

PRELIMINARY PLANS PRESENTATION

Northwood High School **Addition/Facility Upgrade**

Prepared for
Montgomery County Board of Education

February 2020

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Preliminary Plans Presentation

Northwood High School **Addition/Facility Upgrade**

919 University Boulevard West,
Silver Spring, Maryland 20901

Montgomery County Board of Education

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Ms. Deborah Szyfer	Senior Facility Planner, Division of Capital Planning

Facility Advisory Committee

Involvement

The preliminary plans for the Northwood High School addition/facility upgrades project were developed based on the educational specifications prepared by Montgomery County Public Schools (MCPS). Through a series of public work sessions, several design alternatives were developed and evaluated. The proposed plans presented herein were modified and evaluated in accordance with suggestions and recommendations received during the schematic design work sessions.

Membership of Committee

Ms. Mildred Charley-Greene	Principal	Northwood High School
Ms. Sara Baudry	Assistant Principal	Northwood High School
Ms. Linda Jasper	Assistant Principal	Northwood High School
Mr. Jake Lee	Assistant Principal	Northwood High School
Mr. Delmer Padgett	Assistant Principal	Northwood High School
Mr. Corey Ahearn	Staff	Northwood High School
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Mr. Ryan Casavant	Staff	Northwood High School
Ms. Jill Clark	Staff	Northwood High School
Mr. Tony Dickens	Staff	Northwood High School
Ms. Suzy Duong	Staff	Northwood High School
Mr. S Eaton	Neighbor	Community
Ms. Lora Elinoff	Parent	Highland View Elementary School
Ms. Keyly Ferrufino	Student	Northwood High School
Mr. Dave Fischer	Neighbor	Community
Mr. Marco Fuggitti	Staff	Northwood High School
Mr. Kevin Gunthert	Parent	Northwood High School
Ms. Lucy Hick	Parent	Sligo Middle School

Facility Advisory Committee (continued)

Membership of Committee (continued)

Mr. Hasani Isreal	Staff	Northwood High School
Ms. Holly Jones	Staff	Northwood High School
Ms. Michaela V. Johnson	Parent	Northwood High School
Mrs. Jean Marie Joseph	Staff	Northwood High School
Ms. Kristen Kane	Parent	Northwood High School
Ms. Karen Kraus	Staff	Northwood High School
Ms. Michelle Reed Kretkowski	Staff	Northwood High School
Mr. David Lindsay	Staff	Northwood High School
Ms. Daisy Lopez	Student	Northwood High School
Ms. Isabella Magarowitz	Student	Northwood High School
Ms. Ashley Marchionini	Parent	Northwood High School
Ms. Molly Mayer-Whittington	Staff	Northwood High School
Ms. Michele Moller	Parent	Northwood High School
Ms. Josary Moreno-Mejia	Student	Northwood High School
Ms. Zelda Myers	Student	Northwood High School
Mr. Andrew Peim	Staff	Northwood High School
Ms. Jeanett Peralta	Staff	DHHS-School Health Services
Ms. Allison Perry	Neighbor	Community
Ms. Miriam Plotinsky	Staff	Northwood High School
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Ms. Brandy Reazer	Staff	Northwood High School
Mrs. E. Reff-Presco	Staff	Northwood High School
Ms. Kristin Ruopp	Staff	Northwood High School
Mr. Mike Sauter	Neighbor	Community
Ms. Jenn Sawin	Parent	Northwood High School
Ms. Kristy Schwatka	Staff	Northwood High School
Ms. Dunya Siddique	Student	Northwood High School
Mr. Dan Stein	Staff	Northwood High School
Mrs. Lynne Stevens	Staff	Northwood High School
Mr. Kevin Verbrugge	Neighbor	Community
Ms. Maggie Welsh	Student	Northwood High School
Mr. John Wilson	Parent	Northwood High School
Ms. Lizzie Zoz	Student	Northwood High School

Northwood High School Addition/Facility Upgrade

Project Information

Background/History

Location: 919 University Boulevard West, Silver Spring, Maryland 20901

Cluster: Downcounty Consortium

History: Northwood High School, located on University Boulevard West, was originally constructed in 1956 with additions completed in 1958, 1964, and 1974. In 1985, the school was closed and reopened as a holding school in 1989. Due to the increasing student enrollment in the Downcounty Consortium, the school was reopened in 2004.

1956 Construction of Original School	151,002 square feet
2004 Reopened	253,488 square feet
2023 Planned Demolition	-253,488 square feet
2025 Planned New Facility	402,787 square feet
Total	402,787 square feet

Site Size: 29.3 Acres

Current and Projected School Capacity and Student Enrollment for Northwood High School:

	Preliminary	Projections							
	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2029	2034
Program Capacity	1508	1508	1508	1508	1508	1508	2700	2700	2700
Enrollment	1808	1839	1885	1936	1994	2004	2007	2049	2113
Space Available/ Deficit	(300)	(331)	(377)	(428)	(486)	(496)	693	651	587

Current Parking Spaces: 367

Project Information (continued)

Educational Program Objectives

The purpose of the project is to provide Northwood High School with an up-to-date facility while increasing the capacity to 2,700 students to accommodate projected student enrollment in the Downcounty Consortium. In order to accomplish these objectives, the existing school will be demolished and replaced on the same site.

The proposed Northwood High School will meet the requirements of the educational specifications for a new high school by providing one hundred twenty-six (126) teaching spaces for grades nine through twelve when completed in September 2025. The current student enrollment at Northwood High School is 1,808 and is projected to be approximately 2,007 by the 2025–2026 school year. The new school facility will increase the capacity of the school from the current 1,508 seats to approximately 2,700 seats with a core capacity for 2,700 students.

In efforts to address the over-utilization at the high school level in the Downtown Consortium and Walter Johnson High School, the approved Fiscal Year 2019-2024 Capital Improvements Program (CIP) included three capital projects to address the over-utilization in these areas. The approved CIP included an expansion of Northwood High School, the reopening of Charles W. Woodward High School, and an addition at John F. Kennedy High School. The expansion of approximately 1,200 seats at Northwood High School will require the building to be demolished and replaced on site. On March 25, 2019, the Board of Education approved that Northwood High School project be constructed with students off-site and that Northwood High School operate at the Charles W. Woodward High School as a temporary holding facility during the construction period.

