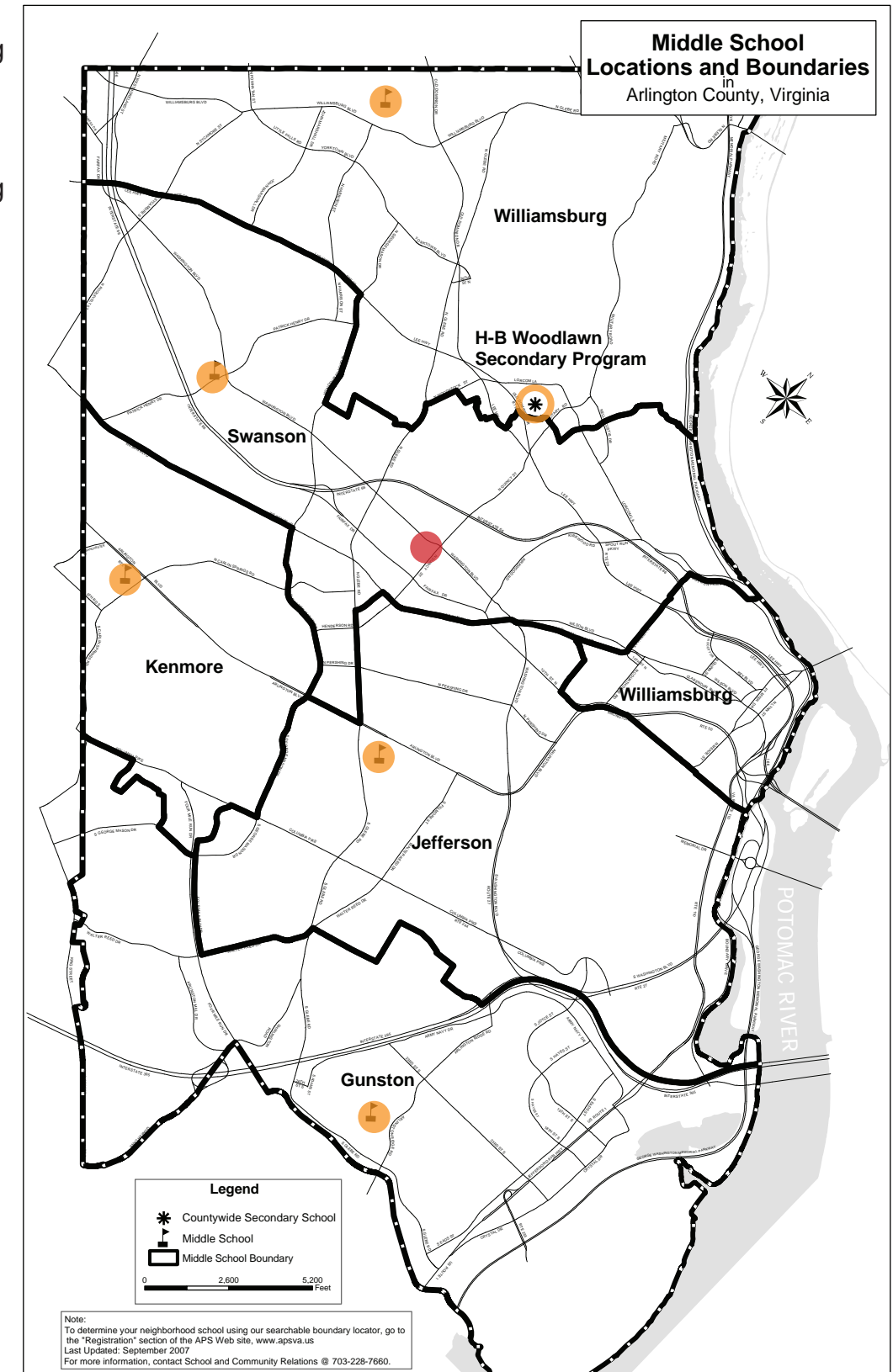
This study is based upon the following:

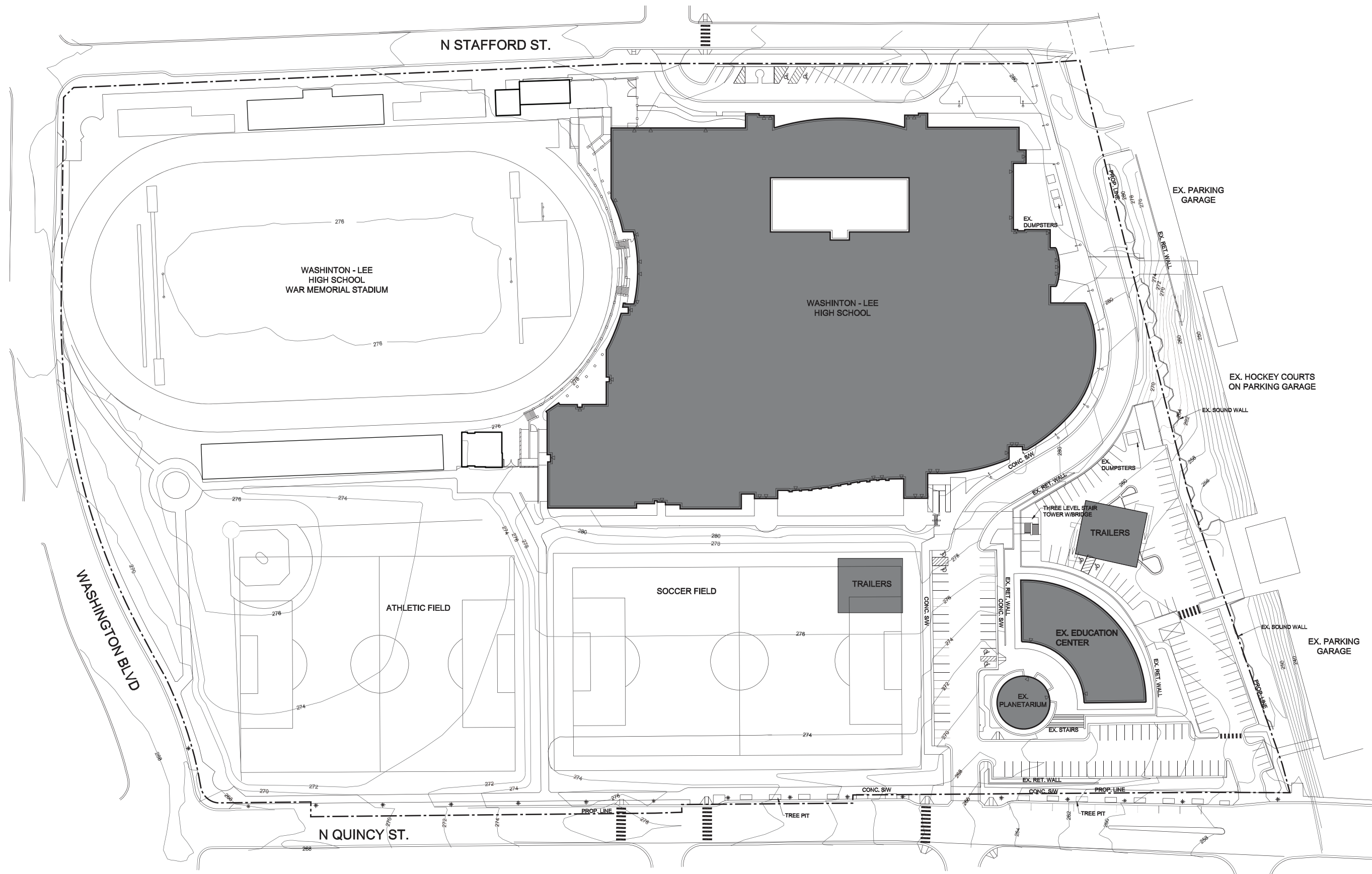
- Two Meetings with Arlington Public Schools Department of Design and Construction Services staff.
- A site visit to the proposed site to observe:
  - Washington-Lee High School morning arrival and afternoon dismissal.
  - Site topography and building entrance locations and elevations.
  - Locations of storm water systems
  - Locations and access to parking for the high school and the education center.
  - Vehicular and pedestrian circulation.
- Review of the Kenmore Middle School Final Design Report.
- Review of the Washington-Lee High School Final Design Report.
- Review of the Washington-Lee High School Use Permit documents.
- Review of the Memorandum of Understanding for use of the I-66 Parking Deck.
- Review of Arlington County Zoning requirements for off street parking.

- Review of the Memorandum of Agreement Between Arlington County and Arlington Public Schools Regarding use of the outdoor athletic facilities located on the Washington-Lee High School campus and Quincy Park.
- Review of the Memorandum of Agreement Between Arlington County and Arlington Public Schools Regarding Construction of the new combination diamond I rectangular field on the Washington-Lee High School Complex.

### Arlington County Middle Schools

- Middle Schools
- Proposed Middle School
- H-B Woodlawn Secondary Program





EXISTING SITE PLAN





## EXISTING CONDITIONS ANALYSIS



The site is located in the Ballston-Virginia Square neighborhood of Arlington, Virginia. The site occupies an entire street block bounded by Washington Boulevard to the south, North Quincy Street to the east, Interstate-66 to the north, and North Stafford Street to the west. The site area is approximately 19.5 acres and bounded by residential zoned land use to the south, east and west. The site currently contains the existing Washington-Lee High School with an indoor pool, a small softball field, a stadium consisting of a track and football field with bleachers, a multi-purpose recreation field, on-grade parking, and no significant vegetation. In addition, the site also contains the Education Center that houses the administrative staff and a surface parking lot at its northeast corner.

The site generally slopes from the northwest to southeast with slopes ranging from 2% to 25%. A large retaining wall between the service drive and the Education Building parking is approximately 20-feet high. A three level stair tower with bridge connects the pedestrians from the lower Education Building parking to the high school/pool. There are 2 athletic fields (softball and soccer) along North Quincy Street. This soccer field appears to be a practice field as the High School plays their formal soccer matches in the football/soccer stadium. Additionally, there are temporary trailers presently set-up on a portion of the multi-purpose recreation field that reduces the effective play area for soccer use.

### Utilities

#### Water

The site is served by public water. An existing 16-inch water main is present runs along the service drive and connects to an existing 16-inch water main within North Stafford Street and an existing 16-inch water main at North Quincy Street to create a looped system. Smaller service lines (8-inch diameter) extend from the 16-inch water main to serve the various buildings.

#### Sanitary

The site is served by public gravity sanitary sewer. An existing sanitary sewer main (8-inch and 15-inch in diameter) is located along the northern property line and flows from North Stafford Street to North Quincy Street. Sanitary sewer extends from the main to the serve the various buildings.

#### Storm Sewer

Storm drainage for the site consists of sheet and/or channel flow to the underground closed conduit system. Storm run-off is captured by surface inlets and conveyed to the 72-inch CMP underground detention system located north of the Education Building. The detention facility captures the eastern half of the site which includes portions of the high school roof. The storm water facility discharges into an existing 7-foot x7-foot concrete box culvert located perpendicular to the northern corner of the site. The culvert collects run off from storm pipes to the north and from Route 66. The box culvert may act as underground detention from I-66. Further investigation and review of plans for I-66 would be necessary to confirm. The existing underground detention from the school ultimately discharges into the box culvert.

#### Electric Service

The site is served by underground electrical conduits originating from the North Quincy Street. A generator, which serves as a backup source for the high school is located at the northwestern corner of the parking lot.

#### Natural Gas

The site is served by underground 6-inch natural gas conduit originating from North Quincy Street.







1.



3.



4.



2.



4.



5.

1. Main Entrance to Education Center from East

2. Internal drive connecting N. Stafford and N. Quincy Streets from N. Quincy Street. Dedicated parking for the Washington-Lee pool on the left.

3. Access to Education Center lower level parking lot from I-66 parking deck.

4. W-L modular classrooms with stair tower to upper level.

5. North parking lot of Education Center from West.

6. North parking lot of Education Center from East.





1.



3.



5.



2.



4.



6.

1. North Quincy Street from Education Center looking South.  
2. North Quincy Street from Education Center looking North.

3. Multi-purpose field, Washington-Lee High School, and Education Center from across North Quincy Street.  
4. Sidewalk between multi-purpose field and Washington-Lee High School looking North.

5. Multi-purpose field, Washington-Lee High School, and Education Center from Southeast.  
6. Sidewalk between multi-purpose field and softball field looking West.





1.



3.



5.



2.



4.

1. Internal drive and retaining wall from upper level.

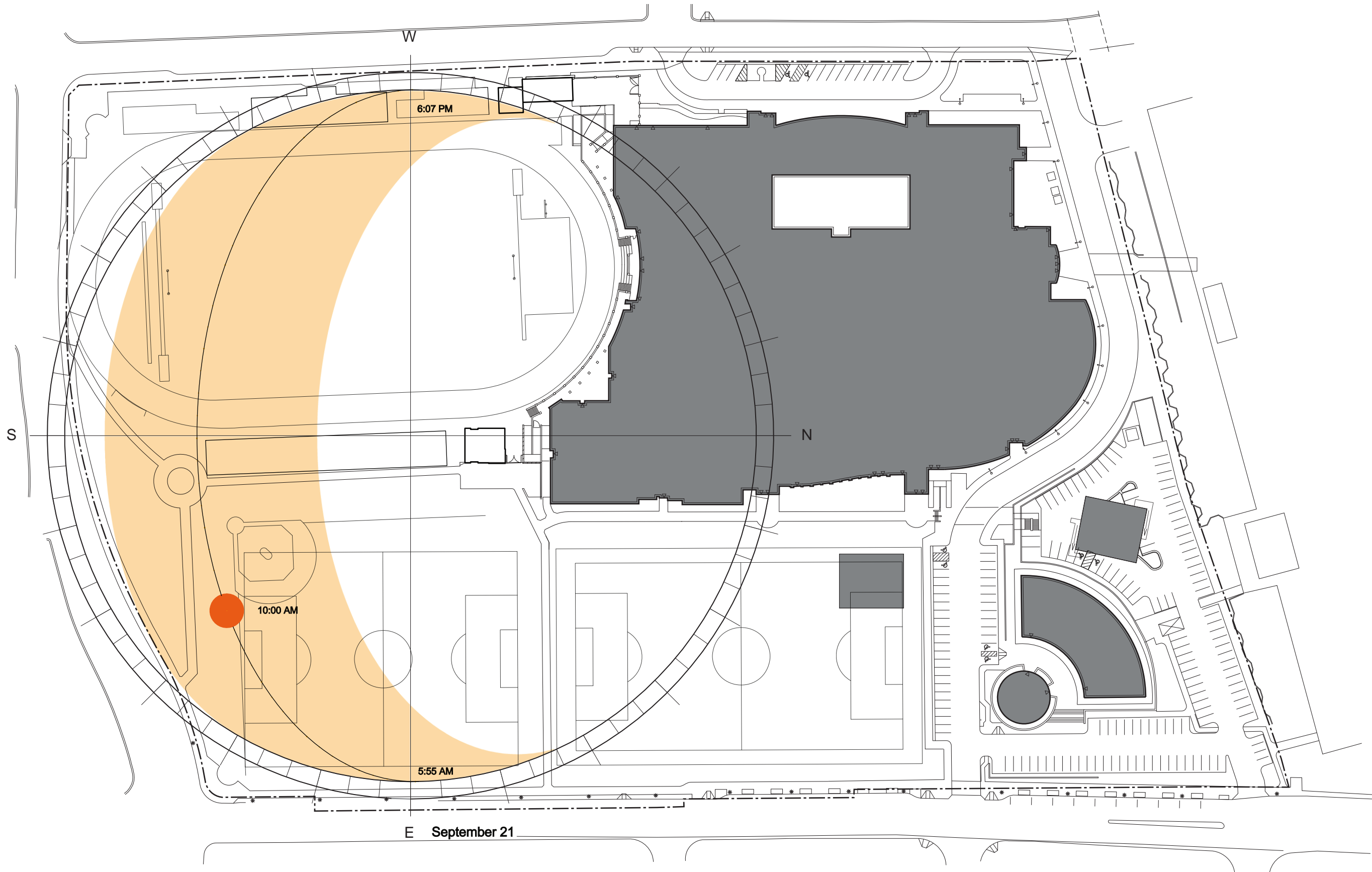
2. Internal drive, retaining wall, and generator from lower level.

3. Washington-Lee High School drop off loop and visitor parking from North Stafford Street.

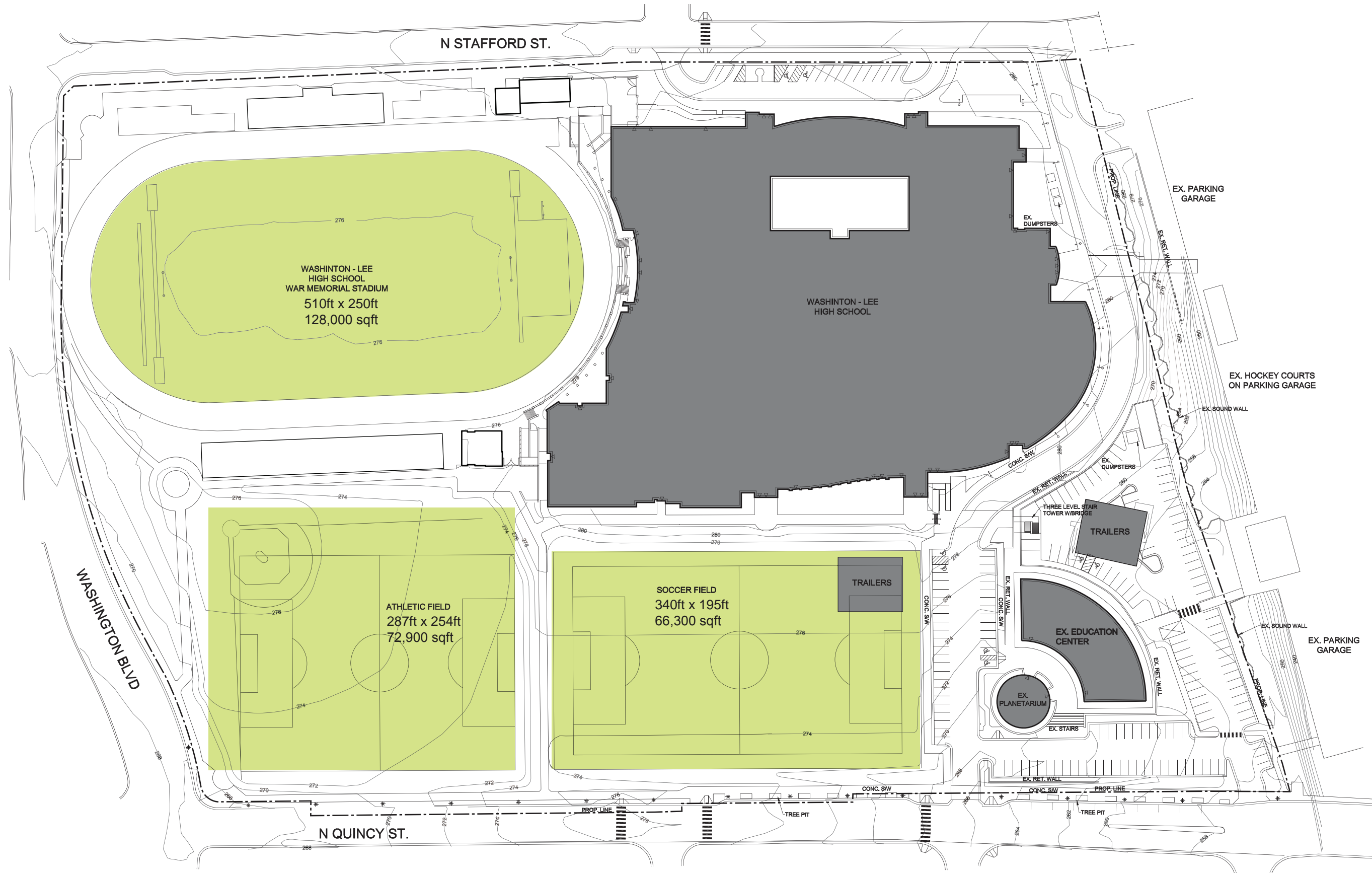
4. Internal drive and retaining wall from upper level during afternoon bus pickup.

