

THOMAS JEFFERSON MIDDLE SCHOOL

FEASIBILITY STUDY
08/07/2025

Abbreviated Version





architecture incorporated

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1.1 PROJECT TEAM

Arlington County Public Schools

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Summer Consultants | MEP Engineering Chip Anastasi | Senior Vice President

Kennedy Structural Engineers | Structural Engineering Sean Kennedy | President

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1.2 PROJECT INTRODUCTION

Arlington Public Schools provided Architecture, Incorporated the opportunity to conduct a long-term feasibility study of Thomas Jefferson Middle School. The overarching goals of the study are to evaluate the existing facility, develop a minimum of three main options for potential renovation and / or addition, and to provide cost estimates for all options.

Firstly, to understand Thomas Jefferson Middle School today, this study examines the history of the building, including the intent of the original construction and all subsequent renovations. To understand the condition of the building, the project team, composed of professional architects, structural engineers, civil engineers, and MEP engineers, began the study with a site walk and survey of the existing facility on January 2nd, 2025. The condition of the building is evaluated against myriad criteria including energy efficiency, educational requirements for square footage, code compliance, etc. to gain an understanding of how well the school is serving its student population.

Secondly, the project team worked with APS to understand the current program square footage requirements for the school. This allowed the team to propose three distinct options for potential renovation and / or additions to the school that align with the goals of APS. The first option (1) proposes a renovation with no addition – resulting in a decrease to student capacity. Option 1A proposes adding only classrooms to bring the student capacity up to current enrollment. Both options 1 and 1A look at the "lightest touch" renovation (i.e. keeping the existing structural grid). Option 2 proposes an idealized renovation and addition. Option 3 proposes constructing a new building on the site. Options 2A and 3A show potential future additions that would increase the student capacity by 10%. In all options, the team has included demolition plans, phasing plans, and county impacts in addition to floor plans.

Finally, we have engaged a cost estimator to evaluate all options and provide cost estimates. This service also includes reconciliation with the APS cost estimator.

Architecture, Incorporated, along with our talented consultant team, look forward to providing a clear, concise, and comprehensive evaluation of Thomas Jefferson Middle School along with solutions to better service the student and faculty at TJMS.



2.1A Background & History

The Building

Thomas Jefferson Middle School and Community Center was completed in 1972 in Arlington, Virginia. It was built as a jointly used, jointly operated, and jointly funded facility shared by both Arlington Public Schools and Arlington County Parks & Recreation. The community center is located at the south end of the building with its own, distinct entrance. A large gymnasium was constructed and shared by the community and school. There is a joint use theater at the north end of the site, although during the school day, the school exclusively uses the theater. The rest of the building houses the middle school.

The Site

The site originally had a large surface parking lot for the school, a surface parking lot for the community center, two multi-purpose fields, two basketball courts, four tennis courts, and two baseball diamonds (see page 09).

The School

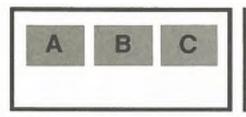
Through a charette style planning session, the resulting design solution provided a two-story building of three schools-within-a-school (see figure to right). Each "school" was defined by its own entrance on the upper floor as well as color coding provided by carpeting and wall color. Each school was laid out in five-foot modules and a very open floor plan to allow for flexibility of spaces to be defined by demountable partitions and / or furniture solutions.

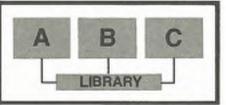
The Connection

An open floor plan to foster student connection was prioritized in the school design. A multi-use facility to foster community connection was prioritized in the building design. Over the course of the day, the building uses shift (see page 12 for visual). At 9am, the school is in use by the students, and the community has access to the community center. The gymnasium is divided to give access to both groups. By 4pm, adult education uses take up more than half of the school while after school student activities occupy the remaining space. Finally, at 9pm, adult education occupies most of the school and the community use has expanded to the entire theater and gymnasium.

The Impact Today

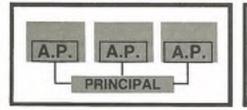
These large program spaces are still in place today. The community utilizes a portion of the gym throughout the school day, wood shop and art studio rooms, and the theater for local performances. Today, this poses a potential for a security risk and creates a disconnect between similar space uses for both the school and the community.

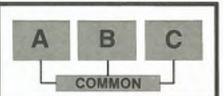




This is a school. Within this school are three "little schools". The school's design will allow flexibility in instruction by either grade or discipline.

The three schools will be closely related to the library. The library will be the focal point for the instructional program containing 24,000 volumes, study carrels and viewing and typing areas





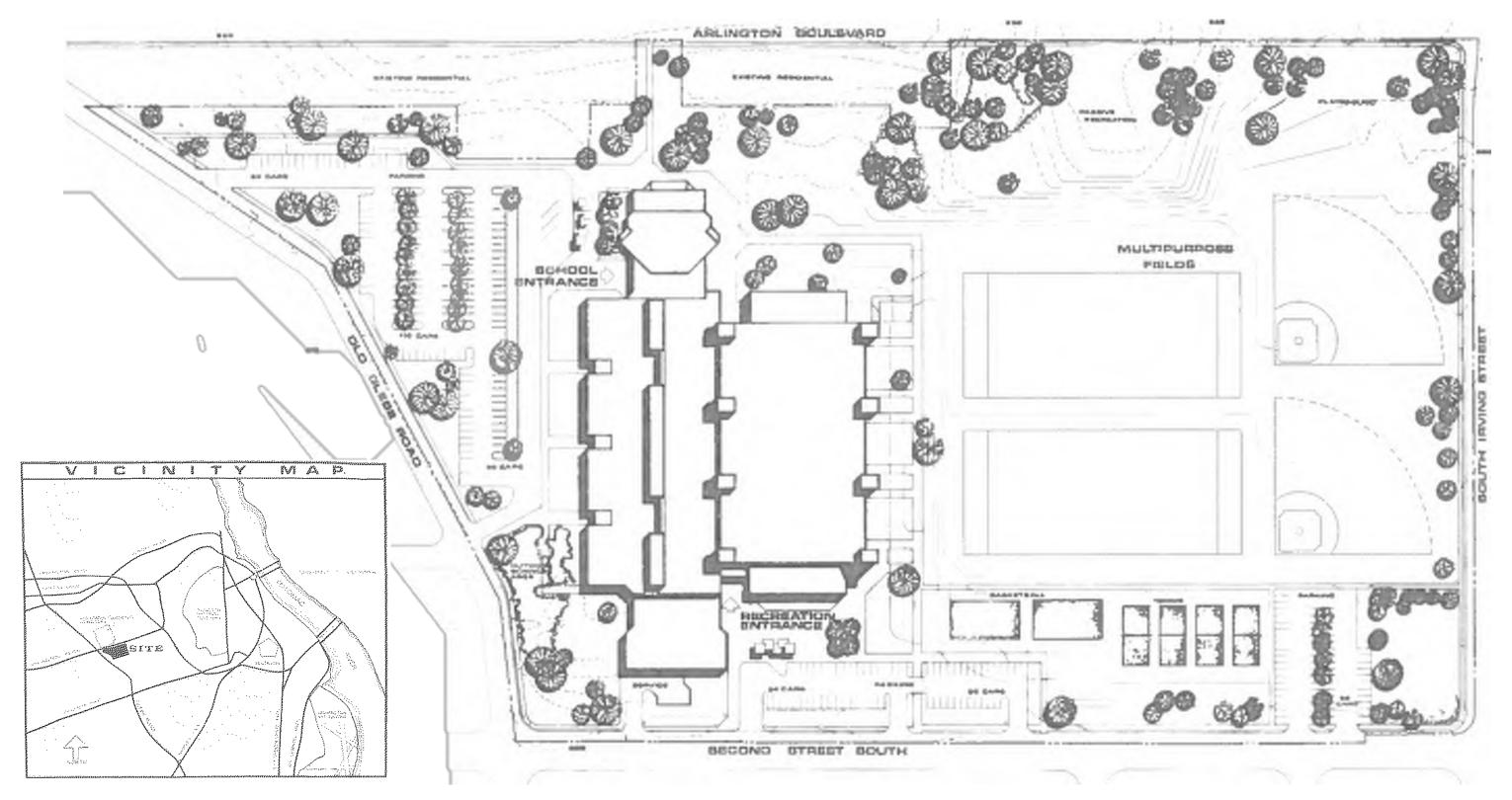
core. Each school administrator (assistant principal) rooms; dining commons, auditorium and the con will be responsible to the school principal. will be responsible to the school principal.

addition to the academic areas, each school will. Students in the three schools will share commo ontain its own teacher's work and preparation facilities. These facilities will include: science, art, toilets, guidance offices, and administrative home economics, and industrial arts labs; music

SCHOOL WITHIN-A-SCHOOL CONCEPT

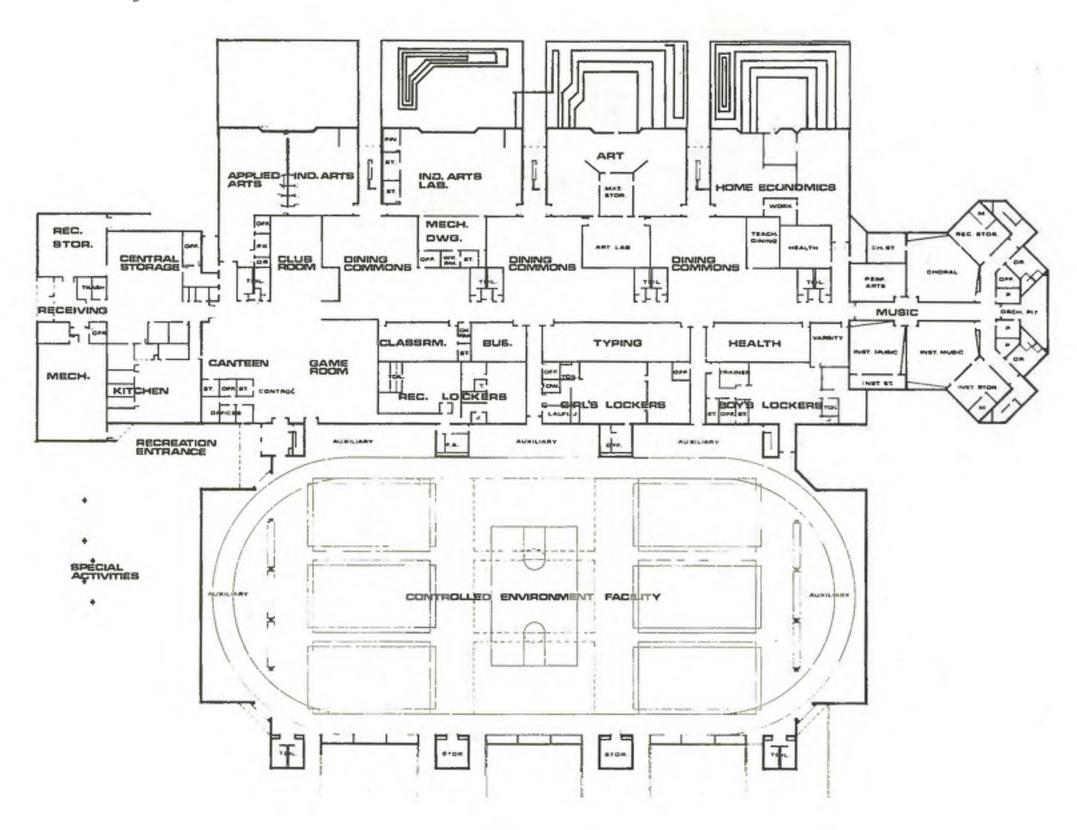
Image from TJ Faculty Booklet, 1972

2.1A Background & History



Original (1972) Vicinity Map & Site Plan Left Image from 1972 Drawing Index, Right Image from TJ Faculty Booklet, 1972

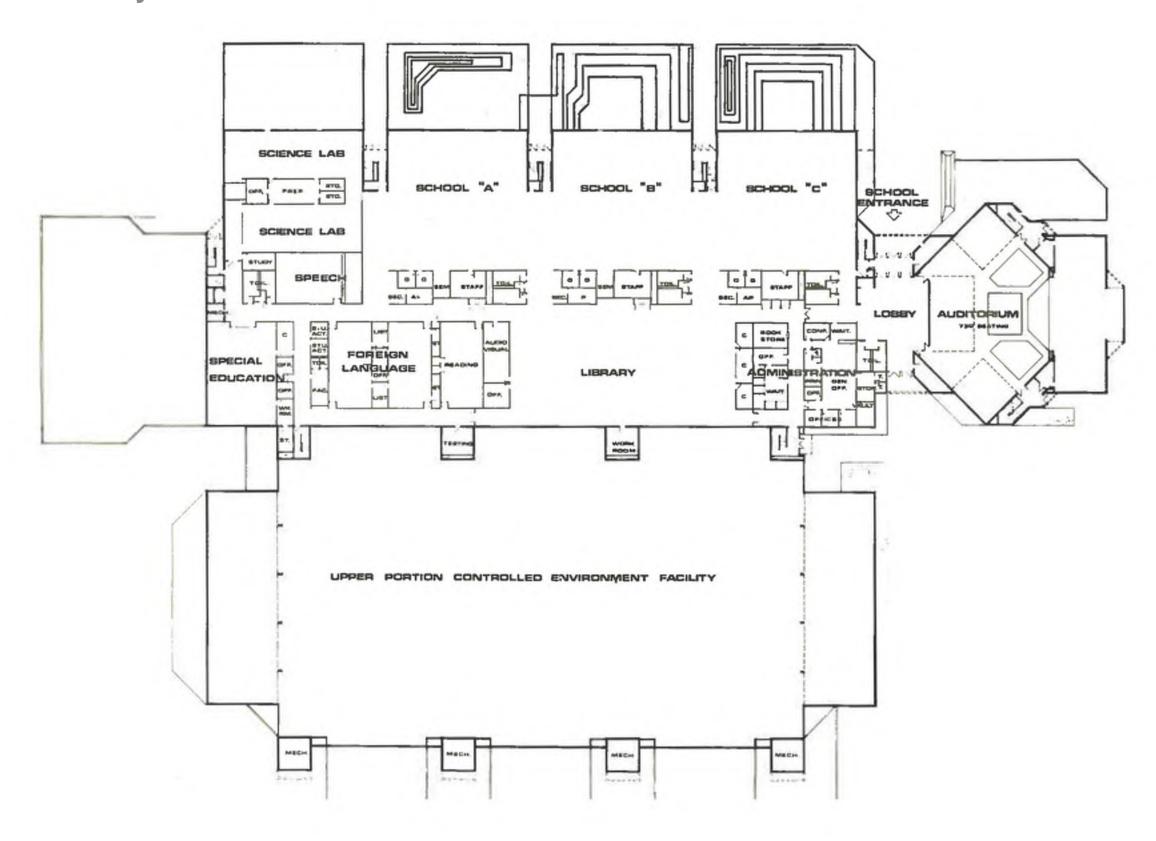
2.1A Background & History



Original (1972) Ground Level Plan Image from TJ Faculty Booklet, 1972

NOTE: FLOOR PLANS THROUGHOUT ARE ORIENTED

2.1A Background & History



Original (1972) Level 1 Plan

Image from TJ Faculty Booklet, 1972



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2.1B Previous Renovations & Studies

1985: Art studio ventilation retrofit

1990: As a reaction to the original three large spaces in which all core classes were taught, modular wall panels were installed and mechanical and electrical alterations completed on the upper and lower levels of the school to create enclosed classrooms, offices, and staff spaces. These rooms created three core classroom areas; science, special education, health, and counseling departments; and a main administration suite.

1992: As a reaction to the original three large spaces in which all core classes were taught, modular wall panels were installed, and mechanical and electrical alterations were completed to create enclosed core classrooms and a media center on the upper level and core classrooms and an art room on the lower level.

1993: A minor renovation to the lower level included installation of steel wall panels to create the woodshop in the technology education area, replacement of the doors between the school corridor and community center game room with automatic controlled doors, and a replacement of the exterior doors on the east wall of the gymnasium.

The modular wall panels exist today. When installed, they created classrooms that are under the square footage requirements of current APS and VDOE standards, have little to no access to daylight, and some have columns within the rooms.

1994: Weight room enclosure.

1995: Emergency generator added.

1997: Chiller replacement.

1998: Telecommunications infrastructure installed, including voice and data cabling and drops and telecommunications closets with power and air handling equipment. Cooling tower replacement.

2001: Theater renovation, including new seats, carpet, and lighting.

2002: Sport surfacing and court striping installed in gymnasium.

2004: Boiler replacement.

2005: Feasibility Study by unknown, evaluated conditions at the school and provided recommendations for its renewal

2007: Feasibility Study by Perkins Eastman, reviewed previous study and conducted further assessment of building and site, completed educational specifications, developed alternative concept designs and further development of selected concept design

2009: Large Improvement Project

Site improvements including adding trees, signage, parking lot striping, and altering parking spaces.

Provide new and additional windows and skylights. Renovate commons area, media center, outside play area, and finishes. Provide handrail at ramp. Replace doors between recreation room and service corridor.

On the exterior, masonry pointing, repair of exterior masonry walls, replace sealants at exterior, prepare and paint metal siding and parapet cap, repaint a portion of the exterior doors, replace EPDM roof at cooling tower.

Replace fire detection and alarm system throughout school, theater, and community center. Provide additional exit signs in corridor between school and gym. Provide heat detection for proscenium curtain in theater. Repair / replace fireproofing. Repair fire alarm at theater stage. Provide fire stopping for all penetrations of fire and smoke barriers.

Under the mechanical scope, replace dual-duct mixing box actuators and controls, replace air handlers, energy recovery modules, inline fans, and associated work in the gymnasium. Replace school penthouse dual duct air-handling units, pumps, and associated work. Replace single zone air-handling units plus all associated work located in the theater. Repair chiller controls and perform building wide water balance. Replace seven rooftop exhaust fans. Replace four console fan-coil units. Upgrade remaining ATC control to interface to 1999 BAS.

Complete installation of emergency generator remote panel. Upgrade elevator controls.

2011: Feasibility Study by Perkins Eastman, proposed addition concept for the middle school to expand indoor/outdoor teaching spaces, create a new entrance with visual presence, and create new cafeteria / multi-purpose room convenient to existing loading dock. The proposed addition planned to increase enrollment and support APS' sustainable, high performance building goals.

2014: Feasibility Study by VMDO, included conceptual designs and cost estimations for each of the four schemes

2019: Construct Alice West Fleet Elementary School

Demolish large surface parking lot to construct the 212,245 GSF elementary school. Parking is moved to underground garage at new school.

During the significant site construction, two stairwells at TJMS were altered to allow accessible egress from the ground level to the exterior. Fire lane access was maintained.

2023: Construct secure vestibule at main entry.

2.1 ARCHITECTURAL 2.1C Existing Plans

The Building:

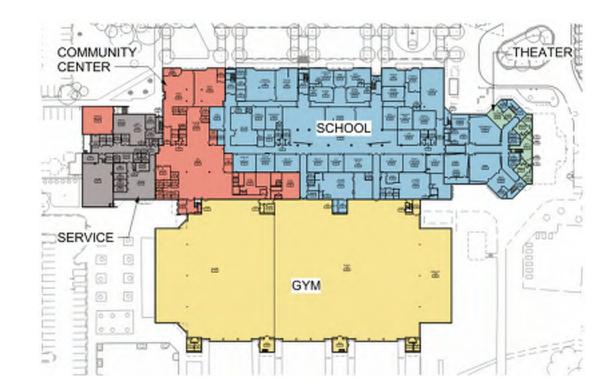
Thomas Jefferson Middle School and Community Center is a jointly used building used by APS and Arlington Parks & Recreation. The school and community center is a two-story masonry and steel framed structure. The gymnasium is a one-story concrete, masonry, and steel truss structure approximately 39'-0" high measured from the floor slab to the top of the main roof, 59'-0" high measured from the floor slab to the top of the eight tower roofs. The top of the fly tower at the theater is 51'-0" above grade. The community center access is on the ground level at the south end of the site while the school entrance is on level 1 at the north end of the site. The school kitchen is embedded within the community center. School staff is required to move between the community center and school throughout the day to supply food to the serving area in the cafeteria.

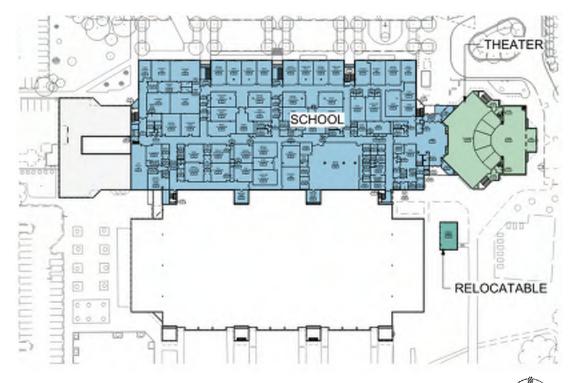
Gross Square Footage

Middle School
Joint-use theater & associated spaces
Joint-use gymnasium
Community Center
Service wing
Grand Total GSF:
Relocatable (not included in grand total)
128,292 GSF
13,697 GSF
67,033 GSF
19,391 GSF
6,862 GSF
235,275 GSF
863 GSF

The exterior walls are typically constructed with 8" concrete masonry units (CMU) with fully attached 4" brick facing. The stage walls at the theater are 12" CMU with the same 4" brick facing. The wall assembly is problematic because:

- There is no cavity in the wall between the CMU and brick. Water that infiltrates the brick veneer remains in the wall and is unable to exit by way of a cavity and weep holes. This caused the metal reinforcing to corrode and mortar to spall.
- The different thermal movement characteristics of the brick and CMU tied together into a single assembly (vs. joined by metal ties as is standard today) is causing damage to the wall.
- There is no insulation in the exterior walls, significantly reducing the R-value of the wall assembly.
- There is no vapor barrier in the exterior walls to prevent condensation from forming within walls and deteriorating building materials and finishes.







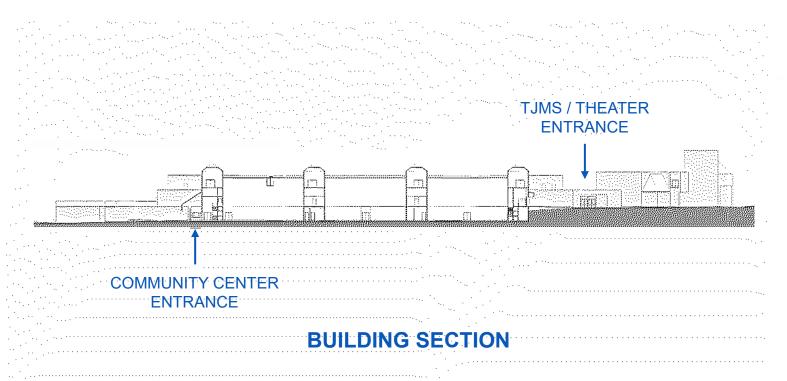
2.1 ARCHITECTURAL 2.1C Existing Plans

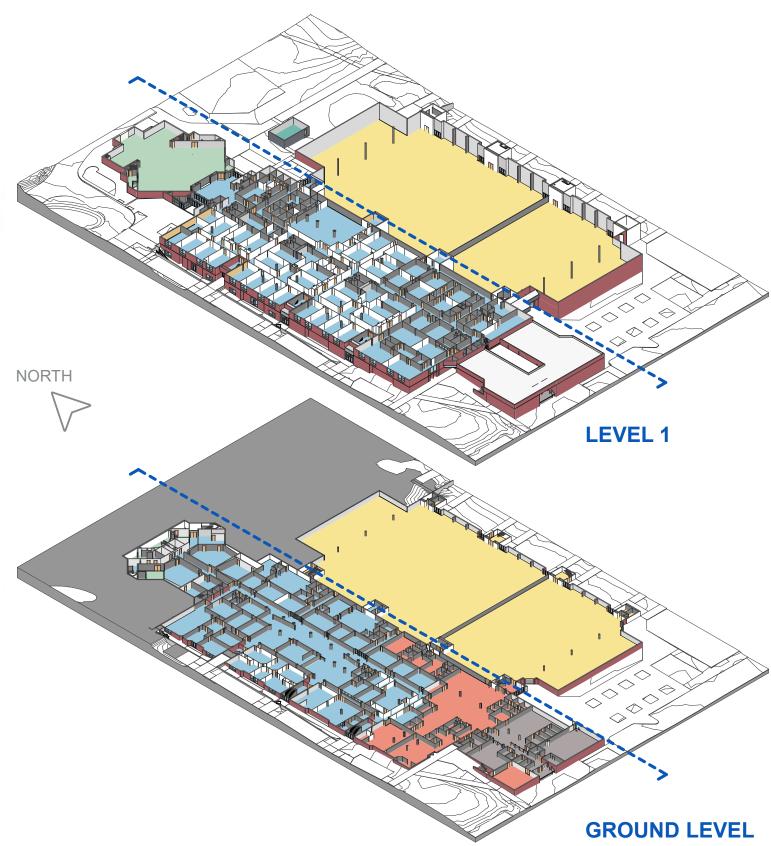
The School:

The school was constructed with an open floor plan where all classes were taught in three spaces with a limited number of exterior windows. The installation of modular wall panels in the early 1990s created enclosed classrooms with glass partitions between rooms and corridors. The wall panels created undersized spaces that did not follow the column grid resulting in columns in undesirable locations in classrooms.

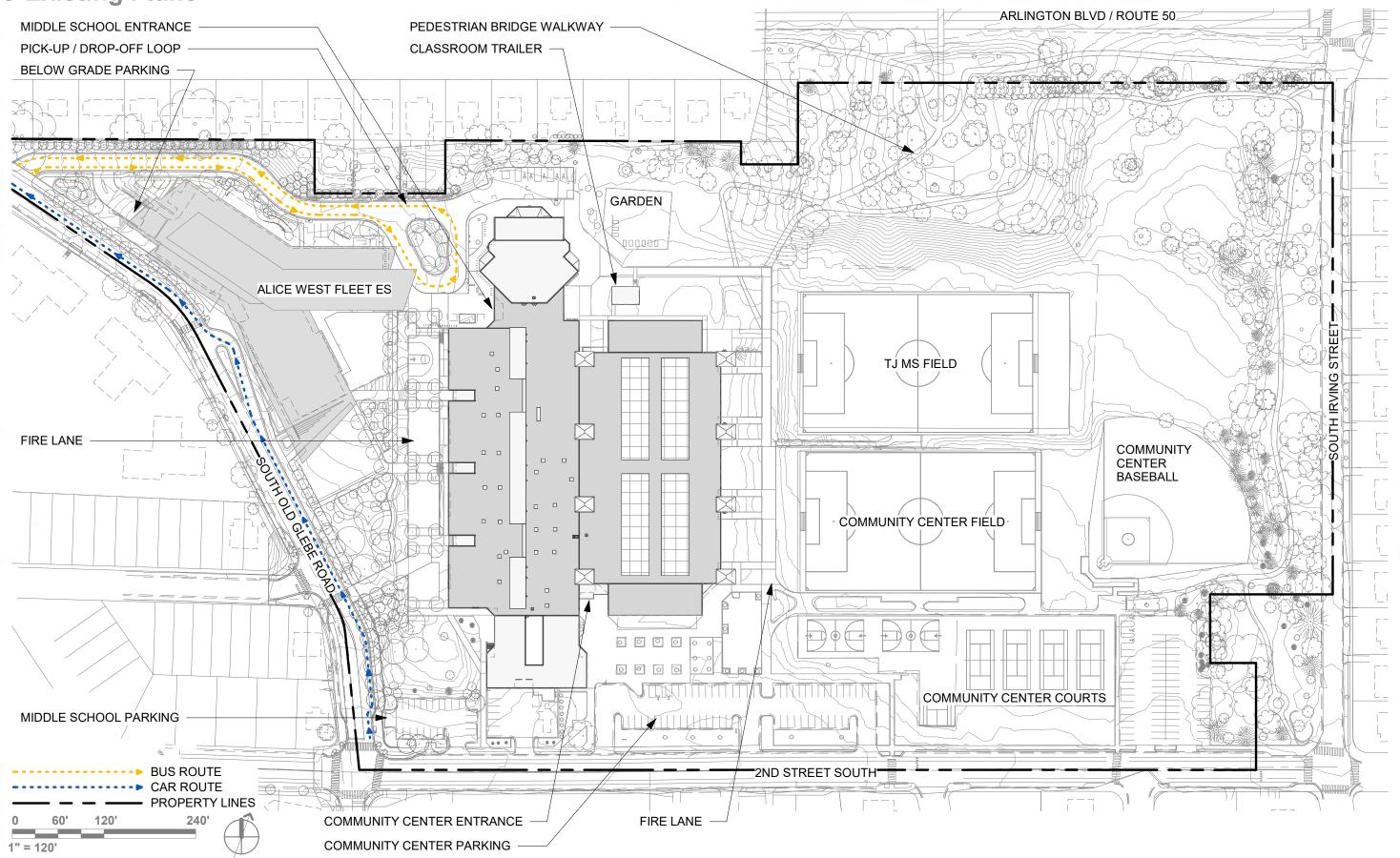
There are currently 1,086 students enrolled at Thomas Jefferson Middle School. This study will look in depth at the student capacity, existing square footage and ideal square footage to reach a student capacity of 1,086 in section 4.0 Program Analysis.

TJMS is unique in the district as it houses the largest proportion of special education programs including SPSA, accommodations for special education classrooms within the pods, English learner education, structured literacy, deaf and hard of hearing, life skills and Interlude.