Stakeholder outreach efforts consisted of three schematic design work sessions in fall 2019 to elicit students, staff, and community input. Participants were asked to share their ideas, goals and concerns for the project. Questions related to safety and neighborhood impact are addressed in the architectural design that incorporates both active and passive security measures. All egress paths, construction fencing, access, and contractor staging will be reviewed by the appropriate permitting agencies and implementation will be monitored to ensure safety and security are uncompromised with minimal impact to the neighborhood.

Project Information (continued)

Educational Program Objectives (Continued)

The following data includes demographic characteristics and program capacity information for high schools in the Downcounty Consortium:

Demographic Characteristics of High Schools in Downcounty Consortium

Schools	2019–2020						2018–2019		
	Total Enrollment	Two or more races %	Black or Afr. Amer. %	Asian%	Hispanic %	White %	FARMS%*	ESOL%**	Mobility Rate%***
Montgomery Blair HS	3227	4.2%	24.1%	13.9%	33.7%	23.9%	33.3%	17.0%	11.0%
Albert Einstein HS	1820	3.6%	17.6%	7.6%	48.5%	22.4%	36.3%	17.1%	12.9%
John F. Kennedy HS	1830	1.5%	25.0%	6.8%	61.4%	5.3%	50.5%	25.0%	15.6%
Northwood HS	1808	3.0%	24.9%	4.7%	53.4%	13.7%	49.7%	22.3%	19.9%
Wheaton HS	2193	2.3%	19.8%	11.2%	57.4%	9.3%	46.9%	20.9%	11.4%

*Percent of students approved for Free and Reduced-priced Meals Program (FARMS) during the 2018–2019 school year.

**Percent of English for Speakers of Other Languages (ESOL) during the 2018–2019 school year. High School students are served in regional ESOL centers.

***Mobility Rate is the number of entries plus withdrawals during the 2017–2018 school year compared to total enrollment.

Notes: Native Hawaiian/Pacific Islander and American Indian/Alaskan Native categories total less than 1% and were therefore excluded from the table.

Due to federal and state guidelines, demographic characteristics of schools of less than or equal to 5 students per category are reported as 0%.

Project Information (continued)

Teaching Stations and Spaces Provided When Completed - Northwood High School

Standard Spaces

Standard Classrooms	(75)
Drama Classroom	(1)
Developmental Reading	(1)
Project/Collaboration Rooms	6
Workrooms	3
Large Staff Offices	4
Small Staff Offices	2
Composition Aid Work Area	1
Textbook Storage	5

Social Emotional Services Suite

Classrooms	(3)
Student Support Room	1
Staff Office	1
Office (Psychologist/Social Worker)	1
Transition Space	1

Special Education

GTLD Classroom	(1)
Resource Rooms	3
Speech & Language	1
OT/PT Room	1
Transition Office	1
Conference Room	1
Itinerant Staff Offices	2
Support Staff Office	1
Accommodation Rooms	5
Large Staff Office	1
Textbook Storage	1

ESOL

Classrooms	(7)
Large Staff Office	1
Storage	1

Science

Science Laboratories (Island layout)	(6)
Science Laboratories (Perimeter layout)	(11)
Preparation Rooms	6
Chemistry Preparation Rooms	3
Chemicals Storage	1
Storage Rooms	5
Greenhouse	1
Greenhouse Preparation Room	1
Textbook Storage	1

College, Career, Research, Development

CCRD Classroom	(1)
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Art Department

Ceramic/Sculpture Room	(1)
Kiln/Glaze/Prep Room	1
Ceramic Pug Room	1
Studio Art Rooms	(2)
Photography Room	(1)
Dark Room	1
Digital Art Room	(1)
Digital Photography Room	(1)
Department Office	1
Storage Rooms	6

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Project Information (continued)

Teaching Stations and Spaces Provided When Completed - Northwood High School (continued)

Music Department

Instrumental Room		(1)
Instrumental Storage Room	1	
Choral Room		(1)
Office/Library	1	
Practice Rooms	4	
Robe/Uniform Storage	1	
Small Ensemble/Keyboard Laboratory		(1)

Technology Education

Foundations of Technology Labs		(3)
Student Storage Spaces	5	
Computer Laboratories		(2)
Office	1	

Multipurpose Laboratory

Laboratory		(1)
Storage	1	

Career Child Development

Laboratory		(1)
Observation Room/Classroom	1	
Office/Storage	1	

Physical Education/Athletics

Main Gymnasium		(1)
Ticket Booth	1	
Indoor Concessions Area	1	

Physical Education/Athletics (continued)

Second Gymnasium		(1)
Dance Studios		(2)
Fitness/Cardio-Pulmonary (Weight) Room		(1)
Auxillary Gymnasium		(1)
Wrestling Room		(1)
Storage Closets	4	
Health Classrooms		(2)
Locker Rooms	2	
Shower/Drying Areas	2	
Toilet Rooms	2	
Towel Storage Rooms	2	
Staff Offices	2	
Common Planning Room	1	
Resource Teacher Office	1	
Team Rooms	7	
Athletic Director Office	1	
Athletics Dept. Storage	1	
Coaches Offices	2	
Coaches Closets	2	
Referee Office	1	
Football Equip./Uniform Drying	1	
Training Room	1	
Laundry Room	1	
General Storage	1	
Chair and Table Storage	1	
Outside Storage	1	
Storage Rooms	2	

Project Information (continued)

Teaching Stations and Spaces Provided When Completed - Northwood High School (continued)

Library Media Center

Circulation Area	1
Main Learning Environment	1
Work and Production Area	1
Television Studio	1
Editing Rooms	4
Media Services Technician Office	1
Storage Rooms	3

Student Activities Facilities

Student Council Suite	1
School Store	1
School Store Storage	1
Journalism Staff Room	1
Yearbook Staff Room	1
Literary Magazine	1

Auditorium

House Area	1
Concession Booth	1
Stage	1
Orchestra Pit	1
Orchestra Pit Storage	1
Scenery Construction/storage	1
Stage Offices	2
Make-up Room	1
Dressing Rooms	2
Costume Storage	1

Auditorium (continued)

Projection Room	1
Lightning Equipment Storage	1
Costume Construction	1
Musical Equipment/Piano Storage	1
Ticket Booth	1

Staff Offices

Academy Coordinator Office	1
Staff Development Offices	2
Internship Coordinator	1
IT Systems Specialist Office	1
Staff Support Offices	6