5. Washington-Lee High School access ramp from I-66 parking deck.



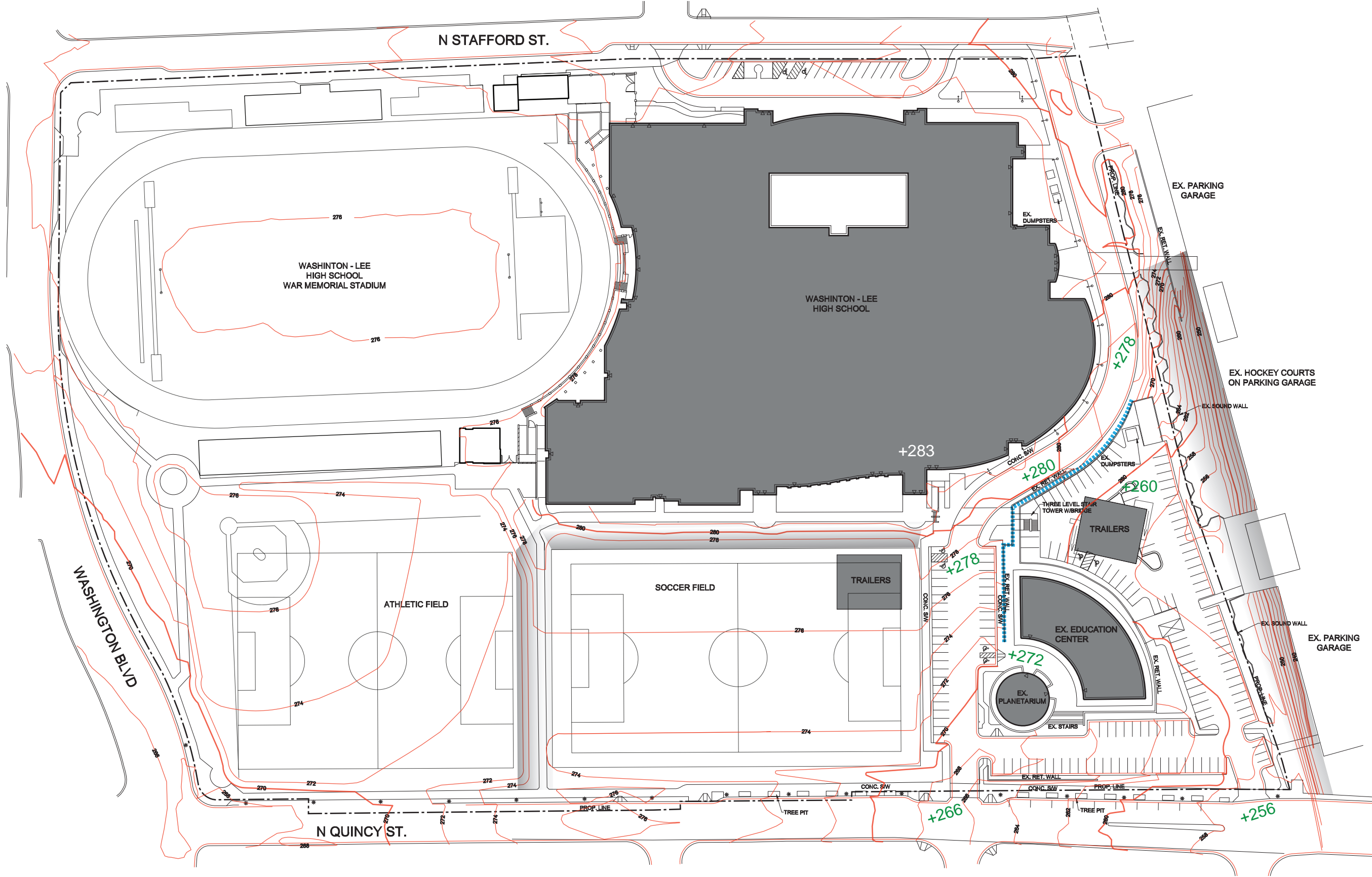


SOLAR ORIENTATION



**ATHLETIC FIELDS**

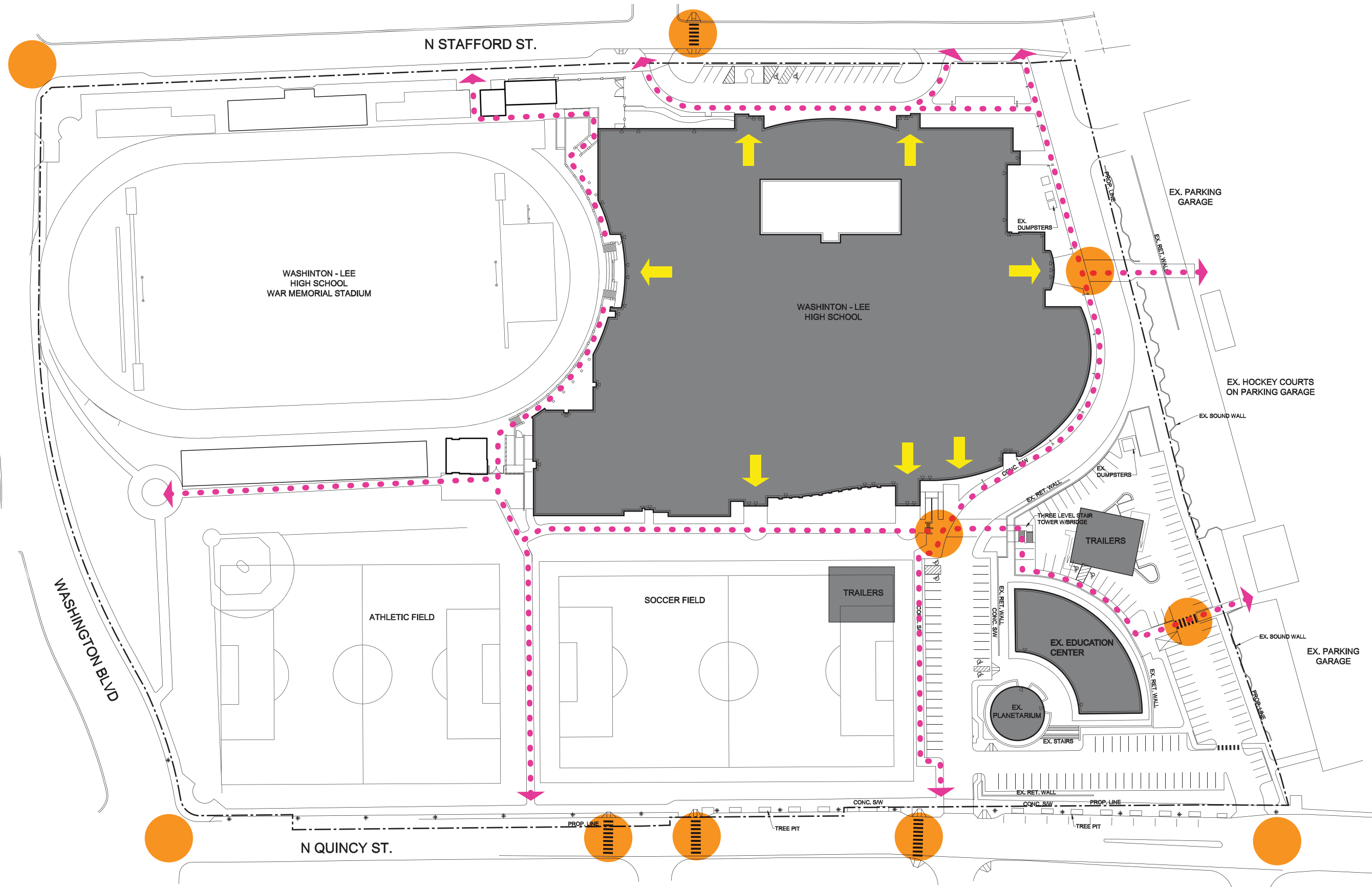




TOPOGRAPHY

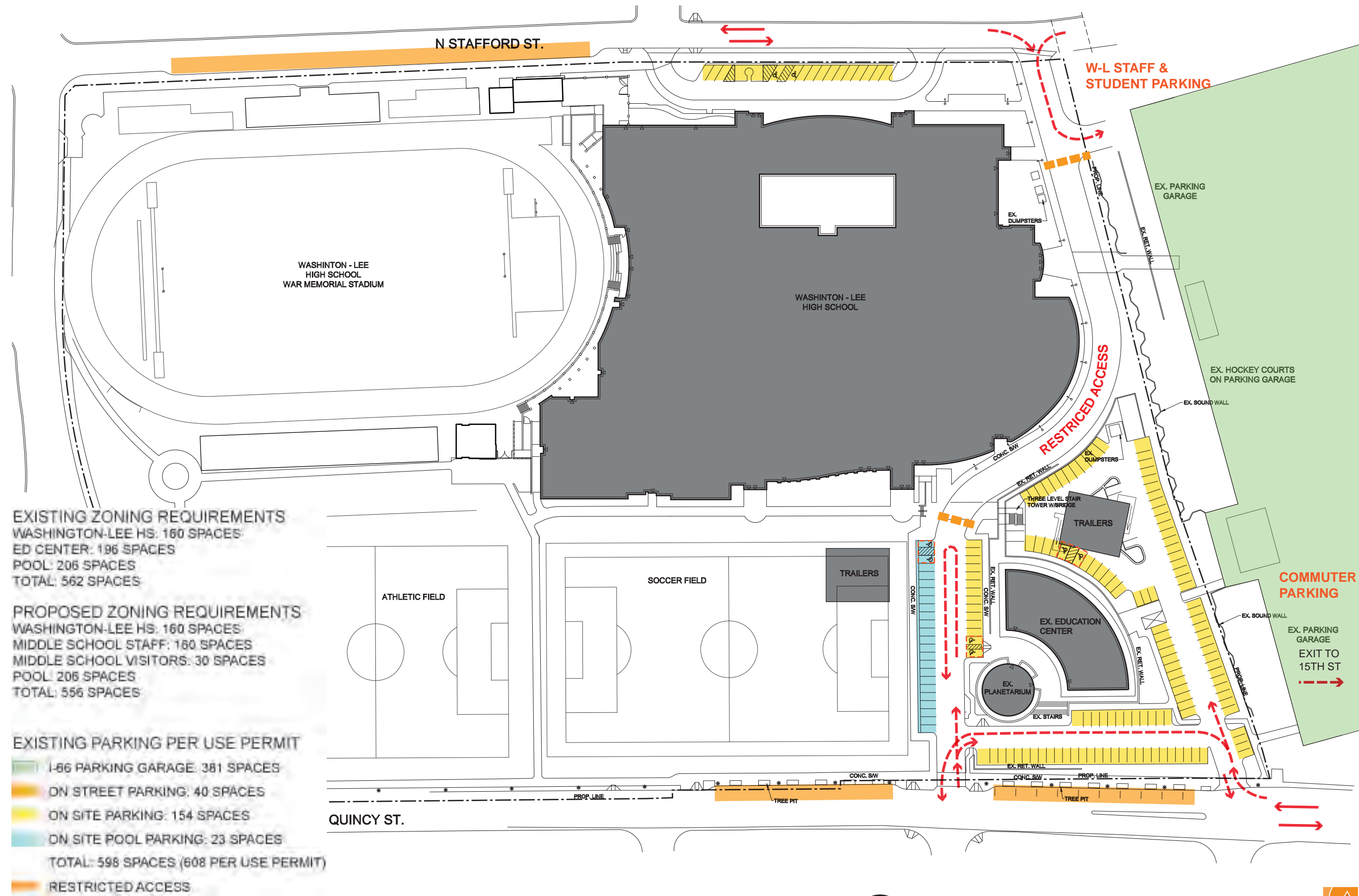






PEDESTRIAN CIRCULATION





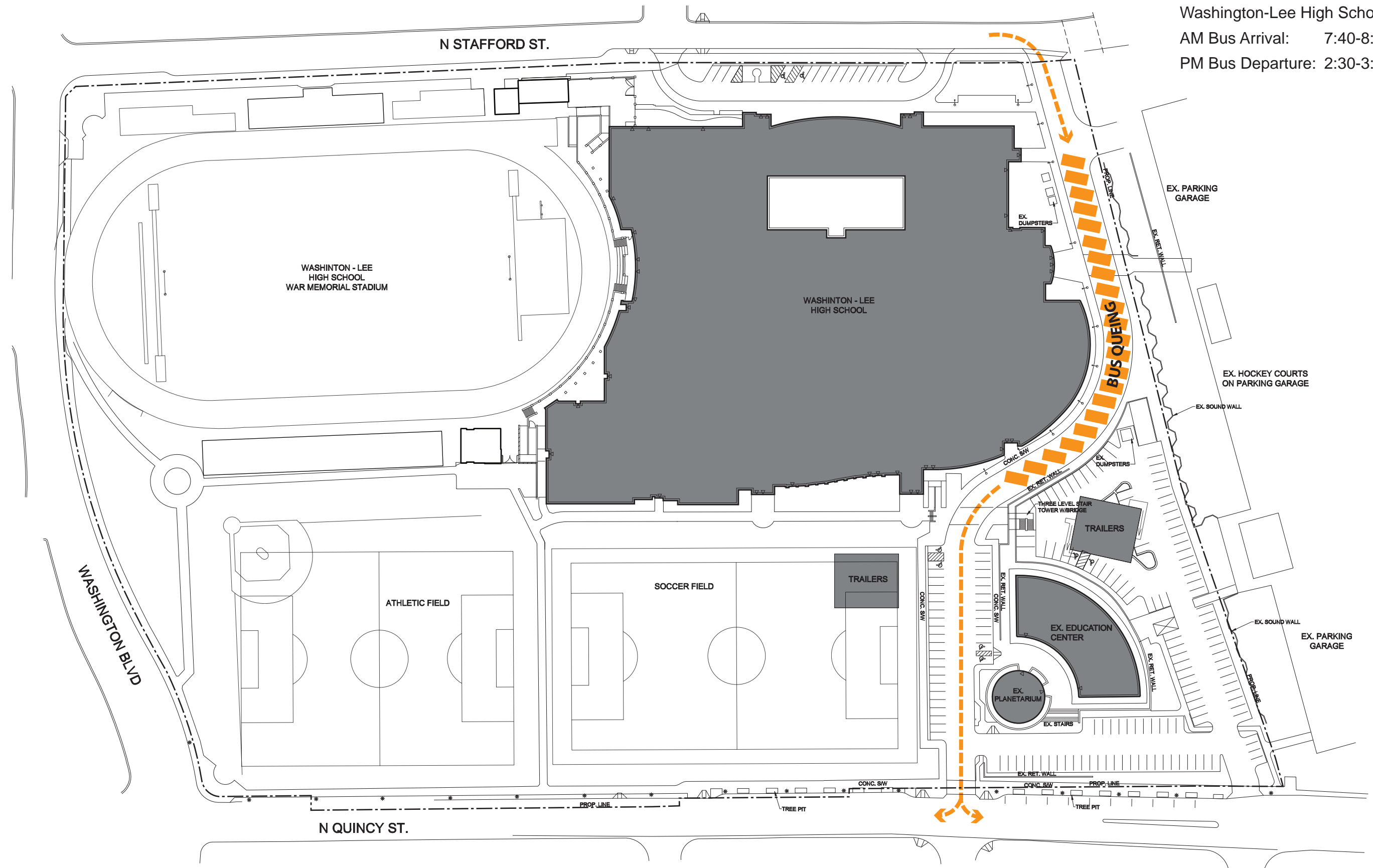
# PARKING REQUIREMENTS



QUINN EVANS ARCHITECTS



Washington-Lee High School  
 AM Bus Arrival: 7:40-8:00 AM  
 PM Bus Departure: 2:30-3:30 PM

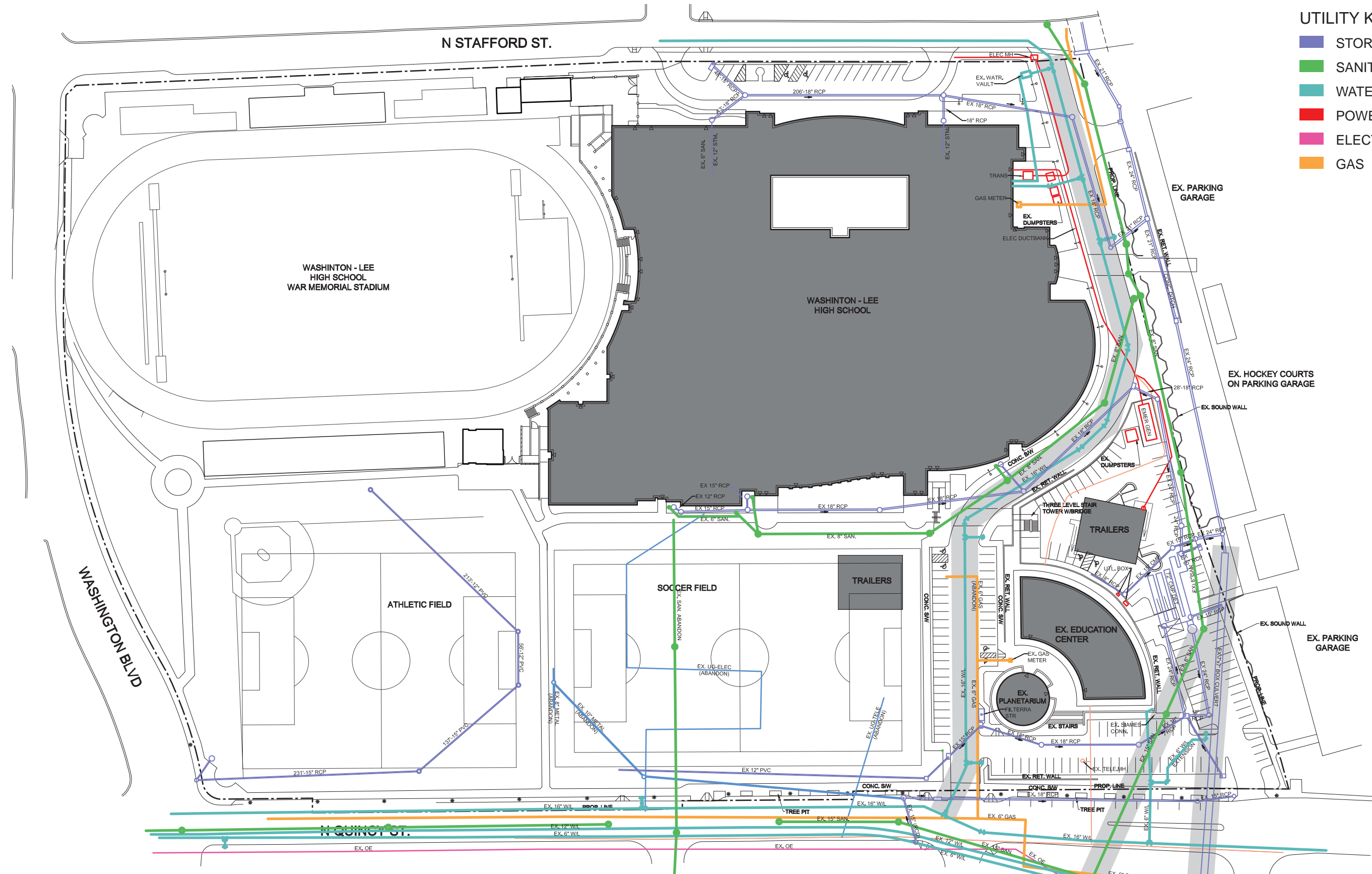


**BUS CIRCULATION**

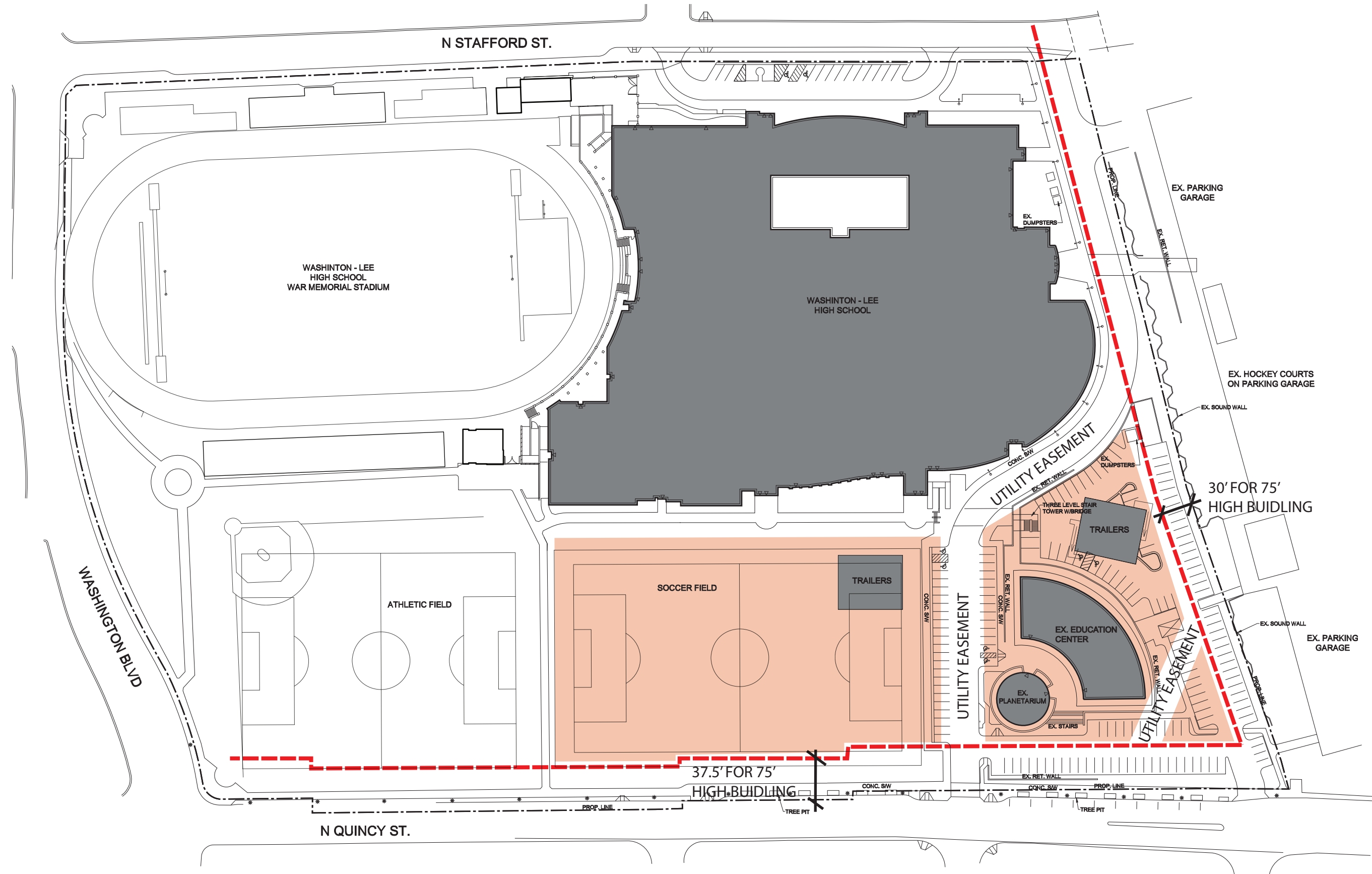




- UTILITY KEY**
- STORM
  - SANITARY
  - WATER
  - POWER
  - ELECTRICITY
  - GAS



**UTILITIES**



BASE ELEVATION AT 270'  
 (AVERAGE ELEVATION AT PROPERTY LINE)



**BUILDABLE AREA**



## CODE STUDY

A preliminary code study was conducted to understand the Zoning and Building Code requirements related to the construction of a middle school on the site of the Education Center.