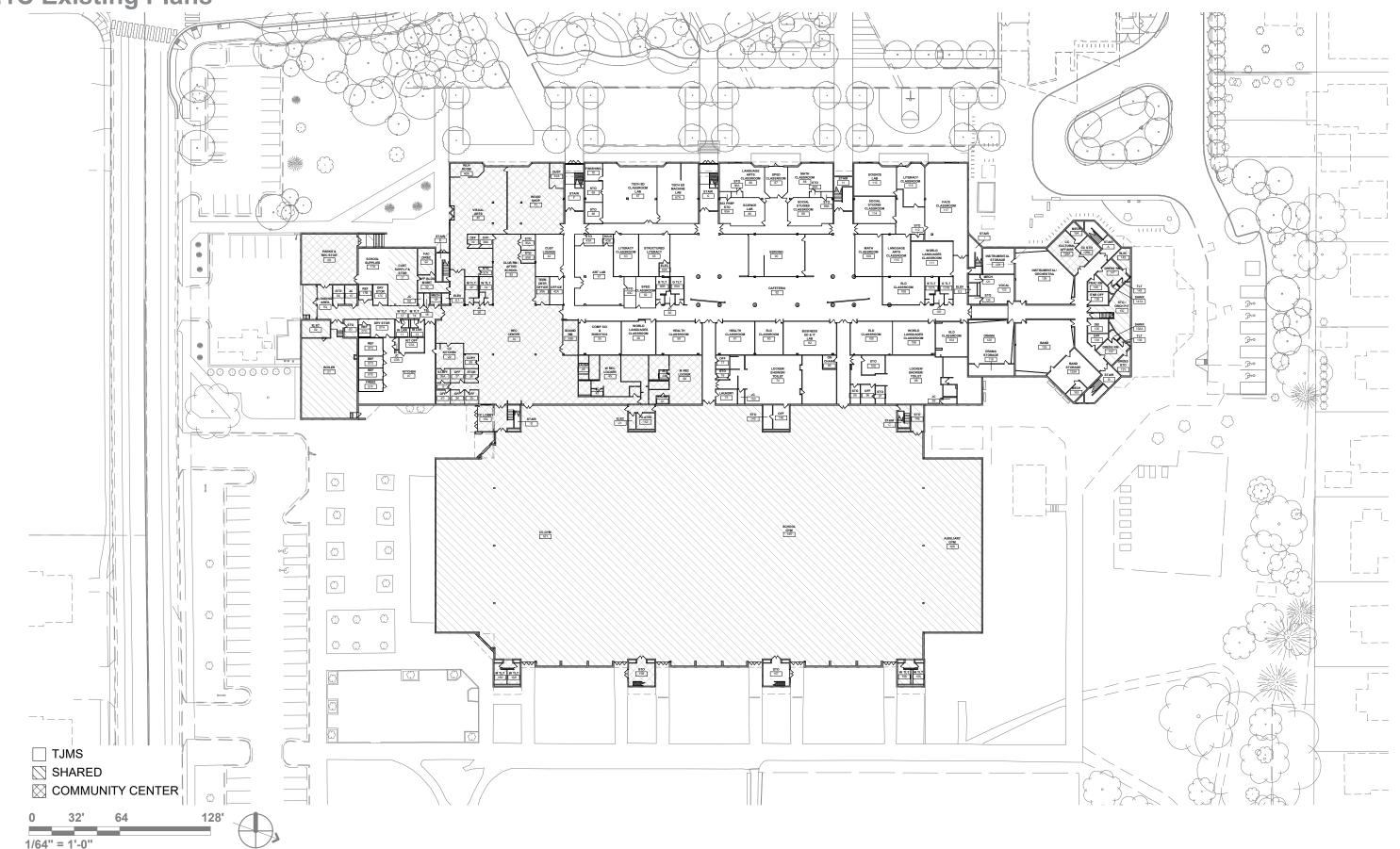




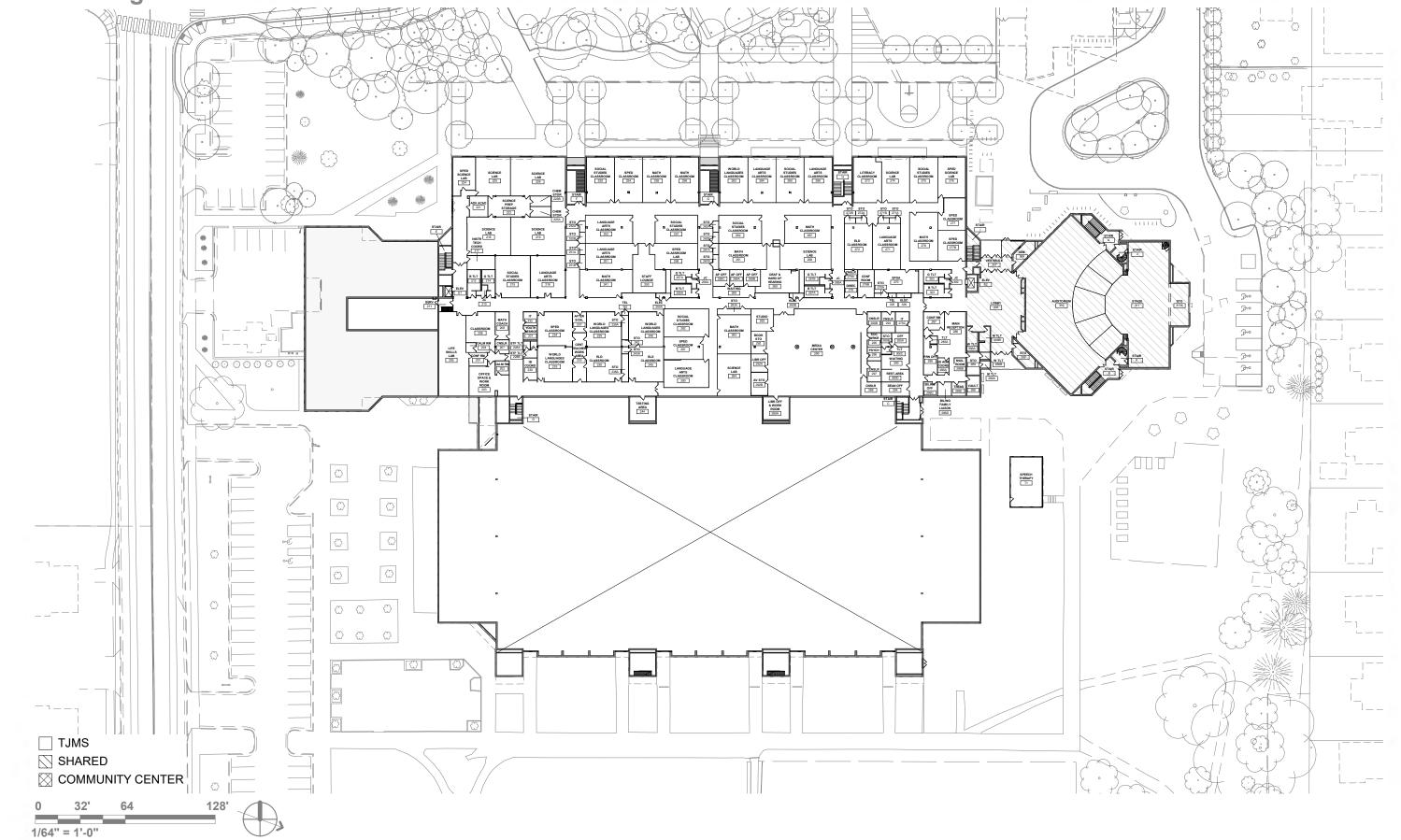
2.1 ARCHITECTURAL 2.1C Existing Plans



2.1C Existing Plans



2.1C Existing Plans



Location

The site is located on an 8.62-acre lot (Parcel ID #24-011-058) that is bounded by Alice West Fleet Elementary School (west side), Single Family Residential (north side), Thomas Jefferson Park (east side), and 2nd Street South (south side). The larger overall site (including 18-acre Parcel ID #24-011-037) is shared with Alice West Fleet Elementary School and Thomas Jefferson Park. There are several large areas of open space, including playgrounds, athletic fields and courts around the site.



Zoning Information

The site appears to be zoned S-3A based upon County Tax Records.

It is apparent that the existing school has an existing Use Permit. Requests have been made to Arlington County and APS to provide this information. Additional research shall be required beyond the scope of this initial study.

24-011-058 125 S OLD GLEBE RD ARLINGTON VA 22204

General Information

Owner COUNTY SCHOOL BOARD OF ARLINGTON		Legal Description VAN EVERY ET ALS PROPS THOS JEFF JR HIGH SCHOOL 375690.95 SQ FT				
Mailing Address		Trade Name T J JR HI & COMMUNITY CENTER				
Year Built	Units	EU#				
1972	N/A	N/A				
Property Class Code	Zoning	Lot Size				
215-Gen Comm - other	S-3A	375690				
Neighborhood#	Map Book/Page	Polygon				
980000	063-11	24011058				
Site Plan N/A	Rezoning N/A	Tax Exempt 8 - Arlington County School Board Owned No				

24-011-037 115 S OLD GLEBE RD ARLINGTON VA 22204

General Information

Owner COUNTY BOARD OF ARLINGTON		Legal Description VAN EVERY ET ALS PROPERTIES 784,323 SQ FT				
Mailing Address		Trade Name AliceWestFleetElemSch/SoccerFields				
Year Built	Units	EU#				
N/A	N/A	N/A				
Property Class Code	Zoning	Lot Size				
200-GenCom VacLand-no siteplan	S-3A	784323				
Neighborhood#	Map Book/Page	Polygon				
980000	063-11	24011037				
Site Plan N/A	Rezoning N/A	Tax Exempt 1 - Arlington County Board Owned No				

Zoning Information

Below is the Internal-Departmental Memorandum, dated 02/28/1994, which provides, "Criteria for Use Permit Process for School Expansions". This memo sets out certain criteria that APS may be held to, to determine if a school needs to amend an existing Use Permit or may require a new Use Permit (if none exists). It is highly recommended that the Client obtain the services of an experienced land use attorney to assist in the interpretation of the Zoning Ordinance recommendations and any subsequent coordination with County agency staff.

ABLINGTON COUNTY, VIRGINIA INTER-DEPARTMENTAL MEMORANDUM

Pebruary 28, 1994

TO: Susan A. Ingraham Glyde Hawkins

FROM: Bob Klute

UNJECT: Criteria to for Use Permit Process for School Expansions

These are the criteria which we developed last year and got a (qualified) buy-off from Schools. These criteria would be used to determine when Arlington County School expansion proposals would require a Use Permit:

- o Any increase in enrollment exceeding the established design capacity of a school (this criterion is already included in the Zoning Ordinance);
- o Any permanent building expansion which increases the existing building footprint by more than 20% and which extends the building footprint toward the property line (this criterion is based on an existing standard in the zoning Ordinance which triggers a site plan amendment for site plan approved projects infill within a building footprint, such as courtyards, would not be included under this):
- o Any increase in parking of more than 50 spaces or of parking lot or play lot area more than 20,000 square feet (there is a Zoning Ordinance standard which requires a Use Permit for public parking lots meeting this criterion);
- o any increase of more than 10% of site coverage (this criterion is proposed for where an expansion proposal might represent less than 20% of building footprint change or less than 30 pc king spaces, but through a combination of building footprint change and parking increases could still create considerable impacts. It is intended to draw in small others after where a change might have a property of meeter impact on the community).

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Setbacks

Based upon Section 3.2.6 of the Zoning Ordinance the following setbacks shall apply:

- Front Yard: (along 2nd Street S. or S. Irving St.): The larger of either 50 feet from said centerline of any street, or 25 feet from any street right-of-way line
- Side Yard: (10ft + 1 ft per 2.5 ft of building height above 25 ft): 14ft (based upon a 35ft building height)
- Rear Yard: On interior lots no structure shall be located closer than 25 feet from a rear lot line

** Please note that an amendment to an existing Use Permit may allow APS to modify and vary the proposed yards, if needed.

Building Height (max.): 45 feet

Floor Area Ratio (max.): None

The Alice West Fleet Elementary Final Board Report included the following modifications:

The project has had an extensive public review process that began in September 2014 with the establishment of the Thomas Jefferson Working Group (TJWG) by the County Board, and continued in June 2015 with the APS appointed South Arlington Working Group (SAWG). The current design has been endorsed by the School's Building Level Planning Committee (BLPC) and the County's Public Facilities Review Committee (PFRC). The proposed new elementary school plan requires County Board consideration of modifications for height from 45° up to 70°, front setback reduction from 50° to the street centerline to 37.8°, rear setback to property line from 28° to 0°, and parking modifications from 292 to 250. The proposal is also consistent with the GLUP's Public Use designation, and is generally consistent with the County's Principles of Civic Design and the TJWG's Guidelines, Conditions & Design Principles.

Topography

Most of the site is flat, with slopes ranging from 0%-5%. The site generally slopes from north to south with a ridge in the top center, splitting drainage. Sports fields in the eastern half of the property were constructed on elevated platforms, creating a low point in the northeast.



Wetlands/RPA

Based upon the County RPA map, there are no known wetland or RPA areas present on the site. Further verification should be conducted by a wetlands consultant as part of preliminary design work.

Tree Canopy Coverage

Based on aerial imagery below, the site has minimal existing tree cover, with small pockets of individual landscape trees planted throughout the site. A Tree Inventory should be developed in the future and a tree preservation plan developed, as required. A Certified Arborist should be utilized to determine the quality and life expectancy of the tree inventory. Further investigation of potential impacts to existing trees and cost implications for their removal shall be considered during the development of proposed school expansion plans.

Per Section 61-10-C.3 of the Chesapeake Bay Preservation Ordinance, "Dedicated school sites, playing fields, or other non-wooded public recreation areas, and other facilities and uses of a similar nature are exempt from these tree canopy coverage requirements," therefore no minimum tree canopy coverage is

required for the site.



Existing Soil Survey

According to the USDA NRCS Soil Survey, Sassafras-Urban Land-Neabsco complex makes up the vast majority of the soil on site.

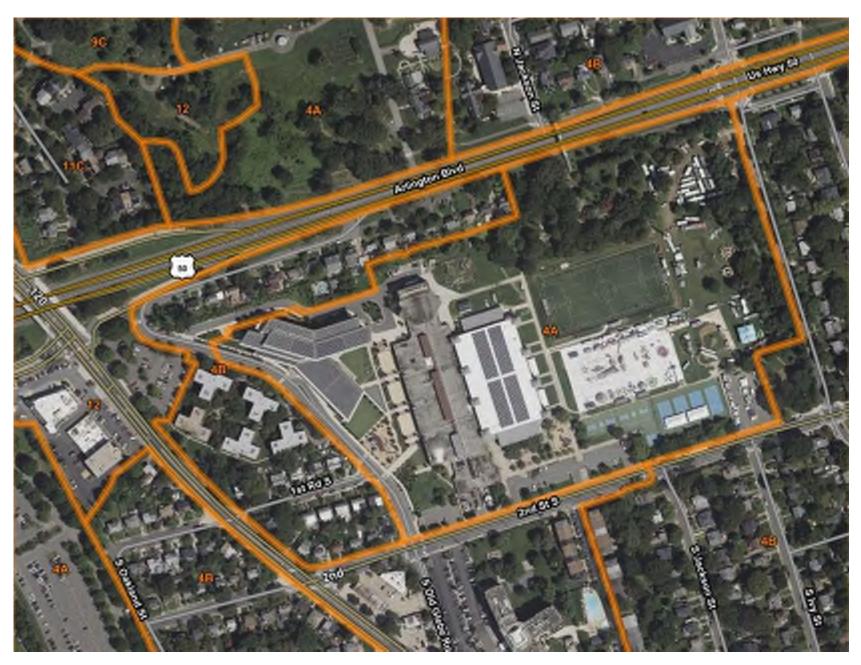
Of the Sassafras-Urban Land-Neabsco complex, 40% is assumed to be Sassafras complex, 35% is assumed to be Urban Land, and the remaining 15% is assumed to be Neabsco complex. Sassafras complex falls within Hydric Soil Group B, while Neabsco complex falls within Hydric Soil Group D.

Infiltration may be possible on the Sassafras-type soils. Soil tests are recommended in areas with proposed BMPs to confirm the assumed design hydrologic

soil group due to the variance throughout the site.

Map Unit Legend

Map Unit Symbol	Map Unit Name
4A	Sassafras-Urban land- Neabsco complex, 0 to 3 percent slopes
4B	Urban land-Sassafras- Neabsco complex, 3 to 8 percent slopes
9C	Sassafras gravelly sandy loam, 8 to 15 percent slopes
11C	Urban land-Sassafras complex, 8 to 15 percent slopes
12	Urban land-Udorthents complex, 2 to 15 percent slopes



Parking Requirements

Parking is provided onsite, primarily to the south of the existing building. One (1) parking space per each 7.5 students is required for employee parking, plus one (1) space for each 40 students for visitor parking. Further investigation of potential impacts to existing parking shall be considered during the development of proposed school expansion plans.

** Please note that an amendment to an existing Use Permit or new Use Permit may allow APS to modify and vary the existing/proposed parking, if needed.

Parking Provided On Site:

- Alice West Fleet Garage 214 spaces
- Southwest Corner Lot 23 spaces
- Loading Area South of Middle School 6 spaces
- Southern Lot 57 spaces
- Southeastern Lot 56 spaces
- Northern Lot 5 ADA spaces
- Total 361 spaces

Per discussions with APS, the site is currently adequately parked. Any spaces removed as a result of development will need to be replaced elsewhere on site.

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Wet Utilities

- Storm The County Maps show the site and the significant storm drainage that exists around the site. The existing storm drainage flows from north to south, from areas north of the site. Storm drainage pipes, structures and inlets are located along both the east and west sides of the existing building. The site drains in a southwesterly direction towards an existing system located at the intersection of S. Old Glebe Road and 2nd Street South. The size of the outfall varies, but appears to be 33" dia. & 54" dia. pipes and ties into a 54" pipe. Further investigation of this outfall system will be needed, if and when a project proceeds for this site. Analysis of the downstream impacts and hydraulic grade-lines will be required.
- Sanitary One existing 15" sanitary main runs south along S Old Glebe Rd. and one existing 8" sanitary main runs south along S Irving St. There is also an existing 8" sanitary main running along the northern property line serving the row of houses fronting Arlington Boulevard. The existing middle school building has two sanitary lateral connections. The first is in the northwest, combining with sanitary flow from Alice West Fleet Elementary and running south along the western side of the middle school. The second is located on the south face of the middle school, flowing to a manhole in the loading area. From that manhole, an 8" line goes west, where it ties into the 15" main on S Old Glebe Rd.
- Water Existing water mains are located in all three adjacent streets. There is a 6" main in S. Irving Street, an 8" main in 2nd Street South, and a recently upsized 8" main in S. Old Glebe Road that was constructed as part of the Alice West Fleet Elementary project. A 6" fire-line and 3" domestic line service the building in the loading dock area off of 2nd Street South.
 - o A pressure zone boundary passes through the County Park site to the east of the existing building. Careful consideration and attention needs to be made of this boundary. Additional water-mains may be required to build a pipe network that will be able to deliver required fire flows and pressures needed to serve a new building that may be located in the northeast corner of the County Park land.
 - Fire Hydrant flow tests shall be required and need to be requested as part of preliminary design efforts. These requests require a fee and are conducted by Arlington County.
 - o No transmission mains appear in the area. Easement widths of the existing water-mains located on site will need to be researched and provided (such as via an updated Title Report).

The following slides show the County storm, sanitary, and water maps, and a combined wet utilities exhibit.

Dry Utilities

- Overhead Electric Overhead electric borders the site on all three sides running along the west side of S. Old Glebe Road, running along the south side of 2nd Street South, and running along the west side of S. Irving Street.
- Underground Electric The existing middle school building is serviced by an underground electric duct bank that originates from a pole on the south side of 2nd Street South. The rest of the underground electric on the site is serving the lights for the existing fields and tennis courts and the asphalt paths throughout the site.
 - o It is critical that a dry utility consultant be part of the Design Team to help minimize cost and time delays required to negotiate with DVP. Because this school is embedded in an existing community with existing and future power needs, it is critical that this design be developed early in the design and permitting process.
- Gas Gas mains are located along the S. Irving Street and 2nd Street South site frontages. The existing middle school has a gas lateral that runs from the loading area in the south to the main in 2nd Street South.
- <u>Telecom</u> Telecom borders the site on all three sides running along the east side of S. Irving Street, running along the south side of 2nd Street South, and running along the west side of S Old Glebe Road.
- Fiber Optic The existing middle school is fed by a fiber optic connection originating from the western side of S Old Glebe Road at the intersection of 1st Street South.

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2.2A Existing Site and Utilities

Constraints

- The overall site has several constraints that must be considered when expanding or replacing the middle school. Alice West Fleet Elementary was recently constructed in the northwest corner of the site, limiting the space available for expansion to the west. Thomas Jefferson park has two athletic fields with lighting just east of the middle school, preventing expansion in that direction. The park also has tennis courts, a baseball field, and associated parking lots parking lots along 2nd Street South, which would need to be relocated/replaced elsewhere on site if they are impacted.
- A system of asphalt walking trails with lighting traverses the northeast quadrant of the site, providing important access for students. These paths connect to a pedestrian bridge over Route 50 to the north and to the surrounding neighborhood, providing site access for many students that walk to school. This connectivity must be preserved with any proposed development.
- The storm system in the northeast quadrant combines three outfalls from Route 50 that drain through the neighborhood and into the site. These are large storm pipes that will need to be relocated if they are impacted by development.
- There are several underground utilities in the southwest corner of the site, including sanitary, storm, and electric. There are also a significant number of overhead utility poles on the County and APS properties. These poles may be impacted with the development program and may require relocation and/or removal. Careful attention should be made of any existing guy wires, which can also present constraints.

Opportunities

- Available space for additions or new buildings is limited but does exist. The southwest corner of the site and the area northeast of the middle school both offer opportunities for building expansion. The entire eastern part of the site along S Irving Street is relatively undeveloped.
- All major utilities are present and readily accessible throughout the site, offering great flexibility in the location of new development.
- The site is very flat, which is important for ADA access, site access and connectivity, and building entrances.

arch arch

architecture incorporated

Existing Conditions Summary

- No signs of excessive structural deflection
- Expansion joint connection concerns at wall between school and community gymnasium
- Some minor settlement cracks in the masonry walls should be repaired under the orchestra pit stairs
- Wood shop below grade exterior wall should be repaired for both cracking and water infiltration
- Settlement cracks in theater exterior walls under the raised seating should be repaired.
- Column layout not ideal (interfere with classroom and library layout)

Existing Structural System

Foundation

- 4" concrete slab on grade
- Conventional spread footings
 - 4,000 psf bearing capacity

Steel Framed Floor

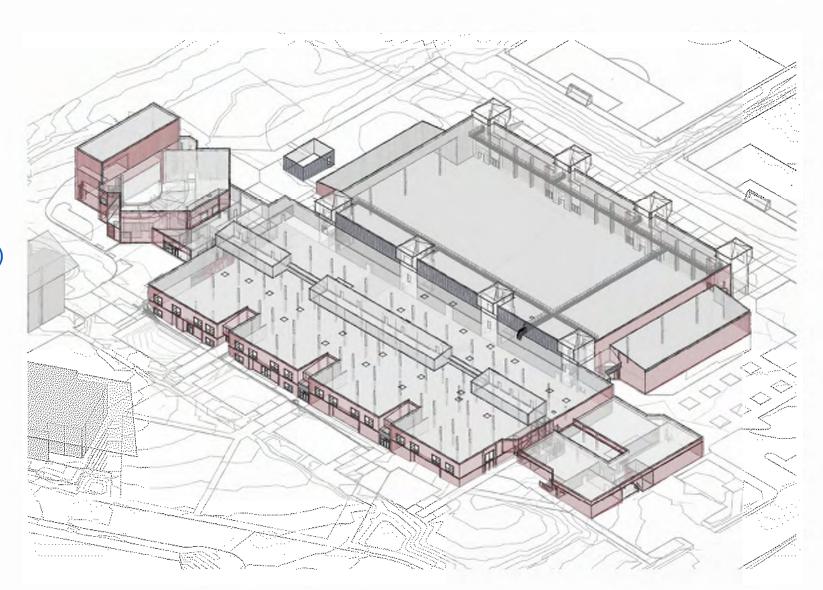
- 2" thick concrete slabs on form deck
- Open web joists at 24" OC
 - o 10" to 20" Deep
- Floor girders steel beams
 - o 14" to 21" deep

Steel Framed Roof

- Steel roof deck
- Open web joists at 6 ft OC
 - o 10" to 28" deep
- Roof girders steel beams
 - o 14" to 24" deep

Wall Between School & Community Gym

• 12" Concrete



<u>Impacts on Potential Changes to Existing Structure</u>

- Adding a floor would require reinforcing all columns and footings and replacement / relocation of the entire existing roof.
- At least 50% of the roof structure would need to be reinforced to support a new Photovoltaic System. The existing roof does not have the capacity to support a new PV system that weighs approximately 8 psf.



HEATING SYSTEM:

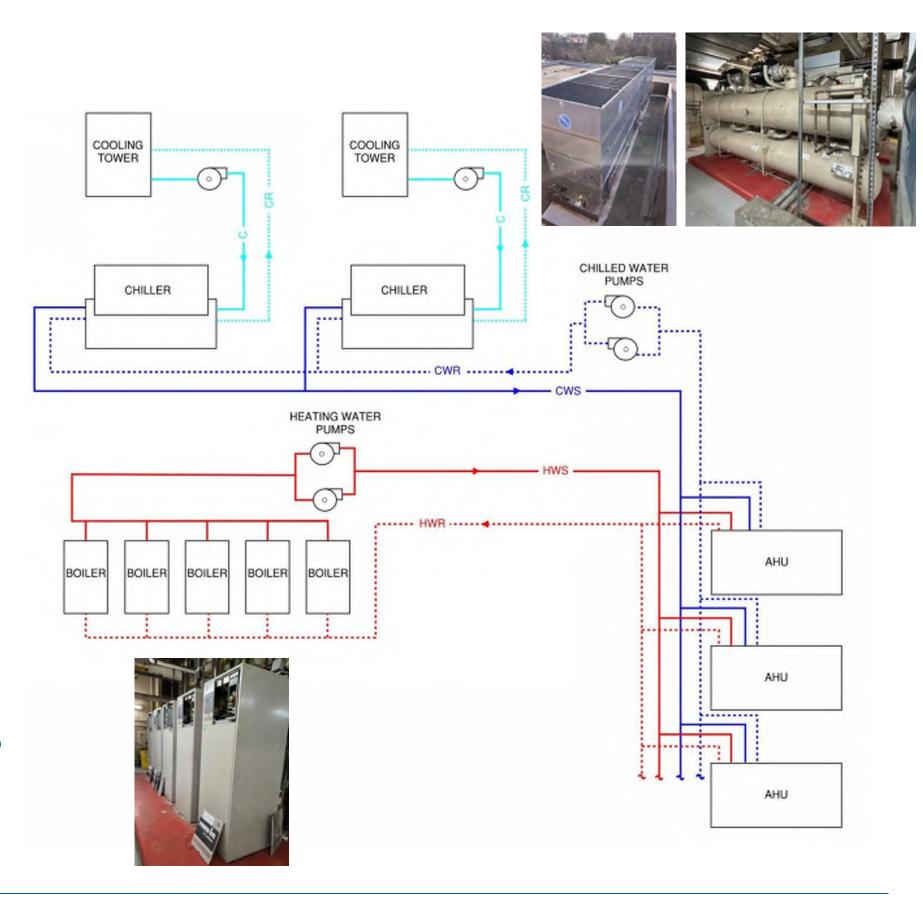
The school is heated by five 2,000 MBH modular gas fired boilers manufactured by Lochnivar, model Power-Fin. These boilers were provided in a 2004 renovation and located in the main mechanical room on the south side of the school replacing the original boilers. The boilers have a 5:1 turndown and produce heating water that is routed in 8" mains using 1500 gpm double suction centrifugal primary pumps through the school where it is distributed to the air handling units, fan coil unit and terminal unit heating coils. Secondary pumps 9 and 10 circulate heating water from the primary loop to the gymnasium air handling unit heating coils.

Although most of the original heating coils were originally sized at 190 deg F, the supply water temperature from the Lochnivar boilers is understood to operate at 160 deg F.

The combustion air for the boilers is provided by wall mounted intake louvers with controlled dampers. The stainless-steel boiler vents are routed up individually through the roof of the mechanical room.

COOLING SYSTEM:

The existing 420-ton centrifugal chillers were provided in 1999 in the main mechanical room, replacing the original building chillers. The chillers were designed as a high flow at 1400 gpm each with a low temperature drop of 7.2 F, from 52.2 F to 45 F. The cooling towers were replaced in 1999 and located on the roof of mechanical room. The cooling towers are used to reject heat from the chillers, both designed to reject 1260 gpm of condenser water from 95 deg F to 85 deg F. The three 1260 gpm double suction centrifugal pumps were also replaced in 1999.





AIR DISTRIBUTION SYSTEMS:

There are a total of 29 air handling units (AHUs) serving the school which are summarized in table below. There are eight constant volume dual duct air handling units located in the penthouse that provide the heating, cooling and ventilation to the main portion of the building serving the classrooms on the ground and upper levels. These air handling units are original to the building and have reached the end of their useful life. These constant volume AHUs supply air through the cold and hot deck plenums through the air distribution ductwork to dual duct constant volume terminal boxes located above the ceilings in the classrooms that they served. While this system when operating correctly is effective in maintaining space temperatures, it is antiquated and uses significantly more fan energy when compared to the modern variable volume AHUs and terminal boxes.

The community center and school gymnasium are served by eight constant volume AHUs, with one located in each of the eight towers serving these two spaces. These eight systems were each sized at 20,000 cfm which is a significant amount of fan energy used to condition the gym and community center. The systems were all originally provided with heat recovery energy wheels to pre-treat the outside air ventilation, but these wheels were not installed in an accessible location allowing for proper maintenance resulting in them unlikely to have been functional for any length of service.

The auditorium, stage and band areas are also served by constant volume AHUs located on both the ground and upper levels. These AHUs have been replaced with units manufactured by Carrier in 2009 and 2010.

There are two kitchen areas serving the building, one for the school and students located on the ground floor of the main building and the

second kitchen area located by the main mechanical room that is used by the community center. Ventilation hoods and exhaust is provided in both kitchen areas. Make-up air and kitchen hood exhaust fans are located on the roof.

HVAC CONTROL SYSTEM:

The existing HVAC is controlled by an Automated Logic building automation system which appears to be functioning well.

	40.000	Airflow	Installation	CAV or	F	
AHU	Area Served	(cfm)	Year	VAV	Type	
-1	Ground Level South Classrooms	18,000	1972	CAV	Dual duct, horizontal, modular	
2	Upper Level South Classrooms	16,000	1972	CAV	Dual duct, horizontal, modular	
3	Upper Level South Classrooms	20,000	1972	CAV	Dual duct, horizontal, modular	
4	Ground Level South Classrooms	14,000	1972	CAV	Dual duct, horizontal, modular	
5	Ground Level North Classrooms	19,000	1972	CAV	Dual duct, horizontal, modular	
6	Ground Level North Classrooms	15,000	1972	CAV	Dual duct, horizontal, modular	
7	Upper Level North Classrooms	16,500	1972	CAV	Dual duct, horizontal, modular	
8	Upper Level North Classrooms	16,000	1972	CAV	Dual duct, horizontal, modular	
9	Community Center Gym - SW	20,000	1972	CAV	Vertical, modular	
10	Community Center Gym - SW	20,000	1972	CAV	Vertical, modular	
11	School Gym - NW	20,000	1972	CAV	Vertical, modular	
12	School Gym - NW	20,000	1972	CAV	Vertical, modular	
13	School Gym - NE	20,000	1972	CAV	Vertical, modular	
14	School Gym - NE	20,000	1972	CAV	Vertical, modular	
15	Community Center Gym - SE	20,000	1972	CAV	Vertical, modular	
16	Community Center Gym - SE	20,000	1972	CAV	Vertical, modular	
17	Auditorium - lower left	5,000	2010	CAV	Vertical, modular	
18	Auditorium - lower middle	5,000	2010	CAV	Vertical, modular	
19	Auditorium - lower right	5,000	2010	CAV	Vertical, modular	
20	Auditorium - upper left	5,000	2010	CAV	Vertical, modular	
21	Auditorium - upper right	5,000	2010	CAV	Vertical, modular	
22	Stage	13,000	2010	CAV	Vertical, modular	
23	Auditorium Vestibule	1,100	2010	CAV	Horizontal, modular	
24	Auditorium Lobby	3,600	2010	CAV	Horizontal, modular	
25	Ground Level - Orchestra	4,000	2010	CAV	Vertical, modular	
26	Ground Level - Band	4,000	2010	CAV	Vertical, modular	
27	Vestibule	1,200	1972	CAV	Horizontal, modular	
28	Storage	4,300	1972	CAV	Horizontal, modular	
29	Kitchen	12,000	1972	CAV	Horizontal, modular	

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SANITARY WASTE SYSTEM:

The school's existing building sanitary sewer runs from the NW corner of the building heading south and parallel with the west side of the school where it connects to the existing municipal 12" sanitary pipe southwest of the building underground near the intersection of S. Old Glebe Rd. and 2nd Street South.

There are four below grade sanitary sewers exiting the building along the west side ranging in size from 4" to 6" and combining into an 8" sanitary waste. Along the south side of the building there are also four sanitary waste pipes exiting the building ranging in size from 4" to 5", and combine to an 8" pipe moving SW.

Most of the aboveground observable sanitary waste and vent piping is cast iron and original to the building, making it over 50 years old. Over the years there have been modifications and additions to the interior building sanitary waste system resulting in some PVC pipe also observed in the system.

 Above and below ground properly installed and maintained cast iron sanitary waste pipe, that is not exposed to caustic soils or corrosive environments, has an estimated average useful lifespan of 100 years or more.

STORMWATER REMOVAL SYSTEM:

The building's existing underground stormwater system runs parallel with the building's east and west sides moving from north to south and joining together at the southwest corner of the building site where it connects with the municipal 15" reinforced concrete pipe (RCP) located underground at the intersection of S. Old Glebe Road and 2nd Street South.

Stormwater exists the building in six places along the east (gymnasium) side of the facility. The stormwater pipe traves south as a 12" where it connects with the existing municipal 54" RCP at the SE corner of the gymnasium.

Stormwater exits the NE side of the building in 6 locations and joins the existing 48" municipal RCP located at the NE corner of the gymnasium.

The west side of the building has seven existing stormwater mains exiting the building ranging in size from 4"to 6". The mains travel south gathering to a 15" where it joins with the existing municipal 24" RCP at the SW corner of the school under Old Glebe Road.

The existing visible interior storm pipe is original to the building hub and spigot cast iron pipe ranging in sizes from 4" to 8".

The existing roof drainage system was observed to be in disrepair with missing dome strainers on some roof drains, areas of ponding water, and a non-code-compliant stormwater drainage system.

 Missing domes strainers on roof drains help to keep leaves, twigs, ballast, and other foreign objects from entering the drainage system. Ponding of water could be due to roof settlements, clogged roof drains, possible obstructions in rain leaders or any combination thereof.



Roof Water Ponding



STORMWATER REMOVAL SYSTEM:

The existing stormwater drainage system as installed is not compliant with the 2024 International Plumbing Code.

- Secondary (emergency overflow) roof drains or scuppers shall be provided where roof perimeter construction extends above the roof in such a way as to trap water.
- Additionally, secondary emergency roof drains shall have the endpoint of discharge separate from the primary system and the discharge shall be above grade in a location that would normally be observed by the building occupants or maintenance personnel.

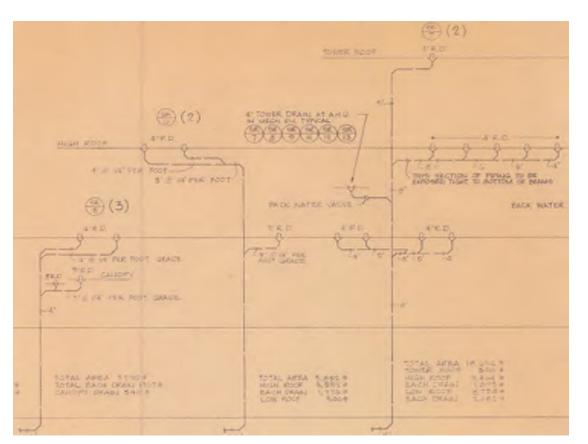
The figure to the right shows all the floor drains piped together via the same pipe to rain leaders with discharges underground.