Administration Suite

General Office	1
Principal's Office	1
Assistant Principals' Office	5
Administrative Support Office	1
Dean of Students	2
Principal's Secretary Office	1
Business Administrator Office	1
Financial Specialist Office	1
Business Administration Waiting Area	1
Conference Room	1
Large Team/Testing Room	1
Storage	1
Paper Storage	1

Project Information (continued)

Teaching Stations and Spaces Provided When Completed - Northwood High School (continued)

Administration Suite (continued)

Testing Room	1
PTA Storage Room	1
Attendance Office	1
Office Workroom/Storage/Toilet Area	1
Photocopy Room	1

Counseling Suite

Counselors' Offices	11
ESOL Counselor Office	1
ACES Coach Office	1
School Psychologist Officer	1
Waiting Room	1
Conference Room	1
Records Room	1
Registrar's Office	1
Transcript Secretary's Office	1
Workroom	1
Career Information Center	1

Security Suite

School Security Office	1
In-School Suspension Room	1

Staff Facilities

Staff Rooms	2
Staff Dining	1

Food Services Facilities

Student Dining	1
Serving Area	1
Food Preparation	1
Dry Food Storage	1
Ref.&Frozen Food Storage	1
Office	1
Locker/Toilet Room	1
Loading & Receiving Platform	1

Building Services Facilities

Building Services Office	1
Locker/Shower Area	1
Compactor/Trash Room	1
General Storage and Receiving Area	1
General Storage Rooms	6
Building Services Outdoor Storage	1

Mechanical Spaces

Telecom Equipment Closet (TEC)	1
Telecommunications Closets	7

Total Teaching Stations:

(126)

Project Information (continued)

Teaching Stations and Spaces Provided When Completed - Northwood High School (continued)

School-based Wellness Center

Administrative Center

General Office/Reception Area	1
Conference Room	1
Storage Closets	2
Large Storage Closet	1

Health Clinic

Health Assessment Rooms	2
Health Assessment Room - Nurse Practitioner/Physician Office	1
Laboratory	1
Medical Supplies Storage Area	1
Data Entry and Records Room	1
Toilet Room	1

Mental Health/Social Services/ Youth Development Suite

Youth Development Conference	1
Mental Health & Wellness Activities Group Room	1
Program Manager Office	1
Case Manager Office	1
Site Coordinator Office	1
Mental Health/Youth Development Staff/Therapy Room	1
Toilet	1

School Health Room

Waiting Area	1
Treatment/Medication Area	1
Rest Areas	2
School Nurse Office	1
Isolation Room	1
Storage	1
Toilet Rooms	2

Project Information (continued)

Project Design Objectives

Building design will encourage a collaborative interdisciplinary approach to accommodate the educational program. Each instructional area will have adequate learning spaces, work areas, restrooms, and storage facilities.

Building design goals include:

- Creating a defined and welcoming entrance for the school with administrative control, supervision, and security
- Creating a building with functional spatial relationships
- Creating a building that allows easy supervision of students
- Allowing convenient and secure non-school hours access to activity areas of the building
- Designing a building that respects the surrounding neighborhood
- Minimizing the footprint of the building to support sustainability
- Creating a safe and healthy environment for students and staff

Project Information (continued)

Site Design

Features:

Northwood High School is located on a 29.3 acre, one parcel property located at 919 University Boulevard West, Silver Spring, Maryland 20901. The site is bounded to the north by vacant wooded property owned by the Maryland State Highway Administration, south by residential properties on Caddington Avenue, east by residential properties on Loxford Terrace, and west by University Boulevard (Maryland State Route 193). There is a requirement for a 10-foot dedication along University Boulevard for future roadway improvements.

Pedestrian access to the rear of the school; including baseball, softball and stadium fields, as well as, the eight tennis courts, four basketball courts and the grandstand with plaza, will be provided by sidewalks meeting current Americans with Disabilities Act (ADA) requirements. An accessway from Loxford Terrace to the plaza area will be provided along with a site connection to the Future Park Greenway Trail that is planned from Northwest Branch Stream Valley Park to Sligo Creek Stream Valley Park. Right-of-way improvements will consist of a separated single bicycle lane on University Boulevard as well as comprehensive plan of Kensington-Wheaton Communities - Green Corridors improvements, consisting of a landscape green space separating the sidewalk from University Boulevard.

There are four driveway curb cuts along University Boulevard that provide access to the school site. The existing high school student drop-off area, southern parking lot and eastern parking lot are accessed from the southern right-in only driveway from University Boulevard. The existing student drop-off loop is south of the high school building and the exit is a driveway controlled by traffic signals on University Boulevard. The north-central right-in only driveway provides the entrance for the existing bus parking and northern parking lot while the bus parking exit is the northern right-out only driveway to University Boulevard. The existing driveway curb cuts will remain to serve the new high school; however, the traffic flow will be modified for the new high school and the south-central exit only driveway and the north-central right-in only driveway will be consolidated.

Project Information (continued)

Site Design (continued)

Stormwater Management:

Generally, the northern, western and southern boundaries drain into existing on-site curb and grate inlets and exit the site into the existing storm sewer system in University Boulevard along the western property line. The south-eastern grass area drains via overland sheet flow towards Caddington Avenue. The north-eastern grass area flows into a pipe system that discharges into a riprap outfall leading to the wooded area at the northeastern property corner.

There are seven Storm Filter cartridge systems, two water quality stone infiltration trenches and a sand filter scattered around the property that provide existing water quality treatment on-site. For water quantity, the existing school impervious areas are controlled by a 10-foot corrugated aluminized metal pipe detention system in the bus parking lot along with the water quality stone trenches along the baseline of the baseball field.

For the upgraded facility, the existing 10-foot corrugated aluminized metal pipe detention system will be re-utilized for water quantity control. In addition to the existing water quality treatment facilities, additional measures, such as micro-bioretenion facilities, green roofs, or pervious pavement, will be included to meet Environmental Site Design (ESD) requirements to the maximum extent practicable and to meet the Montgomery County Department of Permitting Services requirements.

Utilities:

Wet and dry utility services/connections including water, sewer, gas, telephone, data, and electric, will be provided to support the needs of the upgraded facility. Utility service connections will be made to existing utility lines located within University Boulevard right-of-way.