The following are the current relevant code documents:

- County of Arlington, Virginia Zoning Ordinance 2013
- Virginia Uniform Statewide Building Code (USBC) which includes the Virginia Construction Code 2009, which thereby incorporates the International Building Code 2009

### Zoning Code Study

The key zoning requirements considered for the initial site planning are as follows:

#### Zoning:

“S-3A,” Special Districts

#### Land Use:

The site is designated on the GLUP as “Public” Parks (local, regional, and federal). Schools (public). Parkways, major unpaved rights-of-way. Libraries and cultural facilities.

To the north: A multi-story public parking garage over I-66 that is used by the Education Center, the High School. and for commuter parking; Across I-66 there are R-6 One Family Dwellings, Oak Grove Park zoned “S-3A”. I-66 is located 20 to 30 feet lower than the adjacent properties.

To the west: “R-5” One Family, Restricted Two Family Dwellings

To the east: “R-5” One Family, Restricted Two Family Dwellings; “M-1” Light Industrial; “CM” Limited Industrial

To the south: “RA8-18” Apartment Dwelling; “RIS-30T” Residential Townhouse Dwelling; Quincy Park is adjacent to the site to its southeast across Quincy Street and Washington Boulevard.

### Permitted Height: 45 feet (75 feet for high schools).

The height of high schools and school administration buildings on sites that are 19 acres or more, may be increased to a height not exceed 75 feet, subject to the approval of a use permit.

Due to the limited site area available for the proposed school, it is anticipated that the school will exceed 45’ height. A special exception from the zoning code would therefore need to be obtained.

### Setbacks: Front yard

No structure shall be located closer to the centerline of any street or officially designated street right-of-way (as defined in this zoning ordinance) than 50 percent of the height of the building. For the purpose of determining setbacks, a limited access highway shall be considered as an abutting lot and not as a street or street right-of-way.

### Required On-Site Parking (Ratio for Middle Schools):

190 Spaces (1 per each 7.5 students of design capacity for employee parking plus 1 space for each 40 students of design capacity for visitor parking)

The parking requirements for the middle school are very similar to those for the existing Education Center. Per the Washington-Lee High School Use Permit, the Education Center requires 196 parking spaces. The proposed middle school would require 190 spaces. With the anticipated demolition of the Education Center, we therefore concluded that the net parking that should remain on site shall not be lessened more than 6 parking spaces. In the site area identified for the middle school, there are 162 parking spaces. 23 of those spaces are dedicated to the W-L Pool.

The recommended parking strategy is to:

- Remove the 162 spaces at the Education Center Site.
- Retain the 20 On-Street parking spaces on N Stafford St
- Retain the 20 On-Street parking spaces on N Quincy St
- Retain the 15 On-Site visitor parking spaces on N Stafford St
- Retain the 15 On-Site visitor parking spaces on N Stafford St
- Retain the 229 parking spaces for the high school on the I-66 parking deck
- Retain the 152 parking spaces for commuter use on the I-66 parking deck
- Construct a minimum of 178 parking spaces to bring the total number of spaces to 599 spaces (6 less than the current use permit, reducing the 196 spaces for the Education Center to Wthe 190 spaces required for the middle school).

Table of Existing and Proposed Parking

Location	Existing	Proposed
North Stafford Street (On-Street Parking)	20	20
North Quincy Street (On-Street Parking)	20	20
On-site Parking	177	178 minimum
I-66 Parking Deck (School Use)	229	229
I-66 Parking Deck (Commuter Use)	152	152
<b>TOTAL</b>	<b>598 Spaces (605 per Use Permit)</b>	<b>599+ Spaces</b>



## Building Code Study

The building codes were reviewed for sections related to the preliminary planning of the school. Sections of the code that pertain to the building construction were only reviewed to the extent they affect preliminary planning. A full code study should be performed, with the current construction codes, prior to commencing further development of the school design.

## Use Group E - Educational

### Building Height and Area / Types of Construction

Due to the square footage of the proposed school, it is anticipated that the code will require Type 1 construction. Where a building is equipped throughout with an approved automatic sprinkler system, the building height may be increased to 180' and six stories under Type 1B construction. Given the cost premium and challenges with Type 1A construction, it is recommended that the proposed school be limited to six stories.

Table 601 from International Building Code

Fire-Resistance Rating Requirements for Building Elements (Hours)

BUILDING ELEMENT	TYPE I	
	A	B
Primary structural frame <sup>a</sup> (see Section 202)	3 <sup>a</sup>	2 <sup>a</sup>
Bearing walls		
Exterior <sup>f, g</sup>	3	2
Interior	3 <sup>a</sup>	2 <sup>a</sup>
Nonbearing walls and partitions		
Exterior		
Interior <sup>c</sup>	0	0
Floor construction and associated secondary members (see Section 202)	2	2
Roof construction and associated secondary members (see Section 202)	1½ <sup>b</sup>	1 <sup>b, c</sup>

Based on Table 602, a fire separation distance between buildings greater than or equal to thirty (30) feet, fire-resistance rating for exterior walls, for Occupancy Group E and Type IB construction, is not required. Any construction less than thirty feet from the existing Washington-Lee High School would require not only complying with the fire-resistance rating requirements, but also modifying the existing high school to comply with the fire-resistance rating requirements.

It is recommended that any construction adjacent to the existing Washington-Lee High School, or other buildings on the site, shall maintain a minimum fire separation distance of thirty feet.

### Fire Protection Systems

An automatic sprinkler system and fire alarm system shall be required. A fire flow test should be performed to determine the need of a pump system.

In buildings with an Atrium, a smoke control system, installed in accordance with Section 909 of the International Building Code, shall be required.

### High Rise Buildings

A building with an occupied floor located more than 75 feet above the lowest level of fire department vehicle access is considered to be a high rise building under the International Building Code. High-rise buildings shall comply with Sections 403.2 through 403.6 of the International Building Code.

### Atriums

An opening connecting two or more stories other than enclosed stairways, elevators, hoistways, escalators, plumbing, electrical, air-conditioning or other equipment, which is closed at the top and not defined as a mall, shall comply with the provisions of Sections 404.1 through 404.9 of the International Building Code.

### Public Parking Garages

Parking garages other than private parking garages, shall be classified

as public parking garages and shall comply with the provisions of Sections 406.4.2 through 406.4.8 of the International Building Code. Public parking garages shall be classified as either an open parking garage or an enclosed parking garage, and shall comply with the respective requirements for each type.

### Egress

- Common path of travel shall be limited to seventy five (75) feet.
- Exit access travel distance shall be limited to two hundred fifty (250) feet.
- Stories or occupied roofs with an occupant load between 501 and 1,000 shall be provided with three exits.
- Stories or occupied roofs with an occupant load greater than 1,000 shall be provided with four exits.

### Accessibility

Accessible routes within the site shall be provided from public transportation stops; accessible parking; accessible passenger loading zones; and public streets or sidewalks to the accessible building entrance served.

- At least sixty (60) percent of all public entrances shall be accessible.
- An elevator shall be required to connect all levels.

### Soils and Foundations

No geotechnical analysis was performed for this study. Given the need to demolish the existing Education Center on the site, and the recent demolition of the old Washington-Lee High School, in order to construct the new school it is anticipated that the foundations for the new structure will at least need to extend to the lowest level of the demolished substructure. Alternative systems such as structural piles may also be considered. The cost of the underground parking may be partially offset by the cost associated with these deep foundation or structural pile substructures.

A geotechnical investigation shall be conducted prior to commencing further development of the school design.



## EDUCATIONAL SPECIFICATIONS

The Education Specifications for the proposed middle school were based on those from which the Kenmore Middle School was constructed.
















Adjustments to the specifications were made to accommodate the following:

- Increase in capacity from 850 students to 1,200 students.
- A theater/auditorium was not included as they are not typical for a middle school program. The one at Kenmore Middle School was constructed to support their performing arts focused curriculum. There is also a theater/auditorium in the adjacent high school.
- Due to limitations of the proposed site, the gymnasium size was reduced. The Kenmore gymnasium is 15,465 square feet, which accommodates three full sized basketball courts. The proposed gymnasium is 10,600 square feet, which eliminated one basketball court. There is also a substantial gymnasium in the adjacent high school

### Key Assumptions

- Cafeteria remains the same size (three Lunch periods). Two periods could be accommodated using the commons space as additional dining area. The kitchen program was expanded to allow for a full service cooking kitchen. This is based on recent trends to expand culinary services in the school. Should delivered food service continue at the proposed school, this additional space could instead be used to expand the size of the dining area or to support a culinary arts program.

## Summary of Proposed Space Use

Color Designation	Department	Kenmore MS (SF)	Proposed MS (SF)	Delta
	1 Administrative Unit	2,595	4,525	1,930
	2 Student Services	2,065	2,405	340
	3 Counseling Services	1,000	1,220	220
	4 Health Unit	820	1,275	455
	5 Teacher Planning	8,210	11,760	3,550
	6 Student Spaces	710	4,160	3,450
	7 General Instruction	27,234	35,040	7,806
	8 SPED	6,497	6,970	473
	9 Science	7,845	17,400	9,555
	10 Electives	17,895	26,705	8,810
	11 Visual and Performing Arts	31,605	23,610	(7,995)
	12 PE	23,290	20,585	(2,705)
	13 Media Center	6,882	10,765	3,883
	14 Food Services	9,190	13,870	4,680
	15 Custodial Support	1,580	1,655	75
		<b>147,418 TOTAL NSF</b>	<b>181,945 TOTAL NSF</b>	<b>34,527</b>
		56,444 38% Grossing Factor	69,664 38% Grossing Factor	13,220
		<b>203,862 TOTAL GSF</b>	<b>251,609 TOTAL GSF</b>	<b>47,747</b>
		239.84 GSF/Student	209.67 GSF/Student	

## PROPOSED SPACE USE

	PROPOSED MIDDLE SCHOOL				KENMORE MIDDLE SCHOOL				
	QUANTITY	AREA IN S.F.	TOTAL AREA	DEPT. TOTALS	QUANTITY	AREA IN S.F.	TOTAL AREA	DEPT. TOTALS	DELTA
<b>1 Administrative Unit</b>				<b>4525</b>				<b>2595</b>	<b>1930</b>
Waiting/Reception Room	1	450	450		1	395	395		55
Principal's Office	1	320	320		1	320	320		0
Assistant Principal's Office	3	165	495		2	165	330		165
Finance Office	1	135	135		1	135	135		0
Exemplary Projects Coordinator	1	145	145		1	145	145		0
Conference Room	1	225	225		1	180	180		45
Duplication/Production Workroom	1	350	350		1	250	250		100
Supply Storage	1	300	300		1	200	200		100
Mailroom	1	200	200		1	165	165		35
Staff Toilet	2	65	130		2	65	130		0
In School Alternative	1	170	170		1	170	170		0
Night Programs Storage	1	200	200		1	175	175		25
							0		0
Administrative Assistant Office	2	60	120				0		120
Secure Storage Area	1	100	100				0		100
Security Office	1	60	60				0		60
Security Desk	1	100	100				0		100
Staff Lounge	1	450	450				0		450
Technology Resource	3	100	300				0		300
Coat Closet	1	75	75				0		75
Fire Resistive Record Storage	1	200	200				0		200
			0				0		
<b>2 Student Services</b>				<b>2405</b>				<b>2065</b>	
Student Services Reception	1	400	400		1	285	285		115
Speech/Vision	1	175	175		1	175	175		0
Psychologist	1	140	140		1	140	140		0
Social Worker	1	130	130		1	130	130		0
Bilingual Resource Assistant	1	100	100		1	100	100		0
Gifted Program	1	150	150		1	150	150		0
Minority Achievement	1	135	135		1	135	135		0
Youth Resource	1	120	120		1	120	120		0
Attendance	1	105	105		1	105	105		0
Testing Coordinator	1	105	105		1	105	105		0
Prevention	1	115	115		1	115	115		0
Storage/Duplication	1	200	200		1	125	125		75
Student Services Conference Room	1	400	400		1	250	250		150
Staff Toilet	1	65	65		1	65	65		0
Staff Toilet	1	65	65		1	65	65		0
<b>3 Counseling Services</b>				<b>1220</b>				<b>1000</b>	
Counseling Director	1	170	170		1	170	170		0
Counselor	6	110	660		4	110	440		220
Counseling Conference Room	1	150	150		1	150	150		0
Records Vault	1	240	240		1	240	240		0



## PROPOSED SPACE USE (CONT'D)

<b>4 Teacher Planning and Auxillary Services</b>				<b>11760</b>			<b>8210</b>	
Teacher Planning Room	6	500	3000	3	525	1575	1425	
Reading Specialist Office/Workroom	1	530	530	1	530	530	0	
Math Specialist Office/Workroom	1	400	400	1	400	400	0	
Math Storage	1	200	200	1	130	130	70	
HILT Office	1	180	180	1	180	180	0	
HILT Storage	1	150	150	1	150	150	0	
General Book Storage	6	200	1200	1	995	995	205	
Staff Lounge	3	450	1350	3	350	1050	300	
Staff Toilet	10	55	550	8	55	440	110	
Team Storage	9	200	1800	6	195	1170	630	
Team Conference Room	9	100	900	6	100	600	300	
Student Toilet	6	250	1500	6	165	990	510	
<b>5 Clinic</b>				<b>1275</b>			<b>820</b>	
Waiting Room	1	250	250	1	215	215	35	
Rest Area - Boys	1	180	180	1	130	130	50	
Rest Area - Girls	1	180	180	1	130	130	50	
Exam Room	2	125	250	1	125	125	125	
Toilet	2	65	130	1	65	65	65	
PHN Exam/Office	1	155	155	1	155	155	0	
Storage Room	1	80	80			0	80	
Shower	1	50	50			0	50	
							0	
<b>6 Student Spaces</b>				<b>4160</b>			<b>710</b>	
Student Activities Room	1	625	625	1	625	625	0	Under Electives and Other Programs in Kenmore Ed Spec
Check In/Extended Day	1	85	85	1	85	85	0	Under Electives and Other Programs in Kenmore Ed Spec
Student Store	1	150	150			0	150	
Student Store Storage	1	300	300			0	300	
Student Government Office	1	300	300			0	300	
Student Publications Lab	1	500	500			0	500	
Student Lounge	1	200	200			0	200	
Student Commons	1	2000	2000			0	2000	
<b>7 General Instruction</b>				<b>35040</b>			<b>27234</b>	
6th Grade Classroom	15	730	10950	12	729	8748	2202	
7th Grade Classroom	15	730	10950	12	729	8748	2202	
8th Grade Classroom	15	730	10950	12	729	8748	2202	
Flex Classroom	3	730	2190	2	495	990	1200	
<b>8 SPED</b>				<b>6970</b>			<b>6497</b>	
SPED Classroom	3	730	2190	3	729	2187	3	Under General Instruction in Kenmore Ed Spec
SPED Resource Classroom	3	520	1560	3	520	1560	0	Under General Instruction in Kenmore Ed Spec
SPED Science Lab	3	740	2220	3	740	2220	0	Under General Instruction in Kenmore Ed Spec
SPED Testing Room	1	100	100			0	100	
SPED Conference Room	1	150	150			0	150	
SPED Staff Room	1	450	450	1	340	340	110	Under Teacher Planning and Auxillary Services in Kenmore Ed Spec
SPED Specialist	2	110	220	1	110	110	110	Under Teacher Planning and Auxillary Services in Kenmore Ed Spec
SPED Storage	1	80	80	1	80	80	0	Under Teacher Planning and Auxillary Services in Kenmore Ed Spec

## PROPOSED SPACE USE (CONT'D)

9 Science		17400			7845		
Science Lab	12	1200	14400	6	1170	7020	7380 Under General Instruction in Kenmore Ed Spec
Science Prep Room - Double	6	300	1800	3	275	825	975 Under General Instruction in Kenmore Ed Spec
Science Storage	3	400	1200			0	1200
10 Electives and Other Programs		26705			17895		
Reading Classroom	3	705	2115	2	705	1410	705 Under General Instruction in Kenmore Ed Spec
Computer Lab	3	1000	3000	3	940	2820	180 Under General Instruction in Kenmore Ed Spec
Foreign Language	3	780	2340	2	780	1560	780
Foreign Language Storage	1	750	750	1	500	500	250
Interlude	1	730	730	1	560	560	170
Interlude Office	1	90	90	1	90	90	0
Interlude Toilet	1	65	65	1	65	65	0
OT/PT	1	505	505	1	505	505	0
OT/PT Storage	1	75	75	1	75	75	0
			0			0	0
Life Skills	2	530	1060	2	530	1060	0
Life Skills Storage	1	65	65	1	65	65	0
Life Skills Prep Room	1	170	170	1	170	170	0
Life Skills Toilet	1	65	65	1	65	65	0
							0
Nutrition Lab/Demonstration Kitchen	1	1000	1000	1	990	990	10 Under Work and Family Studies in Kenmore Ed Spec
Nutrition Lab/Demonstration Kitchen Storage	1	200	200	1	200	200	0 Under Work and Family Studies in Kenmore Ed Spec
Sewing Lab	1	680	680	1	680	680	0 Under Work and Family Studies in Kenmore Ed Spec
Modular Office/Server Room	1	175	175	1	175	175	0 Under Work and Family Studies in Kenmore Ed Spec
Modular Lab	1	1000	1000	1	1000	1000	0 Under Work and Family Studies in Kenmore Ed Spec
							0
Business/Computer Lab - Decision Theater	1	1200	1200	1	1215	1215	-15 Under Business in Kenmore Ed Spec
Business/Computer Storage	3	85	255	1	85	85	170
							0
Exploratory Lab	1	1600	1600			0	1600
Resource Classroom	6	500	3000			0	3000
							0
Tech Classroom	2	1400	2800	1	1435	1435	1365 Under Technology Education in Kenmore Ed Spec
Tech R&D Lab	1	1200	1200	1	1150	1150	50 Under Technology Education in Kenmore Ed Spec
Tech Ed Office	1	105	105	1	105	105	0 Under Technology Education in Kenmore Ed Spec
Project Materials Storage	1	400	400	1	195	195	205 Under Technology Education in Kenmore Ed Spec
Finishing Room	1	130	130	1	130	130	0 Under Technology Education in Kenmore Ed Spec
Tech Storage	1	250	250	1	90	90	160 Under Technology Education in Kenmore Ed Spec
Distance Learning Broadcast Studio	1	730	730	1	730	730	0 Under Technology Education in Kenmore Ed Spec
Video Production	1	700	700	1	535	535	165 Under Technology Education in Kenmore Ed Spec
Video Control	1	250	250	1	235	235	15 Under Technology Education in Kenmore Ed Spec