Existing gutter drains, existing canopy drains, and existing scupper drains all have discharges exterior to the building that are below grade without any apparent secondary drainage.

DOMESTIC WATER SYSTEM:

The building domestic water service is provided by an existing metered 4" cold water pipe entering in the SE corner of the Lower-Level Boiler/Mechanical Room. Observable cold water, hot water, and hot water recirculating distribution piping distribution piping was fiberglass insulated copper pipe, much of which appeared to be original to the building.

- Type L soldered copper pipe used in typical domestic hot and cold-water systems has an average useful lifespan of 50-70 years depending on water quality, pipe design, and environmental conditions.
- There were some press-connect copper plumbing piping and fittings in the domestic water distribution system observed, mainly located in mechanical spaces, that is newer than original and is the result of building additions, renovations, and repairs over the life of the school building.



Original Construction Riser Diagram Showing Non-Code Compliant Roof Drain Piping



Missing Roof Drain Dome Strainers

2.5 PLUMBING

SUMMER

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DOMESTIC WATER SYSTEM:

Most of the domestic water distribution for the school occurs in the ceiling of the lower-level traveling from south to north where branches take off from the main and serve plumbing fixtures located on the Lower-Level Floor, Upper-Level Floor and domestic water heaters located in the north and south Penthouses.

Domestic hot water is provided from two locations in the mechanical penthouses.

- Existing Penthouse #3, located on the north side of the roof, houses a gasfired A.O. Smith model BC 670-780 copper heat exchanger, manufactured in 1982, that is connected to an insulated 1,000-gallon domestic water storage tank. The storage tank appears to be original to the building. Domestic hot water from this tank is supplies domestic hot water to classrooms and offices on the north side of the building.
- Existing Penthouse #1, located on the south side of the roof, also houses an A.O. Smith copper heat exchanger model 670-932, manufactured in 1994, that is connected to a 1,000-gallon domestic water storage tank and supplies water to lower and upper levels on the south side of the school.
 - The average lifespan of a large steel domestic water storage tank typically falls between 20-30 years, depending on the water quality stored and tank maintenance. At over 50 years of age, the existing domestic water storage tanks have reached the end of useful life and should be replaced during the next major building renovation.
 - The average lifespan of a copper heat exchanger is typically between 12 to 20 years depending on water quality, usage, and maintenance. That would make the north Penthouse domestic water heat exchanger approximately 43 years old and the south Penthouse over 31 years old, both well beyond useful age.

Domestic Water Fixtures

The existing toilet room water closets are white, vitreous china, floor mounted with manually operated 1.6 GPF flush valves. Tested closets functioned as expected and appeared in fair condition.

Urinals are white, vitreous china, wall mounted, with automatic, sensor operated, 1.0 GPF flush valves. Urinals had no partitions between them and were tightly spaced in some areas.

Lavatories observed in the school were white vitreous china, wall mounted with backsplash and a combination of manually operated ADA faucets and automatic, sensor operated, metered faucets.

Refrigerated, electric, surface wall mounted drinking water coolers with bottle filling stations were observed by multi-user toilet rooms and elsewhere throughout the building.

NATURAL GAS:

An existing steel, 4" high pressure natural gas is supplied to the school adjacent to the existing loading dock area at the south end of the building. The 4" welded steel, screwed, and flanged piping is metered and the pressure reduced to 2 psig supply pressure exterior to the building for distribution inside the building.

- Steel pipe located outdoors, when properly maintained and inspected, has an average expected useful life of 50 years.
- Threaded black steel natural gas piping, located in well-protected environments, has an average useful life of 50-100 years.

An existing 3" low pressure natural gas (2 psig) serves 5 existing boilers located in the Lower-level Mechanical Room adjacent to the exterior gas service.

An existing 3" gas runs up the exterior south side of the building to the roof where it is distributed on the roof to rooftop mounted mechanical equipment and the Mechanical Penthouses, supplying natural gas to the existing A.O. Smith domestic water heaters.

Much of the gas piping distribution occurs on the roof. The exterior gas piping, particularly at the incoming service, is showing signs of wear with external pipe oxidation and flaking paint.



MAIN ELECTRICAL SERVICE:

The main electrical service was provided during the original 1972 construction of the school. The main gear is a pair of General Electric 3000A and 4000A, 480/277V, 3 phase, 4 wire switch and fuse style switchboards that share an incoming CT cabinet. The secondary from the Virginia Dominion transformer enters the electrical room underground.

The condition of the incoming switchboard equipment is poor and verging on hazardous.

Safely performing maintenance procedures cannot be assured due to the age and condition of the switch. Industry standards recommend that bolted pressure switches be operated and maintained annually to ensure reliable operation during fault conditions. The current condition of the main switch doesn't allow this. The power distribution division of General Electric was sold to ABB in 2017 which would make finding replacement and repair components difficult.

The mechanical plant is supported by a General Electric 600A, 480V, 3 phase motor control center also original to the building and in poor condition.

DISTRIBUTION SYSTEM:

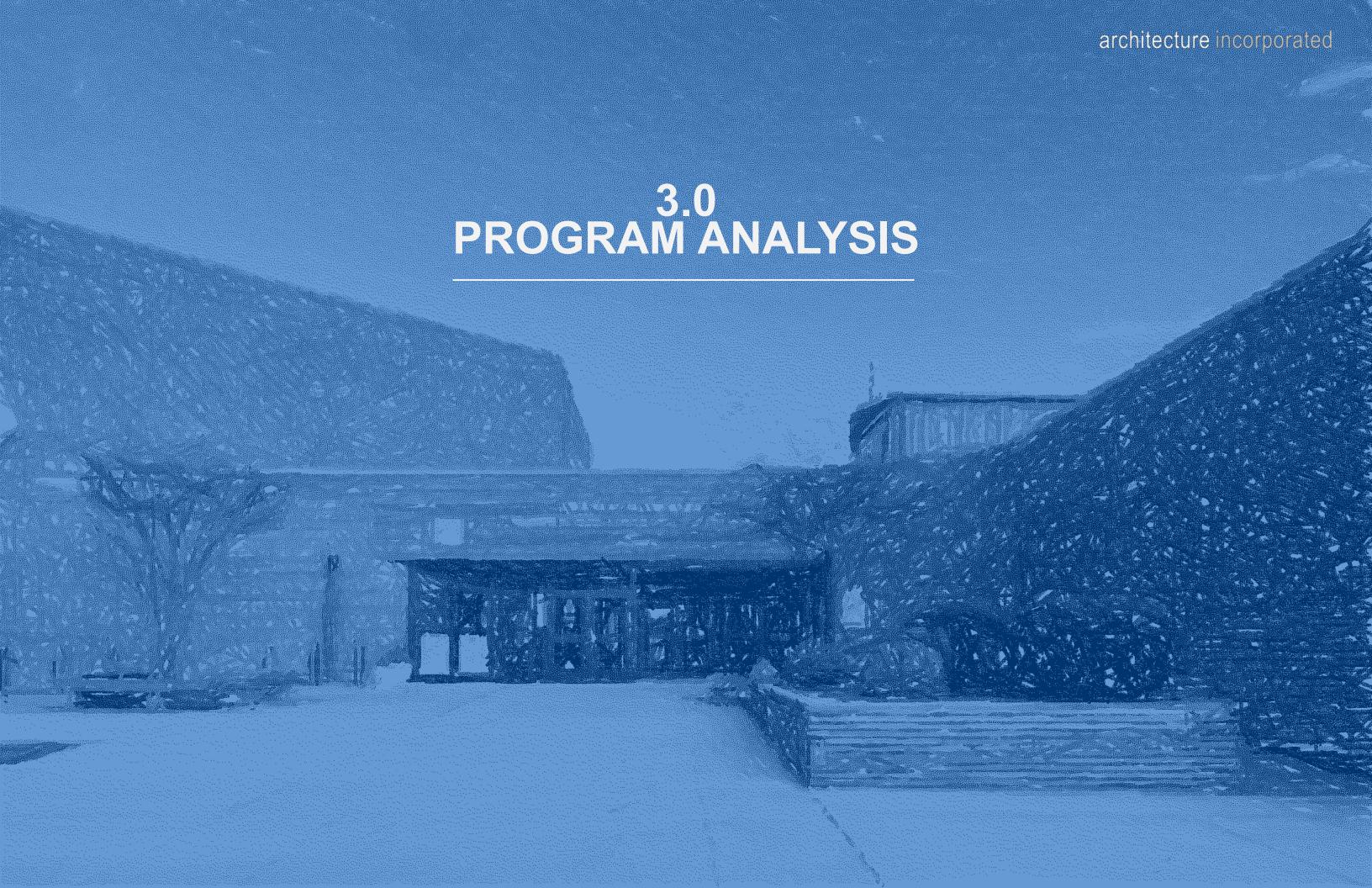
The distribution and branch panelboards are of the same vintage as the main service and motor control center, are manufactured by General Electric and in need of replacement.

LIGHTING:

Lighting throughout the building was inconsistent and not aligned with the needs or arrangement of the spaces for which it was installed. The majority appeared to be various versions of fluorescent fixtures which have reached the end of their serviceable life and are significantly deficient in energy efficient operation.



Main Switchboard



3.1 2004 ED. SPEC VS. EXISTING PROGRAM VS. PLANNED SQUARE FOOTAGE

The spreadsheet below compares square footages from the viewpoint of three key elements to understand how Thomas Jefferson Middle School serves its student population today: APS education specification from 2004, the existing square footages today, and the planned square footage based on feedback from APS and TJMS teachers and staff. Multiple meetings were conducted with TJMS teachers and staff to understand the planned square footage. The program was then sent to APS and adjusted per feedback. The high square footages were used to develop the design studies.

1	NOTES:										
2	PER VDOE RECOMMENDATION AND APS CORRESPONDENCE, CORE CLASSROOMS GENERATE CAPACITY FOR 25 STUDENTS. SPECIAL EDUCATION CLASSROOMS GENERATE CAPACITY FOR 8 STUDENTS.										
3	PROGRAM CAPACITY UTILIZES HIGH SF VALUE										
4				_							
5	OGRAM CATEGORY & ROOMS APS EDUCATION SPECIFICATION EXISTING SCHOOL PLANNED SQUARE FOOTAGE								NOTES		
6	12/2004					PER SCHOOL STAFF FEEDBACK W/ APS OVERSIGHT					
7		SF - LOW	SF - HIGH	# OF ROOMS	SF	# OF ROOMS	SF - LOW	SF -HIGH	TOTAL SF	STUDENT CAPACITY	
8	ENTRY										
9	SAFETY EMERGENCY MANAGEMENT (SEM) OFFICE			1	160	1	200	200	200		2 STAFF MEMBERS
10	SUBTOTAL			1	160	1			200		
11	ADMINISTRATIVE (SUITE)										
12	MAIN OFFICE RECEPTION	600	600	1	774	1	600	600	600		2 DESKS FOR ADMIN
13	PRINCIPAL'S OFFICE	200	200	1	230	1	200	200	200		
14	PRINCIPAL'S TOILET			1	27						
15	EDUCATION ADMIN COORDINATOR	0	C	1	96	1	130	130	130		ASSOCIATED WITH PRINCIPAL
16	CONFERENCE ROOM	200	200	1	186	1	200	200	200		
17	FINANCE OFFICE	100	100			1	130	130	130		
18	TREASURER	0	C	1	97	1	130	130	130		
19	REGISTRAR	0	C			1	130	130	130		
20	DUPLICATION / PRODUCTION	200	200			1	200	200	200		
21	VAULT	100	100	1	129	1	200	200	200		
22	SUPPLY / STORAGE / MAIL ROOM	200	200	2	243	1	300	300	300		
23	STAFF TOILET	65	65	1	34	1	65	65	65		
24	STAFF TOILET	65	65	1	34	1	65	65	65		
25	INSTRUCTIONAL TECHNOLOGY COORDINATION	120	120	1	190	1	200	200	200		CURRENTLY NOT IN ADMIN SUITE
26	ASSISTANT PRINCIPAL (6TH)	120	120	1	137	1	130	130	130		COLOCATE IN 6TH GRADE POD (CURRENTLY NOT IN PODS)
27	ASSISTANT PRINCIPAL (7TH)	120	120	1	113	1	130	130	130		COLOCATE IN 7TH GRADE POD (CURRENTLY NOT IN PODS)
28	ASSISTANT PRINCIPAL (8TH)	120	120	1	138	1	130	130	130		COLOCATE IN 8TH GRADE POD (CURRENTLY NOT IN PODS)
29	SUBTOTAL			15	2,428	16			2,940		

5	PROGRAM CATEGORY s ROOMS	APS EDUCATION	N SPECIFICATION	EXISTING	SCHOOL		PLANNE	D SQUARE FO	OTAGE		NOTES
6		12,	/2004			PER :	SCHOOL STAFF	FEEDBACK V	V/ APS OVERSI	GHT	
7		SF - LOW	SF - HIGH	# OF ROOMS	SF	# OF ROOMS	SF - LOW	SF -HIGH	TOTAL SF	STUDENT CAPACITY	
30	STUDENT SERVICES										
31	DEAN'S OFFICE	0	0	1	195	1	130	130	130		CENTRALLY LOCATED IN BUILDING; EQUALLY ACCESSIBLE
32	ITINERANT OFFICE SPACES	120	120	1	132	3	130	130	390		
33	BILINGUAL FAMILY RESOURCE LIASON	0	0	1	96	1	300	300	300		MEETS WITH FAMILIES
34	BILINGUAL OFFICE	120	120	1	96	1	130	130	130		
35	BILINGUAL PSYCHOLOGIST	120	120								REMOVED FROM PROGRAM
36	VISITING TEACHER (SHARED)	120	120			1	130	130	130		
37	CONFERENCE ROOM	150	150			1	150	150	150		
38	YOUTH RESOURCE	120	120	1	94	1	130	130	130		
39	ENGLISH LEARNER INTERVENTION	0	0			1	130	130	130		
40	ADVANCED ACADEMICS	120	120	1	189	1	130	130	130		PREVIOUSLY "GIFTED"
41	STUDENT ACTIVITIES CENTER	500	500			1	500	500	500		
42	TESTING AREA	0	0	1	309	1	280	280	280		
43	MSRT MIDDLE SCHOOL READING TEACHER	0	0			1	130	130	130		
44	IB COORDINATOR	0	0	1	150	1	130	130	130		
45	AFTER SCHOOL	0	0	1	142	1	130	130	130		
46	DIVERSITY EQUITY INCLUSION	120	120	1	142	1	130	130	130		PREVIOUSLY "MINORITY ACHIEVEMENT"
47	MATH COACH	0	0	1	191	1	130	130	130		
48	SUBTOTAL			11	1,736	18			3,050		
49	COUNSELING SERVICES (SUITE)										COUNSELING SERVICES CURRENTLY WITHIN MEDIA CENTER & ACROSS HALL
50	DIRECTOR	120	120	1	109	1	130	130	130		
51	COUNSELOR	100	100	5	650	5	150	150	750		GROUPS OF 6-8 STUDENTS
52	CONFERENCE ROOM	150	150	1	228	1	150	150	150		CENTRAL TO COUNSELOR OFFICES
53	RECORDS STORAGE	200	200			1	200	200	200		
54	PSYCHOLOGIST	120	120	1	94	1	150	150	150		MOVED FROM STUDENT SERVICES
55	SOCIAL WORKER	120	120	1	95	1	150	150	150		MOVED FROM STUDENT SERVICES
56	INTERVENTION COUNSELOR	0	0			1	150	150	150		
57	SUBSTANCE ABUSE	0	0			1	150	150	150		
58	SUBTOTAL			9	1,176	12			1,830		

5	PROGRAM CATEGORY s ROOMS	APS EDUCATION	N SPECIFICATION	EXISTING	SCHOOL		PLANNE	D SQUARE FOO	OTAGE		NOTES
6		12	2/2004			PER	SCHOOL STAF	FEEDBACK W	// APS OVERSI	GHT	
7		SF - LOW	SF - HIGH	# OF ROOMS	SF	# OF ROOMS	SF - LOW	SF -HIGH	TOTAL SF	STUDENT CAPACITY	
59	CLINIC (SUITE)										
60	WAITING	350	350	1	268	1	350	350	350		
61	PHN / EXAM ROOM	250	250			1	250	250	250		
62	REST AREA	200	200	1	171	. 1	200	200	200		
63	TOILET	65	65	1	35	1	65	65	65		
64	SPEECH THERAPY	200	200	1	784	. 1	200	200	200		MOVED FROM STUDENT SERVICES / CURRENTLY NOT IN SUITE - IN TRAILER
65	PHYSICAL THERAPY	250	250			1	200	200	200		MOVED FROM SPED, PREVIOUSLY "OT/PT"
66	OCCUPATIONAL THERAPY	250	250			1	200	200	200		MOVED FROM SPED, PREVIOUSLY "OT/PT"
67	OFFICE WITH SPACE FOR FRIDGE / FILES	0	0	2	188	1	130	130	130		
68	SUBTOTAL			6	1,446	8			1,595		
69	AUXILIARY SERVICE										
70	BOOK STORAGE	300	300	1	533	1	300	300	300		
71	CENTRAL TEACHER WORK AREA	0	0	1	336	1	1,000	1,000	1,000		
72	TEACHER WORK AREA (6TH)	1,000	1,000			1	500	500	500		COLOCATE IN 6TH GRADE POD (CURRENTLY NOT IN PODS)
73	TEACHER WORK AREA (7TH)	1,000	1,000			1	500	500	500		COLOCATE IN 6TH GRADE POD (CURRENTLY NOT IN PODS)
74	TEACHER WORK AREA (8TH)	1,000	1,000			1	500	500	500		COLOCATE IN 6TH GRADE POD (CURRENTLY NOT IN PODS)
75	STAFF LOUNGE	450	450	1	614	. 2	450	450	900		KITCHENETTE
76	WELLNESS ROOMS (3 @ 130 EA)	0	0			3	130	130	390		
77	PTA STORAGE	0	0			1	400	400	400		
78	SCHOOL STORE (W/ DUTCH DOOR)	0	0			1	130	130	130		
79	SUBTOTAL			3	1,483	12			4,620		
80	FOOD SERVICES										
81	CAFETERIA	4,000	5,800	1	5,373	1	4,000	5,800	5,800		PER VDOE, 9-11 SF PER STUDENT (W/ RECTANGULAR TABLES W/ ATTACHED SEATS)
82	KITCHEN	1,000	1,000	1	1,693	1	1,000	1,000	1,000		CURRENTLY REMOTE (WITHIN COMMUNITY CENTER)
83	SERVING AREA	1,200	1,200	1	1,170	1	1,200	1,200	1,200		MINIMUM 3 LINES
84	SNACK BAR AREA	250	250			1	250	250	250		
85	SALAD BAR AREA	250	250			1	250	250	250		
86	FREEZER (WALK-IN)	150	150	1	135	1	150	150	150		CURRENTLY REMOTE (WITHIN COMMUNITY CENTER)
87	REFRIGERATOR (WALK-IN)	250	250	5	638	1	250	250	250		CURRENTLY REMOTE (WITHIN COMMUNITY CENTER)
88	DRY STORAGE	350	350	2	394	. 1	350	350	350		
89	CAN WASH	65	65			1	65	65	65		
90	OFFICE	150	150	1	182	1	150	150	150		CURRENTLY REMOTE (WITHIN COMMUNITY CENTER)
91	TOILET	65	65			1	65	65	65		CURRENTLY REMOTE (WITHIN COMMUNITY CENTER)
92	LOCKERS	80	80			1	80	80			CURRENTLY REMOTE (WITHIN COMMUNITY CENTER)
93	CAFETERIA STORAGE	200	200			1	200	200	200		
94	CUSTODIAL CLOSET	50	50	1	19	1	50	50	50		CURRENTLY REMOTE (WITHIN COMMUNITY CENTER)
95	SUBTOTAL			13	9,604	14			9,860		

5	PROGRAM CATEGORY s ROOMS	APS EDUCATION	N SPECIFICATION	EXISTING S	CHOOL		PLANNE	D SQUARE FOO	TAGE		NOTES
6		12	/2004			PER	SCHOOL STAF	F FEEDBACK W,	/ APS OVERSIG	GHT	
7		SF - LOW	SF - HIGH	# OF ROOMS	SF	# OF ROOMS	SF - LOW	SF -HIGH	TOTAL SF	STUDENT CAPACITY	
96	MEDIA CENTER										
97	MEDIA CENTER	3,500	4,500	1	3,953	1	3,500	4,500	4,500		
98	LIBRARIAN'S OFFICE s WORK ROOM	300	300	1	287	1	300	300	300		
99	LIBRARIAN'S OFFICE	0	0	1	152	1	130	130	130		OVER 1000 STUDENTS NEED 2 LIBRARIANS
100	A. V. STORAGE	450	450	1	192	1	450	450	450		
101	COMMUNICATIONS ROOM	150	150			1	150	150	150		
102	COMPUTER ALCOVE	600	600			1	600	600	600		
103	READING CLASSROOM	400	400			1	400	400	400		
104	STUDIO	0	0	1	252	1	300	300	300		
105	BOOK STORAGE			1	169						
106	SUBTOTAL			6	5,005	8			6,830		
107	CORE CLASSROOMS										
108	6TH GRADE POD										
109	SPED CLASSROOM	500	500	2	635	4	700	750	3,000	32	ONE SPED CLASSROOM FOR EACH SUBJECT
110	SPED LAB	0	0	2	961	1	1,200	1,200	1,200	8	ONE SPED CLASSROOM FOR EACH SUBJECT
111	LANGUAGE ARTS CLASSROOM	700	750	3	1,945	3	700	750	2,250	75	
112	LITERACY	0	0	3	1,659	3	700	750	2,250	75	
113	SOCIAL STUDIES CLASSROOM	700	750	3	1,835	3	700	750	2,250	75	
114	MATH CLASSROOM	700	750	3	1,972	3	700	750	2,250	75	
115	SCIENCE LAB	1,200	1,200	3	1,916	3	1,200	1,200	3,600	75	
116	SCIENCE PREP / STORAGE	250	250	1	33	1	250	250	250		
117	COMPUTER LAB	830	830								REMOVED FROM PROGRAM
118	BREAK OUT SPACE / FLEX / RESOURCE	0	0			2	400	400	800		
119	STAFF TOILET	0	0			2	65	65	130		
120	TEAM STORAGE	0	0	6	254	1	200	200	200		
121	CONFERENCE ROOM	0	0			1	100	100	100		
122	SUBTOTAL			26	11,210	27			18,280	415	

5	PROGRAM CATEGORY s ROOMS	APS EDUCATION	N SPECIFICATION	EXISTING	SCHOOL		PLANNE	D SQUARE FOO	OTAGE		NOTES
6		12,	/2004			PER	SCHOOL STAFF	FEEDBACK W	v/ APS OVERSI	GHT	
7		SF - LOW	SF - HIGH	# OF ROOMS	SF	# OF ROOMS	SF - LOW	SF -HIGH	TOTAL SF	STUDENT CAPACITY	
123	7 [™] GRADE POD										
124	SPED CLASSROOM	500	500	2	859	3	700	750	2,250	24	ONE SPED CLASSROOM FOR EACH SUBJECT
125	SPED LAB	0	0	1	391	1	1,200	1,200	1,200	8	ONE SPED CLASSROOM FOR EACH SUBJECT
126	LANGUAGE ARTS CLASSROOM	700	750	3	1,891	3	700	750	2,250	75	
127	SOCIAL STUDIES CLASSROOM	700	750	3	1,865	3	700	750	2,250	75	
128	MATH CLASSROOM	700	750	3	1,934	3	700	750	2,250	75	
129	SCIENCE LAB	900	900	3	2,218	3	1,200	1,200	3,600	75	PER VDOE, LABS TO BE 1,200 SF
130	SCIENCE PREP / STORAGE	250	250			1	250	250	250		
131	COMPUTER LAB	830	830								REMOVED FROM PROGRAM
132	BREAK OUT SPACE / FLEX / RESOURCE	0	0			2	400	400	800		
133	STAFF TOILET	0	0			2	65	65	130		
134	TEAM STORAGE	0	0	4	134	1	200	200	200		
135	CONFERENCE ROOM	0	0			1	100	100	100		
136	SUBTOTAL			19	9,292	23			15,280	332	
137	8 TH GRADE POD										
138	SPED CLASSROOM	500	500	2	1,214	3	700	750	2,250	24	ONE SPED CLASSROOM FOR EACH SUBJECT
139	SPED LAB	0	0	1	587	1	1,200	1,200	1,200	8	ONE SPED CLASSROOM FOR EACH SUBJECT
140	LANGUAGE ARTS CLASSROOM	700	750	3	2,023	3	700	750	2,250	75	
141	SOCIAL STUDIES CLASSROOM	700	750	3	1,951	3	700	750	2,250	75	
142	MATH CLASSROOM	700	750	3	1,976	3	700	750	2,250	75	
143	SCIENCE LAB	900	900	3	2,947	3	1,200	1,200	3,600	75	PER VDOE, LABS TO BE 1,200 SF
144	SCIENCE PREP / STORAGE	250	250	1	434	1	250	250	250		
145	COMPUTER LAB	830	830								REMOVED FROM PROGRAM
146	BREAK OUT SPACE / FLEX / RESOURCE	0	0			2	400	400	800		
147	STAFF TOILET	65	65			2	65	65	130		
148	TEAM STORAGE	0	0	4	131	1	200	200	200		
	NIGHT PROGRAM STORAGE	300	300			1	300				
150	CONFERENCE ROOM	0	0			1	100	100	100		
151	SUBTOTAL			20	11,263	24			15,580	332	
152	SHARED 6 TH , 7 TH , & 8 TH										
153	CHEMICAL STORAGE	150	150	2	212	1	150	150	150		
154	ASSISTANT PRINCIPAL WAITING			1	234						
155	SUBTOTAL			3	446	1			150		
156	GROUP INSTRUCTION										
157	AUDITORIUM	3,500	4,500	1	6,138	1		6,138	6,138		USE EXISTING THEATER SHARED WITH COMMUNITY
158	STAGE / STORAGE	1,200	1,200	1	3,113	1		3,113			USE EXISTING THEATER SHARED WITH COMMUNITY
159	STORAGE		<u>-</u>	2	543			·	-		
160	DRAMA	700	750	1	901	1	700	750	750		
161	DRAMA STORAGE	0	0	1	256	1	400	400	400		VERTICAL STORAGE s OTHER
	SUBTOTAL			6	10,951	4			10,401		

5	PROGRAM CATEGORY s ROOMS	APS EDUCATION	N SPECIFICATION	EXISTING	SCHOOL	PER SCHOOL STAFF FEEDBACK W/ APS OVERSIGHT					NOTES
6		12,	/2004			PER	SCHOOL STAFF	FEEDBACK W	// APS OVERSI	GHT	
7		SF - LOW	SF - HIGH	# OF ROOMS	SF	# OF ROOMS	SF - LOW	SF -HIGH	TOTAL SF	STUDENT CAPACITY	
163	ART DEPARTMENT										
164	ART LAB	1,650	1,650	1	1,248	1	1,650	1,650	1,650		
165	STORAGE / PREP	400	400	2	336	1	400	400	400		
166	DARK ROOM	250	250								REMOVED FROM PROGRAM
167	KILN ROOM	150	150	1	54	1	150	150	150		
168	COMPUTER GRAPHICS LAB	850	850								REMOVED FROM PROGRAM
169	COMPUTER GRAPHICS LAB STORAGE	100	100								REMOVED FROM PROGRAM
170	SUBTOTAL			4	1,638	3			2,200		
171	MUSIC DEPARTMENT										
172	BAND	1,800	1,800	1	1,310	1	1,800	1,800	1,800		
173	BAND STORAGE	750	750	1	613	1	750	750	750		
174	VOCAL	1,500	1,500	1	481	1	1,200	1,200	1,200		PER VDOE, SF REDUCED TO 1,200
175	VOCAL STORAGE	200	200	1	43	1	200	200	200		
176	INSTRUMENTAL / ORCHESTRA	1,200	1,200	1	1,314	1	1,200	1,200	1,200		
177	INSTRUMENTAL STORAGE	400	400	1	396	1	400	400	400		
178	OFFICE	120	120	1	134	1	130	130	130		
179	LIBRARY	180	180			1	300	300	300		
180	PRACTICE ROOM	50	50	1	114	4	50	50	200		
181	PRACTICE ROOM	100	100								
182	UNIFORM STORAGE	0	0			1	150	150	150		VERTICAL STORAGE
183	DRESSING ROOM			2	441						
184	DRESSING ROOM STORAGE			1	141						
185	TOILET			2	34						
186	SHOWER			2	77						
187	SUBTOTAL			15	5,098	13			6,330		
188	FAMILY & CONSUMER SCIENCES										PREVIOUSLY "WORK s FAMILY STUDIES"
189	FACS CLASSROOM	1,850	1,850	1	1,727	1	2,000	2,000	2,000		PREVIOUSLY "NUTRITION LAB / DEMO / SEWING"
190	FACS STORAGE	200	200			1	200	200	200		
191	INTERIOR DESIGN s CADD SHARED WITH TECH ED	1,000	1,000								REMOVED FROM PROGRAM
	SUBTOTAL		·	1	1,727	2			2,200		
	TECHNOLOGY ED										
	TECH ED CLASSROOM	1,000	1,200	1	1,534	1	1,600	1,600	1,600		PER VDOE, 1,600 SF REQUIRED FOR TECH ED
	TECH ED STORAGE ROOM	70	70	1	181		70				•
	TECH ED MACHINE LAB	1,200	1,500	1	1,206		1,200		1,500	<u> </u>	
	PROJECT MATERIALS STORAGE ROOM	250	250		181		250		250		
	FINISHING ROOM	140	140		153		140				
	SUBTOTAL			5	3,255				3,560		

5	PROGRAM CATEGORY s ROOMS	APS EDUCATIO	N SPECIFICATION	EXISTING	SCHOOL		PLANNE	D SQUARE FOO	OTAGE		NOTES
6		12	2/2004			PER	SCHOOL STAFF	FEEDBACK W	// APS OVERSI	GHT	
7		SF - LOW	SF - HIGH	# OF ROOMS	SF	# OF ROOMS	SF - LOW	SF -HIGH	TOTAL SF	STUDENT CAPACITY	
200	BUSINESS ED										
201	BUSINESS ED s IT LAB	830	830	1	862	. 1	1,200	1,200	1,200		PER VDOE, LABS TO BE 1,200 SF
202	BUSINESS ED s IT STORAGE	0	0			1	70	70	70		
203	SUBTOTAL			1	862	2			1,270		
204	COMPUTER SCIENCE S ROBOTICS										
205	COMPUTER SCIENCE S ROBOTICS LAB	0	0	1	688	1	1,600	1,600	1,600		
206	COMPUTER SCIENCE s ROBOTICS STORAGE	0	0			1	100	100	100		
207	SUBTOTAL			1	688	2			1,700		
208	WORLD LANGUAGES										
209	LANGUAGES CLASSROOM	700	750	7	4,417	8	700	750	6,000		
210	LANGUAGES STORAGE	0	0	2	102	. 8	50	50	400		
211	SUBTOTAL			9	4,519	16			6,400		
212	ENGLISH LEARNER										PREVIOUSLY "HILT / HILTEX"
213	ELD CLASSROOMS	700	750	7	4,080	8	700	750	6,000		
214	ELD STORAGE	0	0	2	115	8	50	50	400		
215	SUBTOTAL			9	4,195	16			6,400		
216	SPSA /STRUCTURED LITERACY / DEAF & HARD OF HEARING / LIFE SKILLS										
217	SPSA	0	0	1	509	1	700	750	750	10	
218	SPSA STORAGE			1	29						
219	DEAF AND HARD OF HEARING	0	0	1	618	1	700	750	750	8	
220	STRUCTURED LITERACY	0	0	1	568	1	700	750	750	10	
221	LIFE SKILLS LAB	500	500	1	1,187	1	1,200	1,200	1,200	6	PER VDOE, LABS TO BE 1,200 SF
222	OFFICE SPACE + WORK ROOM (DHH INTERPRETER)	0	0	1	546	1	500	500	500		
223	SUBTOTAL			6	3,457	5			3,950	34	
224	INTERLUDE										
225	CLASSROOM	700	750	1	519	1	700	750	750	10	
226	CONFERENCE ROOM	0	0	1	122	. 1	200	200	200		
227	COUNSELOR OFFICE	100	100	1	94	. 1	130	130	130		
228	SMALL OFFICE FOR CALMING ROOMS (2 @ 100)	0	0	2	142	. 2	100	100	200		
229	SUBTOTAL			5	877	5			1,280	10	