Exterior Lighting:

Wall-mounted lighting fixtures will be installed on the exterior of the new facility and will be shielded to protect adjacent residences from intrusive glare while maintaining light levels for safety and security. Pole-mounted parking area and stadium lighting fixtures will be 100% down-lighting to minimize light pollution into the night sky. All exterior light fixtures will be light emitting diode (LED). To conserve energy, all exterior lighting will operate on timers.

Project Information (continued)

Site Design (continued)

Traffic:

The primary goal of the site design is to separate the bus loop from the student drop-off loop while creating a pedestrian friendly/safe access to the school building entrances. The proposed design will maintain the four existing driveways. The southern most driveway will be right-in/right-out for cars and services. The central driveway will be a fully light controlled entrance/exit. There will be a left turn entrance for buses and cars arriving from the north and two left turn exit lanes will be proposed for buses and cars exiting the site and traveling south on University Boulevard. The northern most driveway will be a right in/right out for buses.

The south and south-central entrances leading to the parking area and student drop-off loop contain approximately 320 visitor and staff parking spaces to the west and south of the school building. The north-central and north entrance provide access to the bus loop providing parking for 20 buses and approximately 100 parking spaces for staff and after hours access to the fields.

Forest Conservation:

On-site vegetation and large trees exist throughout the site and are concentrated on the northern, eastern and southern sides of the property lines. The trees along the property border provide screening from the adjacent residential areas. While some trees will be impacted, and will need to be removed, site design will minimize the impacts to existing vegetation.

Project Information (continued)

Building Design

General Description:

The proposed four-story replacement building will be organized around a courtyard and divided into two sections: the academic areas to the north and the activities areas to the south. The main entrance and activities entrance both face University Boulevard. The clearly identified main entrance provides easy access for pedestrians and students being dropped off. There will be dedicated entrances with stairs convenient to the bus loading area. The activities entrance will be easily accessible to pedestrians and the student drop-off and provides access to the auditorium, gymnasium, music suite, and student dining. A third entrance facing University Boulevard will serve the dance program and the adjacent auxiliary gymnasiums. Students will have direct access from locker rooms and gymnasiums to the playfields on the east side of the site without crossing drive lanes or parking areas.

The four-story academic area will be organized around a light-filled courtyard with administration suite facing University Boulevard and located between the main and activities entrances. The remaining ground floor functions will include the School-based Wellness Center, Counseling, Career Child Development (CCD), and the Art Suite with a direct access to the courtyard.

The one-story activities area will be organized along a wide corridor with an open flexible dining area with direct access to the courtyard and a learning stair on the east end. The music suite faces University Boulevard and will be adjacent to the auditorium, which is flexibly designed to accommodate a variety of performance sizes, types, and shows. The kitchen will serve the open student dining area. The gymnasium located on the southeast corner of the building will have direct access to the auxiliary gymnasiums, which will be located along a secondary corridor to allow after-hour use.

The media center will be located on the second level and be designed as an open, flexible project-based learning center. It will be located over the administration suite and face University Boulevard, becoming a primary feature on the facade. The television studio will be adjacent to the media center and overlook the two-story student dining area.

Project Information (continued)

Building Design (continued)

The academic spaces are designed to promote interdisciplinary learning with open collaborative learning areas serving a cluster of classrooms. Science laboratories are organized vertically on the east side of the building promoting project-based, interdisciplinary learning so students' lessons incorporate science, math, social studies, english, and art. Staff offices will also be organized vertically to foster collaboration between educators and provide ease of access of students to teachers to support mentoring and foster positive student/teacher relationships.

The flexible building design for the school will promote a philosophy of adaptable classrooms, and facilitate various presentation formats and learning activities. Multi-purpose and flexible spaces will be designed for both staff and students to collaborate on projects. Furniture that is easily reconfigurable will be provided to maximize the flexibility in the school.

Technology:

Classrooms will be designed to support interactive educational technology that includes controlled wireless computer access and interactive whiteboard systems. Individual classrooms will have distributed computer outlets on the walls and allow multiple group teaching areas within a classroom. Individual classrooms will be designed to provide flexible teaching spaces that include opportunities for small group sessions or lecture sessions. Students can be organized into small groups for project oriented teaching or face a teacher in a traditional lecture style set up.

Code Compliance/Accessibility:

Building and site will be designed to comply with current commercial building codes in Montgomery County, including the 2015 International Building Code (IBC), Maryland Accessibility Code, 2015 National Fire Protection Association (NFPA) Fire and Life Safety Codes, 2012 International Green Construction Code, and the American with Disabilities Act (ADA).

Project Information (continued)

Building Design (continued)

Structural Design:

The structural design will provide the necessary structural elements to support the building dead, live, and lateral loads, while at the same time be compatible with the architectural scheme and the mechanical and electrical systems.

Codes:

The structural design will be in accordance with the International Building Code, 2018. In addition, concrete and steel will specifically conform to “Building Code Requirement for Structural Concrete (ACI 318) and “Specifications for Structural Steel Buildings” (AISC)

Primary Structural System for Building

- The structural system for the building will be a structural steel frame with composite steel beams and steel columns. The elevated slab will be comprised of 3 1/4” light weight concrete on a 2” composite metal deck. The total slab thickness will be 5 1/4”.
- The roof will be constructed 1-1/2” deep, 20 gage roof deck on steel joists supported by steel girders.
- The slab on grade will be constructed of 5” thick, normal weight concrete on a 10 mil vapor barrier over 6” gravel.
- The foundation system is assumed to be shallow spread footings but will be confirmed with the forthcoming geotechnical report.
- Exterior walls will be built of non-load bearing Concrete Masonry Unit (CMU) walls supported on continuous wall footings.
- The lateral resisting system will be a combination of steel braced frames and steel moment frames.
- Stairs will be constructed of CMU bearing walls that are separate from the primary structural steel frame.

Project Information (continued)

Building Design (continued)

Mechanical Systems

Heating, Ventilation, and Air-Conditioning (HVAC) System:

The heating and cooling system for the school will consist of a four-pipe fan-coil unit system. Mechanical infrastructure to support the system will include gas-fired condensing boilers, air-cooled chillers, heating water distribution pumps, and chilled water distribution pumps. Fan coil units serving classroom areas will be positioned above the corridor ceilings, with supply and return ductwork extending from these units to the classroom served. Filter return grilles will be provided for all fan coil units, minimizing above ceiling maintenance requirements.