**PROPOSED SPACE USE (CONT'D)**

11 Arts		23610		31605		
Art Lab	3	1200	3600	2	2705	895 Under Art in Kenmore Ed Spec
Art Computer Lab	1	800	800	1	410	390 Under Art in Kenmore Ed Spec
Kiln Room	1	150	150	1	55	95 Under Art in Kenmore Ed Spec
Art Storage	3	150	450	1	110	340 Under Art in Kenmore Ed Spec
						0
Auditorium/Stage	1	1200	1200	1	12125	12125 Under Auditorium in Kenmore Ed Spec
Dressing Room - Boys	1	300	300	1	300	0 Under Auditorium in Kenmore Ed Spec
Dressing Room - Girls	1	300	300	1	300	0 Under Auditorium in Kenmore Ed Spec
Toilet Room	2	70	140	2	70	140 Under Auditorium in Kenmore Ed Spec
Receiving/Set Construction and Storage	1	1200	1200	1	1330	1330 Under Auditorium in Kenmore Ed Spec
Piano Storage	1	90	90	1	90	0 Under Auditorium in Kenmore Ed Spec
Control Room	1	280	280	1	280	280 Under Auditorium in Kenmore Ed Spec
Ticket Office	1	100	100	1	100	100 Under Auditorium in Kenmore Ed Spec
Toilet Room	2	380	760	2	380	760 Under Auditorium in Kenmore Ed Spec
			0			0
Black Box	1	2820	2820	1	2820	2820 Under Black Box in Kenmore Ed Spec
Control Room	1	110	110	1	110	110 Under Black Box in Kenmore Ed Spec
Storage	1	180	180	1	180	180 Under Black Box in Kenmore Ed Spec
Drama and Theater Arts	1	730	730	1	710	710 Under Electives and Other Programs in Kenmore Ed Spec
Prop Storage	1	400	400			400
Material Storage	1	400	400			400
Costume Storage	1	200	200			200
						0
Band	1	2000	2000	1	2000	2000 Under Music in Kenmore Ed Spec
Band Storage	1	505	505	1	505	505 Under Music in Kenmore Ed Spec
Orchestra	1	1515	1515	1	1515	1515 Under Music in Kenmore Ed Spec
Orchestra Storage	1	500	500	1	375	375 Under Music in Kenmore Ed Spec
Vocal	1	1445	1445	1	1445	1445 Under Music in Kenmore Ed Spec
Vocal Storage	1	200	200	1	105	105 Under Music in Kenmore Ed Spec
Office/Library	1	190	190	1	190	190 Under Music in Kenmore Ed Spec
Vocal Office	1	105	105	1	105	105 Under Music in Kenmore Ed Spec
Small Practice	4	55	220	3	55	165 Under Music in Kenmore Ed Spec
Large Practice	3	100	300	2	100	200 Under Music in Kenmore Ed Spec
						0
Dance Studio	1	1900	1900	1	1965	1965 Under Physical Education in Kenmore Ed Spec
Dance Changing	1	155	155	1	155	155 Under Physical Education in Kenmore Ed Spec
Dance Storage	1	250	250	1	240	240 Under Physical Education in Kenmore Ed Spec
Dance Office	1	115	115	1	115	115 Under Physical Education in Kenmore Ed Spec
						0
12 Health and Physical Education		20585		23290		
Gym	1	10600	10600	1	15465	15465 Under Physical Education in Kenmore Ed Spec
Online Wellness Technology	1	1965	1965	1	1965	1965 Under Physical Education in Kenmore Ed Spec
OWT Storage	1	105	105	1	105	105 Under Physical Education in Kenmore Ed Spec
Staff Office	5	110	550	5	110	550 Under Physical Education in Kenmore Ed Spec
Office Conference Room	1	110	110	1	110	110 Under Physical Education in Kenmore Ed Spec
Mat Storage	1	290	290	1	290	290 Under Physical Education in Kenmore Ed Spec
PE Storage - Indoor	1	500	500	1	375	375 Under Physical Education in Kenmore Ed Spec
Pe Storage - Outdoor	1	600	600	1	470	470 Under Physical Education in Kenmore Ed Spec
DPRCR Office/Storage	1	115	115	1	115	115 Under Physical Education in Kenmore Ed Spec
Laundry Room	1	110	110	1	110	110 Under Physical Education in Kenmore Ed Spec
Staff Toilet - Boys	1	80	80	1	80	80 Under Physical Education in Kenmore Ed Spec
Staff Toilet - Girls	1	80	80	1	80	80 Under Physical Education in Kenmore Ed Spec
Locker/Shower Room - Boys	1	1500	1500	1	1385	1385 Under Physical Education in Kenmore Ed Spec
Locker/Shower Room - Girls	1	1500	1500	1	1385	1385 Under Physical Education in Kenmore Ed Spec
Janitor's Closet	2	40	80	2	40	80 Under Physical Education in Kenmore Ed Spec
Health Classroom	3	800	2400	1	725	725 Under Physical Education in Kenmore Ed Spec

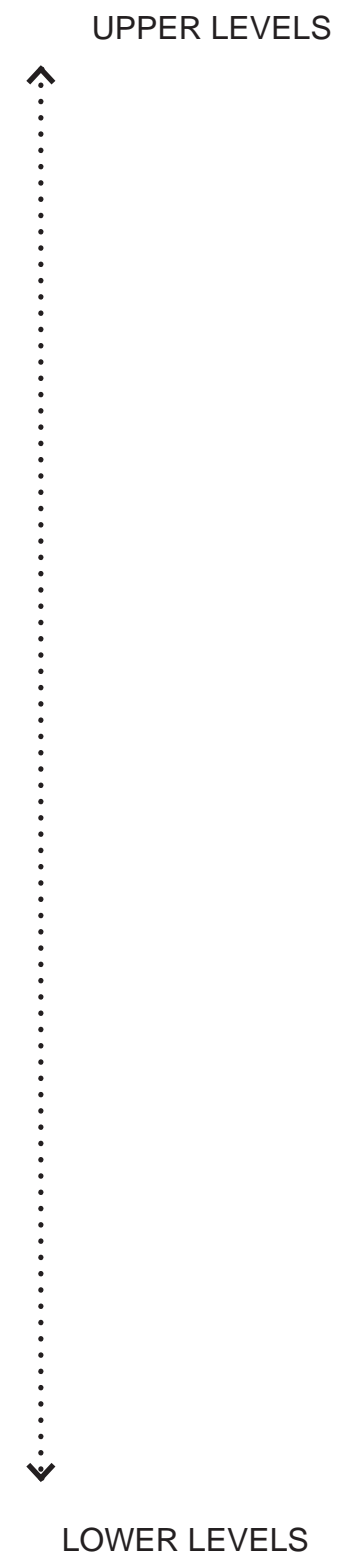
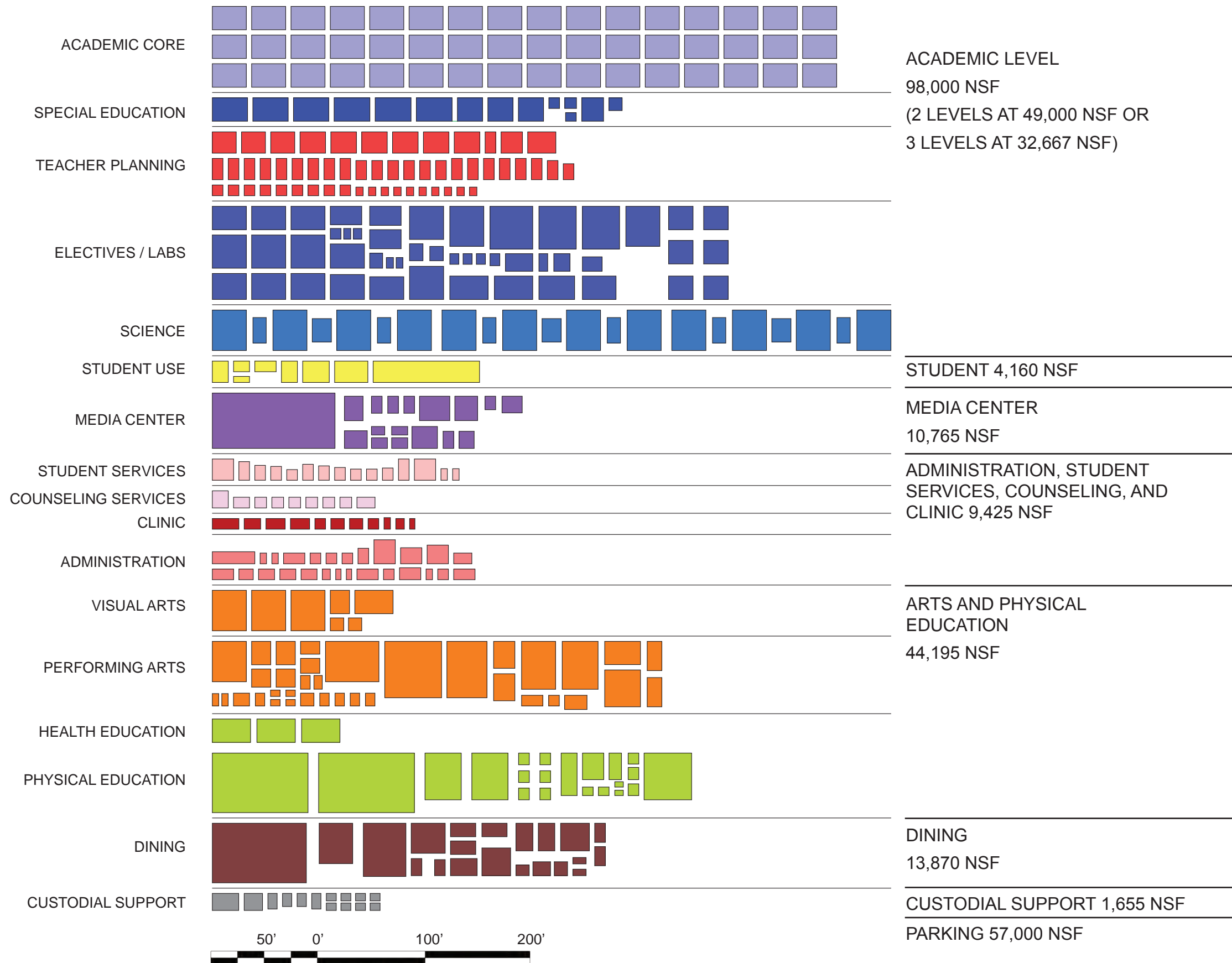
## PROPOSED SPACE USE (CONT'D)

13 Media Center				10765	6882			
Reading Room	1	6000	6000	1	4400	4400	1600	
Librarian Office	2	150	300	1	150	150	150	
Librarian Workroom	1	350	350	1	200	200	150	
Audio Visual Storage	1	500	500	1	365	365	135	
Communications Room	1	150	150	1	150	150	0	
Head End Closet	1	65	65	1	62	62	3	
Electronic Classroom	1	650	650	1	650	650	0	
Reading Classroom	1	490	490	1	490	490	0	
ITC Office	1	120	120	1	120	120	0	
ITC Storage	1	295	295	1	295	295	0	
Study Rooms	3	150	450			0	450	
Electronic Classroom	1	650	650			0	650	
Conference Room	1	225	225			0	225	
Periodical Storage Room	1	120	120			0	120	
Storage	1	400	400			0	400	
14 Food Services				13870	9190			
Dining Room	1	4950	4950	1	4835	4835	115	
Serving Area	1	900	900	1	735	735	165	
Snack Bar/Salad Area	1	300	300	1	300	300	0	
Kitchen	1	2000	2000	1	1370	1370	630	
Dry Storage Room	1	700	700	1	335	335	365	
Walk-In Freezer	1	300	300	1	240	240	60	
Walk-In Refrigerator	1	300	300	1	165	165	135	
Food Service Office	1	160	160	1	125	125	35	
Locker Room	1	150	150	1	90	90	60	
Toilets	1	65	65	1	65	65	0	
Table/Chair Storage	1	1200	1200	1	460	460	740	
Custodial Closet	2	75	150	2	55	110	40	
Toilet - Boys	1	180	180	1	180	180	0	
Toilet - Girls	1	180	180	1	180	180	0	
Janitor & chemical/soap storage Room	1	125	125			0	125	
Pot and Pan Wash	1	150	150			0	150	
Can wash/drying Room	1	160	160			0	160	
Dish/Tray Wash Room	1	400	400			0	400	
Trash Room	1	400	400			0	400	
Recycling Room	1	700	700			0	700	
Receiving Area	1	400	400			0	400	
15 Custodial Support				1655	1580			
Custodial Office	1	125	125	1	125	125	0	
Custodial Lounge	1	275	275	1	275	275	0	
Locker - Men	1	105	105	1	105	105	0	
Locker - Women	1	105	105	1	95	95	10	
Toilet - Men	1	65	65	1	65	65	0	
Toilet - Women	1	65	65	1	65	65	0	
Custodial Equipment Storage	1	400	400	1	400	400	0	
Custodial Supplies	1	125	125	1	125	125	0	
Janitor's Closets	6	65	390	5	65	325	65	

**181,945 TOTAL NSF**  
 69,664 38% Grossing Factor  
**251,609 TOTAL GSF**  
 209.67 SF per Student

**147,418 TOTAL NSF**  
 56,444 38% Grossing Factor  
**203,862 TOTAL GSF**  
 239.84 SF per Student



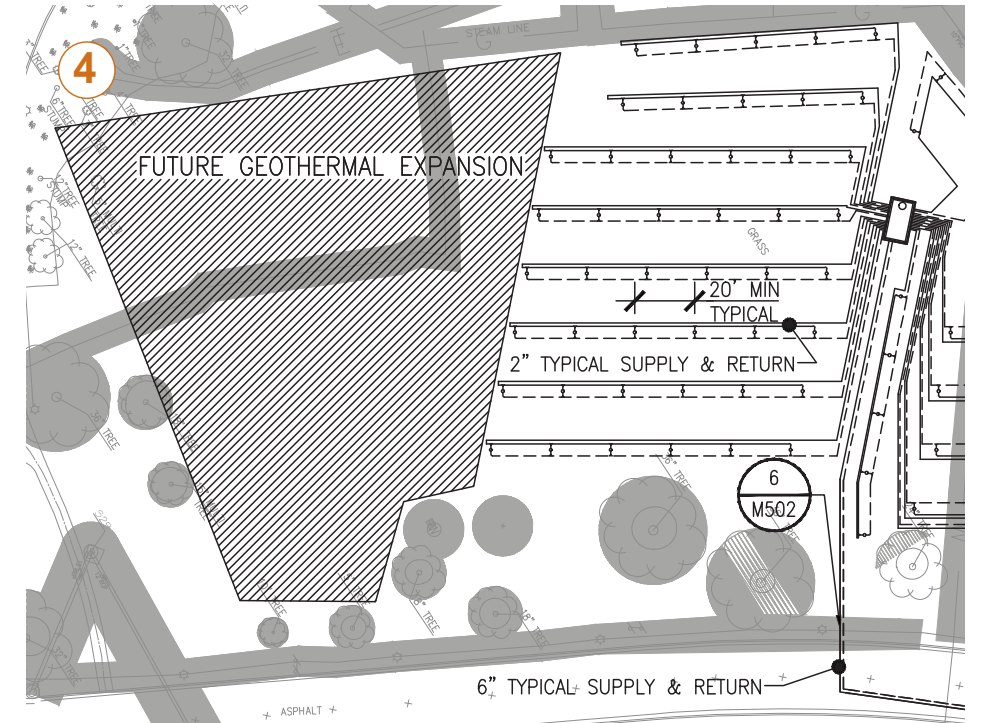
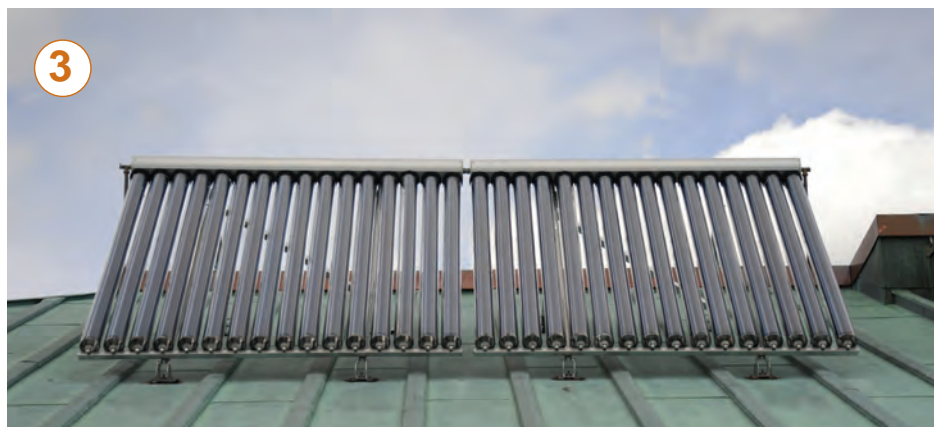


## SUSTAINABILITY AND HIGH PERFORMANCE SCHOOLS

At the site planning level, a number of sustainable strategies may be considered to promote energy efficiency and high performance learning environments in the later stages of development. For this study, the primary considerations relevant to this project centered on solar orientation and natural daylighting strategies, opportunities for ground source mechanical systems, and site stormwater measures.

The concepts evaluated in this study each have unique strengths and weaknesses as relate to these key criteria. The small building footprint, and north-south orientation of the site, present challenges to natural daylighting strategies. The favorable south facing classroom orientation is a challenge to achieve in a consistent and equitable manner across the core learning environments. The concept that prioritized this approach was only possible if the existing multi-purpose field was eliminated. As a result many of the core classrooms have either east or west facing glazing. The control of solar heat gain for these facades should be carefully considered through energy modeling as the design progresses.

The limited building site does present opportunities to use the existing multi-purpose field for a ground source heat pump system. Additionally, the quantity of impervious surfaces that contribute to greater demands for stormwater management are thereby reduced. Underground parking strategies would minimize the amount of both impervious surfaces and surfaces that contribute to heat island effects.



1. INTEGRATED PHOTOVOLTAICS
2. ROOF TOP SOLAR ARRAY
3. ROOF TOP SOLAR HOT WATER SYSTEM
4. GEOTHERMAL FIELD



## PROPOSED CONCEPTS

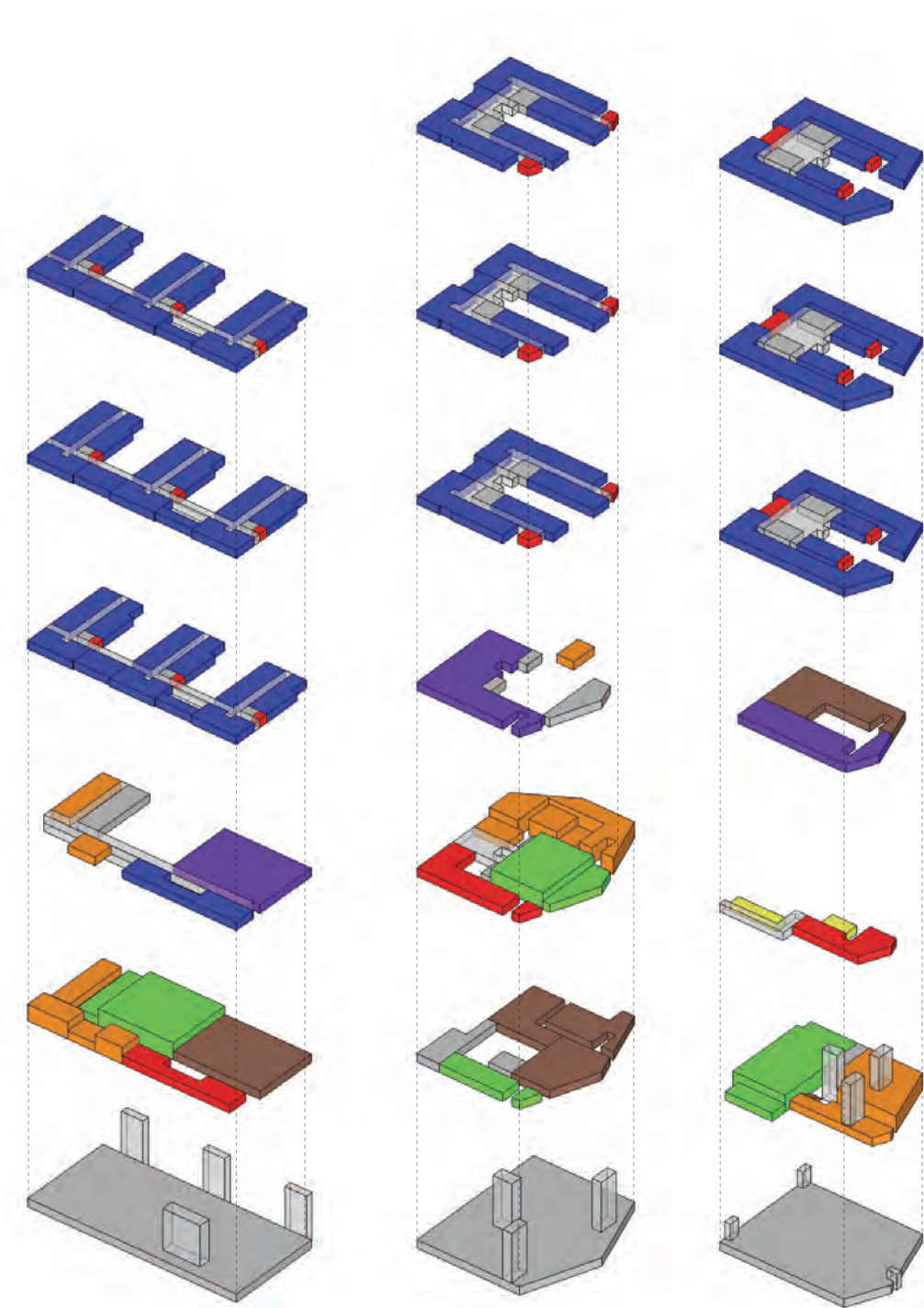
The team evaluated a number of design concepts. Due to the structural requirements associated with these spaces, all of the concepts that were evaluated located the large volume and community program spaces; such as the gymnasium, Performing Arts program, media center, and cafeteria; on the lower levels. Due to the limitations of the size of the site, the academic program was located on the upper levels.

Three strategies for their organization were evaluated:

- Organized in a horizontal manner on the main entry level.
- Gymnasium and Performing Arts one level below grade, connected to the main entrance with a multi-story atrium. The media center and cafeteria are stacked above this level.
- Gymnasium and Performing Arts are at the level of the main entry. The media center and cafeteria are located below this level, partially below grade.

Strategies to provide south facing natural light to the core classroom environments was a primary determinant in one of the initial concepts. Given the buildable site has minimal south facing frontage, this scheme required classroom clusters to be organized in three bars with core classrooms on the south side, and resource rooms and computer labs on the north side. This scheme was only feasible if the multi-purposed field was eliminated from the site.