5	PROGRAM CATEGORY s ROOMS	APS EDUCATIO	N SPECIFICATION	EXISTING	SCHOOL		PLANNE	D SQUARE FOO	TAGE		NOTES
6		12	/2004			PER	SCHOOL STAFF	FEEDBACK W	// APS OVERSI	GHT	
7		SF - LOW	SF - HIGH	# OF ROOMS	SF	# OF ROOMS	SF - LOW	SF -HIGH	TOTAL SF	STUDENT CAPACITY	
230	PHYSICAL EDUCATION DEPT										
231	GYM	8,000	10,500	1	33,688	1	8,000	10,500	10,500		CURRENTLY SHARED WITH COMMUNITY CENTER. EXISTING SF CALCULATION BASED ON SF OF GYM WHEN VINYL CURTAIN IS DOWN - I.E. THE PORTION OF THE GYM THE STUDENTS USE
232	GYM STORAGE	300	300	5	565	1	300	300	300		
	AUXILIARY GYM	2,000	2,000	1	5,060		2,000	2,000	2,000		CURRENTLY SHARED WITH COMMUNITY CENTER
234	AUXILIARY GYM STORAGE	200	200	1	165		200	200	200		
235	OFFICE	150	400	3	418	2	130	130	260		
236	LOCKER / SHOWER / TOILET	3,000	3,000	2	4,672	2	3,000	3,000	6,000		
237	LAUNDRY	200	200	1	155	1	200	200	200		
238	HEALTH CLASSROOM	700	750	2	1,370	2	700	750	1,500		
239	EXTERIOR STORAGE - ATHLETIC s PE	400	400	1	308	2	200	200	400		CURRENTLY NOT EXTERIOR
240	CUSTODIAL CLOSET	20	20	2	90	2	80	80	160		
241	STORAGE - REC DEPT	200	200	1	1,378	1	200	200	200		
242	GENDER NEUTRAL CHANGING	0	0	1	90	2	700	700	1,400		
243	SUBTOTAL			21	47,959	18			23,120		
244	CUSTODIAL SUPPORT										
245	CUSTODIAL CLOSET	80	80	8	400	13	80	80	1,040		
246	OFFICE	100	100	1	182	1	130	130	130		
247	SUPPLIES	250	250	1	250	1	250	250	250		
248	EQUIPMENT STORAGE	300	300		572	1	300	300	300		
249	OUTDOOR STORAGE	250	250			1	250	250	250		
250	CUSTODIAL LOUNGE	120	120	1	571	1	120	120	120		
251	FEMALE CUSTODIAL LOCKERS	120	120	1	87	1	120	120	120		
252	TOILET	65	65	1	28	1	65		65		
253	MALE CUSTODIAL LOCKERS	120	120	1	87	1	120	120	120		
254	TOILET	65	65	1	28	1	65	65	65		
255	LAUNDRY - MICROFIBER CLEANING PROGRAM	0	0			1	900	900	900		
256	SUBTOTAL			15	2,205	23			3,360		

5	PROGRAM CATEGORY s ROOMS	APS EDUCATIO	N SPECIFICATION	EXISTING	SCHOOL		PLANNE	D SQUARE FOO	TAGE		NOTES
6		12	2/2004			PER	SCHOOL STAFF	FEEDBACK W	// APS OVERSI	GHT	
7		SF - LOW	SF - HIGH	# OF ROOMS	SF	# OF ROOMS	SF - LOW	SF -HIGH	TOTAL SF	STUDENT CAPACITY	
257	BUILDING SUPPORT										
258	TOILETS GIRLS - MULTI	250	250	8	1,135	6	250	250	1,500		
259	TOILETS BOYS - MULTI	250	250	8	1,144	6	250	250	1,500		
260	TOILETS WOMEN (4)	125	125	1	28	2	125	125	250		QUANTITY OF SPACES & SF DEPENDENT UPON UPDATED CODES
261	TOILETS MEN (4)	125	125	1	27	2	125	125	250		AND A/E REVIEW
262	GENDER NEUTRAL RESTROOMS (SINGLE USER)	0	0			6	65	65	390		AND A/ E REVIEW
263	MECHANICAL	7,000	7,000	5	2,595	1	7,000	7,000	7,000		
264	ELECTRICAL	1,000	1,000	13	985	1	1,000	1,000	1,000		
265	OFFICE - BUILDING MANAGEMENT	0	0	1	216	5 1	130	130	130		CURRENTLY REMOTE (WITHIN COMMUNITY CENTER)
266	OFFICE - FACILITIES DIRECTOR			1	222						
267	LOADING AREA			1	252	2					
268	STORAGE			2	224	ļ.					
269	SUBTOTAL			41	6,828	25			12,020		
270											
271	TOTAL NET SF				149,508	606			164,406	1,123	
272	SUBTRACT EXCESS GYM SF FROM EXISTING				-26,248	8					
273	TOTAL NET SF RECONCILED				123,260				164,406		
274	EXISTING GSF OF SCHOOL (EXCESS SF OF GYM IN COMMUNITY CENTER SF)				165,564	ı					
275	EXISTING GSF OF COMMUNITY CENTER				70,624						
276	TOTAL EXISTING GSF: TJMS & COMMUNITY CENTER				236,188	3					
	TOTAL EXISTING GSF: PLANNED SQUARE FOOTAGE TJMS (1.4 GSF FACTOR)								230,168		

Student capacity numbers may vary slightly from other published data depending on how they are calculated (23-28 students / class). For the purposes of this study, the quantity of classrooms is the important factor.

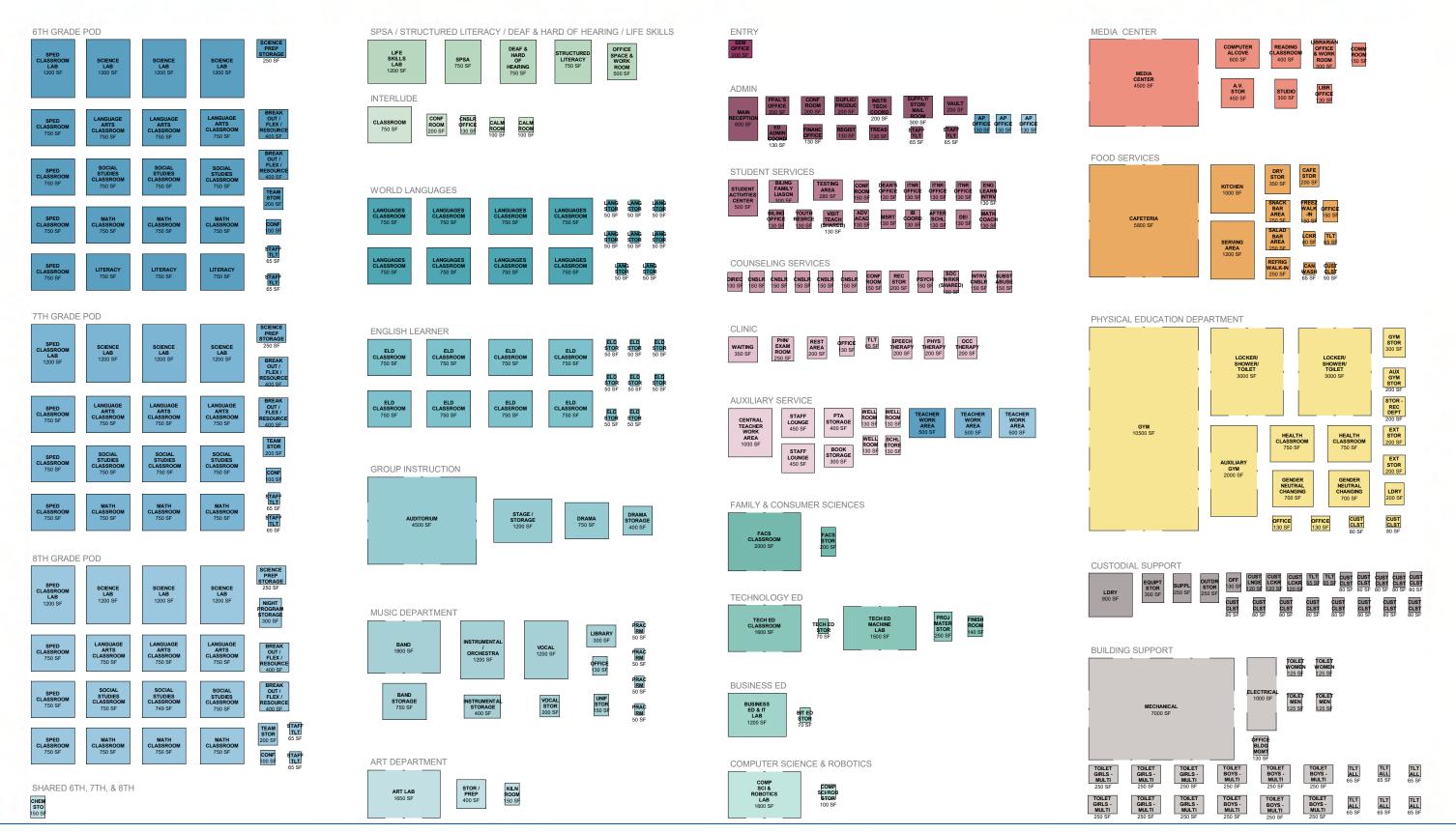
3.2 EXISTING PROGRAM GRAPHIC

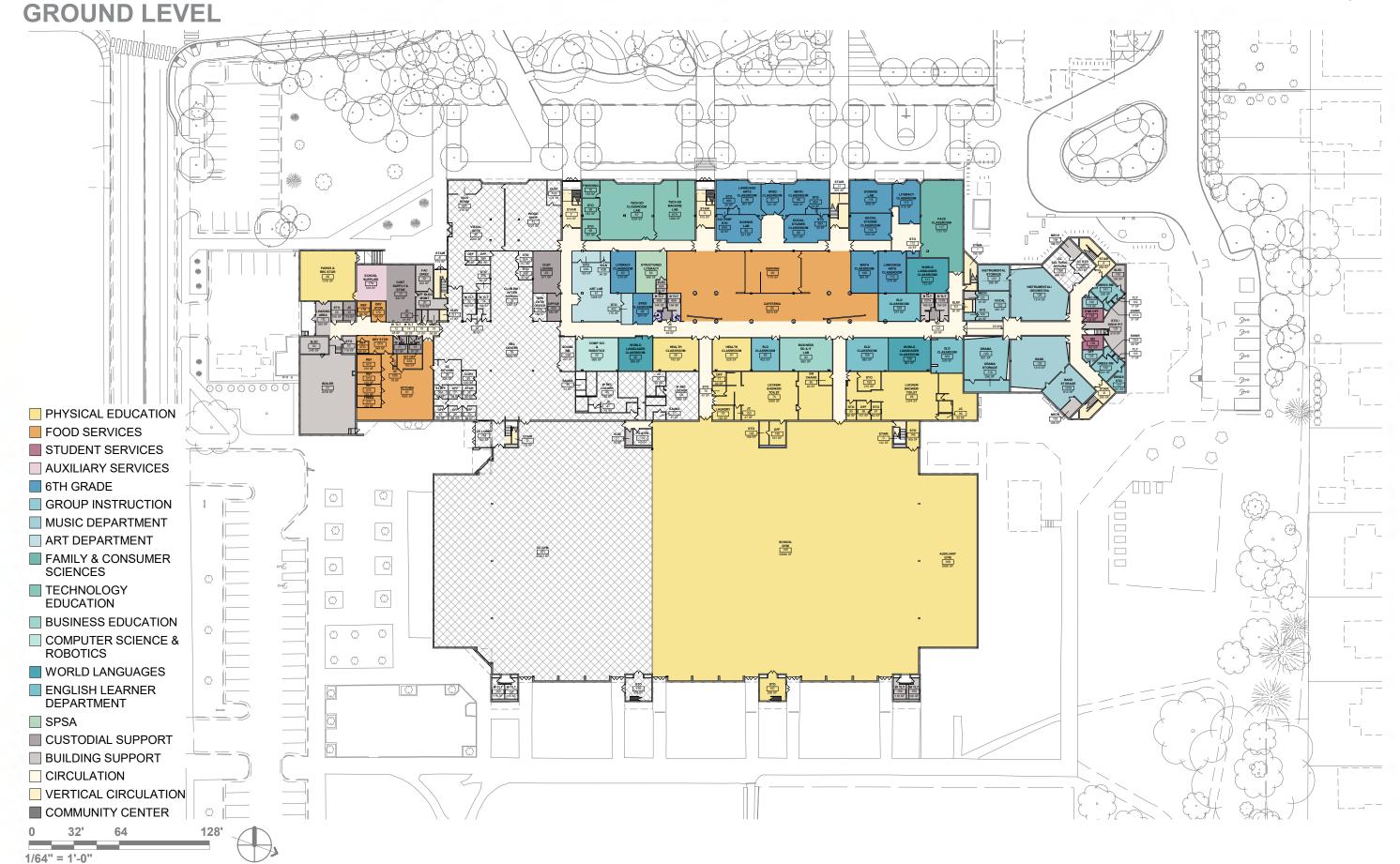
This graphic represents the disparity of square footage between existing school spaces compared to planned square footage.



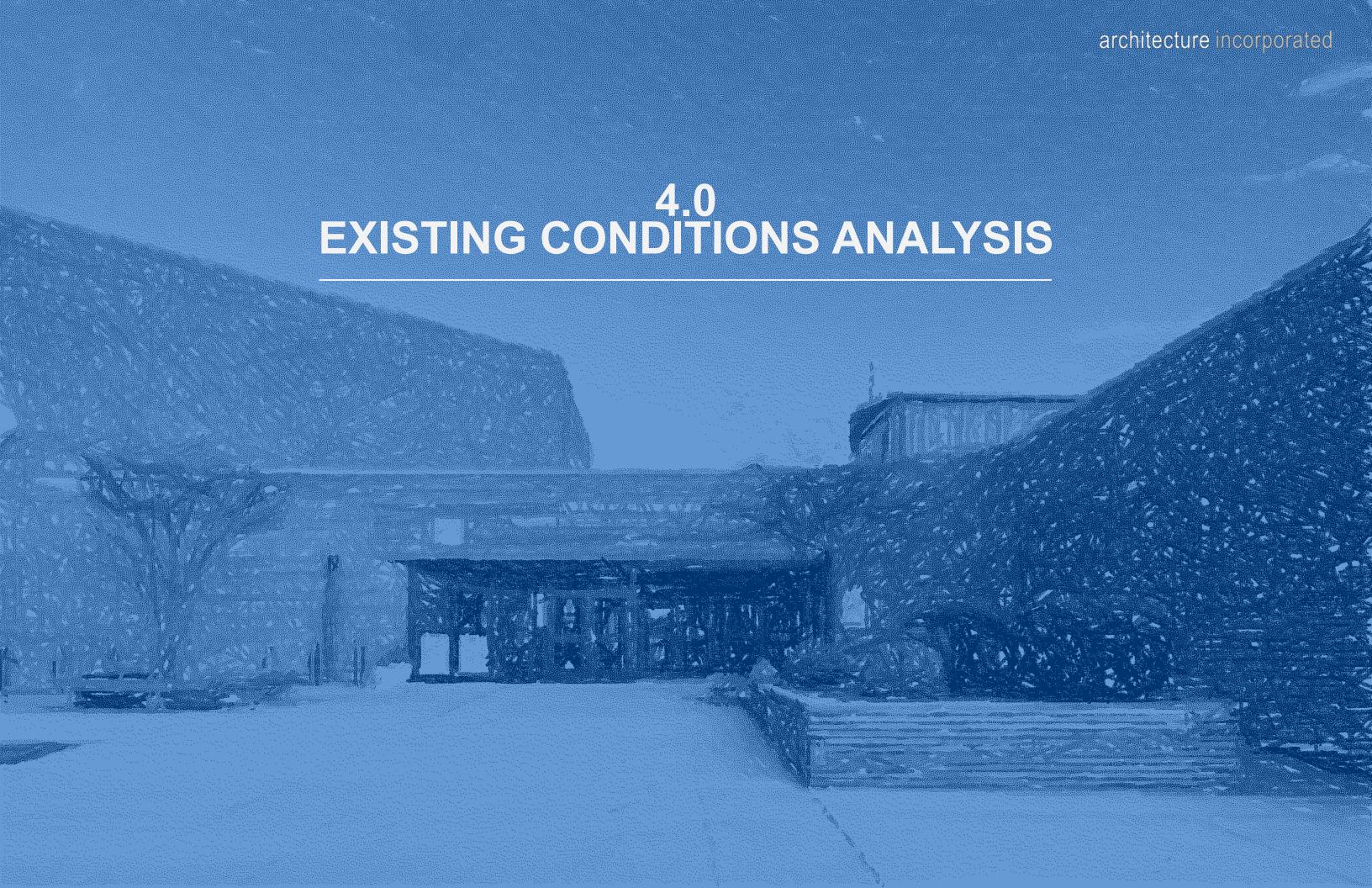
3.3 PROGRAM CAPACITY GRAPHIC

This graphic represents the planned square footage.









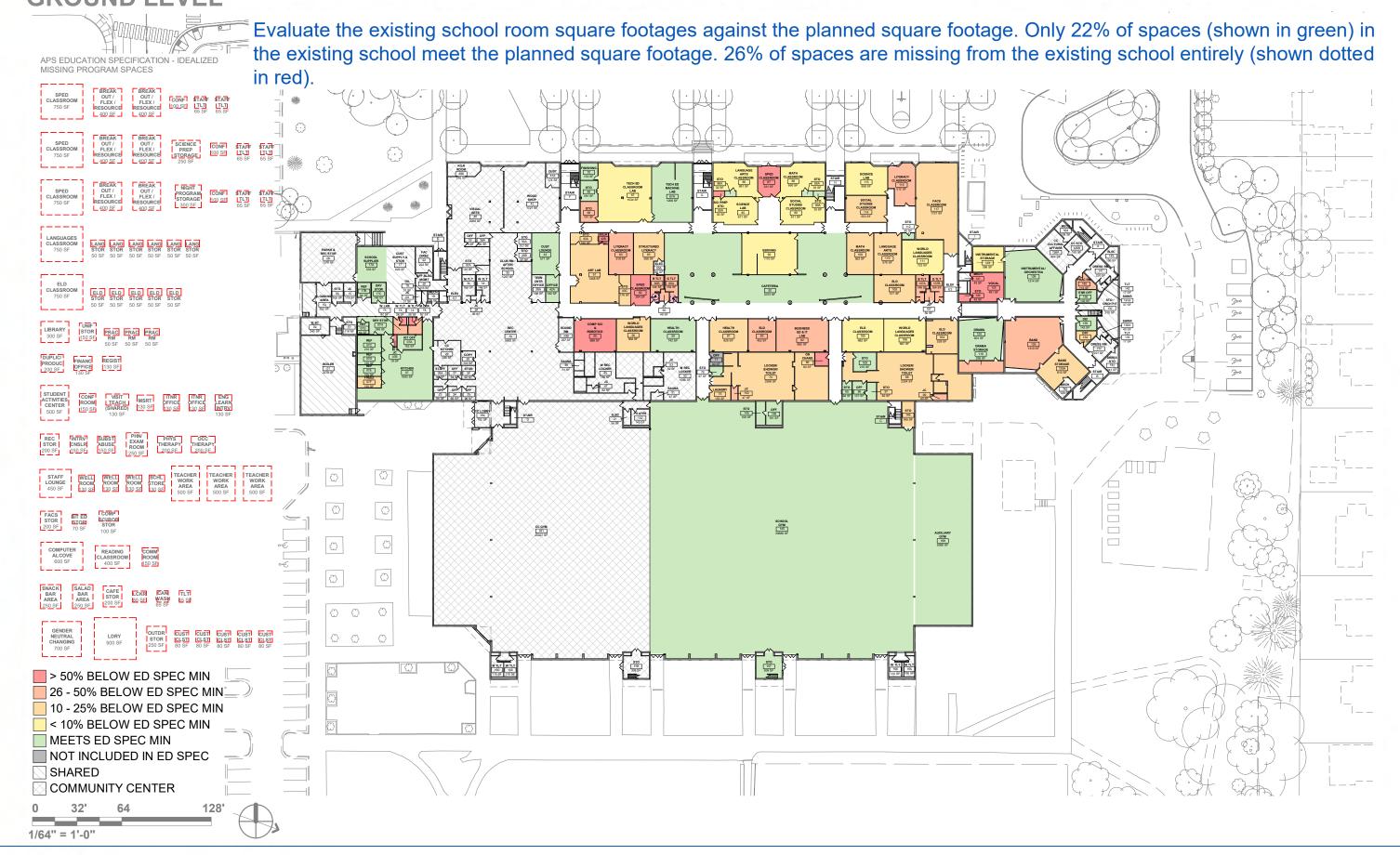
4.1 2004 ED. SPEC. SF ANALYSIS **GROUND LEVEL**

Evaluate the existing school room square footages against the APS 2004 education specification. Only 22.5% of spaces (shown in green) in the existing school meet the requirements set forth in the 2004 ed. spec. 11.1% of spaces are missing from the existing school entirely (shown dotted in red).





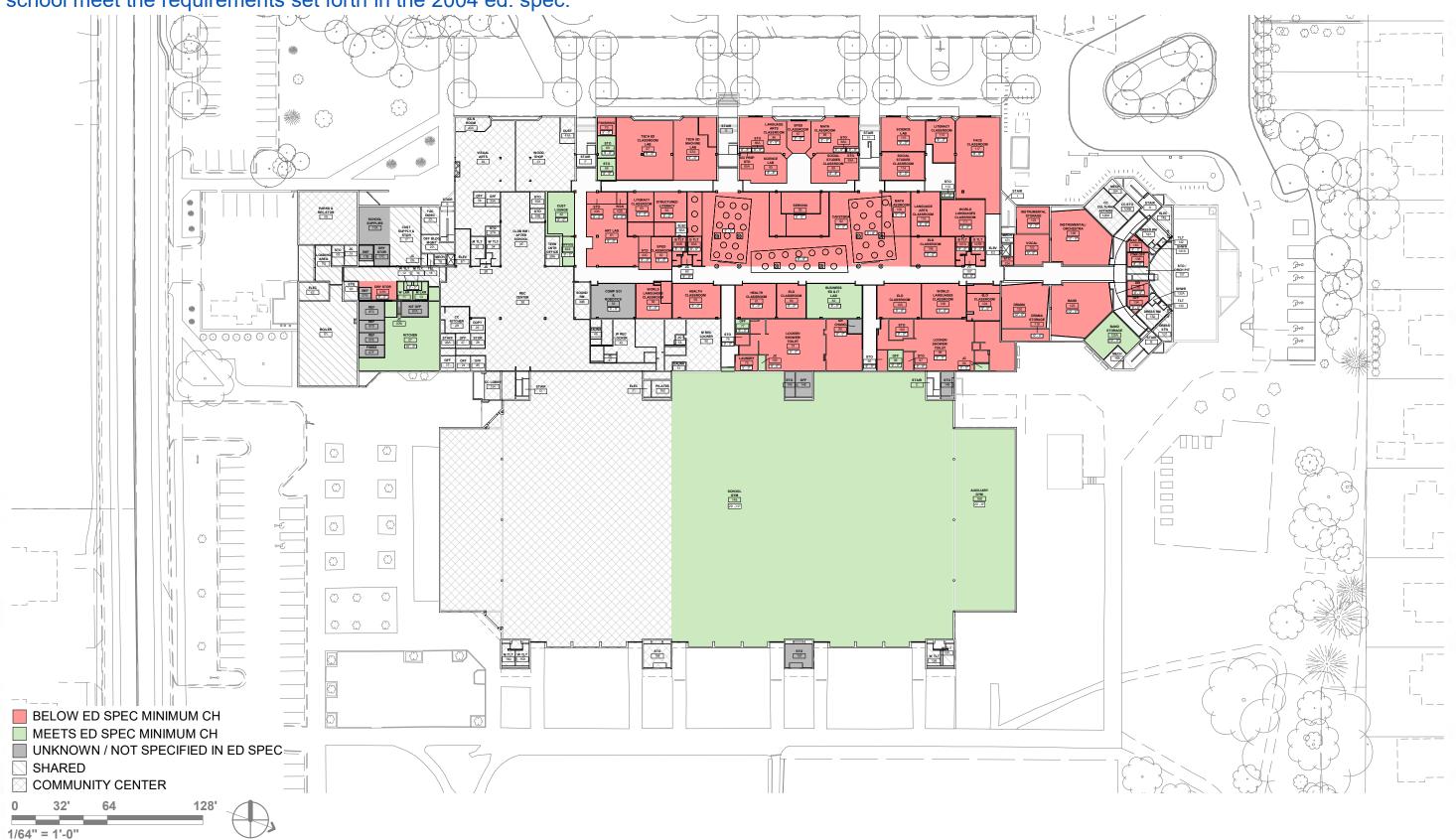
4.2 PLANNED SF ANALYSIS **GROUND LEVEL**





4.3 CEILING HEIGHT ANALYSIS **GROUND LEVEL**

Evaluate the existing school ceiling heights against the APS 2004 education specification. Less than half, 43%, of spaces (shown in green) in the existing school meet the requirements set forth in the 2004 ed. spec.

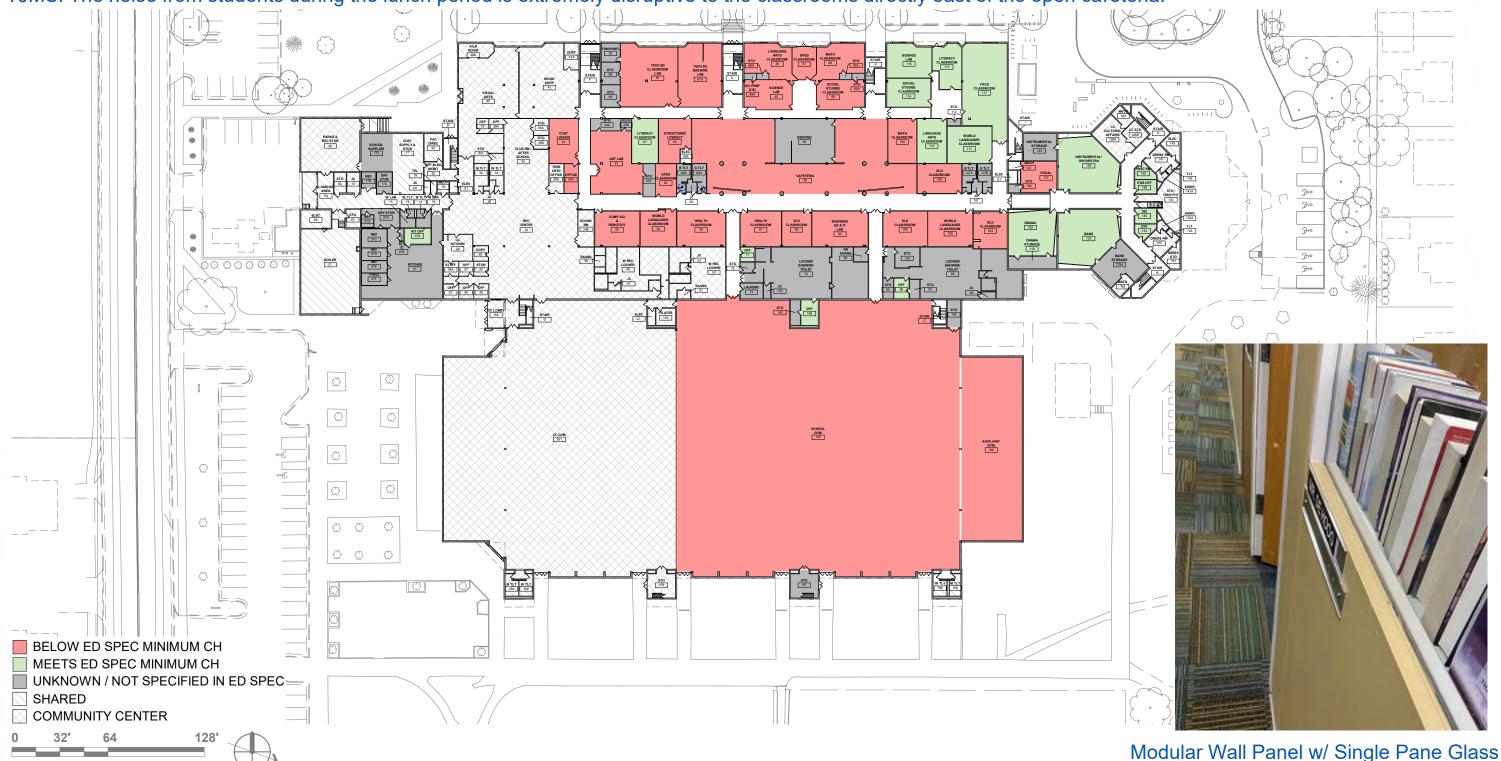




4.4 ACOUSTIC ANALYSIS **GROUND LEVEL**

1/64" = 1'-0'

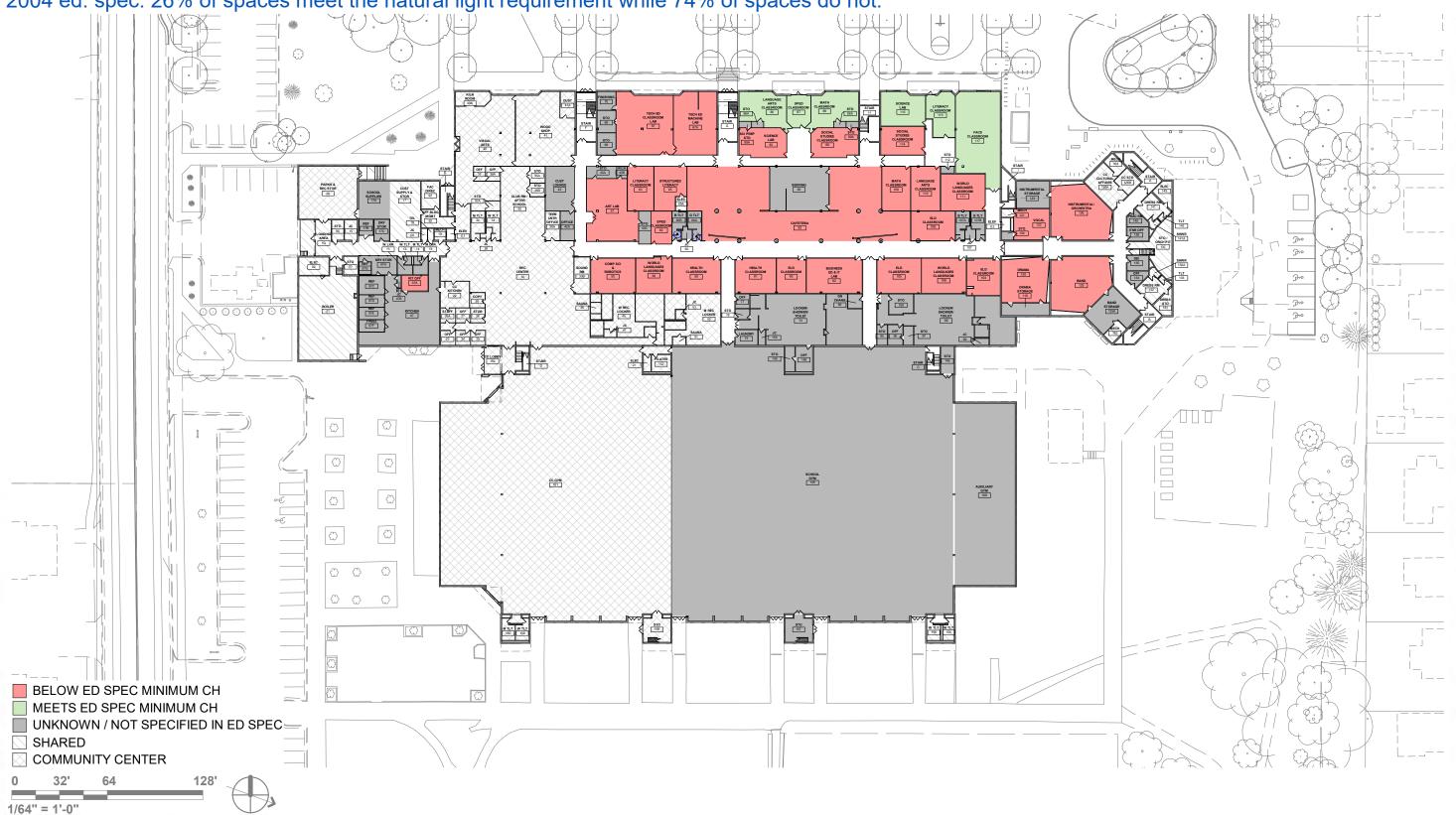
Evaluate the existing school acoustics based on occupant feedback and partition construction. Most interior partitions are 2 1/4" modular wall panels installed in the early 1990s. Although the STC rating is listed as 40 for solid panels, learning spaces have panels with 5'-6" of single pane glass. Single pane glass has a typical STC of 27 – normal speech can be understood through the material. Teachers report that "students can hear everything that is happening in the classrooms next to each other...students cannot concentrate and are distracted by those sounds." The open concept cafeteria significantly contributes to the acoustical issues at TJMS. The noise from students during the lunch period is extremely disruptive to the classrooms directly east of the open cafeteria.