The administration, administrative support, and wellness areas will be provided with heating and cooling through a Variable Refrigerant Flow (VRF) system with air-cooled condensing units. The use of ceiling cassette type VRF terminal units is anticipated.

Conditioned outdoor air for the classroom and administration areas will be supplied by a series of rooftop dedicated outdoor air systems, complete with hot water heating, chilled water or direct expansion cooling, and energy recovery for pre-conditioning and tempering of the outdoor air. Airflow supplied from these units will be dehumidified, conditioned, and delivered directly to each space at a room neutral temperature.

A series of single-zone, four-pipe rooftop modular air-handling units will be provided for space conditioning and ventilation within the main and second gymnasiums, auditorium (stage and house areas), media center, and student dining areas. Individual packaged rooftop units will provide space conditioning and ventilation for the auxiliary gymnasium, wrestling room, fitness room, and dance studio areas. Dedicated outdoor air systems serving team and locker room areas will provide both space conditioning and ventilation. Data/IT closets throughout the school will be cooled through individual ductless split type air-conditioning units with low ambient cooling operation.

Automatic temperature controls will be direct digital type controls (DDC). Control system components will be interfaced with the central MCPS energy management control system for remote monitoring and energy management routines.

The HVAC design shall be compliant with the latest applicable codes, and the current Montgomery County Public Schools facilities design standards.

Project Information (continued)

Building Design (continued)

Plumbing Systems

Plumbing System:

Storm sewer, sanitary sewer and domestic water systems will be provided in accordance with the latest Washington Suburban Sanitary Commission (WSSC) plumbing codes and regulations. A combination fire/water service will extend to serve the proposed high school.

A pair of gas-fired condensing type water heaters will generate domestic hot water for the school. The domestic hot water system will be complete with circulation pumps, an expansion tank, and a thermostatic mixing valve. A natural gas service from Washington Gas will be provided. This gas service will be positioned outdoors and located adjacent to the main mechanical room.

New plumbing fixtures will be designed to meet the Americans with Disabilities Act (ADA) and utilize water conservation features. Floor-mounted water closets will utilize dual-flush type valves, capable of providing either 1.6 or 1.0 gallons per flush. Urinals will be wall-hung and provided with pint flush valves. Wall-hung cast-iron lavatories will utilize self-closing faucets that supply 0.5 gallons per minute (GPM). Showers will utilize 1.5 GPM type heads. The water consumption figures noted are equal to or less than what is required by the current plumbing code and for promoting good water conservation practices.

Fire Protection Systems:

The entire school will be fully-sprinklered throughout with a wet-pipe sprinkler and standpipe system in accordance with the National Fire Protection Association (NFPA) Standards 13 and 14. The sprinkler system will be separated into multiple zones that will align the building's fire alarm pull zones.

A fire detection and alarm control panel with voice evacuation will serve initiation devices (smoke detectors and manual pull stations) and notification devices (fire alarm speakers and strobes). A fire alarm annunciator panel with graphic display will be provided at the main building entrance.

Power System:

There will be two (2) 4000-ampere, 277/480-volt main switchboards serving panelboards and transformers in the main electrical room and electrical closets throughout the school. There will be dedicated panelboards serving mechanical, lighting, emergency lighting, receptacle, and generator standby loads. Power provisions will be made for connections to a temporary portable generator to meet Maryland Emergency Management Agency (MEMA) requirements for the school to be used as an emergency public shelter.

Project Information (continued)

Building Design (continued)

Electrical Systems

Generator Power System:

There will be an onsite outdoor 350-kW natural-gas generator to serve life-safety and standby loads via automatic transfer switches. Life safety loads include emergency egress lighting, exit signs, and fire alarm equipment. Standby loads include teacher station receptacles, telecom room receptacles, kitchen freezer and cooler, energy management system (EMS) panels, elevator cabs, sumps pumps, smoke dampers, and heaters/heat trace for rooftop units.

Lighting and Lighting Controls:

Energy-efficient Light-Emitting Diode (LED) lighting will be provided throughout the building. Classrooms will follow MCPS standards for lighting fixture types. Lighting controls will consist of lighting relay room controllers, lighting control stations (switches), and ceiling mount occupancy and daylight sensors to control lighting fixtures. Lighting control stations in classrooms will provide multiple levels of lighting control. Emergency lighting will be controlled with normal lighting fixtures and automatically switched ON during a loss of normal power.

Exterior Lighting:

Exterior site and building mounted lighting will utilize Light-Emitting Diode (LED) lighting fixtures and will be designed to shield adjacent residences from intrusive glare while maintaining light levels for safety and security purposes. The lighting fixtures will be full cutoff with no uplight to minimize light pollution into the night sky.

Intercom and Sound Systems:

Intercommunications/public address system devices include speakers and call switches. Stand-alone sound reinforcement systems will be provided in the main and second gymnasiums, auditorium, auxiliary gymnasium, student dining, music rooms, fitness room, dance rooms, wrestling room, and athletic fields (football stadium with track and field area, baseball field, and softball field) per MCPS standards.

Communications and Security Systems:

The school will have communications (data and voice) systems including wireless access points throughout for Wi-Fi. Provisions for audio/visual systems for instructional technology will be provided. Security systems will include door access control (card readers), intrusion detection (keypads and motion detectors), and video surveillance (cameras). Distributed antenna system will be provided for public safety radio for first responders.