Initially two options were studied that did not relocate the internal road, at the north end of the site, which connects between North Stafford and North Quincy Streets. Given the need to maintain adjacencies with the playing field and the constraints on buildable site areas, it was determined that viable design solutions would require relocation of the internal road that curves around the Education Center.



PREVIOUSLY STUDIED CONCEPTS

Two concepts are presented in this report for further consideration. The primary feature that distinguished the two schemes is whether the building is organized horizontally or vertically. Each have unique opportunities and challenges, which are summarized as follows:



## Opportunities

### Common to both schemes

- Build a new state of the art middle school design for 21st century learning and curricula.
- Build a school that provides amenities to the Ballston-Virginia Square community and to the larger Arlington Community.
- Share parking and fields with existing high school.

### Concept A - Tower Scheme

- Potential to implement sustainable design features such as a ground source heat pump system, photovoltaic and solar hot water systems, and high efficiency lighting and plumbing systems, which will reduce operational costs.
- Vertical circulation navigates between lower and upper levels of the site. The administrative functions are organized around an entrance at the lower level. The Cafeteria and Media Center are located on an upper level plaza, which is at the same elevation as the high school main floor.
- Gymnasium and Performing Arts on the same level.
- If structured parking is not required, the minimal building foot print may reduce geotechnical remediation costs associated with a previously developed site.
- Abundant access to natural light on all sides at the upper levels.
- Decision to build structured parking may be deferred.

### Concept B - Field Scheme

- Potential to implement sustainable design features such as high efficiency lighting and plumbing systems, and photovoltaic and solar hot water systems, which will reduce operational costs. A ground source heat pump system will likely not be feasible due to the footprint of the school.
- Implement a three level school that is consistent with other Arlington Public Schools.
- A level of underground parking may offset geotechnical remediation costs associated with a previously developed site.
- Gymnasium, Administration, Media Center, and Cafeteria are located on the main entry level. A grand stair connects to a mezzanine with the Black Box Theater, which is immediately visible from the main entrance.
- Building access is controlled at one main entrance.
- Rooftop field will reduce heat gain through the roof.
- Generous entry plaza at lower level.

## Challenges

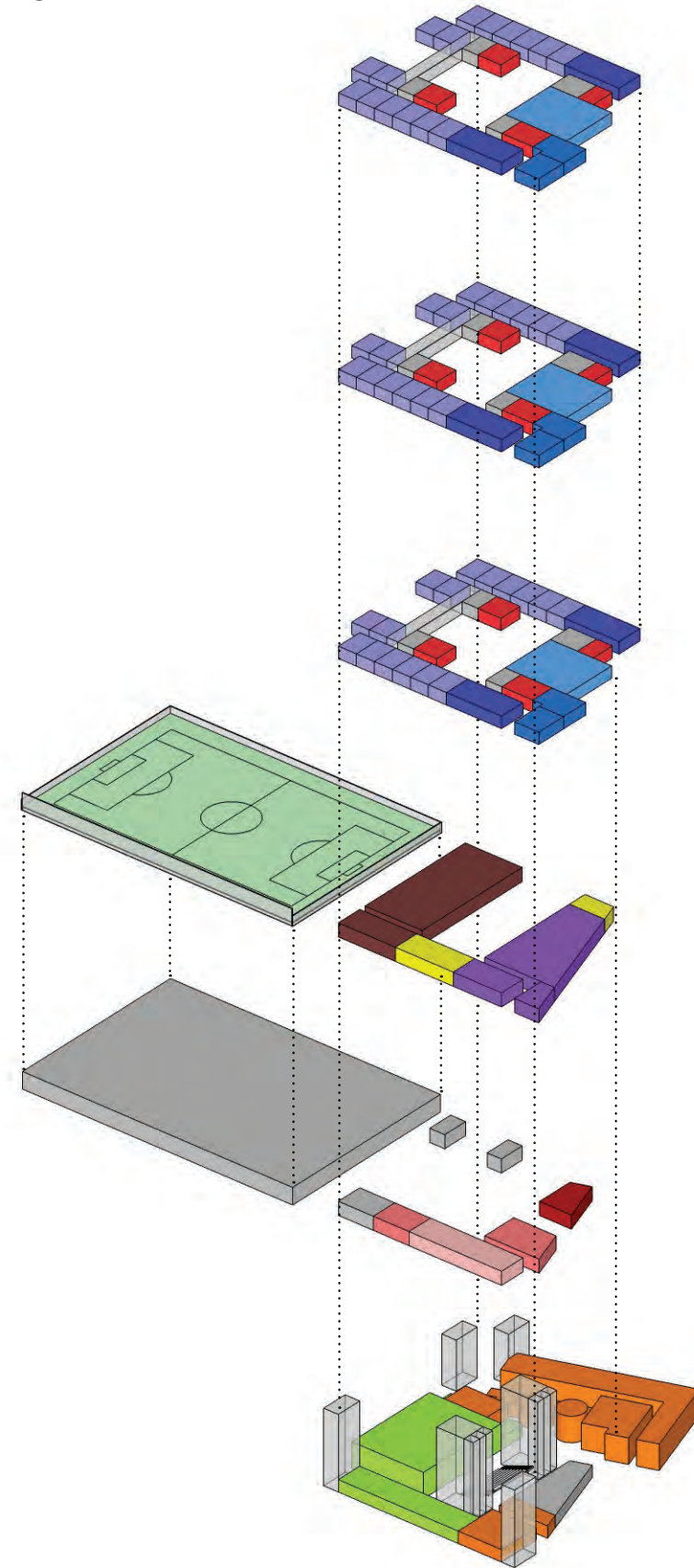
- Minimize the need for underground or structured parking.
- Design site circulation that is not adversely impacted by that of the high school.
- Locate a loading area that does not interfere with pedestrian and vehicular circulation.
- Due to limited site area, the proposed Building Height will require a special exception from the zoning code.

- The building will need a vertical design solution that will likely rise five to six stories. This approach is not common in the Arlington Public Schools system, and will require well considered vertical transportation solutions.
- Performing Arts program is below grade. Gymnasium and Visual Arts program is partially below grade.
- Underpinning of existing high school is required.

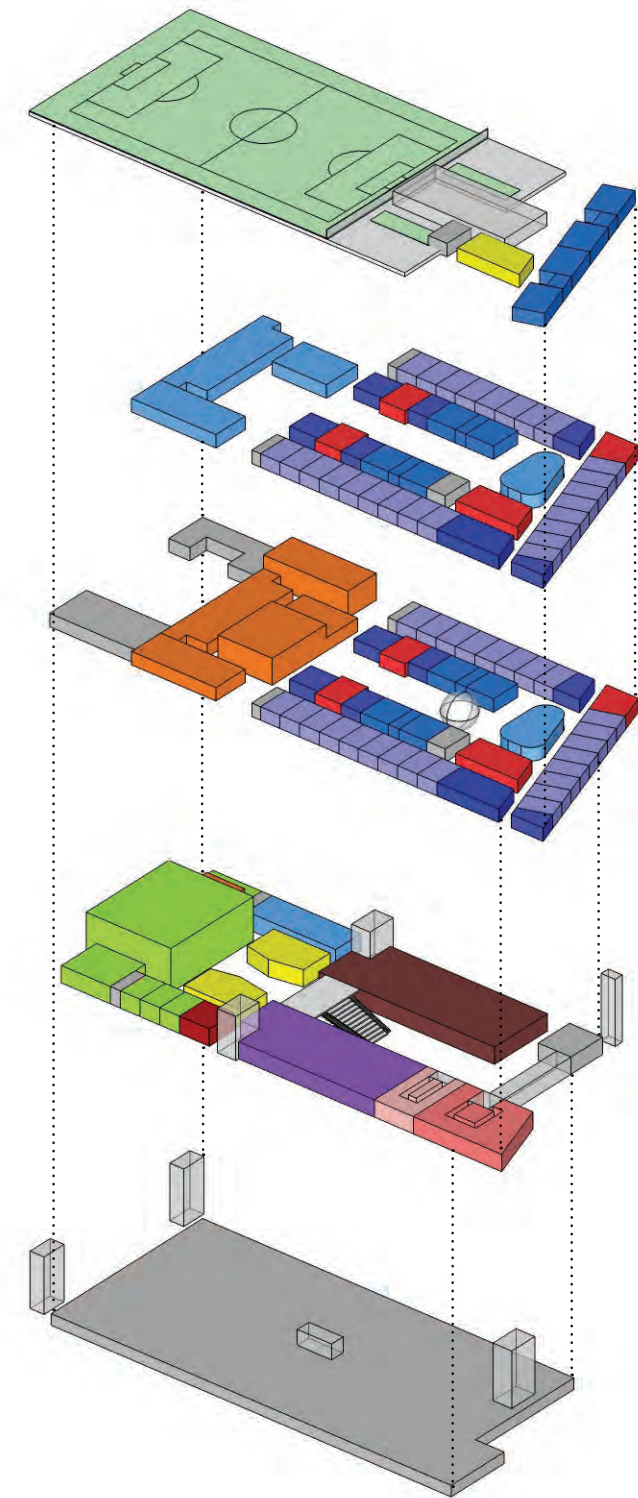
- Maintain existing field space.
- Provide natural light to spaces at the center of the building.
- Provide community access to rooftop multi-purpose field.
- Cafeteria and gymnasium are partially below grade.
- Rooftop field will impose additional loads on the structural system, and require careful coordination of rooftop penetrations.



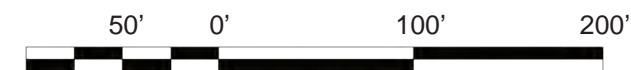
CONCEPT A



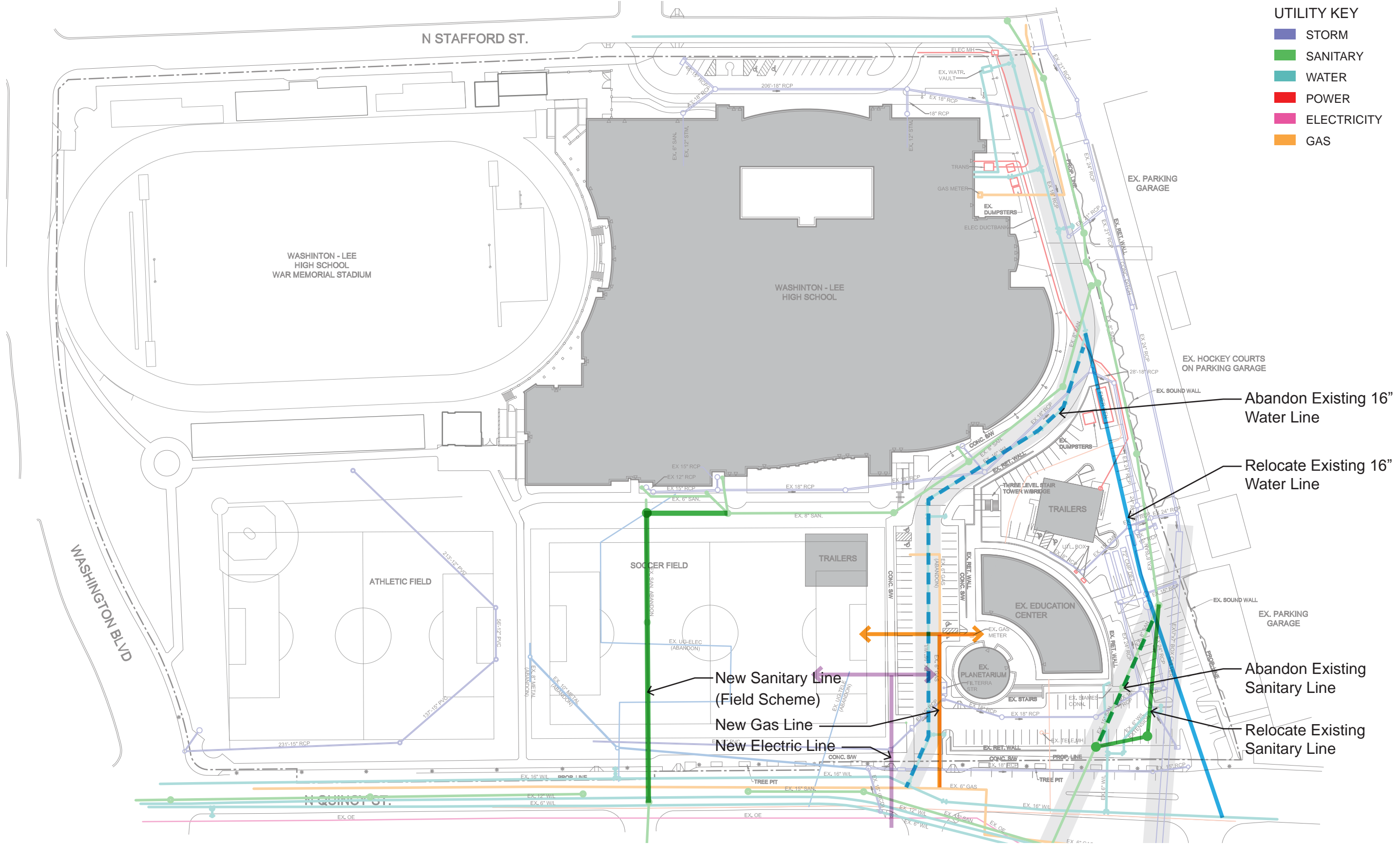
CONCEPT B



COMPARATIVE BLOCKING AND STACKING DIAGRAM



- UTILITY KEY**
- STORM
  - SANITARY
  - WATER
  - POWER
  - ELECTRICITY
  - GAS



**PROPOSED UTILITIES**





## PROPOSED CONCEPT A

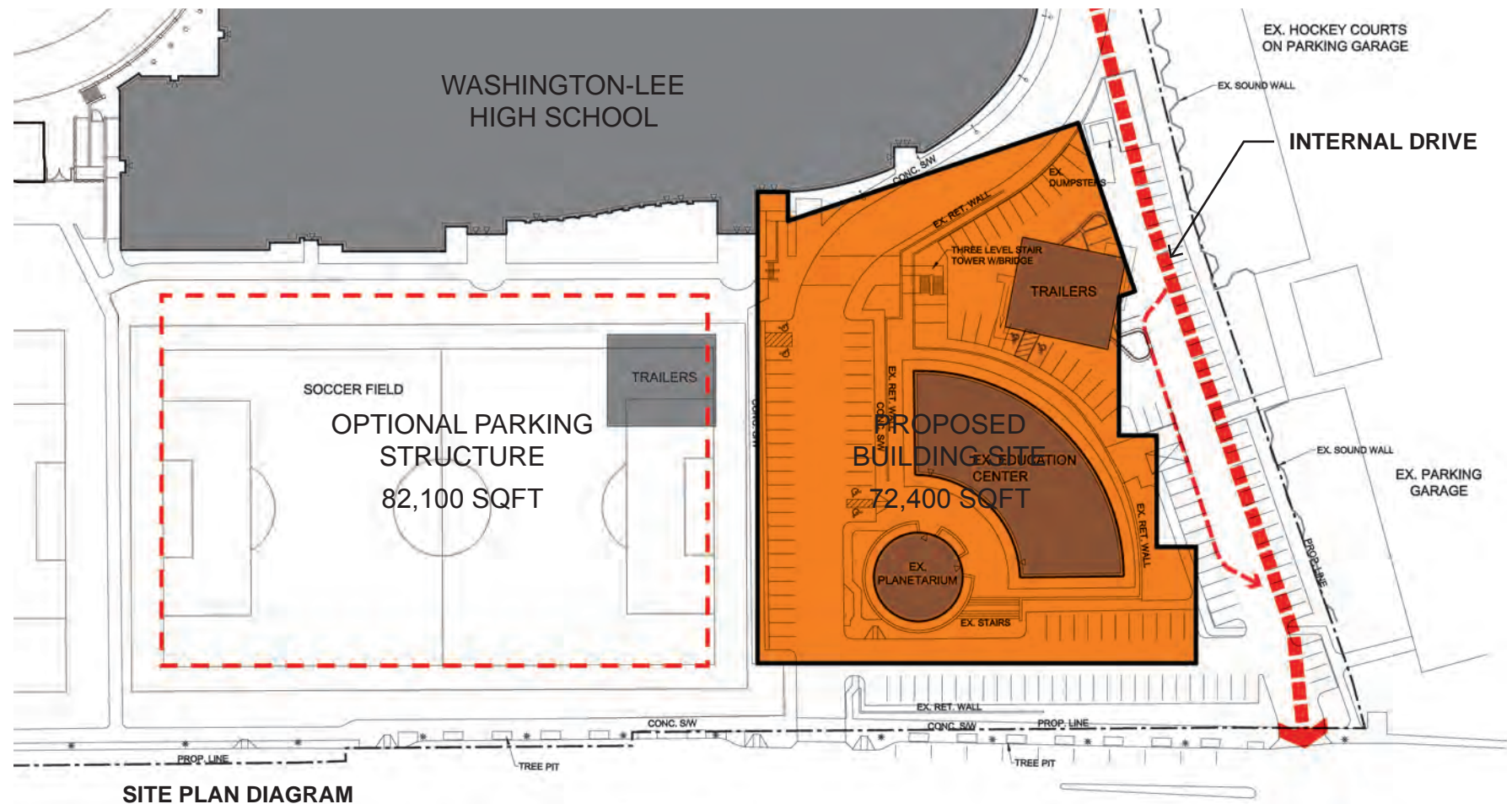
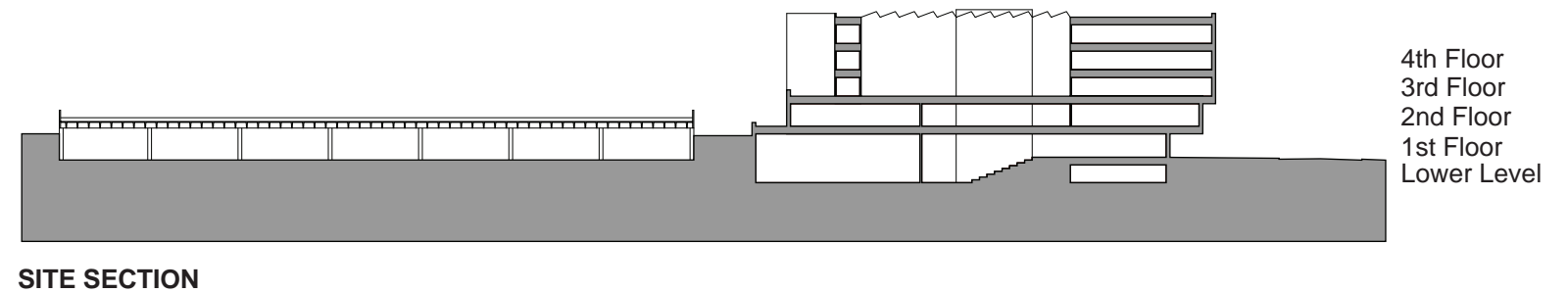
Concept A is sited at the northeast corner of the site, where the Education Center currently stands. The internal drive is realigned at the north end of the site to allow the school to have an immediate adjacency with the multi-purpose field. This also allows for visitor parking and a drop off loop to be accessed from North Quincy Street.

Central to this concept is the organization of the school program, vertically, around a series of multi-story atria. This allows the school to occupy a minimal footprint on the site of the existing Education Center. Additionally, this strategy allows for the adjacent multi-purpose field to remain, or to be considered for a ground source heat pump system. The field may also be reconstructed as a synthetic field above a level of parking, providing covered recreation and community space when not in use.

The program is distributed vertically among six floors as follows:

- 5th floor – 8th grade academic and teacher planning spaces
- 4th floor – 7th grade academic and teacher planning spaces
- 3rd floor – 6th grade academic and teacher planning spaces
- 2nd floor – upper level entry, cafeteria, and media center, student activities
- 1st floor – main entry, administration, and student services
- Lower level – gymnasium, performing arts, and visual arts

One uniform level of parking is located under the multi-purpose field. The typical clear height over the parking is increased to provide a covered indoor recreation and community event space.