4.5 NATURAL LIGHT ANALYSIS **GROUND LEVEL**

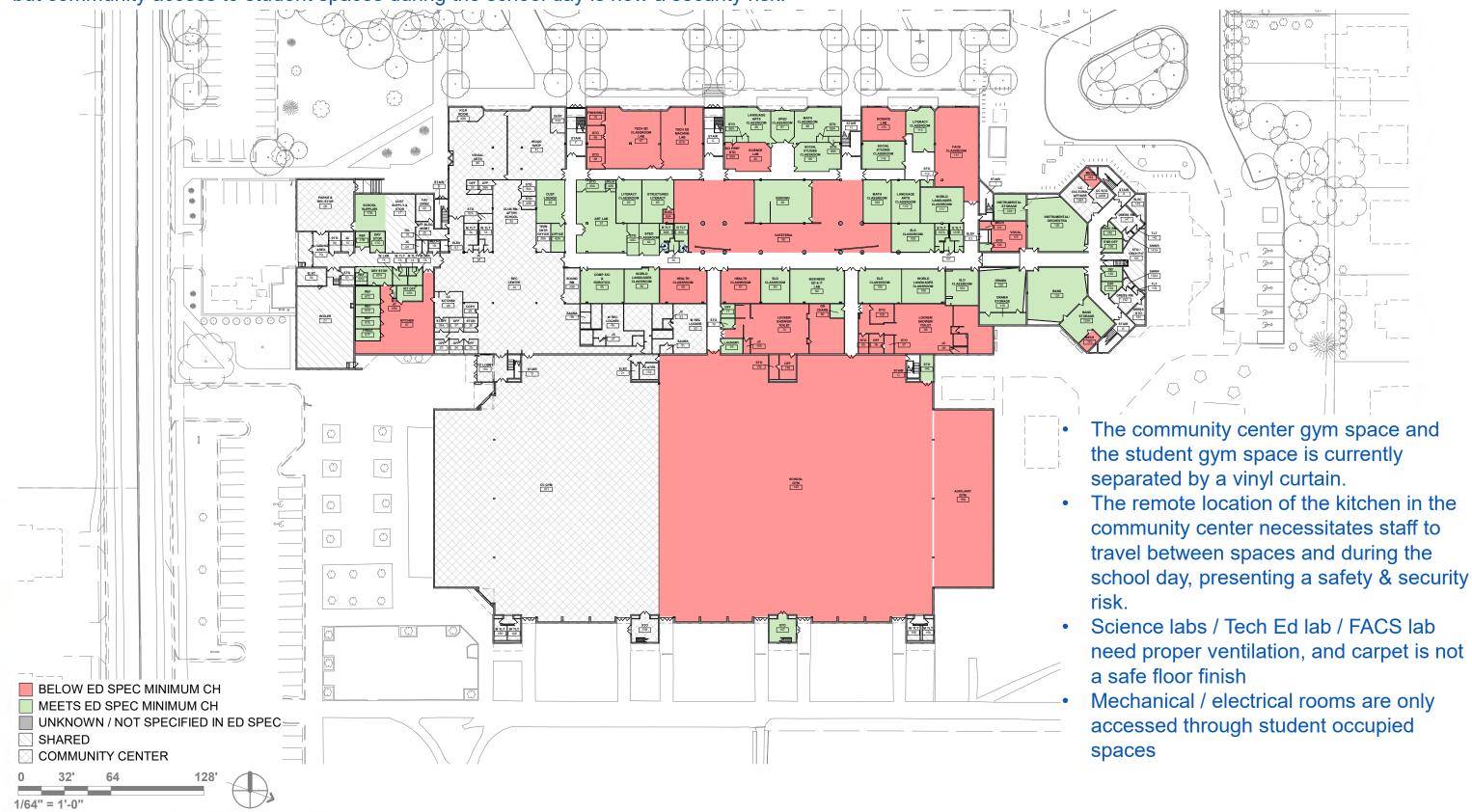
Evaluate the existing learning spaces and offices access to natural light against the APS 2004 education specification. The ed. spec. states that "natural light is important, and operable windows will be required in all classroom-teaching spaces." Certain offices also call for a window to the exterior per the 2004 ed. spec. 26% of spaces meet the natural light requirement while 74% of spaces do not.





4.6 SAFETY & SECURITY ANALYSIS **GROUND LEVEL**

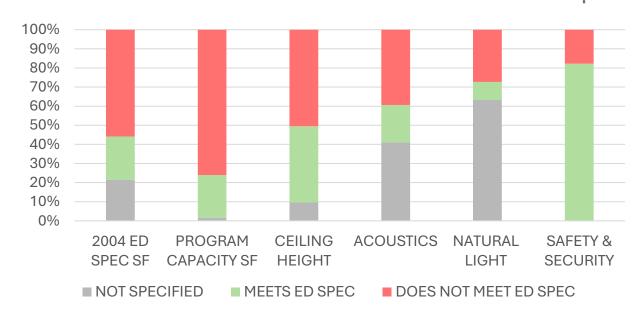
Safety & security needs have evolved over the 53 years since the school was built. Connectivity with the community was prioritized during original design, but community access to student spaces during the school day is now a security risk.





Square Footage Analysis Summary

The evaluation of the existing school room square footages show that over 75% of the spaces do not meet the minimum requirements set forth in the 2004 ed. spec. This study also revealed program spaces that were missing entirely from the school yet are essential to its programmatic function. In a school such as this one, with particular emphasis on serving students with special needs and the deaf or hard of hearing, undersized teaching spaces are a major detriment to the quality of education and accessibility for students.



Ceiling Height Analysis Summary

The ceiling height analysis revealed that over half of the school's spaces fail to meet the 2004 ed. spec. requirements. According to the VDOE, "the minimum ceiling height for any classroom should be nine feet." A majority of TJMS teaching space does not meet this minimum. Additionally, TJMS offers a variety of courses including career and technical education, visual and dramatic arts, and an extensive music program. These classes can involve heavy machinery and large instruments that need an allowable twelve feet of clearance for maneuvering.

Acoustics Analysis Summary

Due to improper program organization and low STC-rated partition use, TJMS does not meet the acoustic standards for educational facility. The current ANSI recommended STC rating for walls separating classrooms is 50 or greater, though most of the current walls in the school range from having an STC of 27 to 40. The lack of isolation of instructional spaces from group assembly spaces creates a significant noise disruption. This negatively effects the quality of teaching throughout the school, especially hindering the education of the deaf and hard of hearing students at TJMS.

Natural Light Analysis Summary

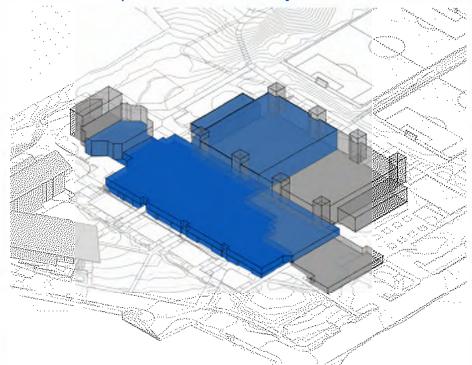
About three-quarters of the school's teaching spaces do not have windows and / or access to natural light. This leads to a variety of negative consequences for the students and faculty of TJMS, such as strained eyesight, circadian rhythm out of sync, poor mood, and a lack of surveillance of school grounds.

Safety & Security Analysis Summary

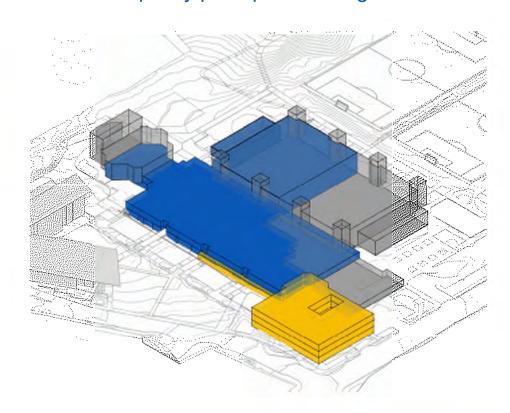
The safety and security of the students and faculty at TJMS are currently not up to standards with the requirements set by the 2004 ed. spec. and the VDOE. From a safety perspective, most of the labs in the school do not have proper ventilation or interior finishes for handling harsh chemicals and toxic gases. From a security perspective, the gym, kitchen, and main reception pose a huge risk for the entrance of a potential threat. The current design of the school lacks many of the recommended design strategies set forth by the VDOE, such as natural surveillance, access control, and territorial reinforcement.



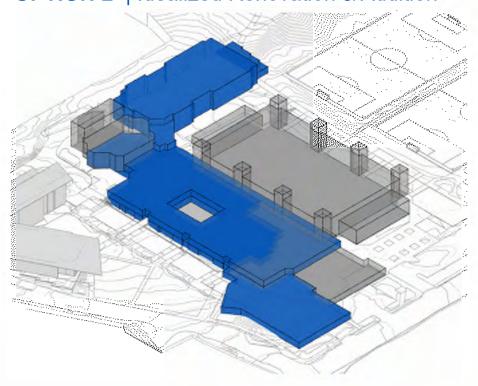
OPTION 1 | Renovation Only



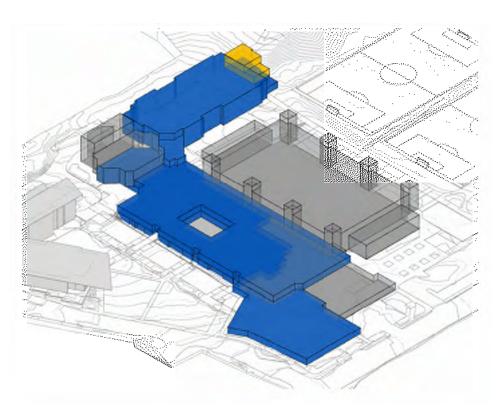
OPTION 1A | 1 + Minimal Addition Student Capacity per Updated Program



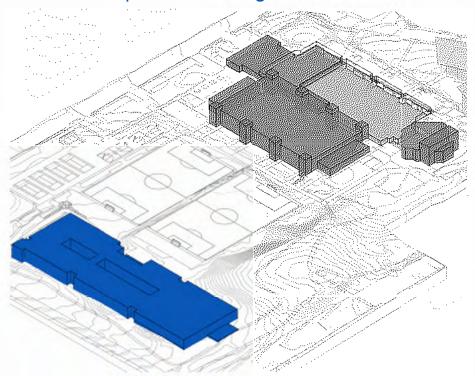
OPTION 2 | Idealized Renovation & Addition



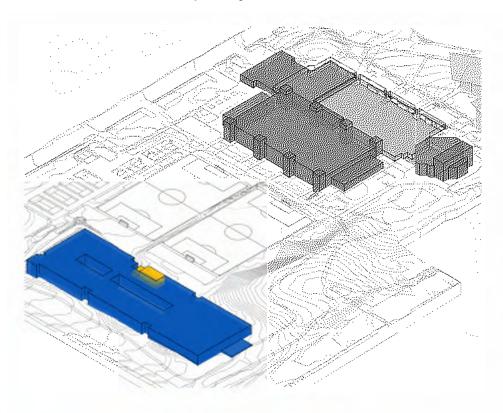
OPTION 2A | Idealized Renovation & Addition + Future 10% Capacity Increase



OPTION 3 | New Building & Renovation



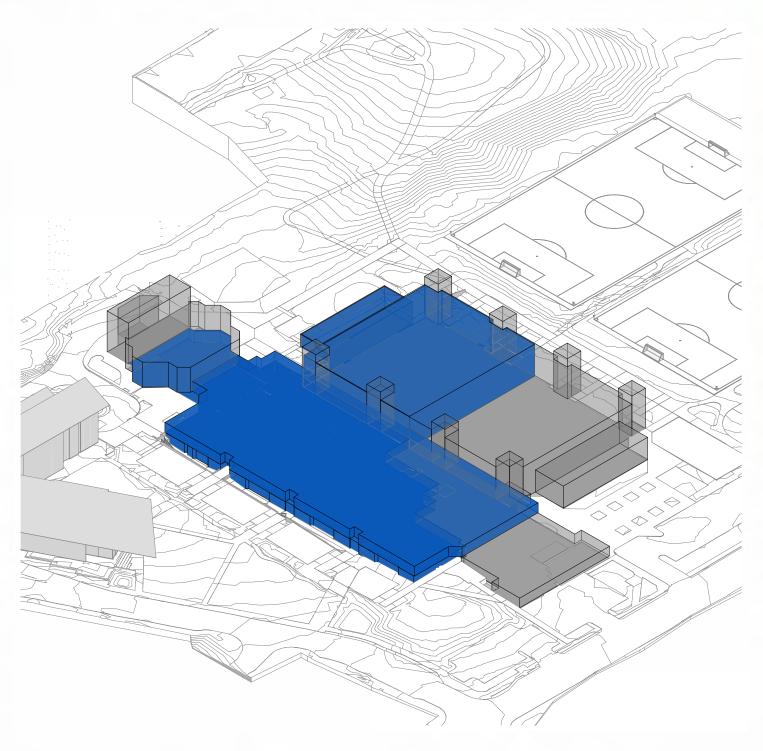
OPTION 3A | New Building & Renovation + Future 10% Capacity Increase

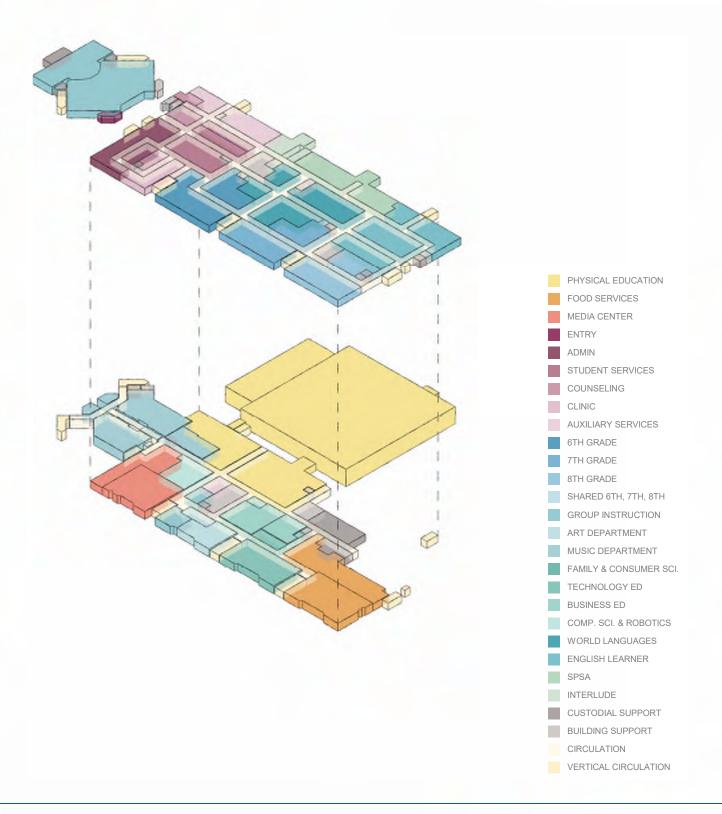




5.2 OPTION 1 - NO ADDITION / DECREASE STUDENT CAPACITY Overview:

Utilize the planned square footage developed as part of this study to renovate the existing school with no additions. All common use spaces are per the program and use the lowest allowable square footage. Due to limitations of space, student capacity generating classrooms are limited producing a decreased student capacity.





5.2 OPTION 1 - NO ADDITION / DECREASE STUDENT CAPACITY Narrative:

Option 1 illustrates the limitations of student capacity when the program is updated to include APS approved square footages for common spaces. This option prioritizes fitting the program spaces into the building but is not able to address problematic issues at TJMS such as ceiling height, access to daylight, safety & security, and organization of spaces. Due to the limited space in this option, program elements are not able to have their own space; their own identity.

The student capacity generated from this option is 393 students; significantly lower than the current enrollment of 1,086 students. Program capacity elements were added at the expense of student capacity generating pods.

This option would necessitate some work in the community center. To have a kitchen collocated with the cafeteria, the community center Visual Arts and Wood Shop would be relocated to the former APS kitchen space. The elevator located within this space would need refurbishment. The gymnasium would not need a reroof but would need new flooring.

Pros:

- Kitchen is adjacent to Cafeteria and does not require staff moving between public spaces and school spaces during the day (helping to alleviate security risk)
- Cafeteria is enclosed space to alleviate disruptive noise
- Cafeteria is placed at exterior wall allowing daylight opportunity
- No major changes to structure

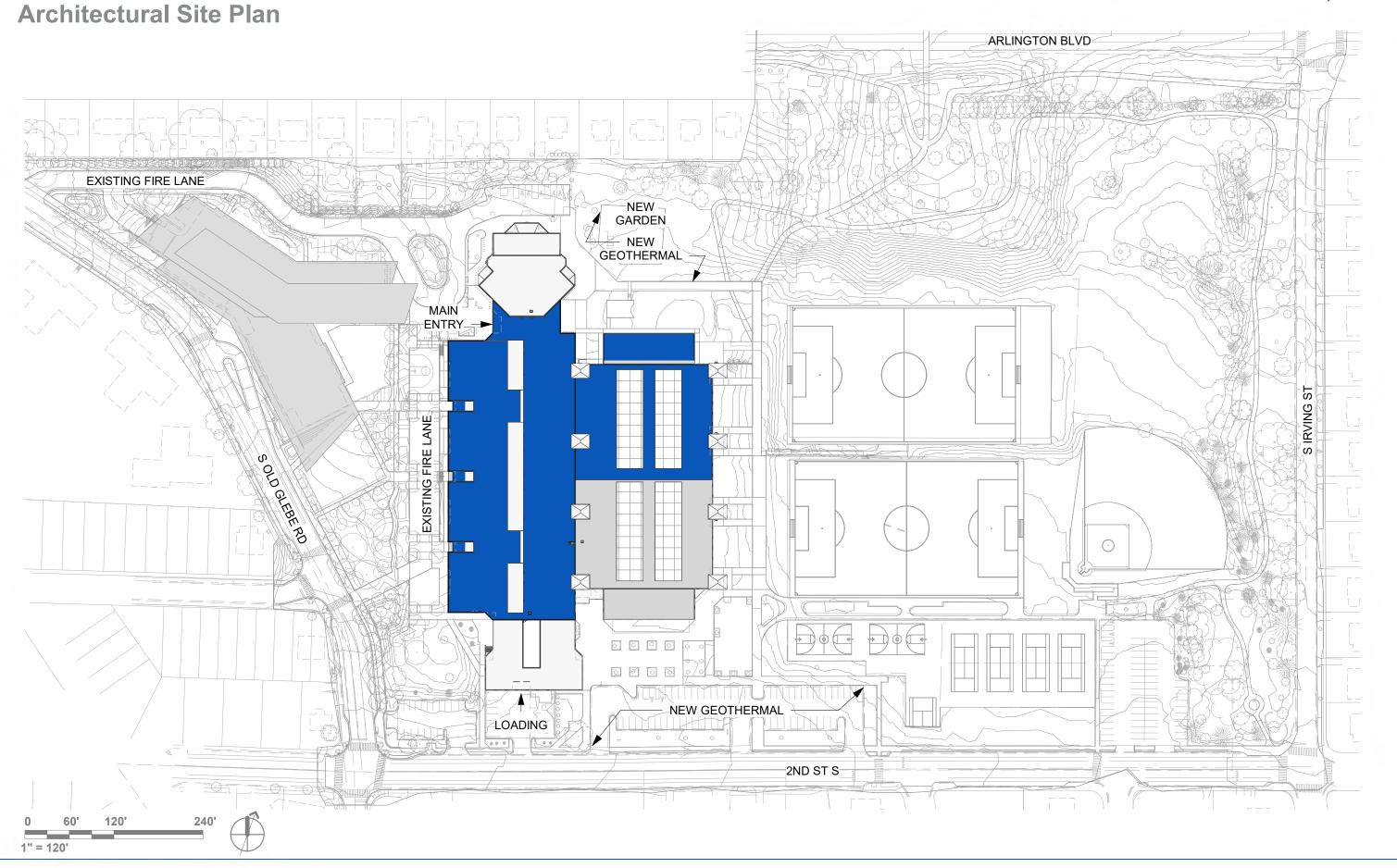
Cons:

- Significantly reduced student capacity
- Space constraints result in lowest allowable sized spaces
- Ceiling heights below VDOE standard
- Majority of classrooms and offices do not have access to daylight
- The gym remains shared with the community, maintaining a major safety & security risk
- Vocal and Drama rooms have significantly lower than allowable ceiling height
- No major changes to structure require columns throughout spaces forcing less than desirable room layout

Changes to GSF

		Existing	Option 1
•	Middle School	128,292	130,501
•	Joint-use theater & associated spaces	13,697	13,697
•	Joint-use gymnasium	67,033	67,033
•	Community Center	19,391	17,182
•	Service wing (including kitchen & mechanical spaces)	6,862	6,862
•	Grand Total GSF	235,275	235,275

5.2 OPTION 1 - NO ADDITION / DECREASE STUDENT CAPACITY



5.2 OPTION 1 – NO ADDITION / DECREASE STUDENT CAPACITY Graphic Program

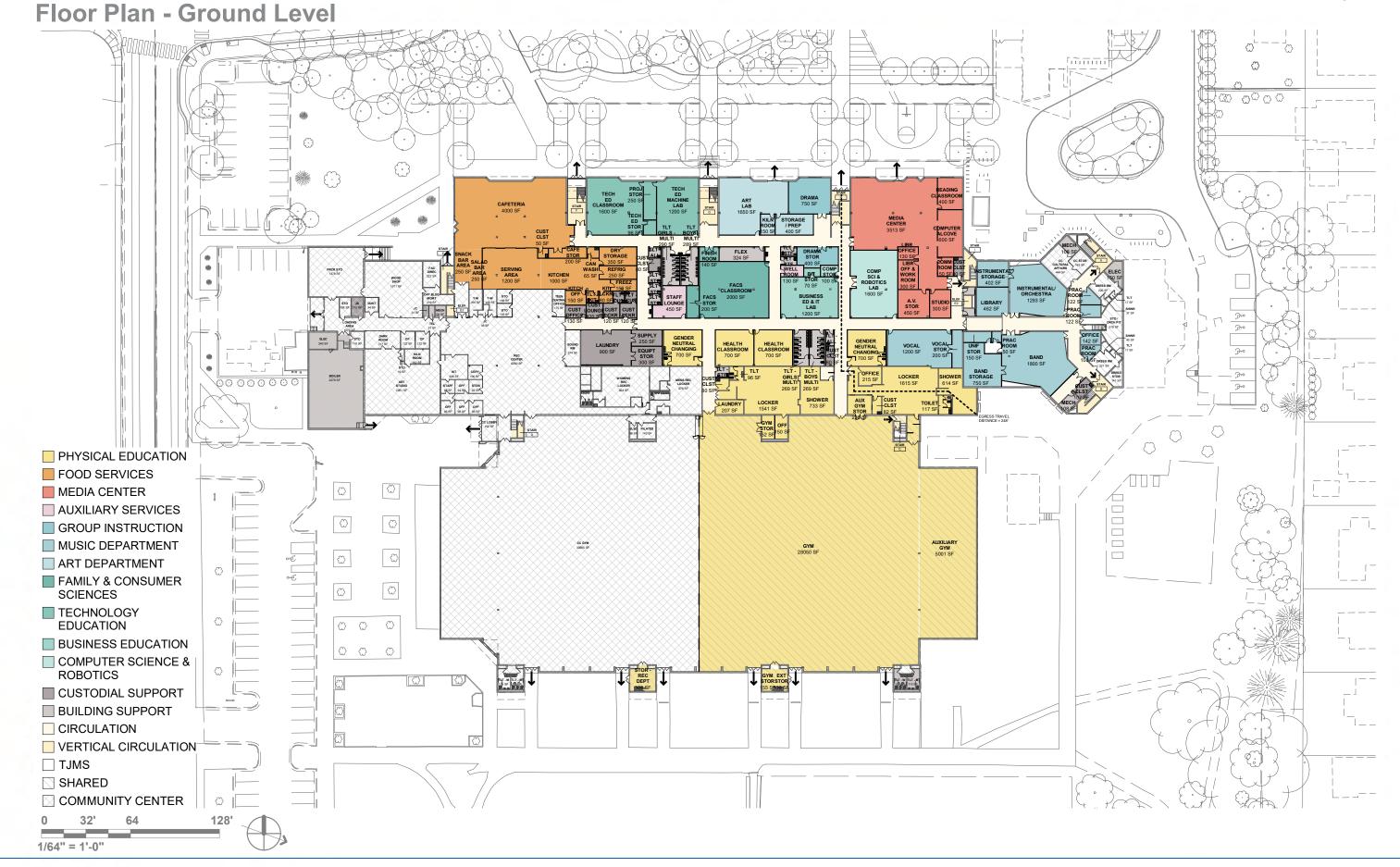
This graphic represents the disparity of square footage between Option 1 school spaces compared to program capacity.



5.2 OPTION 1 – NO ADDITION / DECREASE STUDENT CAPACITY

This graphic represents how the student capacity was calculated.

1	NOTES:			
	PER VDOE RECOMMENDATION AND APS CORRESPONDENCE, CORE CLASSROOMS GENERATE CAI	PACITY FOR 25 STUDENTS. SPECIAL EDUCATION CLASSE	ROOMS GENERATE CAPACITY	FOR 8 STUDENTS.
2				
4				
107	CORE CLASSROOMS			
108	6TH GRADE POD			
109	SPED CLASSROOM	0	700	0
110	SPED LAB	0	1,200	8
111	LANGUAGE ARTS CLASSROOM	1	700	25
112	LITERACY	1	700	25
113	SOCIAL STUDIES CLASSROOM	1	700	25
114	MATH CLASSROOM	1	700	25
115	SCIENCE LAB	1	1,200	25
122	SUBTOTAL	5		133
123	7TH GRADE POD			
124	SPED CLASSROOM	0	700	0
125	SPED LAB	0	1,200	8
126	LANGUAGE ARTS CLASSROOM	1	700	25
127	SOCIAL STUDIES CLASSROOM	1	700	25
128	MATH CLASSROOM	1	700	25
129	SCIENCE LAB	1	1,200	25
136	SUBTOTAL	4		108
137	8TH GRADE POD			
138	SPED CLASSROOM	0	700	0
139	SPED LAB	0	1,200	8
140	LANGUAGE ARTS CLASSROOM	1	700	25
141	SOCIAL STUDIES CLASSROOM	1	700	25
142	MATH CLASSROOM	1	700	25
143	SCIENCE LAB	1	1,200	25
151	SUBTOTAL	4		108
	SPSA / STRUCTURED LITERACY / DEAF & HARD OF			
216	HEARING / LIFE SKILLS			
217	SPSA	1	700	10
219	DEAF AND HARD OF HEARING	1	700	8
220	STRUCTURED LITERACY	1	700	10
221	LIFE SKILLS LAB	1	1,200	6
223	SUBTOTAL	4		34
224	INTERLUDE			
225	CLASSROOM	1	700	10
229	SUBTOTAL	1		10
270				
271	TOTAL STUDENT CAPACITY	36		393





5.2 OPTION 1 – NO ADDITION / DECREASE STUDENT CAPACITY County Impact

Theater

The theater will be renovated during Phase 3 of construction, which will require the community theater production to temporarily use a different stage to be coordinated by the county.

Gymnasium

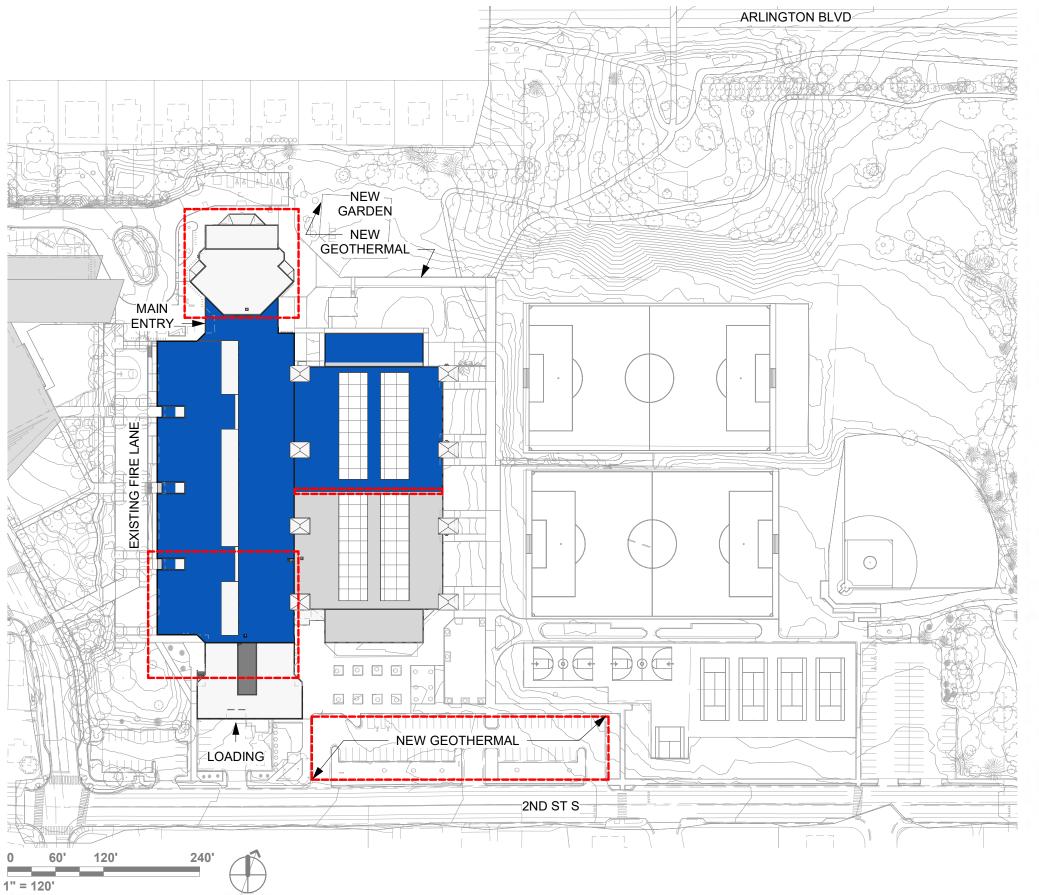
The installation of the operable partition in the shared gymnasium will require a short shut down of the space.

Community Center

The community center will need to be leased for the duration of phase 1 of construction. The square footage of the community center will decrease from 19,391 to 17,182. This is due to the consolidation of the community center, eliminating unnecessary circulation space. Any areas within the community center that are affected will be renovated on behalf of TJMS.

Parking Lot

The installation of geothermal wells will temporarily prevent the community's use of the plan-south parking lot. After construction, the community will be provided a new parking lot on behalf of TJMS



5.2 OPTION 1 - NO ADDITION / DECREASE STUDENT CAPACITY Civil - Demolition Plan

Bowman architecture incorporated

Demolition Summary

- Minimal demolition required
- · Modulars are temporary and will be removed at the completion of the project

Northeast Modular Additions

- 4 trees to be removed
- Existing concrete sidewalk can remain
- Existing garden to be relocated
- · Overhead electric to be relocated
- No impact to existing underground utilities

Southwest Modular Additions

- 11 trees to be removed
- Existing concrete sidewalk can remain
- No impact to existing underground utilities

Northeast Modular Additions

• Due to the temporary nature of this layout, all efforts were made to provide functionality while being cost-conscious. New temporary sidewalks are proposed to provide access to modular entrances while the garden will be preserved and relocated. It is unlikely that the toilets/washroom would be able to connect to the existing sanitary system of the middle school, so a new sanitary lateral connection is proposed, tying into the existing sanitary main to the north. Water for the toilets will need to be connected to the existing building as there is no waterline nearby. Electric connections will also need to be extended from the middle school to provide power to these additions.