Project Information (continued)

Building Design (continued)

Sustainability

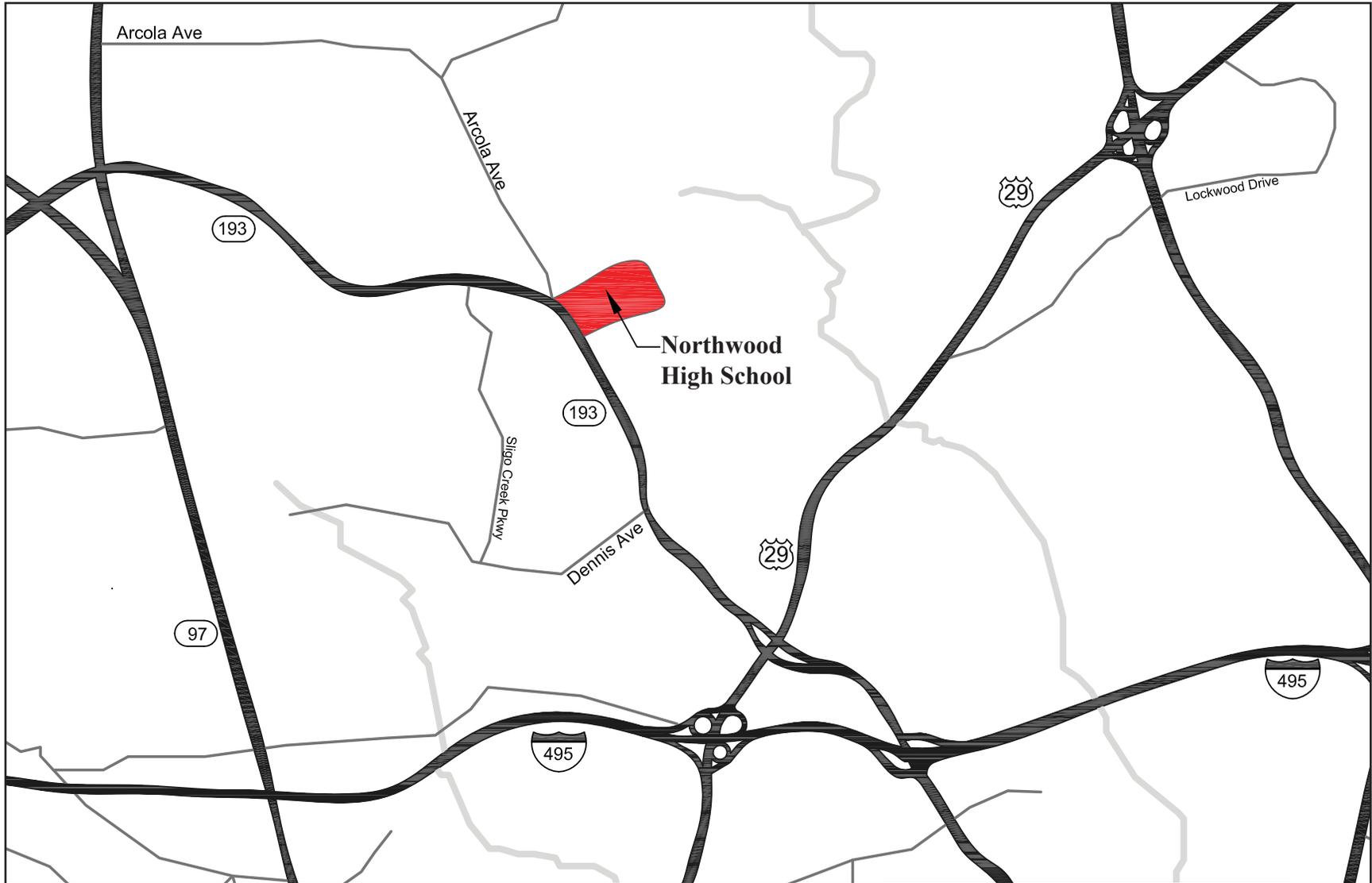
The proposed project will be designed and constructed with an emphasis on the environmental sustainability. The architecture and engineering systems will align with facility management sustainability principals to ensure long term operational effectiveness. The project will be registered with Green Globes. Sustainability features will include the following:

- Encouraging alternative transportation to the school by providing conveniently located bike racks and preferred parking for low-emitting/fuel efficient vehicles and carpools
- Preserving a high percentage of vegetated open space to protect the surrounding ecosystem
- Managing stormwater to both reduce runoff quantity and improve quality
- Using highly-reflective roof surfaces to reduce heat island effect and heat gain to the building
- Installing water conserving, low-flow plumbing fixtures
- Optimizing the energy performance of the building by providing a highly energy efficient building envelope, lighting system and heating, ventilation and air conditioning (HVAC) system
- Optimizing equipment selection, installation, and operation of HVAC equipment through enhanced commissioning of the building systems
- Diverting construction “waste” from landfills that can instead be salvaged for reuse or recycled
- Adhering to construction indoor air quality management plans and using low-emitting building materials to safeguard occupant health
- Providing a high level of occupant control over individual lighting and thermal comfort to promote enhanced indoor environment
- Using construction materials that are recycled and regionally manufactured
- Implementing a Green Housekeeping Plan
- Maximizing daylight in classrooms
- Minimizing background noise level from HVAC systems in classrooms and other core learning spaces and control reverberation time with sufficient sound absorptive materials

One of the primary design factors required to achieve a sustainable facility is the conservation of energy. The importance and consideration placed on energy conservation will be reflected in the configuration and orientation of the building, the use of energy modeling as a design tool, the selection of materials, and the mechanical/electrical systems utilized. The new building will be designed to meet or exceed 2015 International Energy Conservation Code (IECC), as well as Montgomery County energy conservation codes.