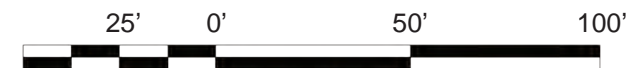


CONCEPT A - SITE PLAN DIAGRAM





CONCEPT A - LEVEL 256'





CONCEPT A - LEVEL 270'

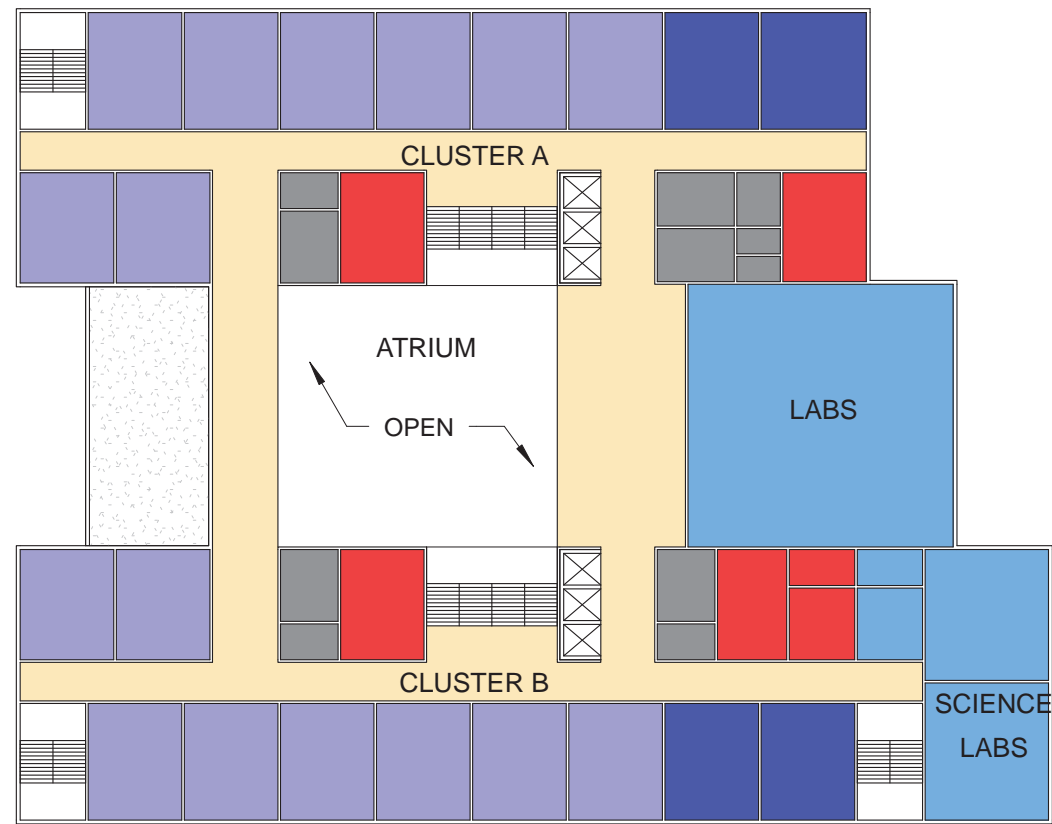






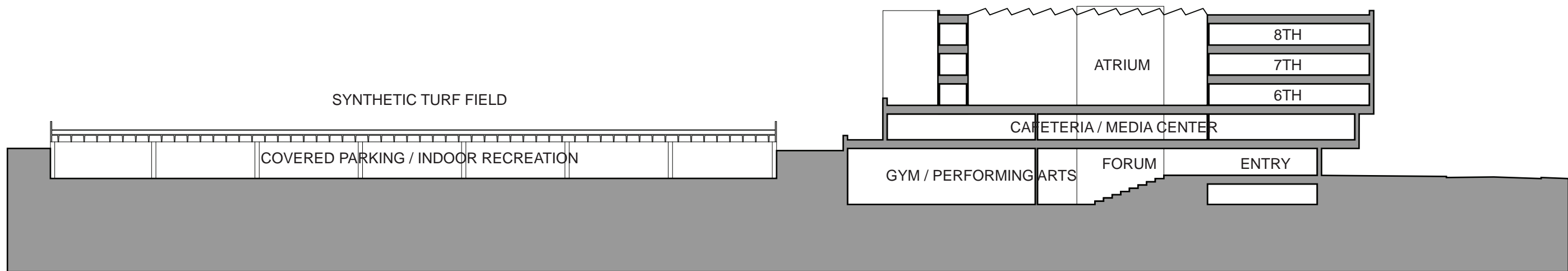
CONCEPT A - LEVEL 284'





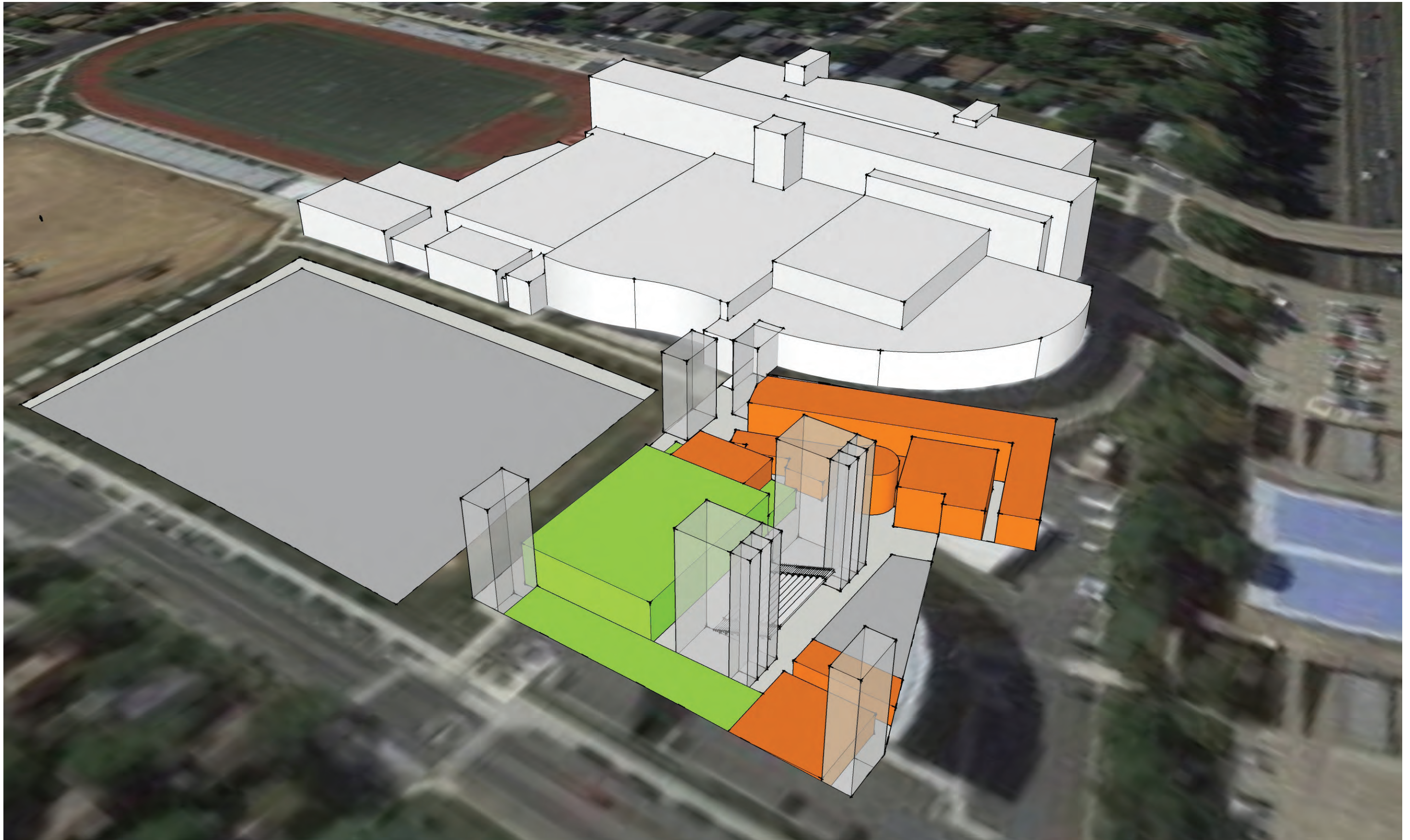
CONCEPT A - LEVEL 302' / 316' / 330'





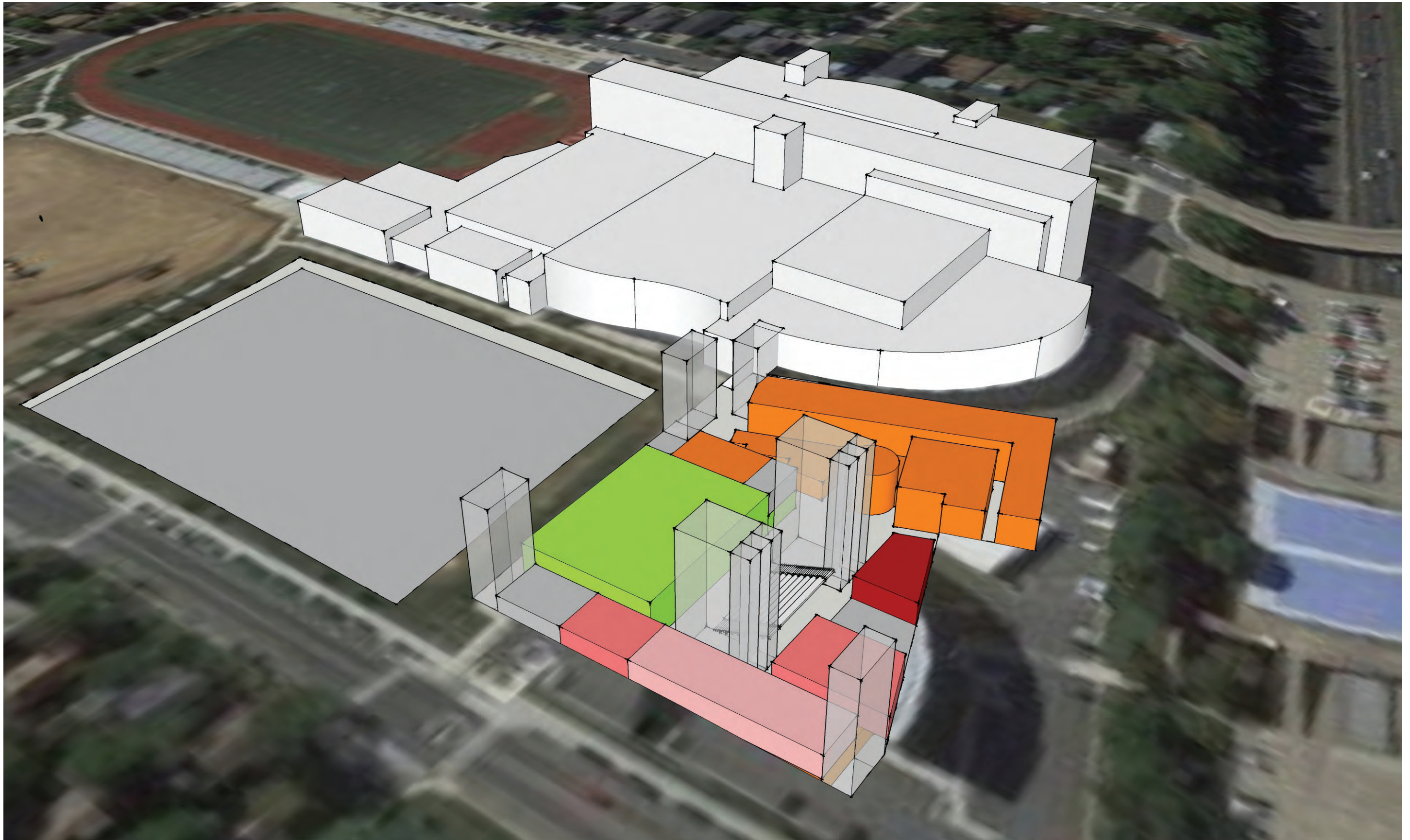
CONCEPT A - SECTION





CONCEPT A - LEVEL 256'





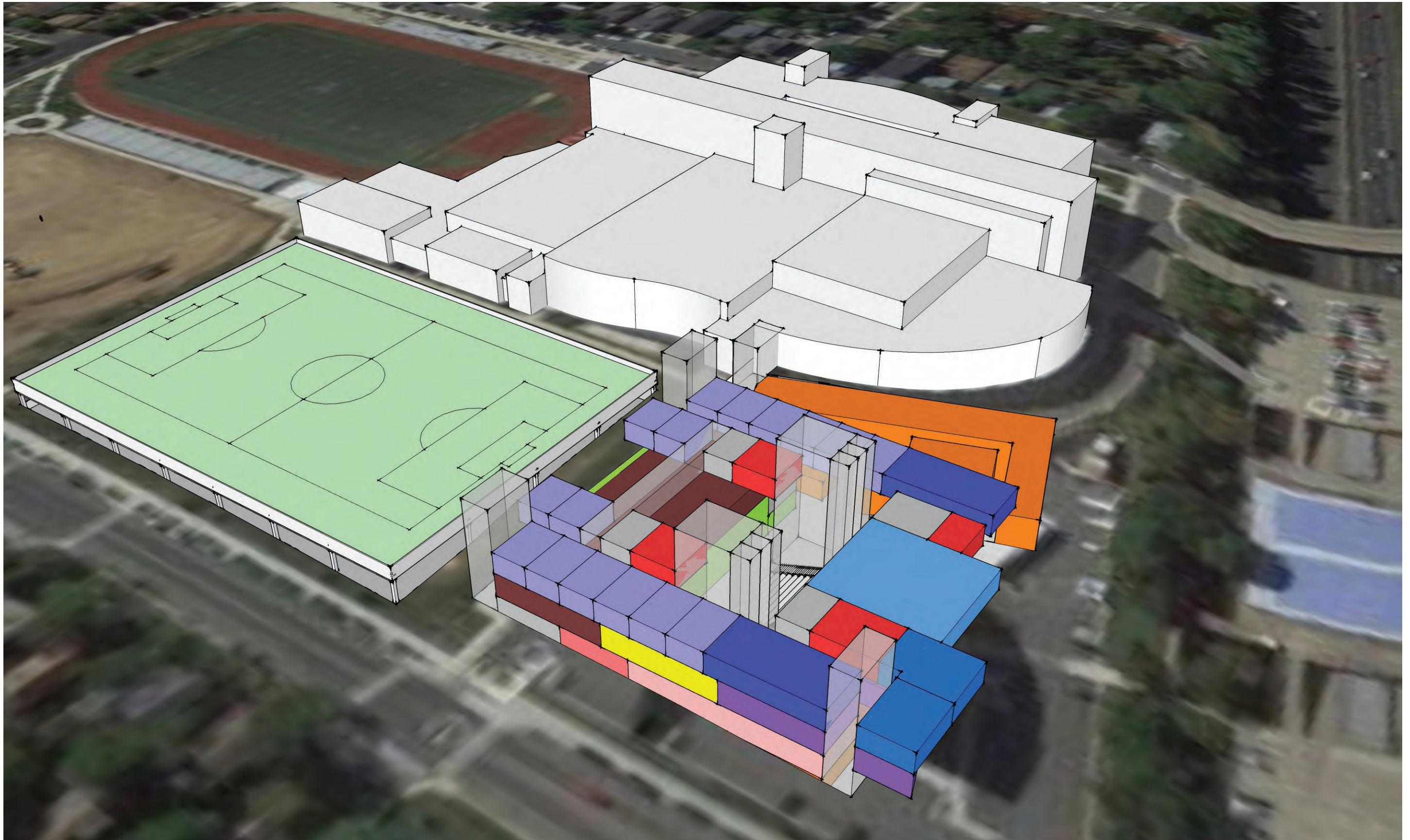
CONCEPT A - LEVEL 270'





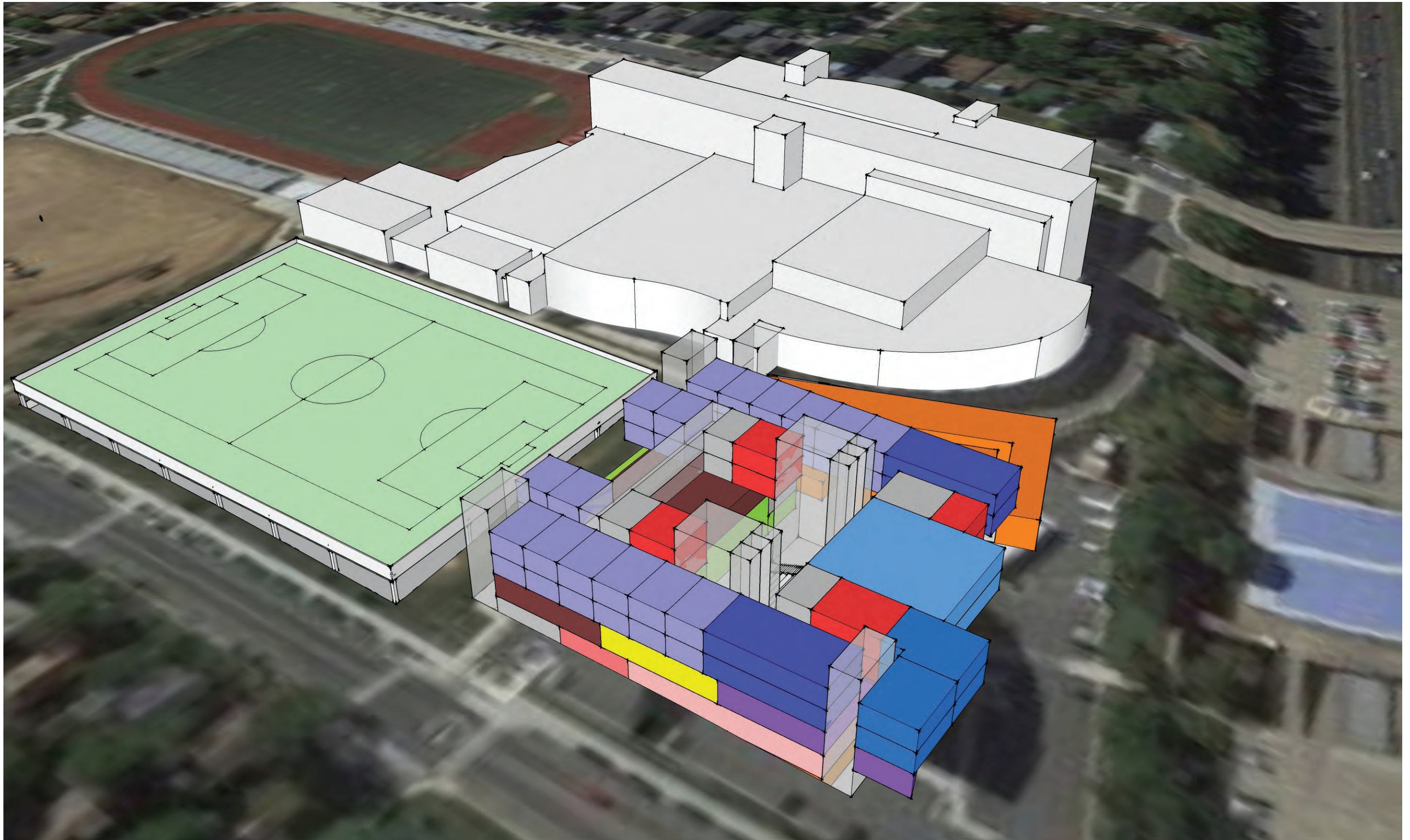
CONCEPT A - LEVEL 284'





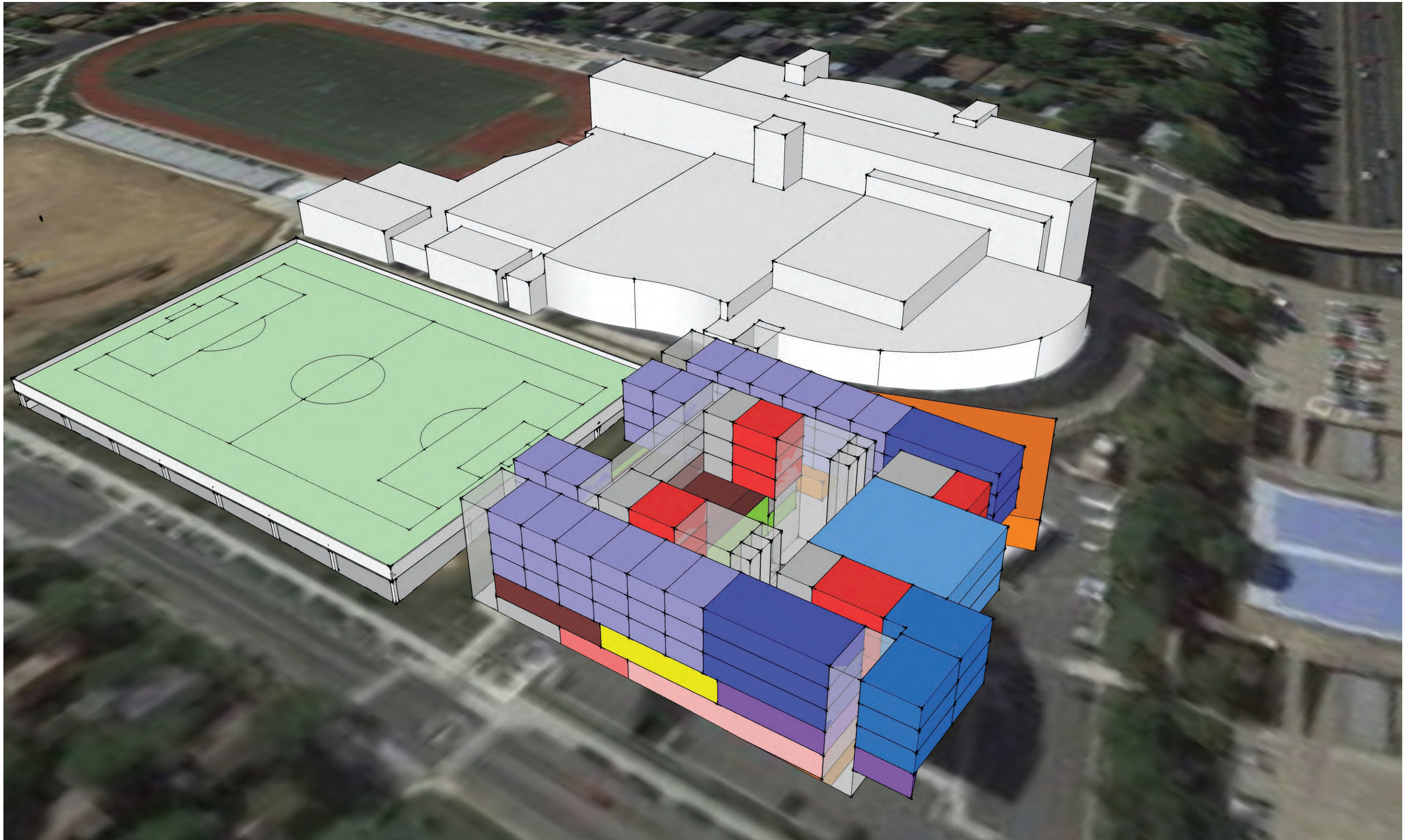
CONCEPT A - LEVEL 302'