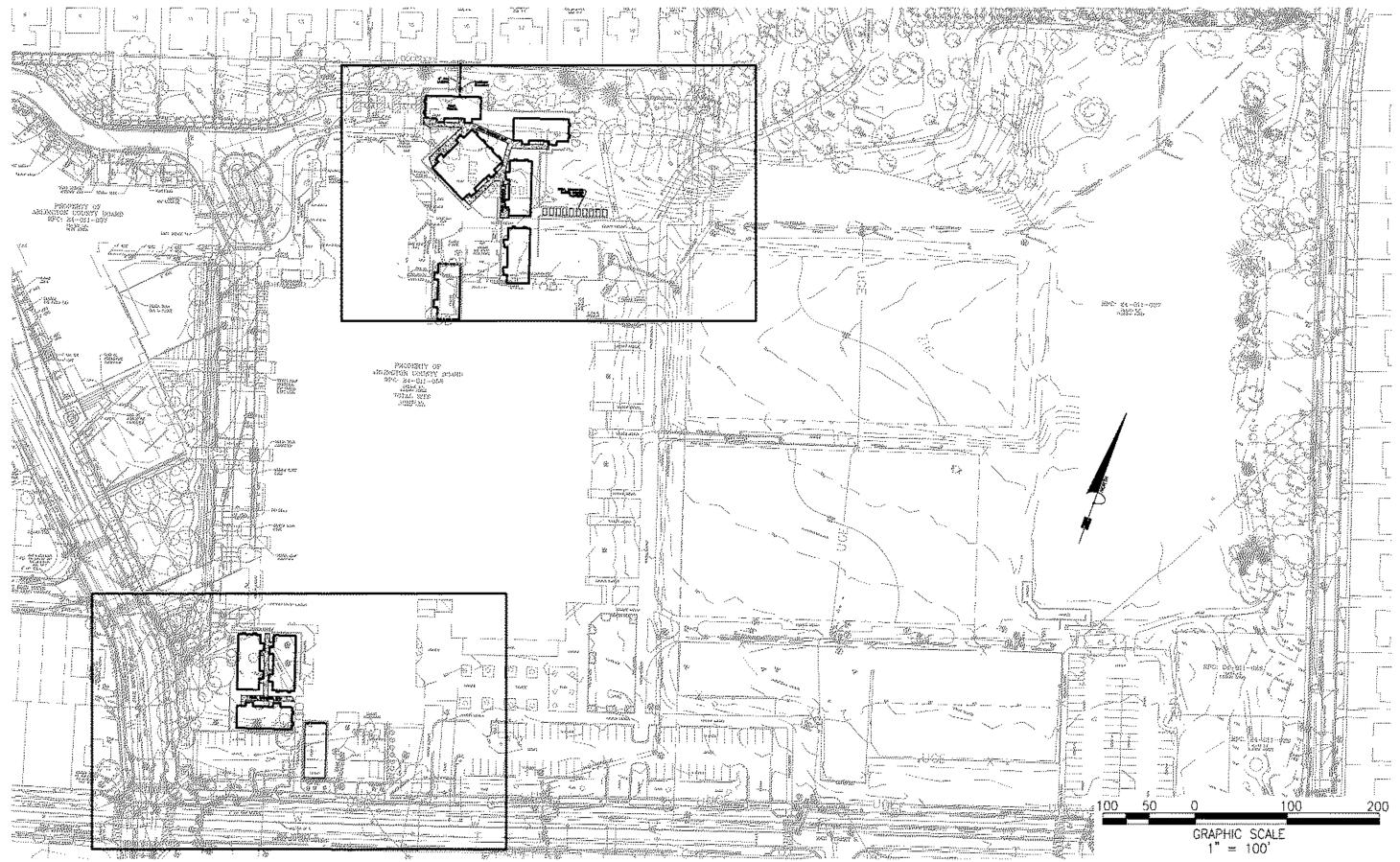
Southwest Modular Additions

• New temporary sidewalks to provide access to modular entrances. Electric and other dry utility connections will be sourced from the middle school building. In order to limit the amount of grading, the southern modular will likely need to be built on concrete piers to counter the steep grade beneath it.

Stormwater Management

 Per discussions with ACPS, stormwater management will not be required for the modulars due to their temporary nature (less than 3 years)

Civil - Site Plan - Overall



5.2 OPTION 1 – NO ADDITION / DECREASE STUDENT CAPACITY Structural



architecture incorporated

Structural Narrative:

This option involves architecturally reconfiguring the spaces internally without modifications to the structure. The modifications to the structure will be limited to reinforcement and new framing for the replacement of the mechanical units and new openings. If the new mechanical units are placed within the existing penthouses, reinforcing would not be expected. New framing for new floor openings and larger wall louvers would be expected. If new units are to be added outside the penthouse areas, the existing bar joists will need to be reinforced to support the new mechanical units. The reinforcement will involve the welding of bars and angles to the existing open web joists.

Structural Modifications Summary

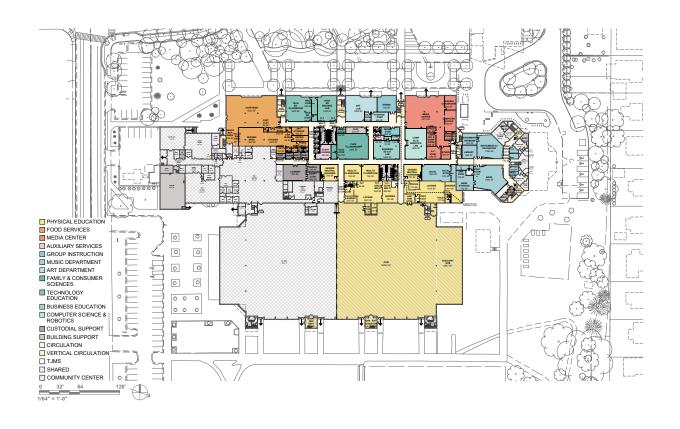
- No major modifications to the steel framing system
- · Modifications limited to new framing for new mechanical shaft requirements
- PV System
 - Would require at least 50% of the existing roof framing system to be reinforced in order to support it
- Mechanical System Upgrades
 - To be done within existing roof penthouse areas which should not require structural upgrades or reinforcement
- New roof top mechanical units would require the existing roof structure to be reinforced

Pros:

Reduced Structural Costs

Cons:

- Existing columns will limit updated classroom layouts
- Roof Structure requires reinforcement for mechanical and PV upgrades



5.2 OPTION 1 - NO ADDITION / DECREASE STUDENT CAPACITY Mechanical



architecture incorporated

MECHANCIAL DESIGN APPROACH

The scope of this study is to evaluate solutions for the options being considered that target a low EUI in the low to mid '20s and to not be dependent on fossil fuels. To meet this goal, geothermal and solar solutions will need to be maximized and considered when performing life cycle analysis. The APS design standard for new construction is to design new mechanical systems with a maximum energy use intensity (EUI) of 22-24.

The existing mechanical system has reached the end of its useful life and should be replaced in its entirety as part of a major phased renovation if that is the selected option. Energy modeling and life cycle analysis will be performed to guide the system design approach with the understanding that systems will need to be designed to last 30-40 years.

In addition, new construction projects and major additions will be designed to the current version of LEED to meet a minimum LEED silver certification level.

MECHANICAL

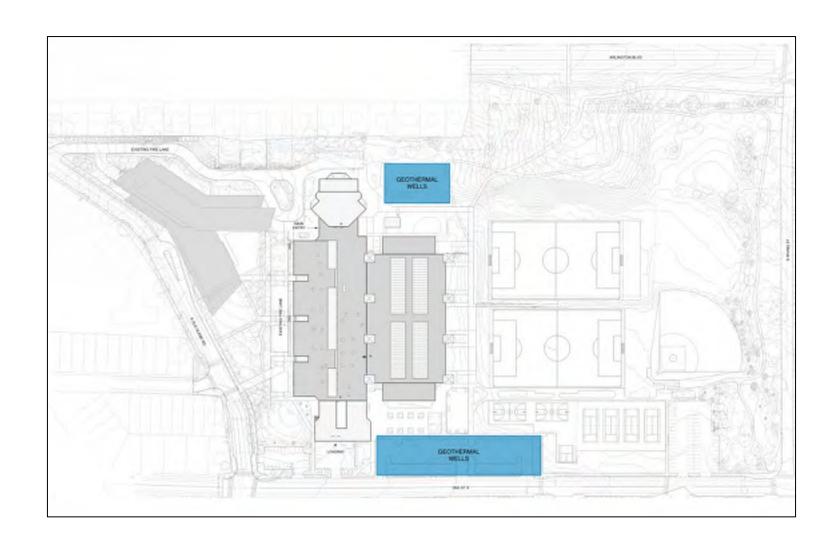
The two main renovation options being considered will add building area to meet the program requirements. The approach in these areas will be to provide new building systems to serve these spaces and connect to the hydronic cooling and heating building loops.

The cooling and heating design approach will be to maximize geothermal performance in accordance with the APS design standards, to meet the project energy goals. The possible Option 1 geothermal wellfield is shown in the figure.

To do this, the building envelope will be improved with a new roof and improved wall and window performance which will lower the overall block cooling and heating required.

In a phased occupied renovation, existing systems will be maintained and converted to new systems.

The estimated peak block load for the future renovated school is roughly 600 tons of cooling and 6,000 MBH of heating. A total of 200 geothermal wells would be provided in one large or multiple smaller fields to meet the cooling and heating building requirements. Centralized water to water heat pumps would be located in the main mechanical room to produce the building chilled and heating water feeding the air distribution systems and terminal units in the building. This approach would allow for the phased replacement of the existing 29 constant volume air handling units with new 4 pipe systems.



5.2 OPTION 1 – NO ADDITION / DECREASE STUDENT CAPACITY Mechanical

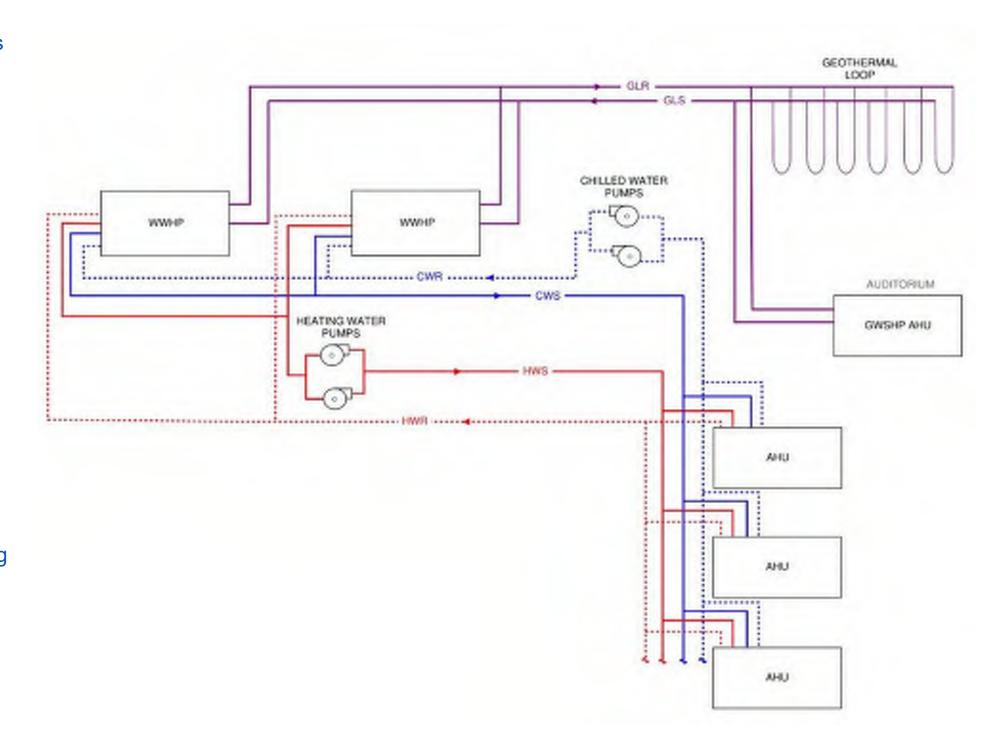


It is envisioned that all 29 constant volume air handling units would be converted to variable volume systems. All classrooms would be served by single duct variable volume air handling units, removing the existing inefficient dual duct system, and providing variable volume fan powered boxes to serve all of the classrooms. This approach will maximize the energy performance with the geothermal performance and by centralized water source heat pumps with compressors, will minimize noise and acoustic concerns in the classroom.

The auditorium, stage and band areas would be replaced with single zone, 4-pipe variable volume AHUs to serve the spaces on both the ground and upper levels.

Some of the larger systems, like the eight total air handling units serving the gymnasium and community center, could be provided as single zone variable volume heat pumps connected directly to the geothermal wells to replace the eight existing AHUs (four serving each space) if more cost effective than providing these systems as 4-pipe air handling units.

All of the existing building ductwork and piping mains would be replaced as part of the phased renovation.



5.2 OPTION 1 – NO ADDITION / DECREASE STUDENT CAPACITY Plumbing



architecture incorporated

PLUMBING DESIGN

Depending on where toilet rooms, locker rooms, cafeteria, kitchen, and science classrooms are located, the existing plumbing distribution and conveyance systems could be extended, modified to accommodate the new layout, or the systems could be replaced entirely.

Reuse of existing underslab sanitary and storm piping: On the Ground Level, there would be some selective slab demolition and excavation to intercept the existing sanitary and storm drainage systems so that new piping can be connected to the existing infrastructure.

Given the age (≥53 years) of below-grade sanitary and stormwater piping, it is recommended that any pipe reused in a renovation be lined with cured-in-place pipe (CIPP) or epoxy resin from the building to the municipal connection.

Provide new underslab sanitary and storm piping: This would require demolition of the entire Ground Level floor slab and removal of all sanitary waste and stormwater piping and a new piping configuration would be provided to 5 feet outside the building perimeter.

Greywater

Sanitary waste from lavatories, showers, locker room drains and drinking fountains could be captured and repurposed for the use of flushing water closets and urinals.

Providing a greywater system in the existing school structure would require extensive drainage system changes above grade to accommodate this type of system.

- It is not recommended that greywater be stored for reuse unless it is mechanically and biologically treated to near potable standards.
- Even when treated, greywater storage should be limited to a few hours and have continuous circulation and disinfection.

Rainwater Harvesting

The existing school roof has approximately 75,000 GSF available for rainwater harvesting. Rainwater could be collected and stored above or below grade in tanks or cisterns for use with fixture flush valves, irrigation system, or HVAC cooling systems.

Rainwater filtration and disinfection components could be provided in the Ground Level Boiler/Mechanical Room along with pump(s) for pressurizing the non-potable water system.

Clarified rainwater would be stored in above ground mounted or below ground buried tank(s) or cistern(s) where the non-potable water would be pumped to points of end use.

Generally, rainwater harvesting systems are more cost effective and easier to maintain than their greywater system counterparts.

 Greywater systems are heavily regulated and require more stringent filtration and disinfection procedures due to higher health risks associated with organic matter and contaminants than rainwater collection systems.

5.2 OPTION 1 – NO ADDITION / DECREASE STUDENT CAPACITY Plumbing



architecture incorporated

Plumbing Fixtures

Over the past 25 years commercial plumbing fixtures have undergone significant advancements in efficiency, performance, and sustainability. Today's commercial-grade toilets, urinals, faucets, and showers use dramatically less water as outlined in Table 1 below.

In a major renovation or building replacement, all the plumbing fixtures serving the school will be replaced with high efficiency 1.28 GPF flushvalve toilets, 0.125 GPF flushvalve urinals, 0.5 GPM metered lavatory faucets, and 1.5 GPM showers.

Fixture	Average use in 2000 Gallons-Per-Flush (GPF or GPM)	Today's High-Efficiency Fixture (GPF or GPM)	% Water Savings
Toilet	3.5 GPF	1.28 GPF (EPA WaterSense)	≥60%
Urinal	1.0 GPF	0 - 0.125 GPF (EPA WaterSense)	50-87%
Faucet	2.2 GPM	0.35 – 0.50 GPM (Sensor Models)	70-85%
Showers	2.5 GPM	1.5 – 2.0 GPM	20-40%

Domestic Water

Most domestic hot and cold-water pipes in the school are now over 50 years old and have reached the end of useful life. It is recommended that the piping and associated insulation be replaced in all school renovation scenarios.

In a phased renovation, separate parallel distribution systems of cold, hot, and hotwater recirculating piping could be installed and commissioned into service prior to any domestic water piping demolition.

Piping to new fixtures would come from the new parallel piping distribution system previously installed while the existing domestic water piping system continues to serve existing plumbing needs of occupied spaces during the phased renovation

The domestic hot water and hot water recirculating distribution systems would need to be removed and replaced with new distribution systems if the domestic water heating plant is relocated to the Ground Level Boiler / Mechanical Room as recommended.

Domestic Hot Water

Under Option 1, it is recommended that the two existing domestic hot water generation plants, currently residing in the north and south rooftop penthouses, be removed and a new domestic water heating system provided in the Lower-Level Boiler/Mechanical Room. This allows for easier access for maintenance.

The proposed replacement domestic hot water heating system is a water-to-water geothermal heat pump domestic hot water heating system with 100% backup gas-fired storage water heater(s). This type system would provide all the domestic hot water needs for the school in the event of heat pump outage.

The domestic heating water system could be augmented by a solar water heating system. The solar water heating system would take some of the load off the gas-fired domestic water heater, which takes the preheated geothermal domestic hot water (±120° F) and boosts the temperature at the storage tank(s) to 140° F.

Solar collection panels or evacuated tubes could be located on the roof with the heat exchanger(s), pump(s), and tank(s) located in the existing Ground Level Boiler / Mechanical Room.

Combining solar thermal water heating with a geothermal heat pump system creates a hybrid domestic water heating solution that maximizes renewable energy use, improves energy efficiency, and provides system redundancy.

In this type of setup, solar energy provides "free" thermal input to help preheat or maintain domestic water temperature, thereby reducing the load on the geothermal heat pump system.

5.2 OPTION 1 – NO ADDITION / DECREASE STUDENT CAPACITY Electrical



architecture incorporated

ELECTRICAL DESIGN APPROACH

The current electrical system is outdated and needs a complete replacement during a phased renovation. The electrical distribution system will be designed to be flexible, durable, and expandable to serve the needs of the school for the next 40 years and beyond.

MAIN ELECTRICAL SERVICE

The main switchboard shall be replaced with a 4000A, front access only switchgear. The switchgear shall feed a power switchboard, mechanical switchboard and lighting distribution panelboard to facilitate electrical energy monitoring requirements of the three load categories. A temporary generator docking station will be integrated into the incoming service to permit roll up generator connections during periods of extended generator maintenance or repair.

The replacement of the main electrical switchboards are a critical item to plan for during the phased renovation. Given the tight proximity of the main electrical room there is a limited number of tradespeople that could effectively work concurrently. Given this restriction a multi-week electrical outage of the entire facility should be planned for to allow the existing gear to be demolished, new feeders and cable installed, new switchgear installed, tested, accepted, and put into service.

New feeders to serve panels to be installed in future phases would need to be installed and pulled to the limits of construction in preparation for extension to final locations in future phases. Temporary connections would be provided to the new electrical service equipment to maintain service to switchboards and panels existing to remain until a future phase of construction.

TEMPORARY SERVICE

Temporary electrical service would need to be coordinated with Dominion Virginia Power to serve the trailer classrooms around the school while under construction. An acceptable means of routing power and telecommunications to trailers would need to be organized in partnership with the county while accomplishing it in the most cost-effective manner that considers the safety of students.



5.2 OPTION 1 – NO ADDITION / DECREASE STUDENT CAPACITY Lighting & PV



LIGHTING

New energy efficient LED lighting will be provided throughout all spaces. Dimmable local lighting controls will be implemented. Daylight control will be evaluated in partnership with the county to understand the potential energy savings and weigh them against the added cost and complexity of the required control equipment. Emergency power circuits will be integrated into the lighting design to provide uninterrupted lighting per the county design guidance.





PHOTOVOLTAICS

Additional photovoltaic panels will be evaluated on a LCCA basis as compared to the structural upgrades required to support the additional roof loading that would result.

5.2 OPTION 1 – NO ADDITION / DECREASE STUDENT CAPACITY ADDITIONAL SYSTEMS



architecture incorporated

FIRE ALARM

The main fire alarm panel is a Simplex 4100U located in the main electrical room. Simplex stopped support for this model in 2011 so replacement parts and support are difficult if not impossible to find. Fire alarm notification and smoke detection devices are located throughout the school but the spacing and location do not meet current standards.

A complete replacement of the fire alarm system is recommended for any large scale renovation to provide a modern supported and maintainable system that meets current APS requirements.

TELECOMMUNICATIONS

The existing telecom rooms at the middle school are not appropriately sized and lack the infrastructure required to support modern networking and instructional technology. There is insufficient space for proper equipment racks, cable management, and cooling, leading to overcrowded and inefficient setups. Power distribution and grounding are also inadequate, creating reliability and safety concerns. These limitations hinder the ability to deploy current and future educational technology effectively.

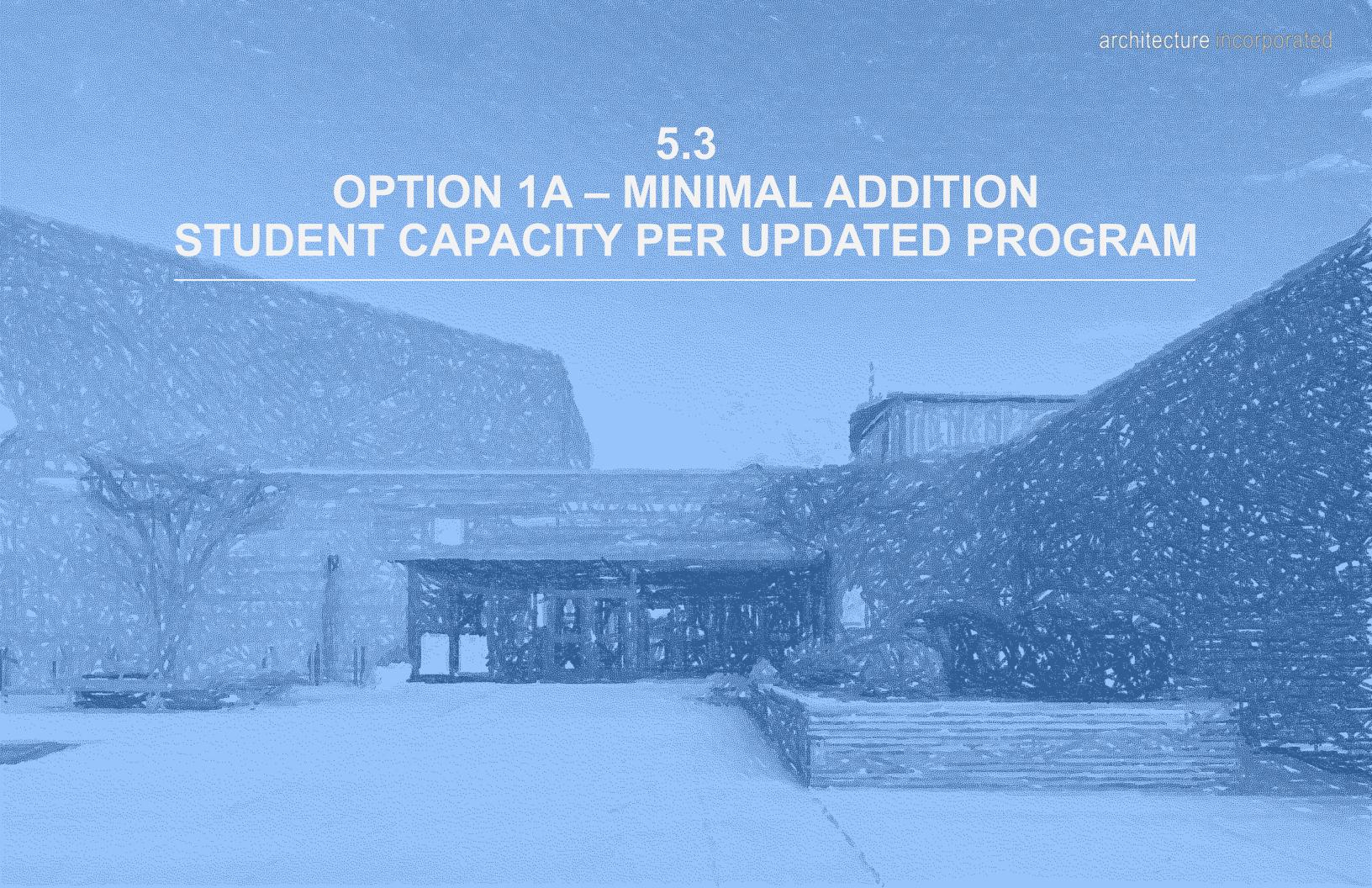
ELECTRONIC SAFETY & SECURITY

Any large-scale renovation shall provide a complete replacement of the electronic safety and security equipment with the latest hardware and firmware on the head-end system, field panels, power supplies and all field devices.

CCTV cameras shall be coordinated with the approved floorplan and locations of the cameras vetted through engagement with the APS security coordinator.

COMMUNICATION & SPECIAL SYSTEMS

All low voltage communications system to include public address, clocks, classroom audio visual, and telephone should be provided new to meet the most up to date APS requirements. Telecommunication infrastructure will be coordinated with the various other communication and special system to provide IP connectivity where needed for the devices function.

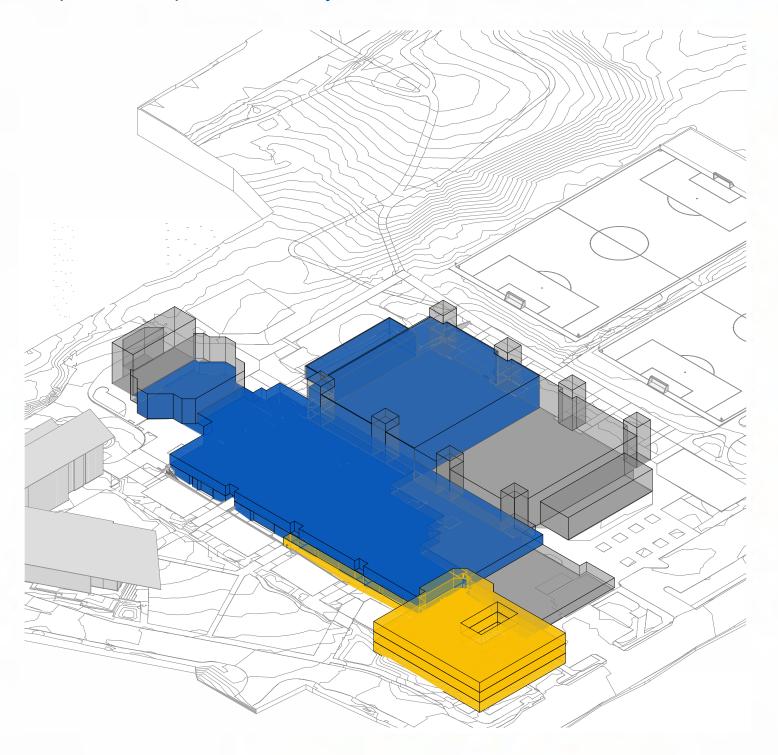


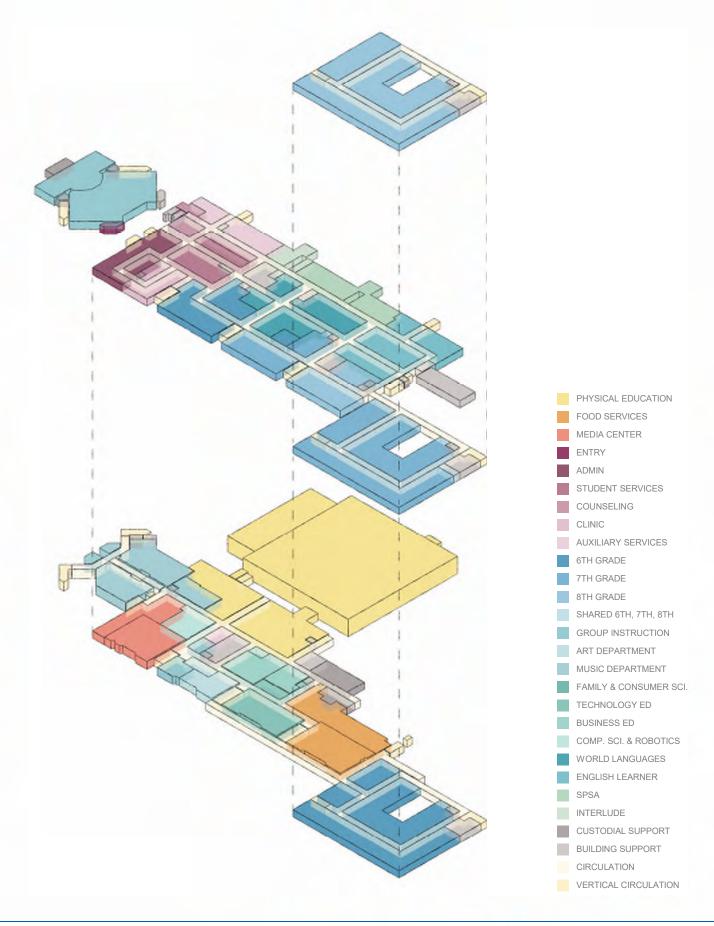
5.3 OPTION 1A - MINIMAL ADDITION

architecture incorporated

Overview:

Utilize the planned square footage developed as part of this study to renovate the existing school and add the most minimal addition possible to reach a student capacity of 1,105. All common use spaces are per the program and use the lowest allowable square footage. The plan is the same as option 1 except the three-story classroom addition.





Narrative:

Option 1A prioritizes fitting the program spaces into the building but is not able to equitably address problematic issues at TJMS such as ceiling height, access to daylight safety & security, and organization of spaces. The new classroom addition provides standard ceiling heights and almost all of the learning spaces have access to daylight with the inclusion of the courtyard.

This option would necessitate some work in the community center. To have a kitchen collocated with the cafeteria, the community center Visual Arts and Wood Shop would be relocated to the former APS kitchen space. The elevator located within this space would need refurbishment. The gymnasium would not need a reroof but would need new flooring.