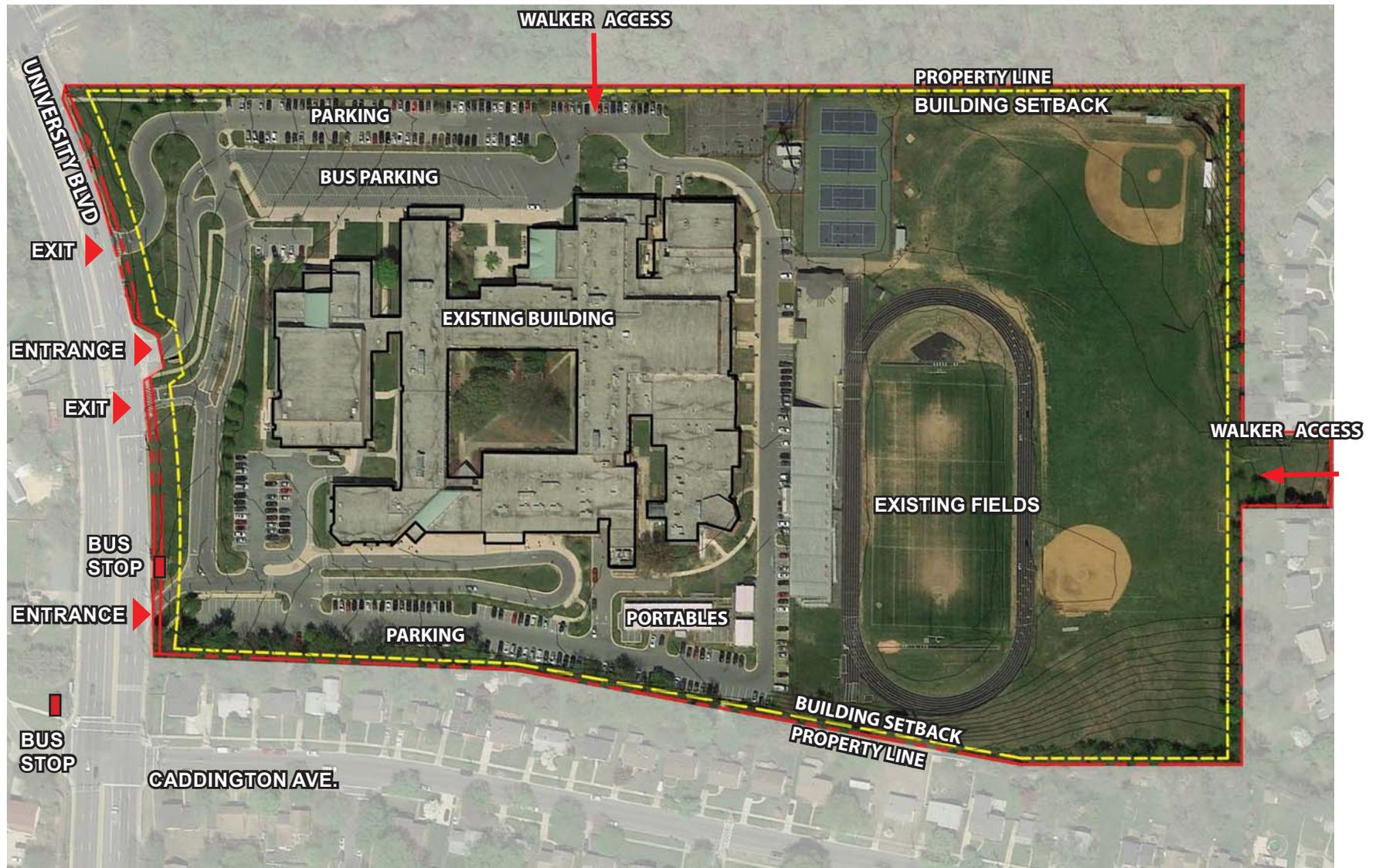
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Vicinity Map



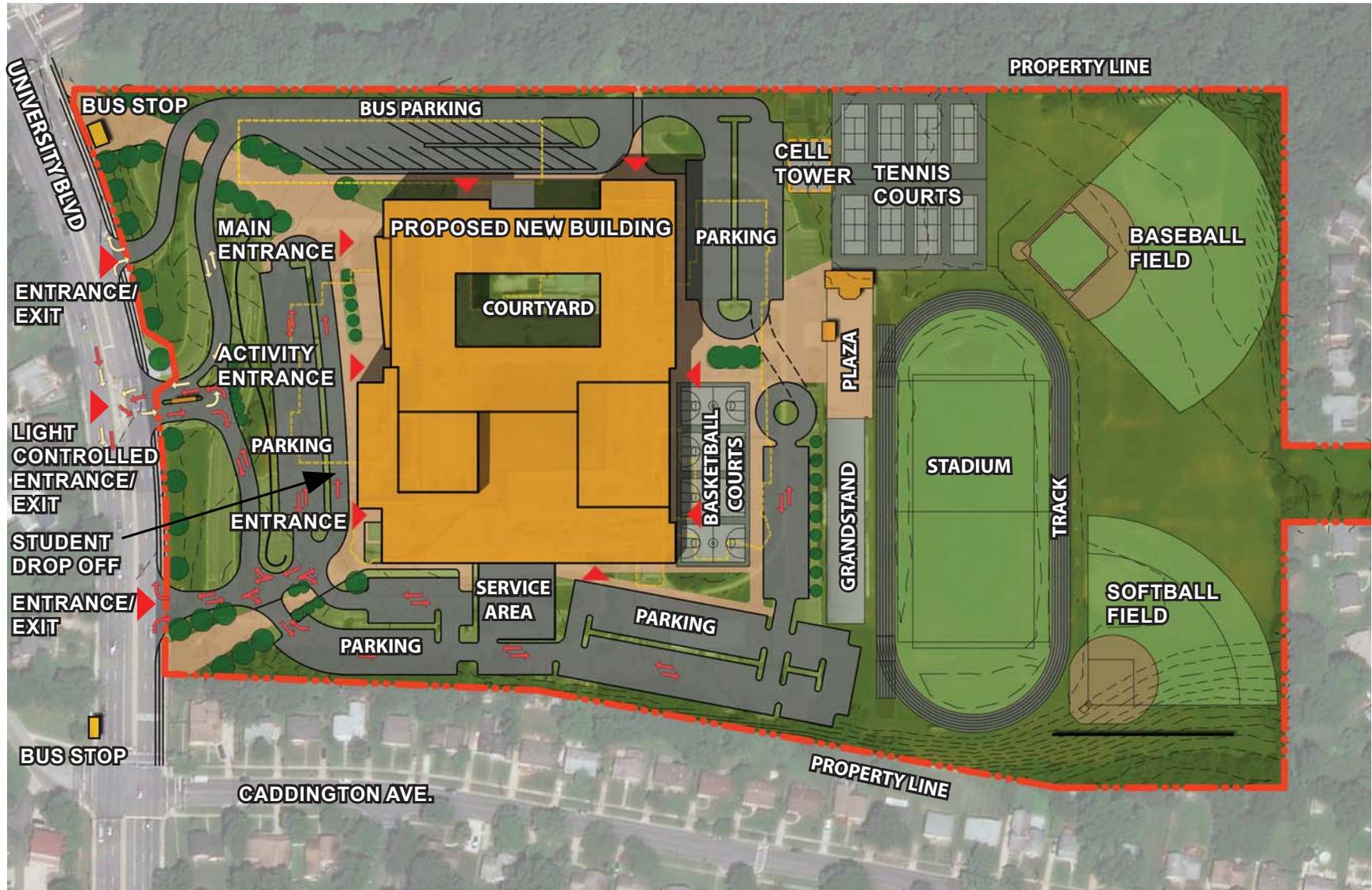
Northwood High School Addition/Facility Upgrade