CONCEPT A - LEVEL 316'



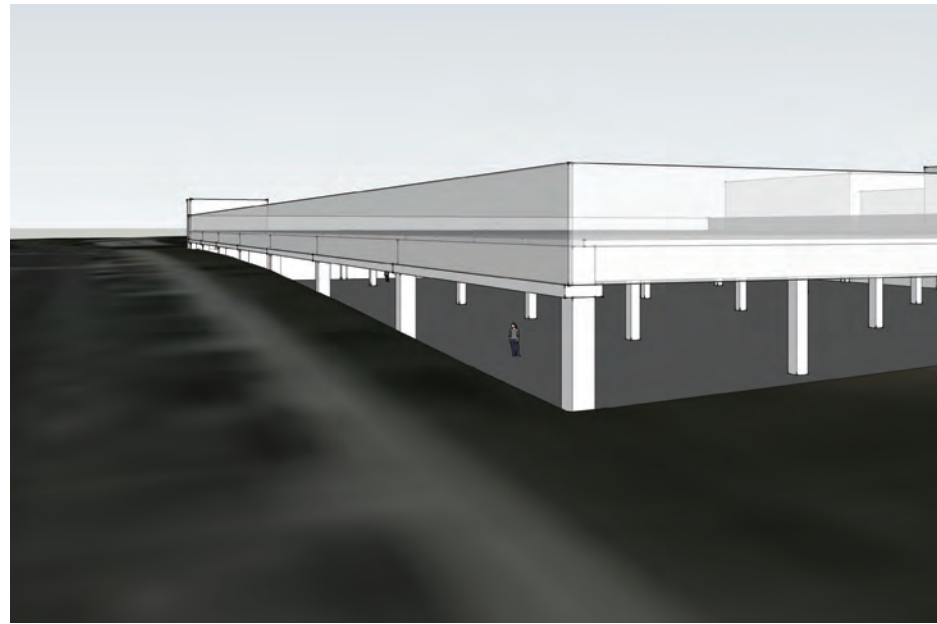


CONCEPT A - LEVEL 330'





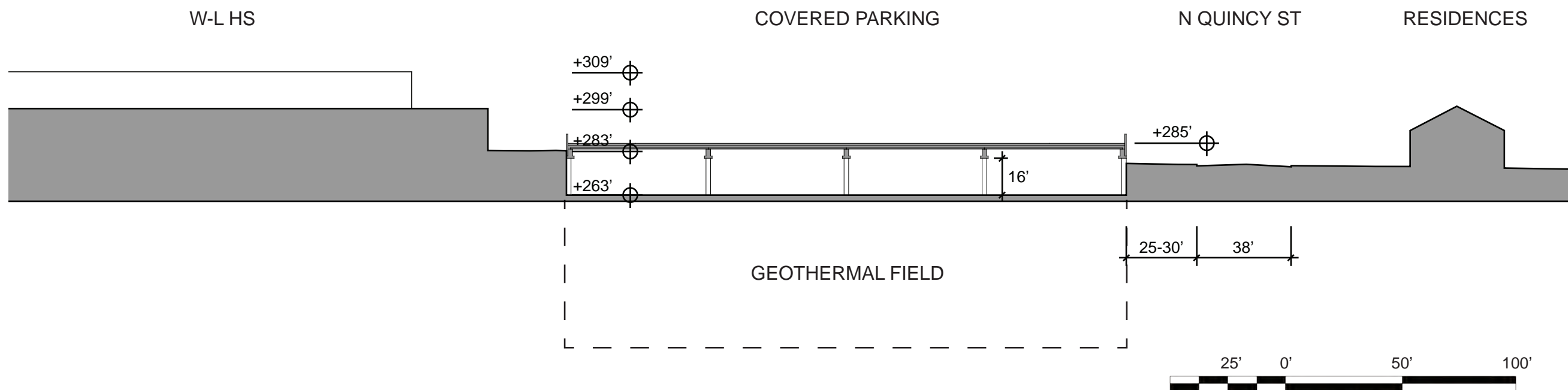
AERIAL VIEW



VIEW FROM N QUINCY STREET



INTERIOR VIEW



**COVERED PARKING / INDOOR RECREATION AND EVENT SPACE +263**

## PROPOSED CONCEPT B

Concept B is sited on the multi-purpose field. Again the internal drive is realigned at the north end of the site to allow the school to have an immediate adjacency with the multi-purpose field. Similarly, this design provides visitor parking and a drop off loop, accessed from North Quincy Street.

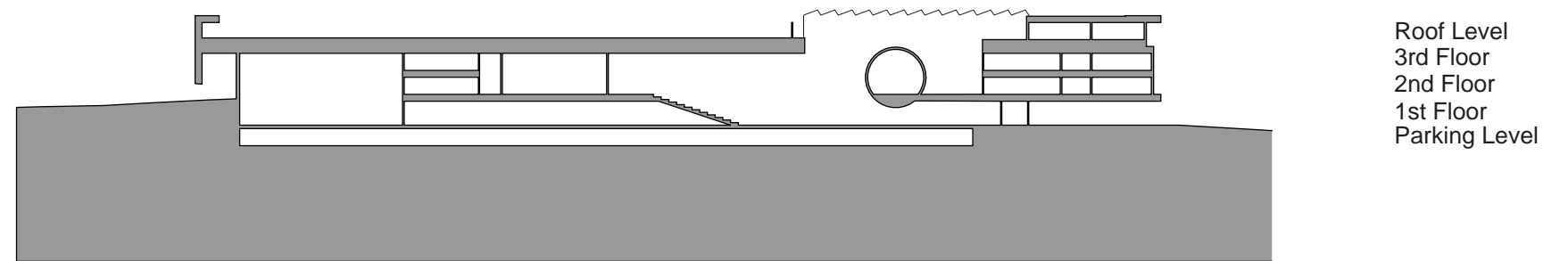
Central to this concept is the organization of the school program, horizontally, across the site with a central atrium. This allows the school maintain a lower profile on the site. Additionally, this concept provides a clear wayfinding strategy, locating all of the main public program uses around the central atrium.

The program is distributed vertically among four floors as follows:

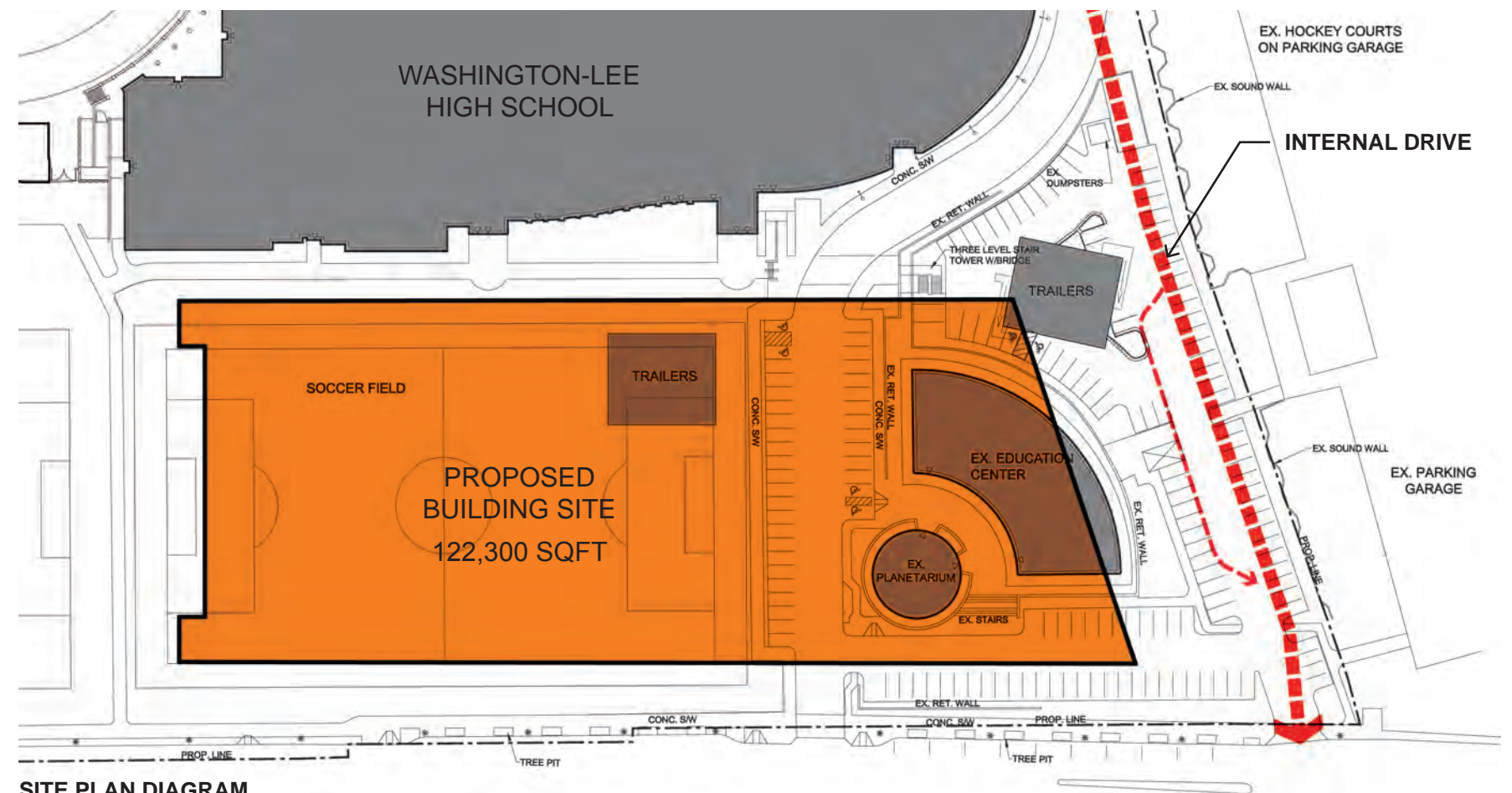
- Roof level – 8th science
- 3rd floor – 7th and 8th grade academic and teacher planning spaces; life skills; technology education
- 2nd floor – 6th and 7th grade academic and teacher planning spaces; visual and performing arts
- 1st floor – main entry; administration; student services; gymnasium; cafeteria; media center; student activities

Horizontally, the large volume program spaces – gymnasium, black box theater, and music rooms - are located on the south side of the site. On north side of the site two levels of academic spaces are stacked over the media center, cafeteria, and administration.

One uniform level of parking is located under the building. To maintain security in the parking area, these spaces are dedicated solely for authorized staff use.



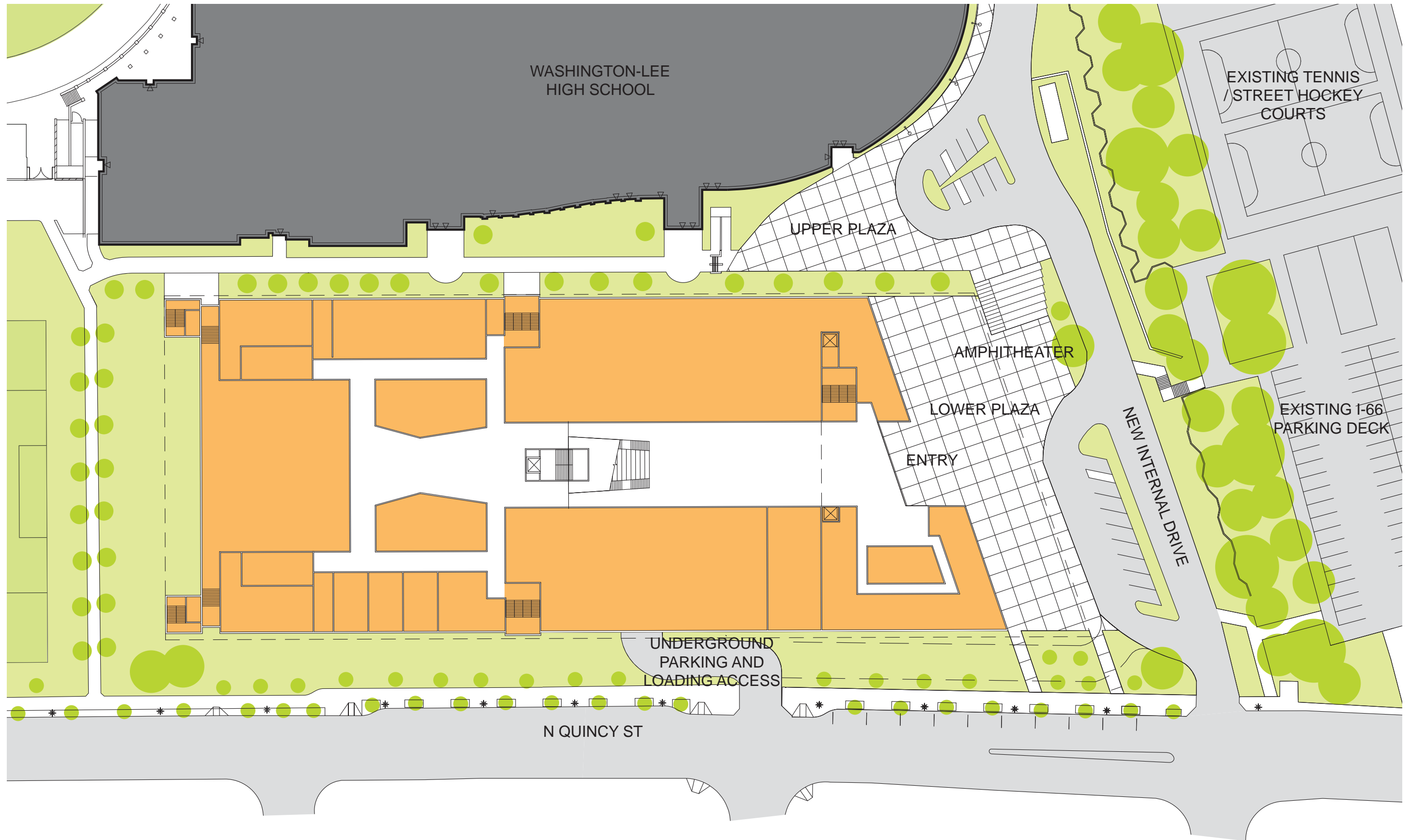
SITE SECTION



SITE PLAN DIAGRAM



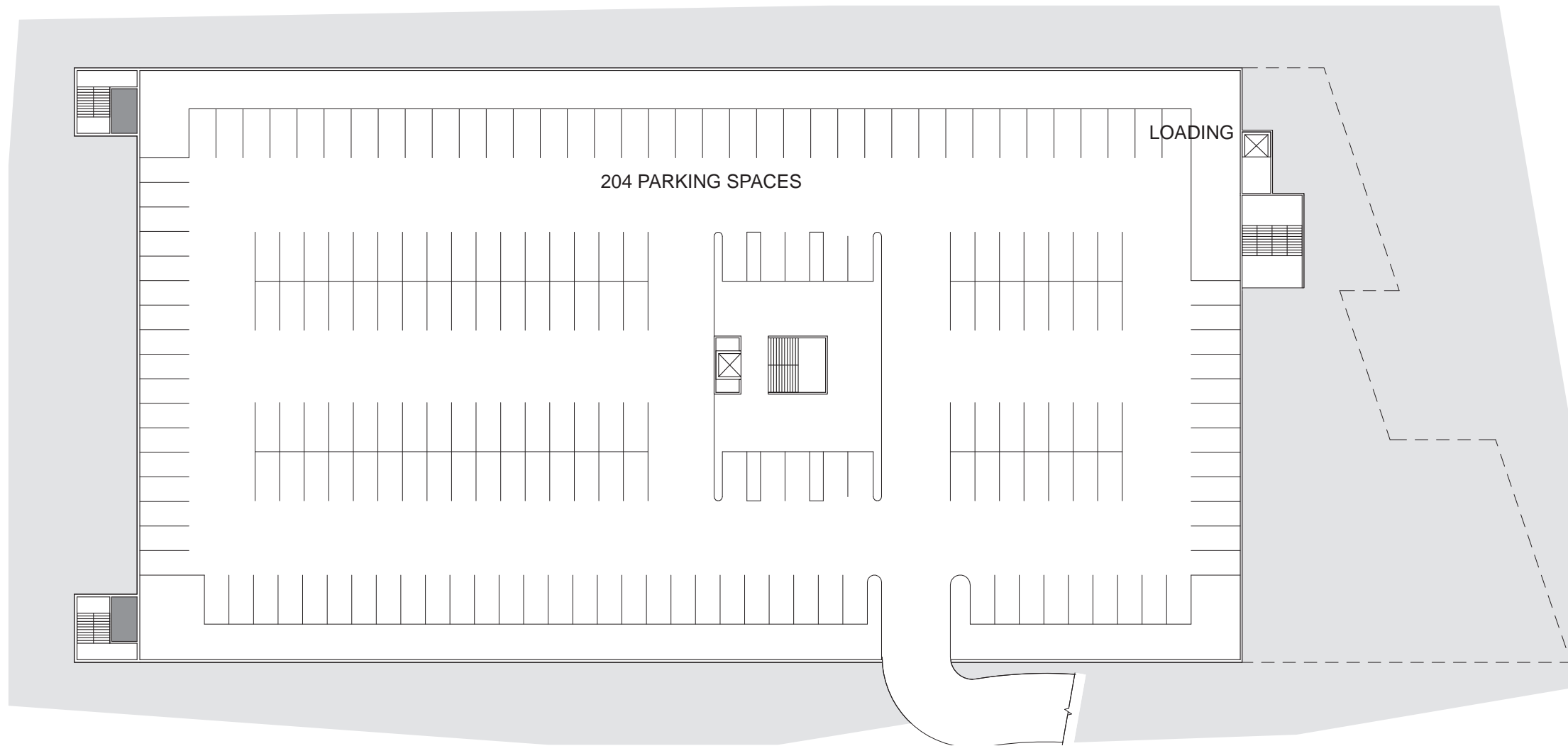




CONCEPT B - SITE PLAN



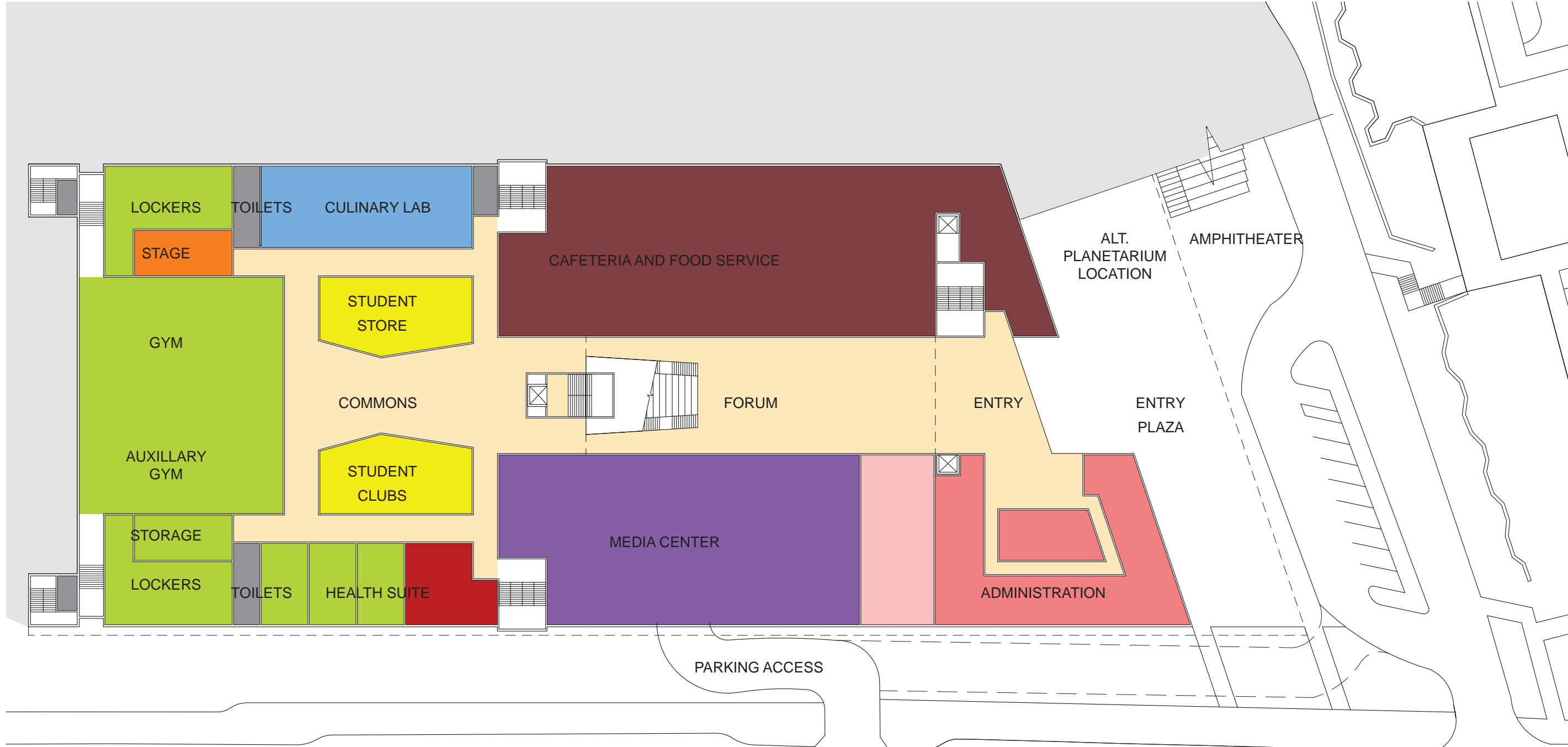
QUINN EVANS ARCHITECTS



CONCEPT B - LEVEL 252'