Pros:

- Kitchen is adjacent to Cafeteria and does not require staff moving between public spaces and school spaces during the day (helping to alleviate security
- Cafeteria is enclosed space to alleviate disruptive noise
- Cafeteria is placed at exterior wall allowing daylight opportunity
- No major changes to structure
- Accommodates required student capacity

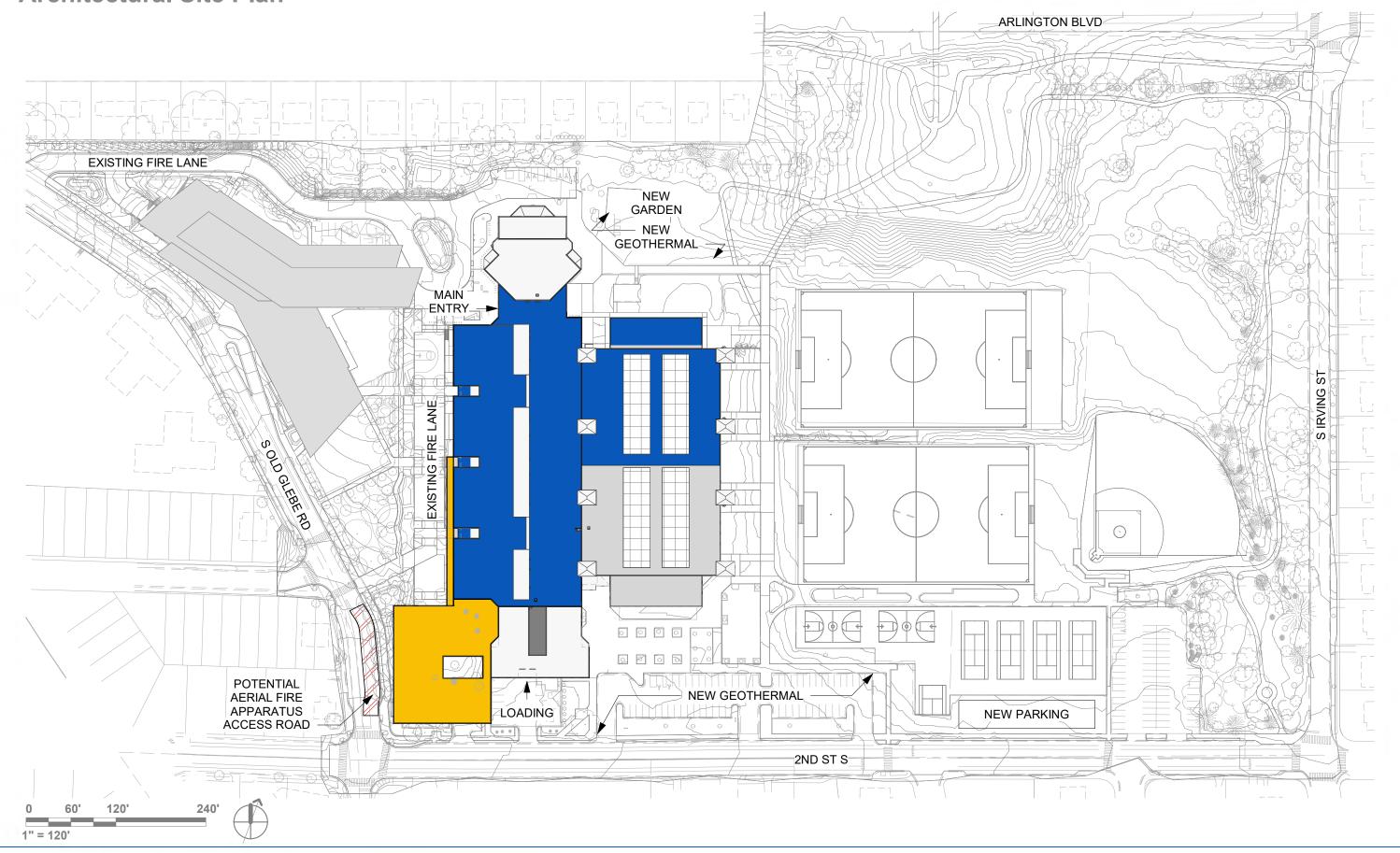
Cons:

- Space constraints result in lowest allowable sized spaces
- Ceiling heights below VDOE standard
- Significant number of classrooms and offices do not have access to daylight
- The gym remains shared with the community, maintaining a major safety & security risk
- Vocal and Drama rooms have significantly lower than allowable ceiling height
- No major changes to structure require columns throughout spaces forcing less than desirable room layout
- Exterior corridor and a three-stop elevator required for addition
- Addition would be on county owned land and require leasing agreement

Changes to GSF

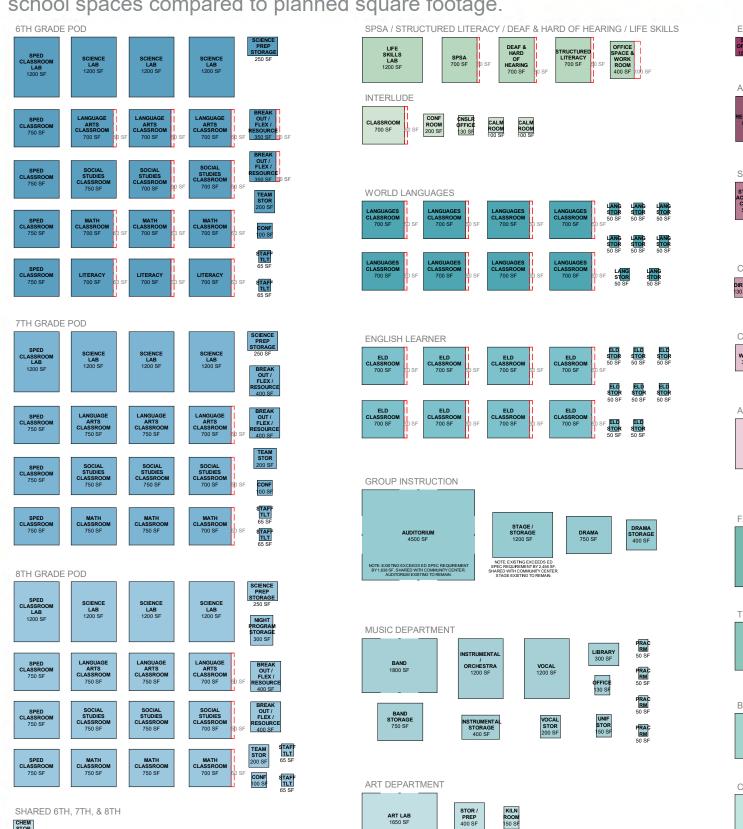
		Existing	Option 1A
•	Middle School	128,292	130,501
•	Middle School addition		60,194
•	Joint-use theater & associated spaces	13,697	13,697
•	Joint-use gymnasium	67,033	67,033
•	Community Center	19,391	17,182
•	Service wing (including kitchen & mechanical spaces)	6,862	6,862
•	Grand Total GSF	235,275	295,469

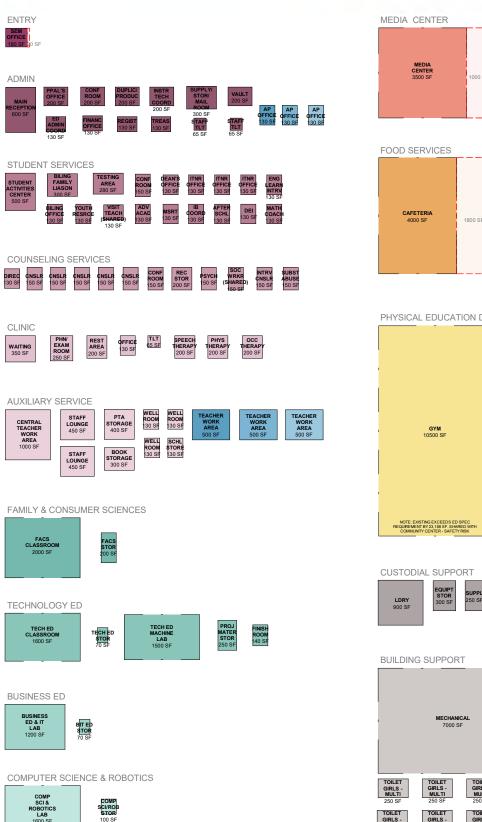
5.3 OPTION 1A – MINIMAL ADDITION Architectural Site Plan

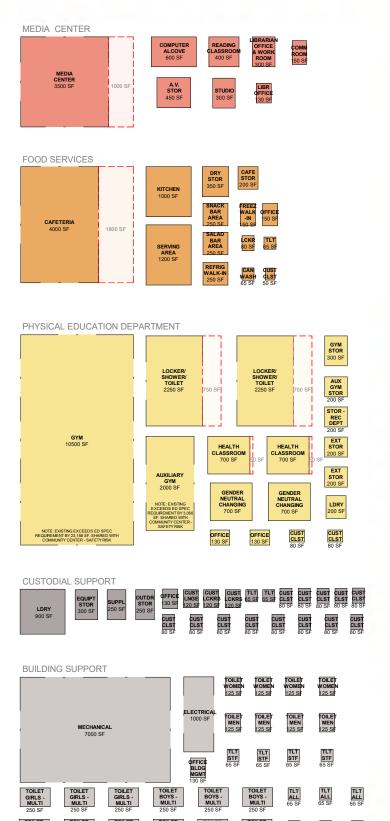


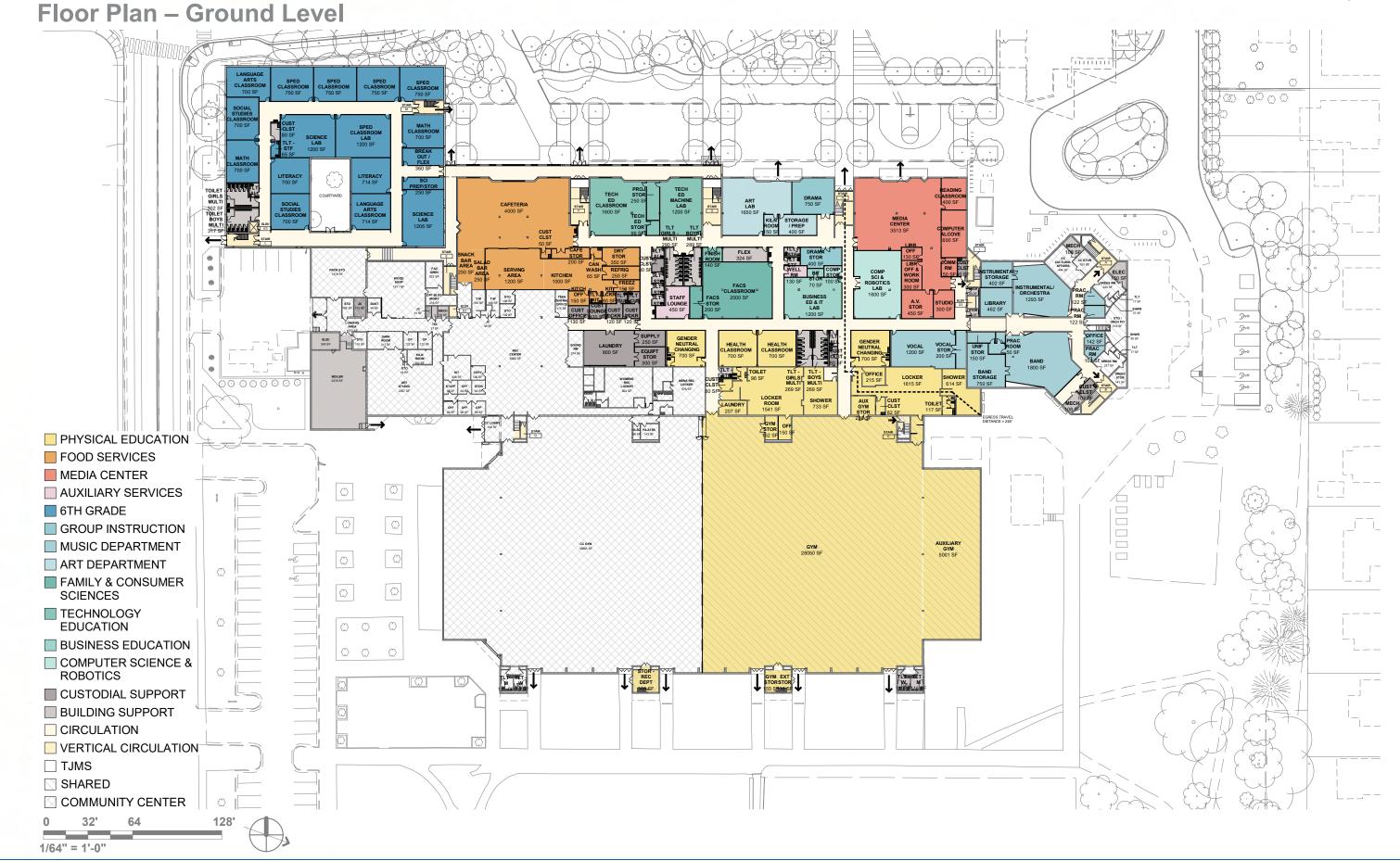
5.3 OPTION 1A – MINIMAL ADDITION Graphic Program

This graphic represents the disparity of square footage between Option 1A school spaces compared to planned square footage.

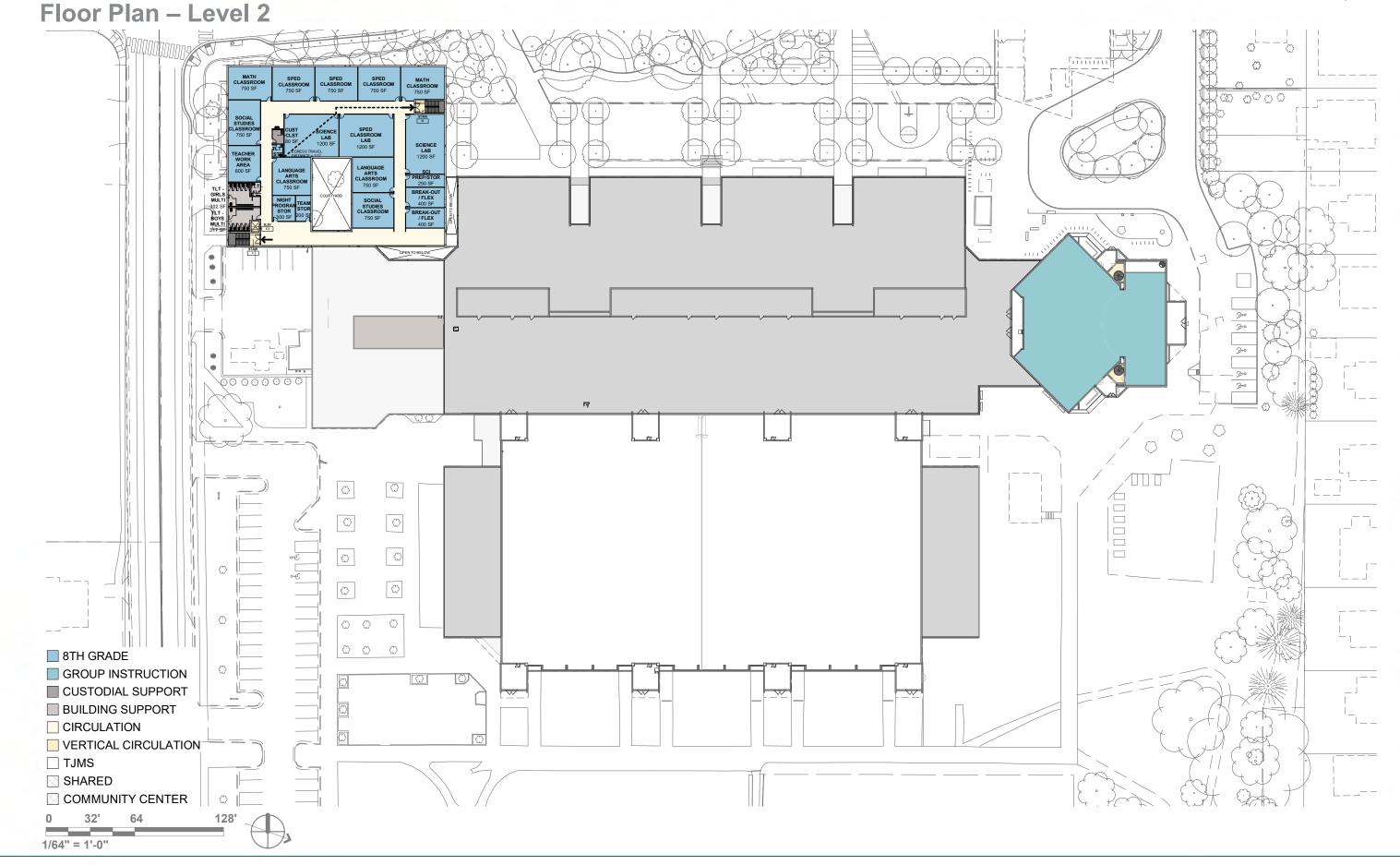












5.3 OPTION 1A – MINIMAL ADDITION County Impact

Theater

The theater will be renovated during Phase 3 of construction, which will require the community theater production to temporarily use a different stage to be coordinated by the county.

Gymnasium

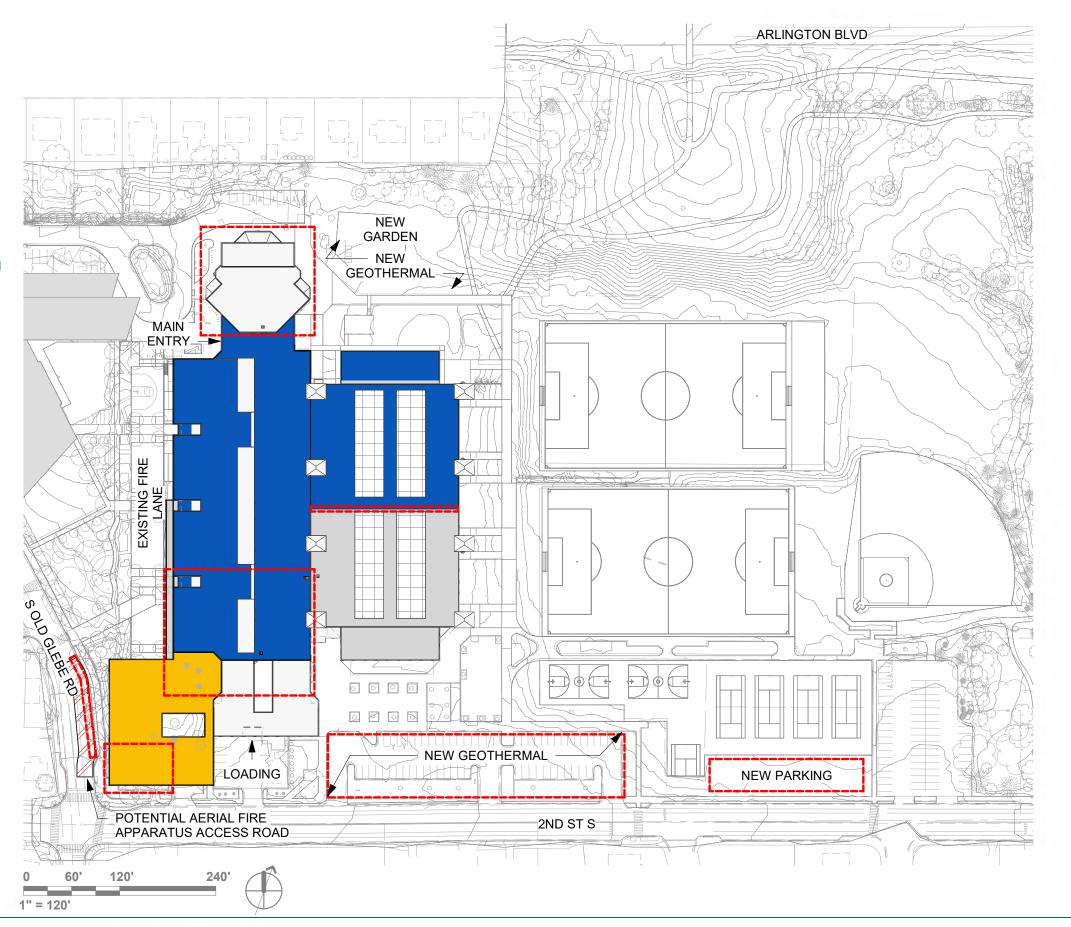
The installation of the operable partition in the shared gymnasium will require a short shut down of the space.

Community Center

The community center will need to be leased for the duration of phase 1 of construction. The square footage of the community center will decrease from 19,391 to 17,182. This is due to the consolidation of the community center, eliminating unnecessary circulation space. Any areas within the community center that are affected will be renovated on behalf of TJMS.

Parking

The addition will result in the loss of the plansouthwest parking lot and a section of street parking along S Old Glebe Road for fire lane access. A new parking lot will be provided by TJMS, just south of the community tennis courts. Additionally, the installation of geothermal wells will temporarily prevent the community's use of the plan-south parking lot. After construction, the community will be provided a new parking lot on behalf of TJMS.



Demolition Summary

Modulars are temporary and will be removed at the completion of the project

Northeast Temporary Modulars

- 4 trees to be removed
- Existing concrete sidewalk can remain
- Existing garden to be relocated
- Overhead electric may need to be relocated depending on height
- No impact to existing underground utilities

Southwest Building Addition

- 19 trees to be removed
- · Two sanitary mains to be relocated
- 54" storm line to be relocated
- Underground electric and fiber optic to be relocated
- Asphalt parking lot, curb, and gutter to be demolished
- Concrete sidewalks to be demolished

Northeast Modular Additions

• Due to the temporary nature of this layout, all efforts were made to provide functionality while being cost-conscious. New temporary sidewalks are proposed to provide access to modular entrances while the garden will be preserved and relocated. It is unlikely that the toilets/washroom would be able to connect to the existing sanitary system of the middle school, so a new sanitary lateral connection is proposed, tying into the existing sanitary main to the north. Water for the toilets will need to be connected to the existing building as there is no waterline nearby. Electric connections will also need to be extended from the middle school to provide power to these additions.

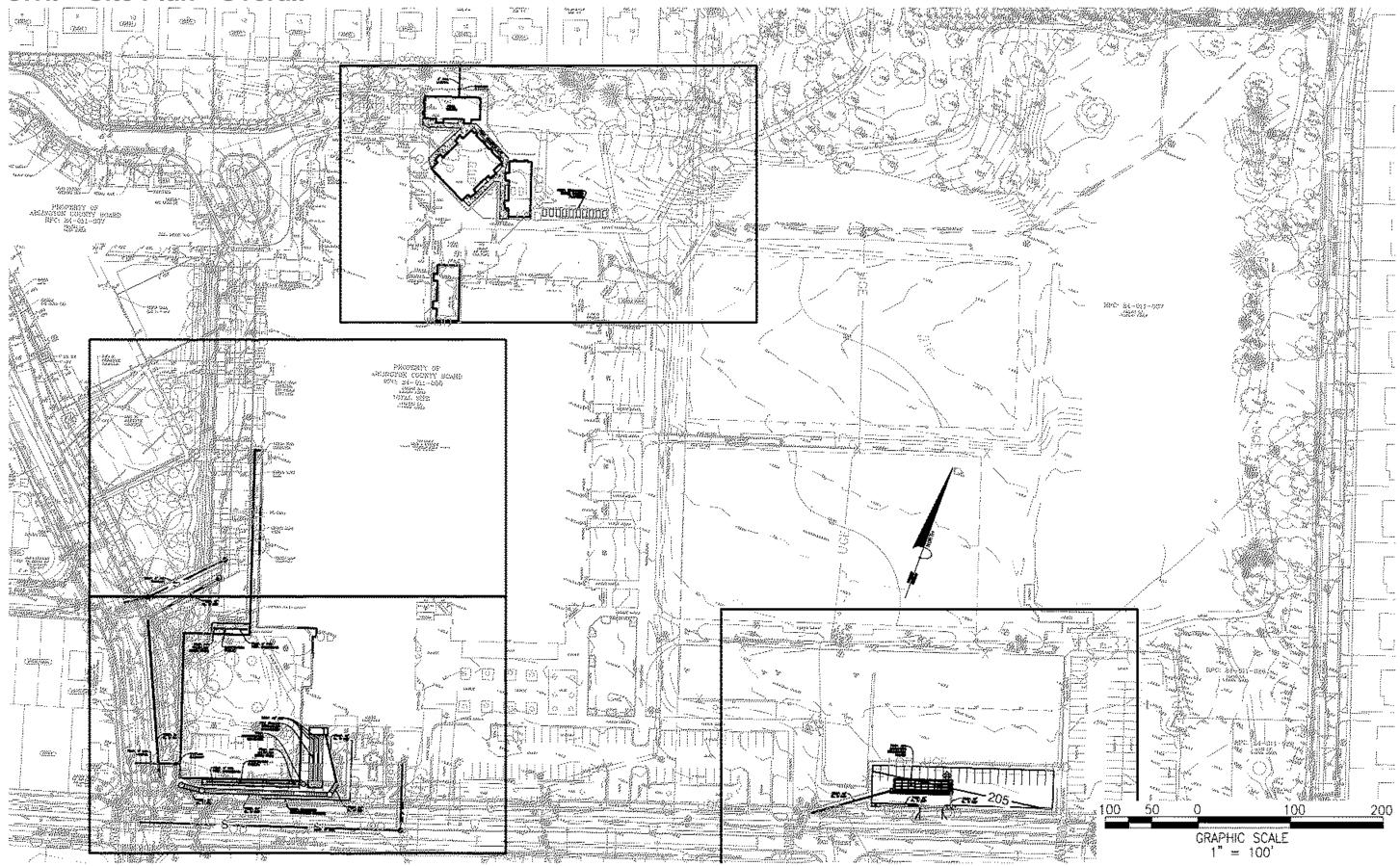
Southwest Building Addition

• The southwest corner of the site contains a parking lot and landscaped area with several underground utilities. The existing sanitary main from Fleet Elementary will be relocated north of the proposed building addition, tying into the sanitary main in S Old Glebe Road. The existing sanitary main from the east will be reconstructed to the south into 2nd Street South, then west to the existing main at the intersection of S Old Glebe and 2nd Street South. The existing 54" storm is a very large storm pipe that will be reconstructed south of the proposed building addition but north of 2nd Street South. The existing underground electric will be relocated along the sidewalk north of 2nd Street South and back through the existing loading area to maintain service to the existing transformers. A new sanitary cleanout and lateral tying into the main in S Old Glebe Road will provide sanitary service for the new building addition. The existing sanitary pipe in this location should be inspected to see whether it can be reused. Water connections will need to be made to the existing building, as there is very limited space for a new water service and meter. A bioretention planter box is proposed along the northern and southern faces of the addition, and a system of underground 48" CMP with upstream hydrodynamic separator is proposed in the loading lot east of the addition. Fire access for this addition exists along S Old Glebe Road and 2nd Street South.

New Parking Lot

• A new parking lot is proposed south of the tennis courts to replace the 23 parking spaces displaced by the new building addition. Storm inlets and a stormwater management facility are proposed, which tie into the existing storm system along 2nd Street South.

Civil - Site Plan - Overall



Stormwater Management

- Due to the increase in impervious area as a result of the building addition and associated site features, stormwater quality and quantity control is required. Per discussions with ACPS, however, the northeast modulars do not require stormwater management due to their temporary nature (less than 3 years). Per the Virginia Stormwater Management Handbook and the Arlington County Stormwater Management Ordinance, the total phosphorus runoff pollution load for the proposed areas shall be reduced by no less than 0.26 pounds per acre, per year.
- In order to meet this requirement, land cover analyses were performed, quantifying the increase in impervious area. This information was entered into the Virginia Runoff Reduction Method spreadsheet, and best management practices were selected and designed to meet the phosphorus removal requirements.

Stormwater - Quality

• Two bioretention planter boxes and a hydrodynamic separator are proposed to treat the southwest building addition. An arch pipe chamber system with an isolator row that filters the stormwater is proposed to treat the proposed parking lot south of the tennis courts. Virginia Runoff Reduction Method spreadsheet outputs are provided on the following slides.

Stormwater - Quantity

• Stormwater quantity requirements were determined using the Energy Balance equation per section 9VAC25-875-600.B.3 of Virginia Code. Energy Balance calculations are provided on the following slides. The stormwater storage will be achieved with a combination of two systems – the pipe storage system in the loading area, and the arch pipe chamber system in the new parking lot.

5.3 OPTION 1A – MINIMAL ADDITION Structural



architecture incorporated

Existing Building Structural Modifications Summary

- No major modifications to the steel framing system
- Modifications limited to new framing for new mechanical shaft requirements
- PV system would require at least 50% of the existing roof framing system to be reinforced in order to support it
- Mechanical system upgrades to be done within existing roof penthouse areas which should not require structural upgrades or reinforcement
- New roof top mechanical units would require the existing roof structure to be reinforced.

New Addition Structural Summary

- 3-Story steel framed addition
- New VUSBC requires ground snow load of 64 psf. Increased from 25 psf.
- Foundation 4" slab on grade and conventional spread footings
- Floor framing
 - o 3.5" Thick concrete slab on 9/16" form deck
 - Typical framing 20" deep joists at 24" OC supported on 24" deep beams
- Roof framing
 - 1 ½" Type B roof deck
 - Typical framing 28" deep joists at 5 ft OC and supported on 21" deep beams

Pros:

- Addition allows for coordinated structure with other disciplines
- New roof structure can accommodate a new PV system

Cons:

- Existing columns will limit updated classroom layouts
- Roof structure requires reinforcement for mechanical and PV upgrades



architecture incorporated

5.3 OPTION 1A – MINIMAL ADDITION Plumbing



PLUMBING DESIGN

This option, like Option 1, reconfigures the existing school layout on the Ground Level and Level 1. Furthermore, this option adds a 3-story 58,000 GSF (gross square feet) addition to the existing structure at the SW corner of the existing school.

Storm and Sanitary Systems

Existing underground sanitary sewer and stormwater piping to the SW of the existing site would need to be removed and reconfigured to accommodate the school addition.

As is the case in Option 1, Option 1A could either reuse the existing underground stormwater and sanitary waste with the aforementioned CIPP or epoxy lining, or could remove the existing piping and replace with new piping.

Domestic Water

As identified in Option 1, the majority of domestic water pipe in service within the school has reached the end of useful life and should be replaced under extensive renovation.

As in Option 1, Option 1A would build an entirely separate main piping distribution system for cold, hot and hot water recirculating systems and commissioned into service prior to any plumbing demolition.

When the various renovation phases are conducted, the new piping systems will be in place to serve new plumbing requirements of the renovation, while allowing occupied spaces not yet under construction to be served by the existing systems.

The existing 4" domestic water entering the existing Lower-Level Boiler/Mechanical Room would provide a connection point to run a cold water main to the 3-story school addition.

Greywater/Rainwater Harvesting

Systems would be implemented as proposed for Option 1.

Option 1A adds approximately 18,300 GSF of roof area to the existing 75,000 GSF of the existing school roof, bringing the total available harvesting area to 93,300 GSF, making rainwater harvesting particularly attractive as a plumbing technology to implement in this option.

Domestic Hot Water

As with Option 1, it is recommended that the domestic water heating plant be moved to the Ground Level Boiler/Mechanical Room to facilitate system maintenance.

Option 1A would remove all existing hot and hot water recirculating piping, valves, and appurtenances. A new domestic hot water distribution and recirculating piping systems will be provided and extended to the reconfigured existing school and SW 3-story addition.

Like Option 1, the proposed replacement domestic hot water heating system is a water-to-water geothermal heat pump domestic hot water heating system with 100% gas fired storage water heater(s). This system would provide all the domestic hot water needs for the reconfigured existing school and addition.

Solar water heating could be added to a geothermal heat pump domestic water heating system to augment the building's domestic hot water system with steady, year-round hot water needed for showers, kitchen, classrooms and lavatories.

5.3 OPTION 1A – MINIMAL ADDITION MEP



architecture incorporated

MECHANICAL DESIGN

The mechanical design for Option1A will be the same approach as in Option 1. During the phased renovation of the existing building, the existing mechanical systems will be maintained and converted to new systems. The addition will be provided with a new system connected to the geothermal field.

ELECTRICAL DESIGN

The electrical design for Option1A will be the same approach as in Option 1. During the phased renovation of the existing building, the existing electrical systems will be connected to the new main incoming service. Distribution and branch panelboards will be phased over to the new service during each stage of the project. The electrical system will be extended into the addition and supported by the new electrical service.

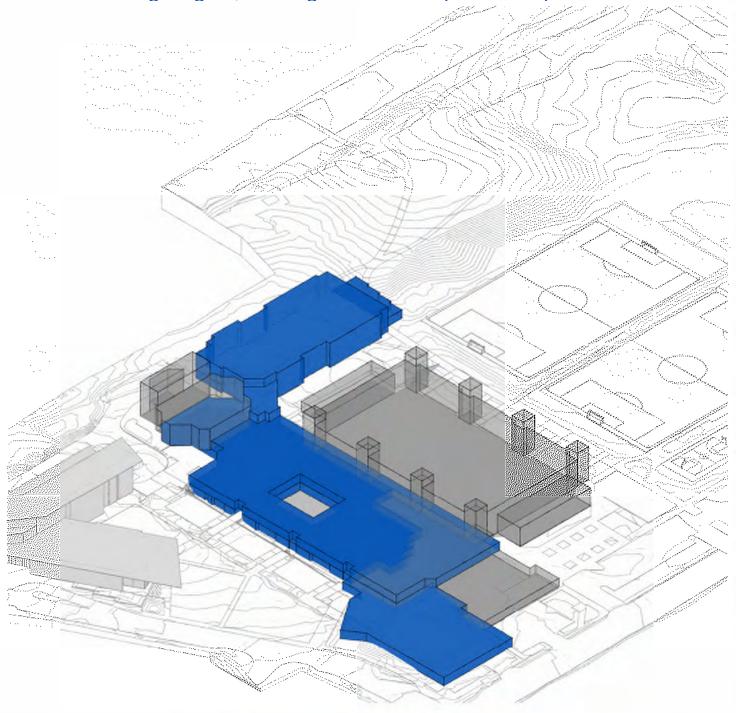
See Additional Systems information per Option 1.

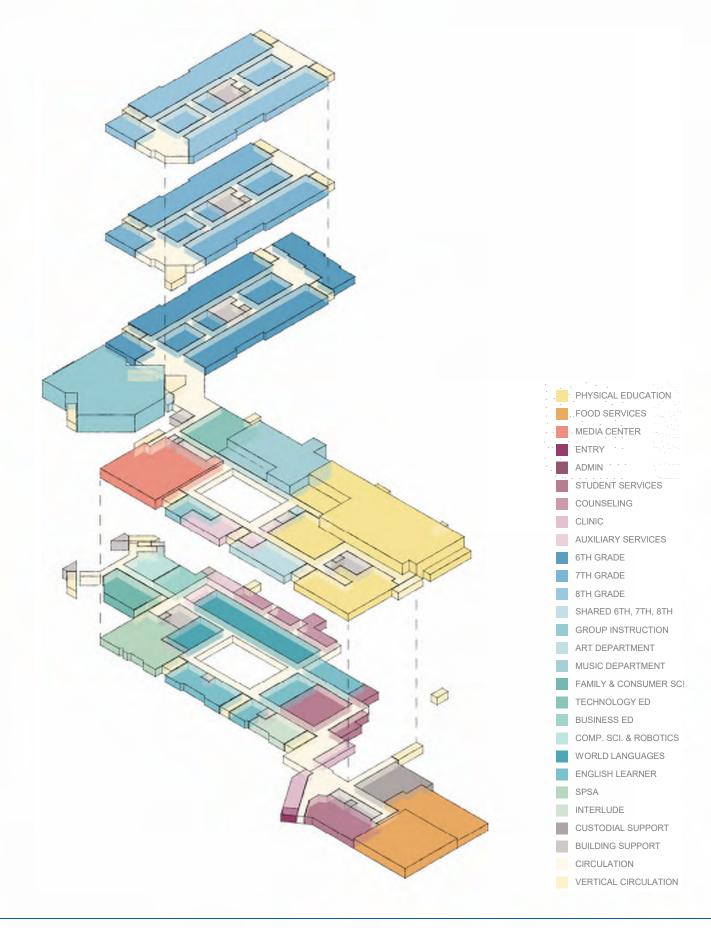


architecture incorporated

Overview:

Utilize the planned square footage developed as part of this study to renovate the existing school with a large classroom addition to the northeast and a one-story administration addition to the southwest. Student capacity is 1,105. All common use spaces are per the program and use the highest allowable square footage. Increased security, exposure to daylight, increased ceiling heights, and organization of spaces are prioritized.