Existing Site Plan

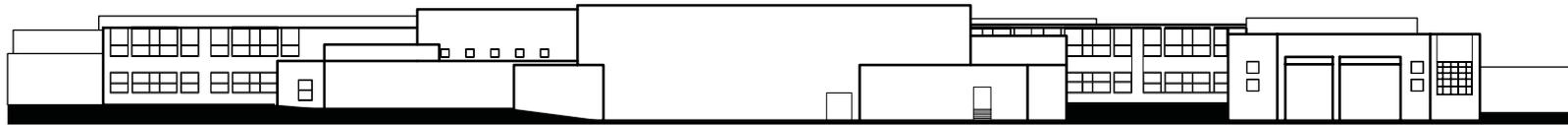


Northwood High School Addition/Facility Upgrade

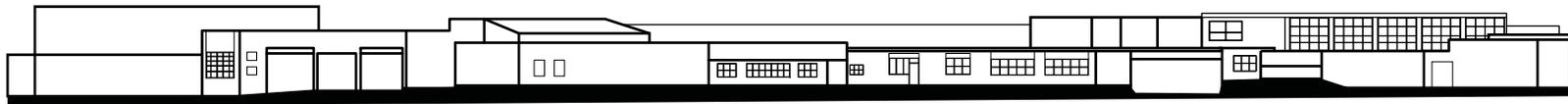
Proposed Site Plan



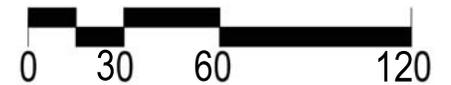
Existing Elevations



West Elevation



South Elevation



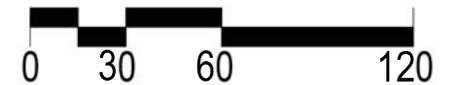
Proposed Elevations



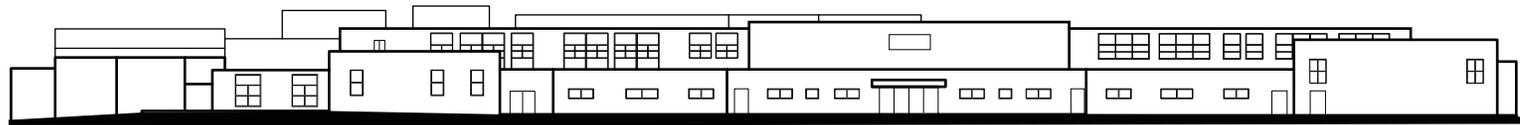
West Elevation



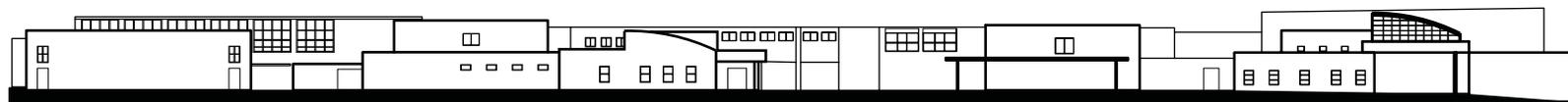
South Elevation



Existing Elevations



East Elevation



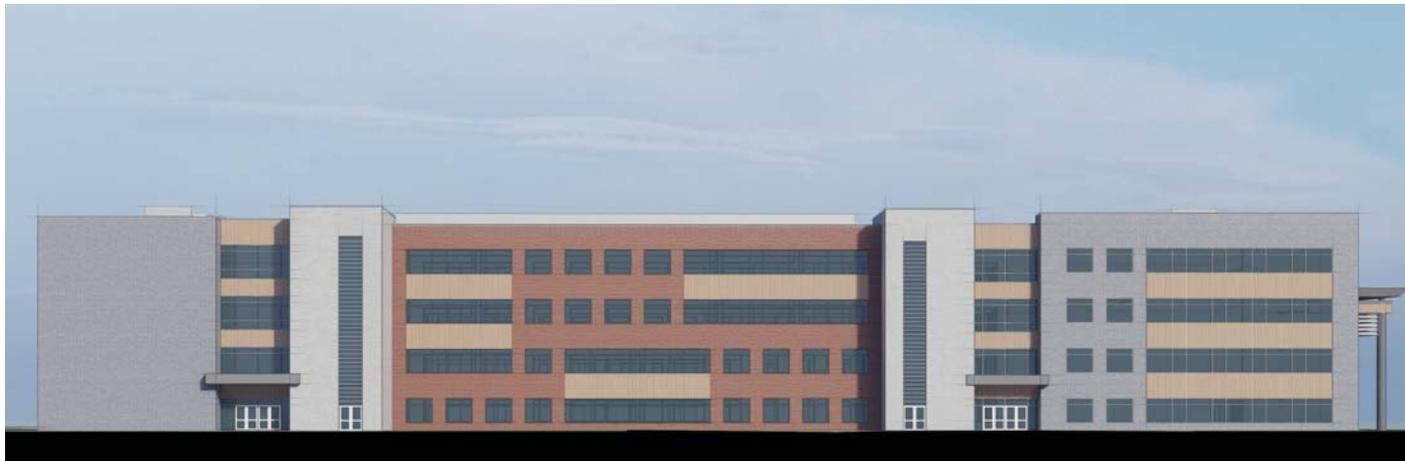
North Elevation



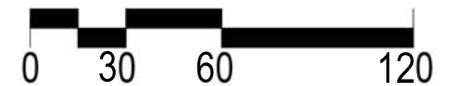
Proposed Elevations



East Elevation



North Elevation



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Project Team, Schedule, and Estimated Construction Costs

Design Team Member

Architect:	Samaha Associates, P.C.
Civil Engineer:	Adtek Engineers, Inc.
Mechanical/Electrical/Plumbing Engineer:	James Posey Associates
Structural Engineer:	Rathgeber/Goss Associates
Kitchen Consultant:	Nyikos Associates, Inc.

Project Schedule

Preliminary Plans Presentation:	February 2020
Construction Documents Completed:	July 2021
Award Construction Contract:	March 2023
Building Completed:	September 2025

Estimated Construction Costs

New Building:	402,787 square feet
Construction Cost Estimate for Building and Site:	\$123,923,000