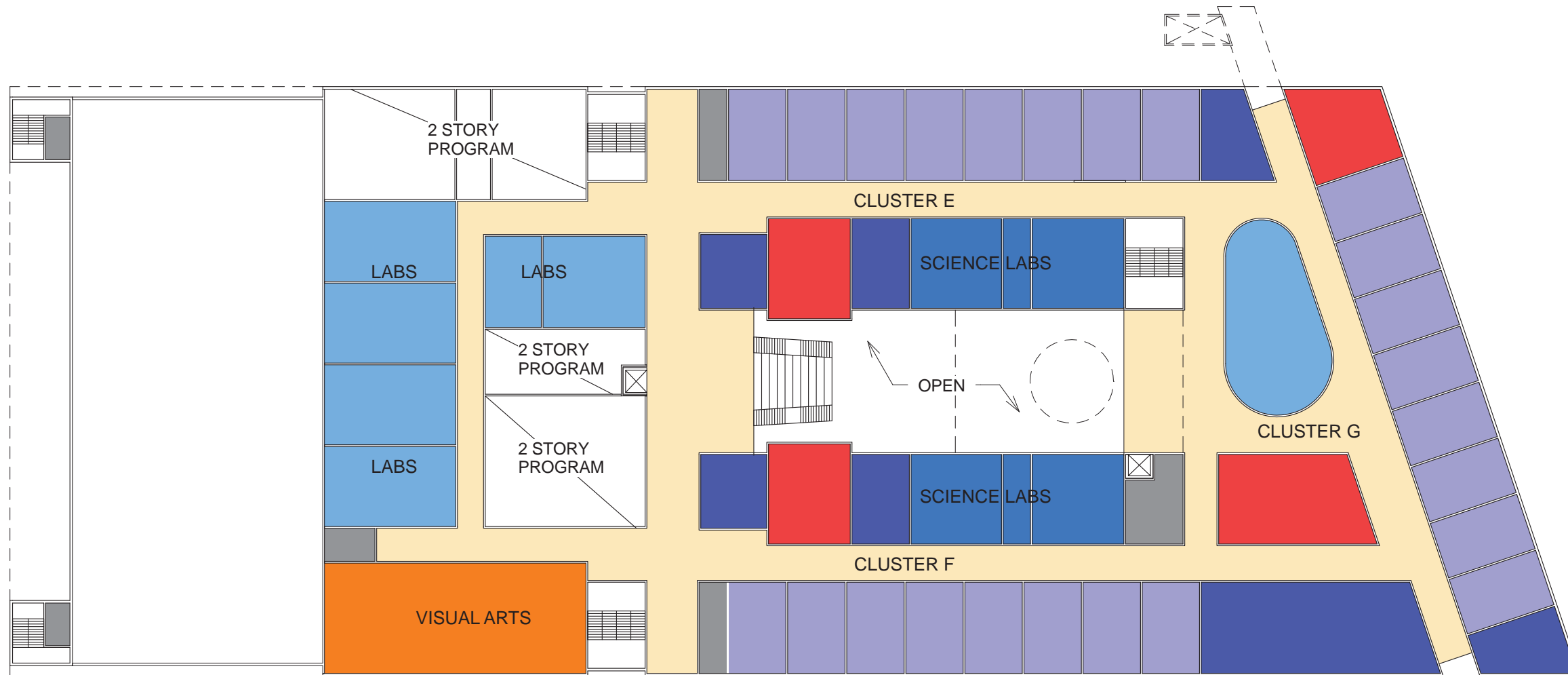
CONCEPT B - LEVEL 268'

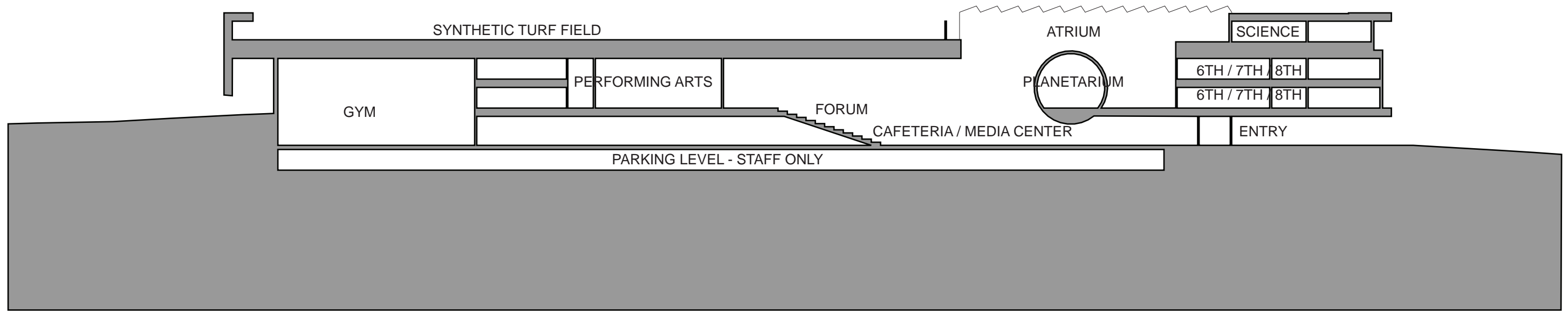


CONCEPT B - LEVEL 284'





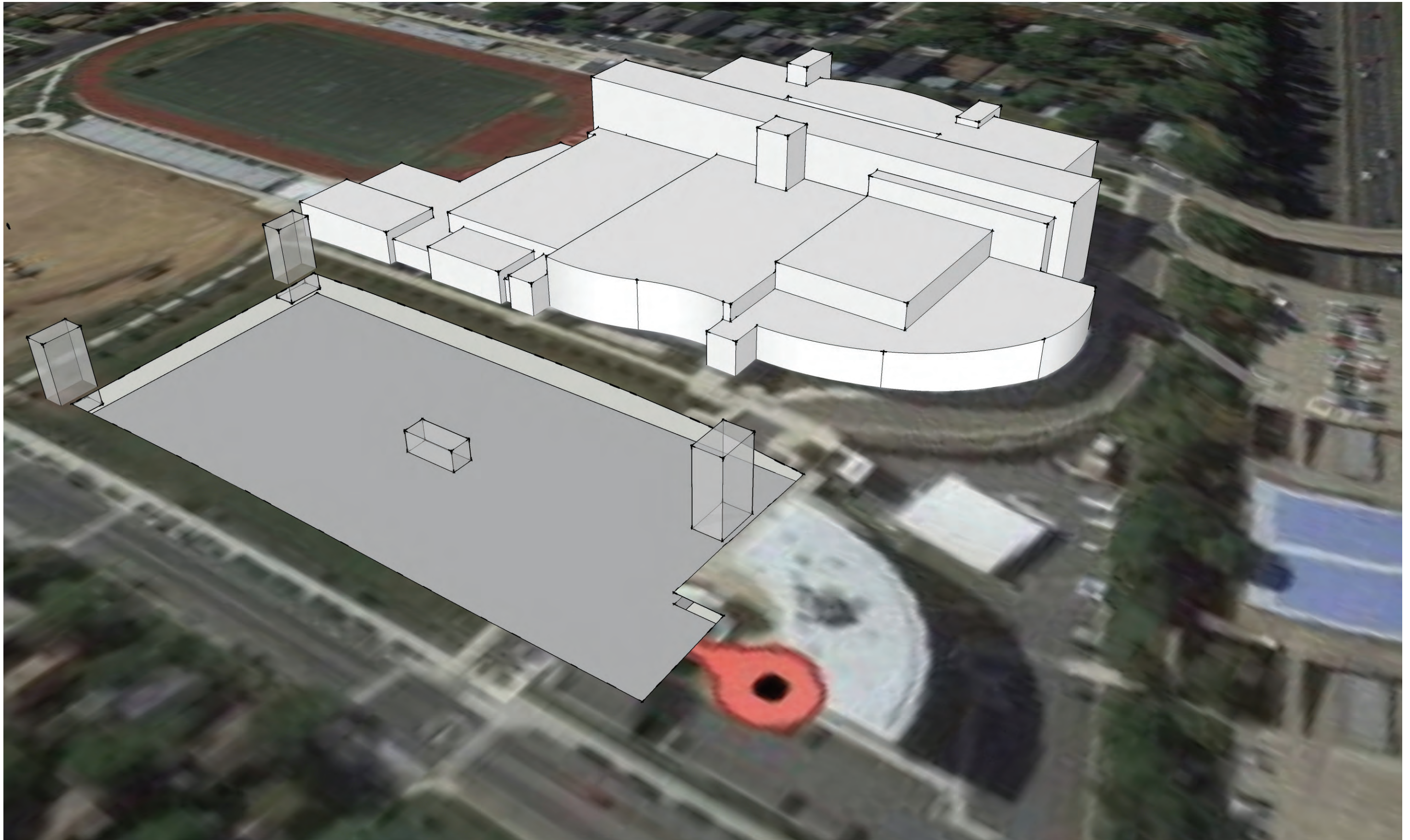




CONCEPT A - SECTION

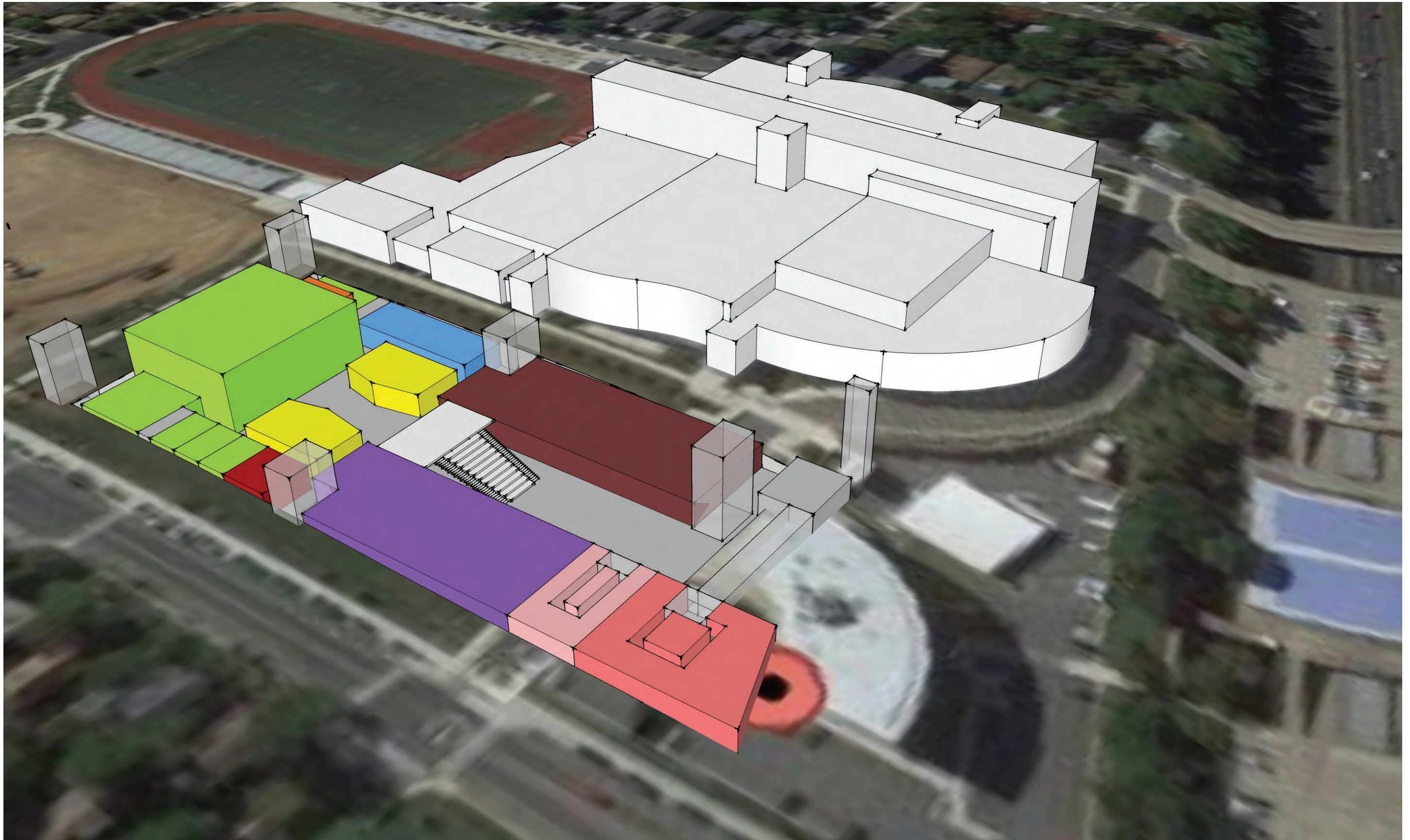






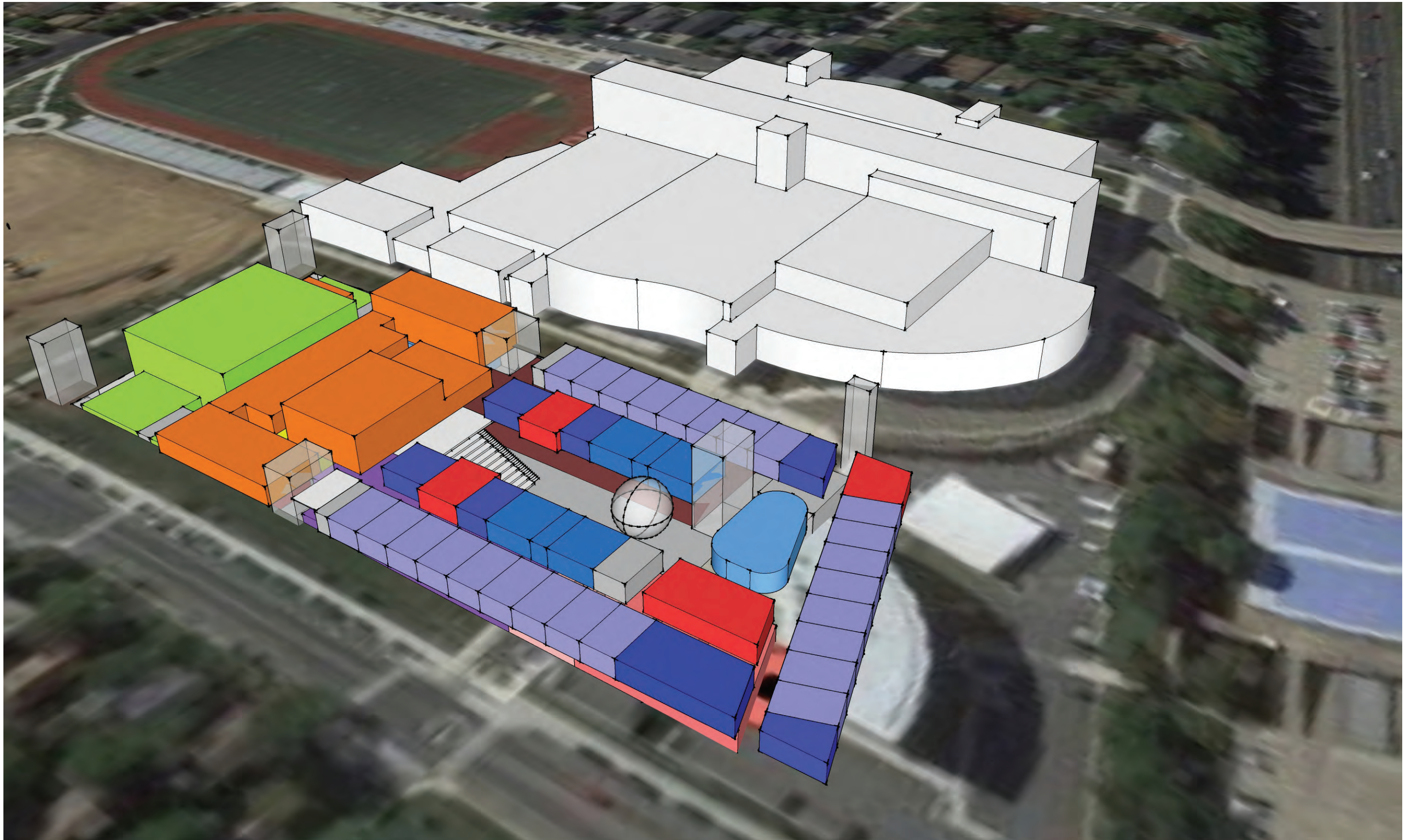
CONCEPT B - LEVEL 252'





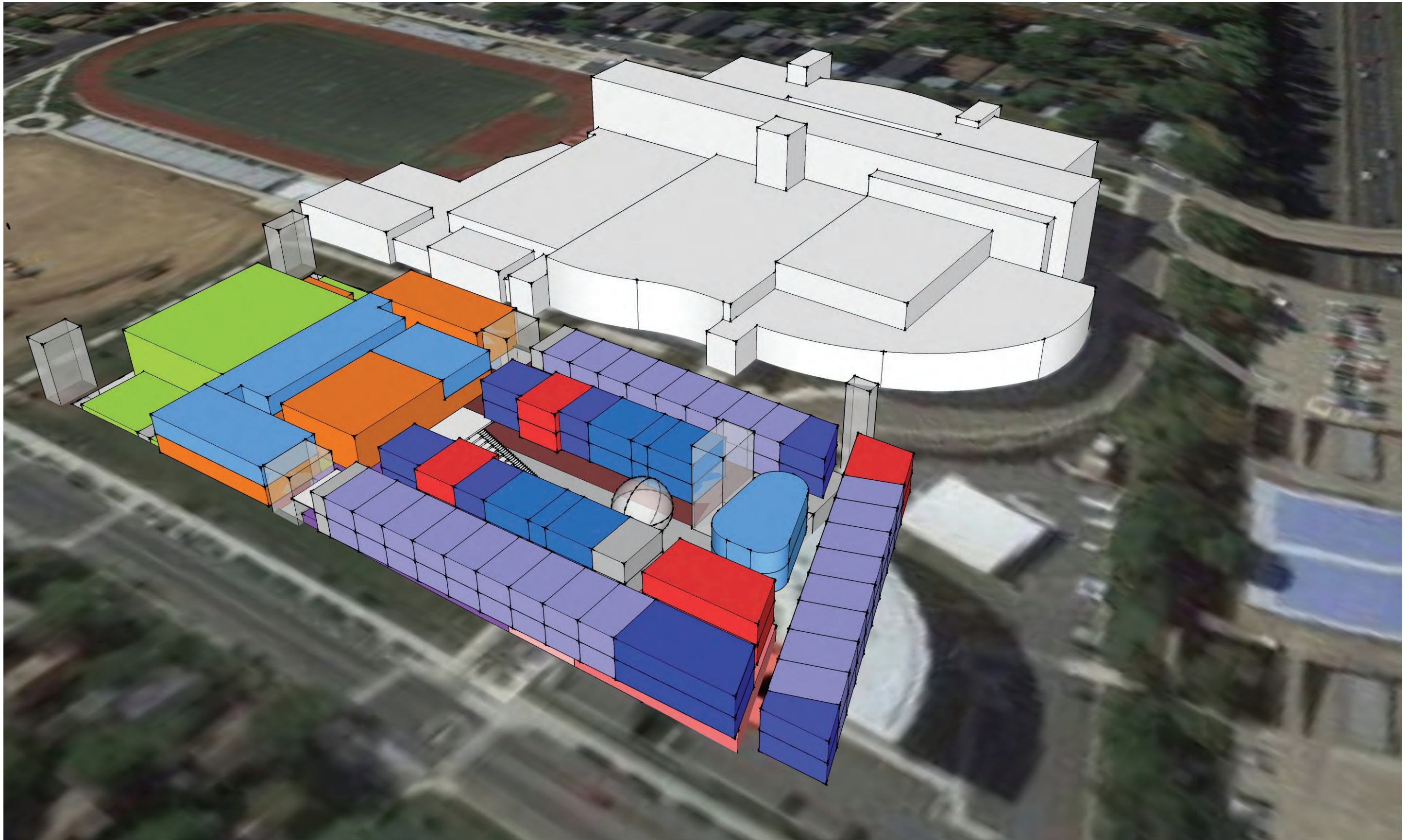
CONCEPT B - LEVEL 268'





CONCEPT B - LEVEL 284'





CONCEPT B - LEVEL 298'





CONCEPT B - LEVEL 312'





CONCEPT B - AERIAL VIEW