Narrative:

Option 2 studies what would be required to best meet the planned square footage and all other required elements of the APS education specification. The structural grid is altered to provide intentional, column free spaces. A large courtyard is added in the existing footprint of the school to allow daylight in learning spaces and a connection to the exterior. This provides equity of learning spaces not possible in options 1 and 1A. The alteration of the structure also allows a clearer grouping of program elements. The gym is provided on Level 1 of the existing building. The cafeteria, kitchen and gym are now solely school spaces greatly improving safety & security. The location of the gyms, music classrooms, and media center on level 1 of the existing building allow a new, higher roof to be constructed so these spaces now meet the required ceiling height.

The one-story southwest addition contains the new entry and administration suite. The corner of S. Old Glebe Rd and 2nd St S. is a natural entry point on the site versus the current location of the school entrance. The three-story classroom pod addition creates distinct identities for each grade. On levels 1 and 2, there is an opportunity for a terrace and / or roof garden. A connection is required between the existing building and the new classroom addition. The circulation space required becomes an asset as a two-story learning stair space. The additional circulation space also becomes overflow space for the theater. pods

This option would necessitate some work in the community center. To have a kitchen collocated with the cafeteria, the community center Wood Shop would be relocated to the former APS kitchen space. To perform the structural work necessary to construct a gym above the community center, it would need to be shut down for a period of time. The elevator located within this space would need refurbishment. The existing gymnasium would not need a reroof but would need new flooring.

- Kitchen is adjacent to Cafeteria and does not require staff moving between public spaces and school spaces during the day (helping to alleviate security risk)
- Cafeteria is enclosed space to alleviate disruptive noise
- Cafeteria is placed at exterior wall allowing daylight opportunity Gym suite is within school, eliminating safety & security risk
- Accommodates required student capacity
- Equity of spaces (size, access to daylight, organization)
 Additions serve as swing spaces. Students move directly into new space and modular classrooms are not needed
- New welcoming main entrance on Glebe / 2nd

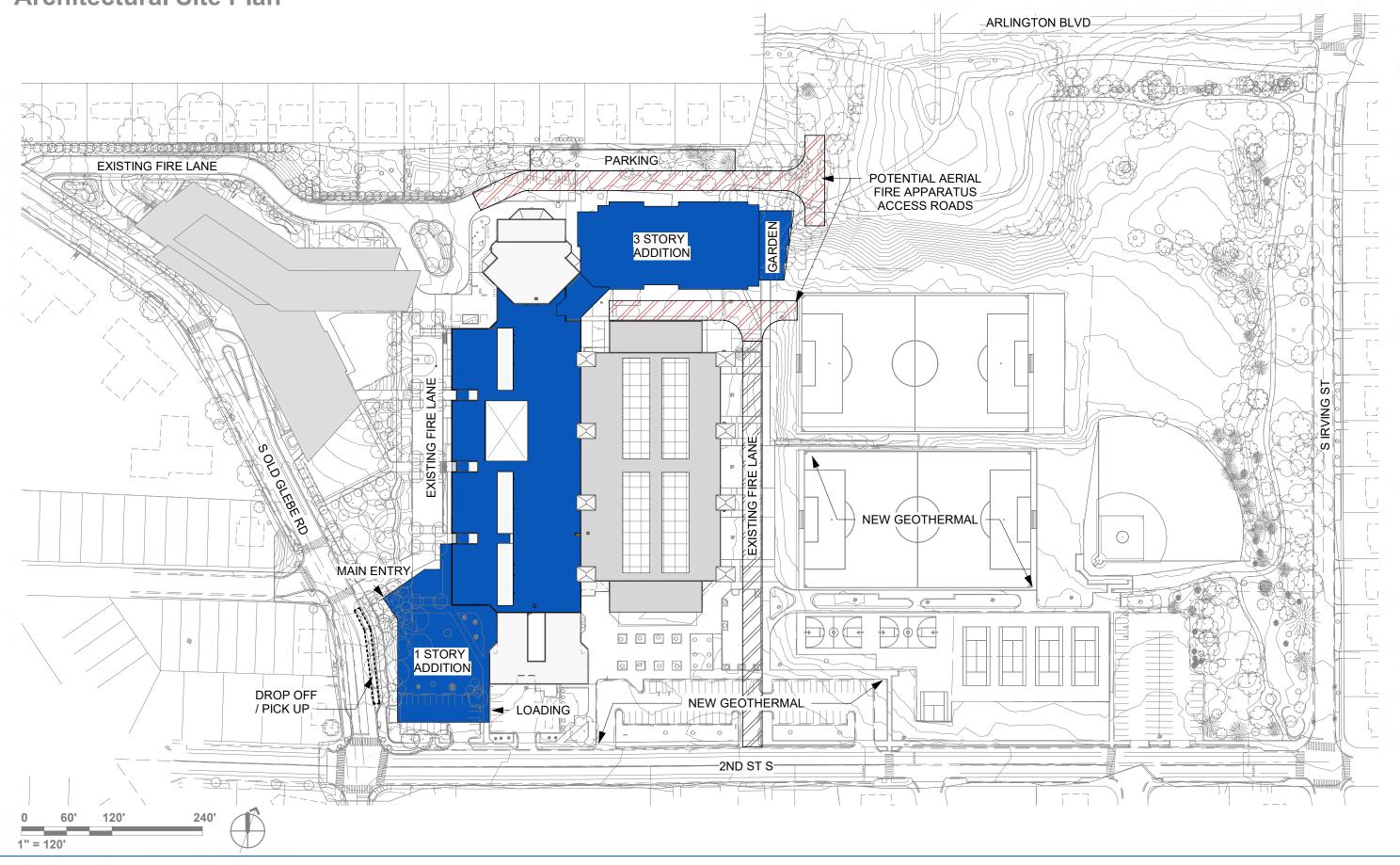
Cons:

- Altering the structure is expensive and requires shutting down the community center for a period
- Addition would be on county owned land and require leasing agreement
- Addition would require a three-stop elevator
- Most / all existing underground utilities will need to be reworked at the corner of Glebe / 2nd

Changes to GSF

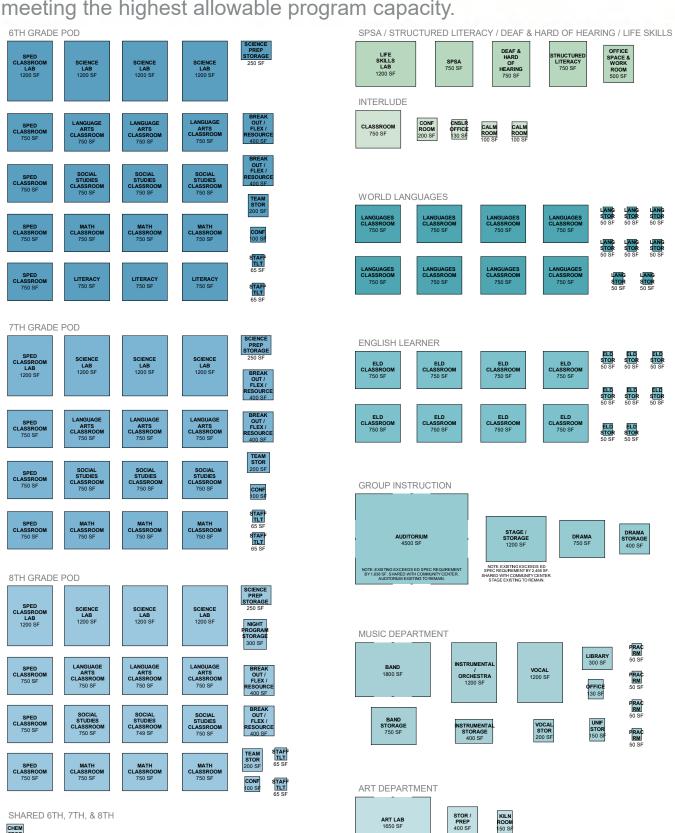
		Existing	Option 2
•	Middle School	128,292	118,024
•	Middle School NW one-story addition	•	23,688
•	Middle School SE three-story addition		89,344
	Grossing Factor (GSF [231,056] / Program SF [164,406])	= 1.41	•
•	Joint-use theater & associated spaces	13,697	13,697
	Community Center gymnasium ·	67,033	67,033
•	Community Center	19,391	20,750
•	Service wing (including kitchen & mechanical spaces)	6,862	6,862
•	Grand Total GSF	235,275	339,398

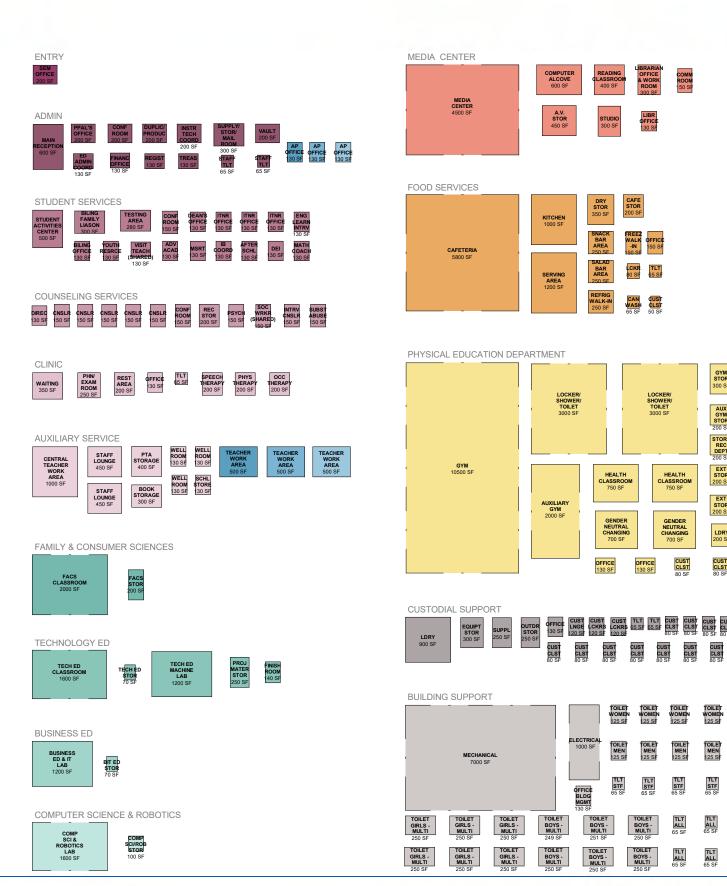
5.4 OPTION 2 – IDEALIZED ADDITION Architectural Site Plan

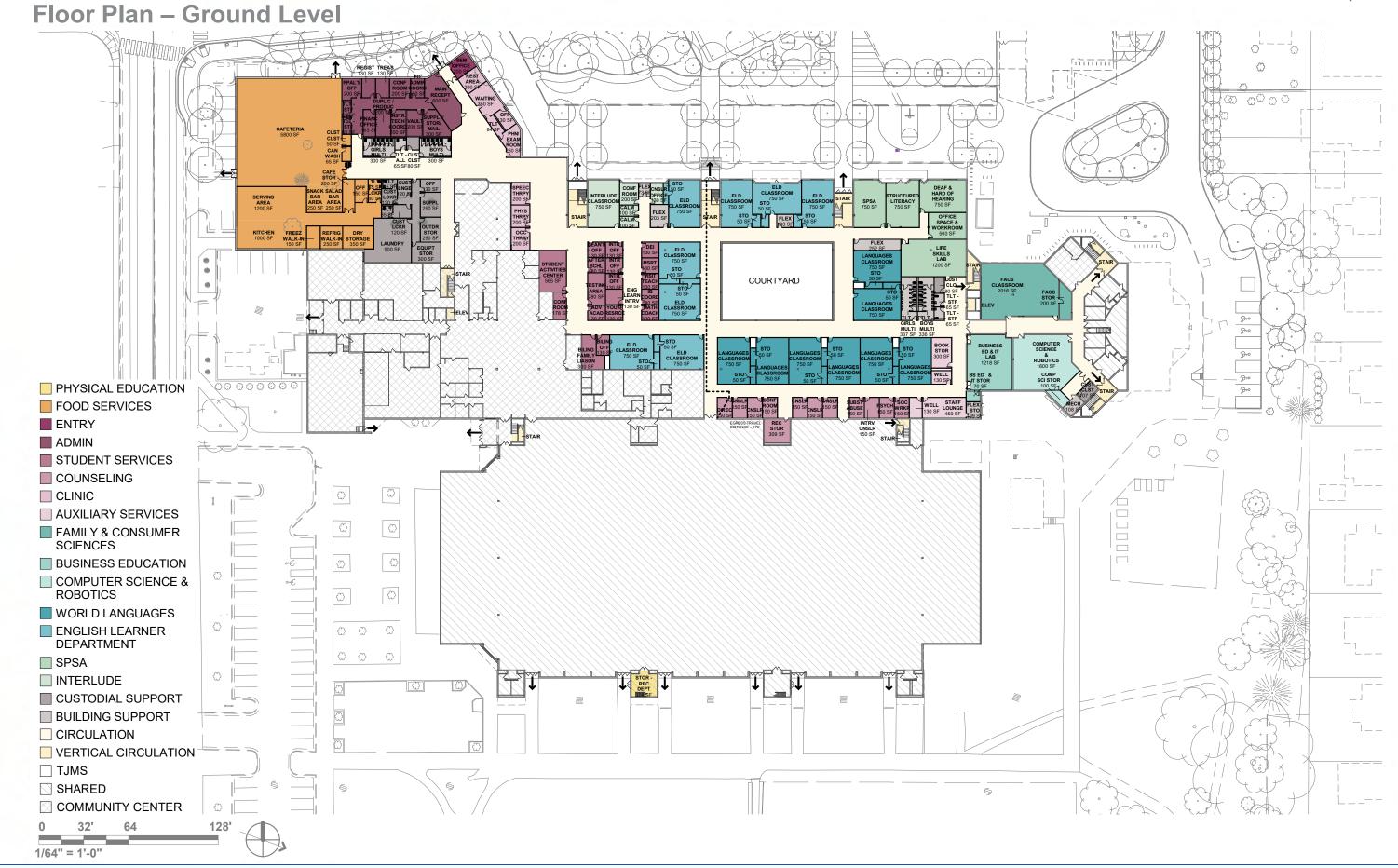


5.4 OPTION 2 – IDEALIZED ADDITION Graphic Program

This graphic represents the square footage of Option 2 school spaces, meeting the highest allowable program capacity.

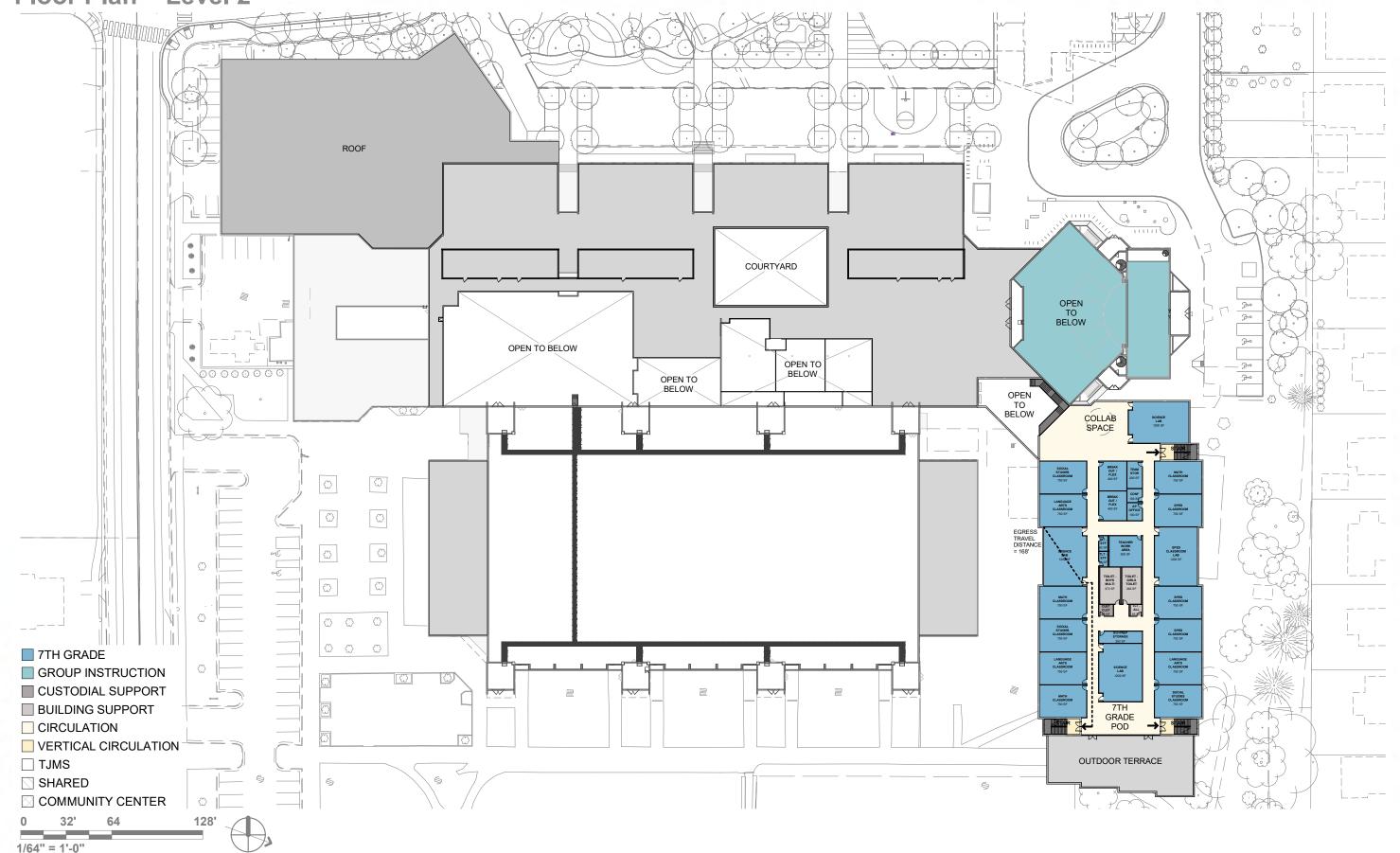


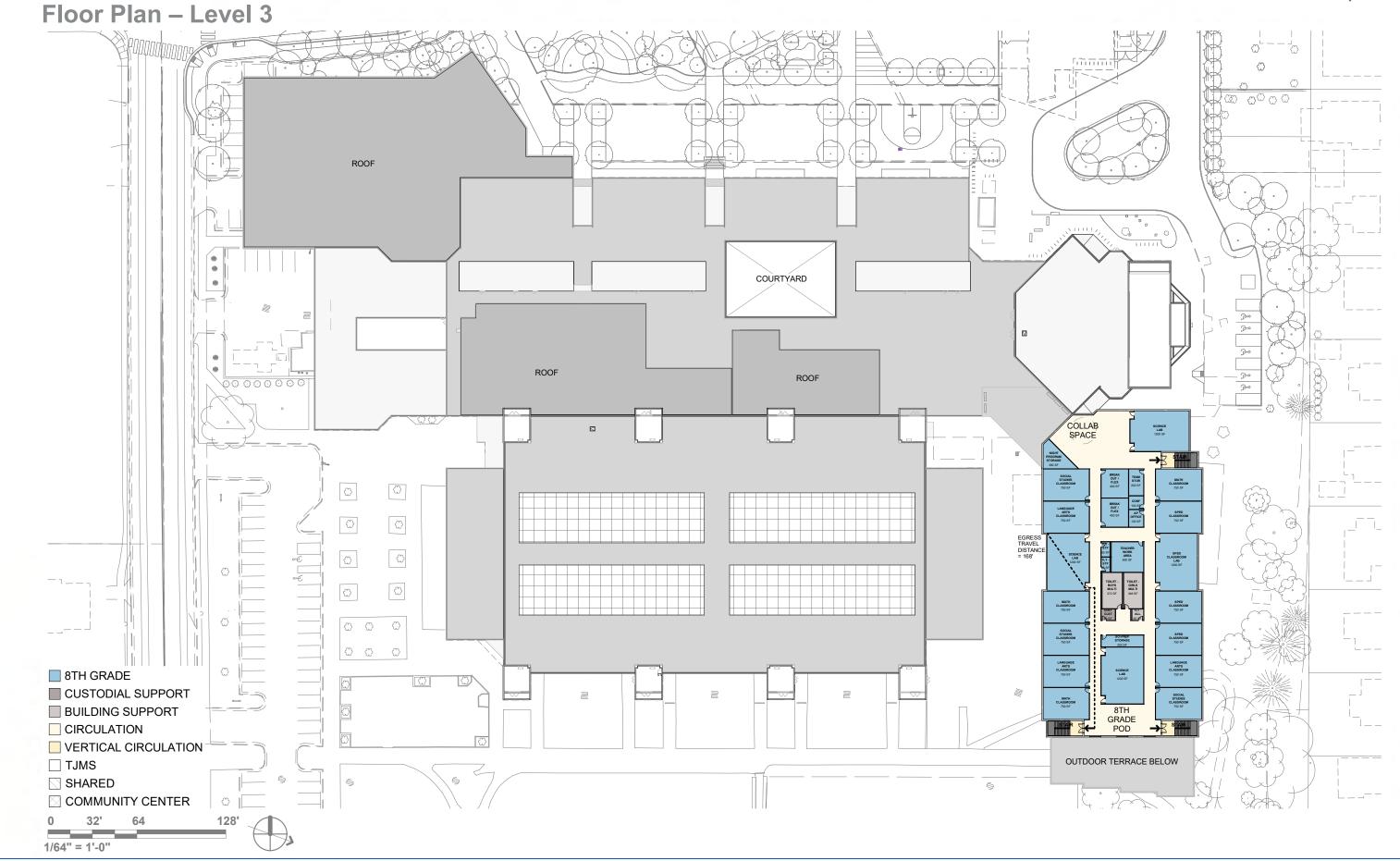






Floor Plan - Level 2





5.4 OPTION 2 – IDEALIZED ADDITION County Impact

Theater

The theater will be renovated during phase 5 of construction, which will require the community theater production to temporarily use a different stage to be coordinated by the county.

Community Center

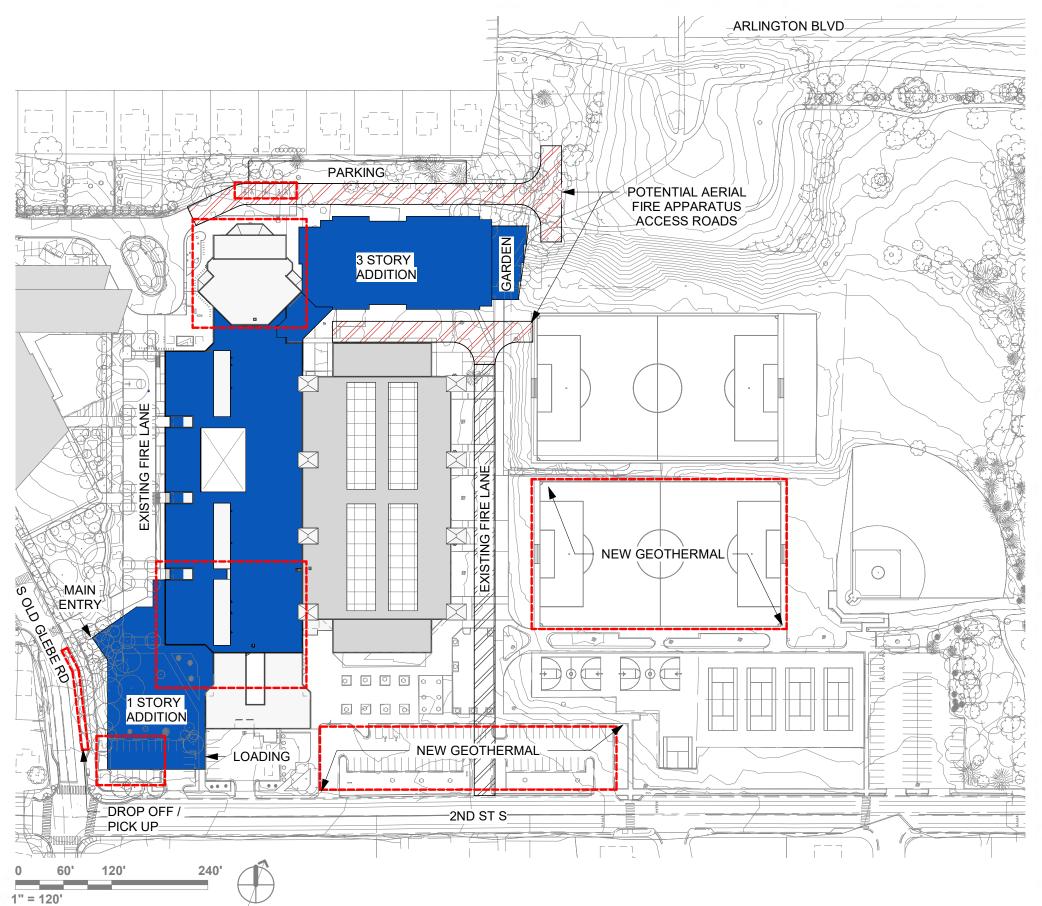
The community center will need to be leased for the duration of phase 2 of construction. The square footage of the community center will increase from 19,391 to 20,750 SF. Any areas within the community center that are affected will be renovated on behalf of TJMS.

Recreational Field

The installation of the new geothermal wells will temporarily prevent the use of one of the recreational fields, but a new field will be provided by TJMS after construction is complete.

Parking

The additions will result in the loss of the plansouthwest parking lot, a section of street parking along S Old Glebe Road for drop-off / pick-up, and the parking north of the theater. A new parking lot will be provided by TJMS, north of the theater and new fire access lane. Additionally, the installation of geothermal wells will temporarily prevent the community's use of the plan-south parking lot. After construction, the community will be provided a new parking lot on behalf of TJMS.



Civil – Demolition Plan

Northeast Building Addition

- 22 trees to be removed
- One story building and shed to be removed
- · Sidewalks and asphalt trails to be removed
- · Roof drain leaders and storm pipes to be reconstructed
- Curb and gutter and existing asphalt parking lot to be removed
- Overhead electric to be removed
- Existing garden to be relocated

Southwest Building Addition

- 54 trees to be removed
- Two sanitary mains to be relocated
- Underground electric and fiber optic to be relocated
- Asphalt parking lot, curb, and gutter to be demolished
- Concrete sidewalks to be demolished
- Existing bioretention serving Fleet Elementary to be relocated

Bowman architecture incorporated

Civil - Site Plan

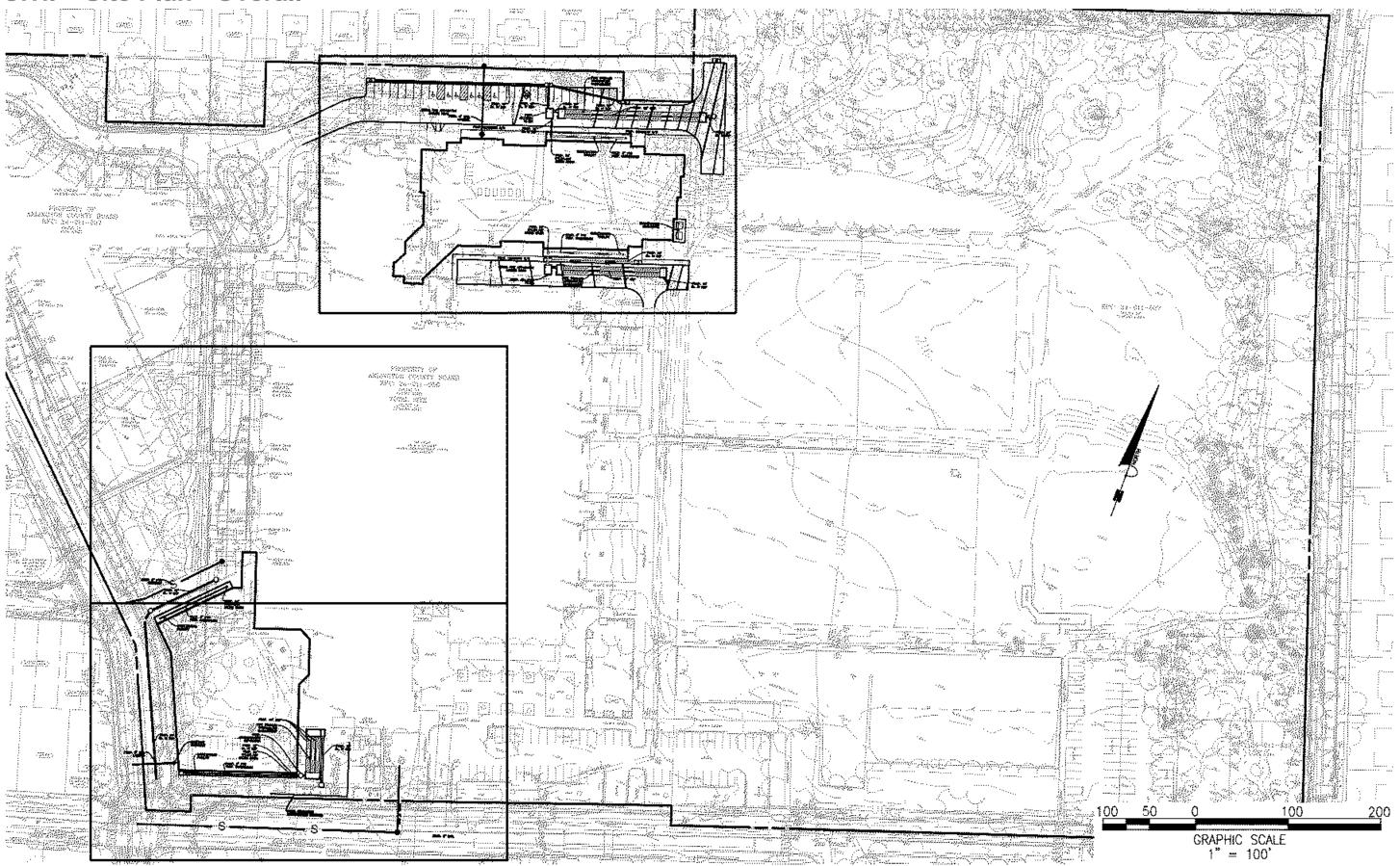
Northeast Building Addition

- The northeast building addition will require an overhaul of the eastern roof drain and stormwater system of the northern portion of the middle school. Water service will be connected to the existing building, and a new sanitary lateral will tie into the sanitary main to the north. Electric service should tie into the existing building, however, depending on the capacity of the existing transformers, a location for new transformers is shown at the southeast corner of the addition.
- Fire access must be provided along the longest face of the addition. To meet this requirement, a new fire apparatus access road with a hammerhead for fire truck turnaround is proposed north of the addition. The 6 ADA parking spaces impacted by the extension of the drive aisle will be relocated north of the proposed drive aisle/fire access road. The 23 parking spaces removed with the demolished parking lot in the southwest corner of the site are also relocated north of the drive aisle. In order to maintain the fire access that currently exists along the eastern face of the middle school, a new fire apparatus access road to the south of the building addition is provided to allow for the truck to turn around.
- Two bioretention planter boxes treat the footprint of the proposed addition, one along the north face of the building and one along the south face. Two manufactured filtering devices are proposed to treat the northern and southern fire access roads and parking. The bioretention outfalls are also treated by these filtering devices. Two systems of underground 48" CMP pipes are proposed to store stormwater runoff from the addition and access roads.

Southwest Building Addition

The southwest corner of the site contains a parking lot and landscaped area with several underground utilities. The existing sanitary main from Fleet Elementary will be relocated north of the proposed building addition, tying into the sanitary main in S Old Glebe Road. The existing sanitary main from the east will be reconstructed to the south into 2nd Street South, then west to the existing main at the intersection of S Old Glebe and 2nd Street South. The existing 54" storm is a very large storm pipe that will be reconstructed south of the proposed building addition but north of 2nd Street South. The existing underground electric will be relocated along the sidewalk north of 2nd Street South and back through the existing loading area to maintain service to the existing transformers. A new sanitary cleanout and lateral tying into the main in S Old Glebe Road will provide sanitary service for the new building addition. The existing sanitary pipe in this location should be inspected to see whether it can be reused. Water connections will need to be made to the existing building, as there is very limited space for a new water service and meter. A bioretention planter box is proposed along the northern and southern faces of the addition, and a system of underground 48" CMP with upstream hydrodynamic separator is proposed in the loading lot east of the addition. Fire access for this addition exists along S Old Glebe Road and 2nd Street South.

Civil – Site Plan - Overall



Stormwater Management

- Due to the increase in impervious area as a result of the building additions and associated site features, stormwater quality and quantity control is required. Per the Virginia Stormwater Management Handbook and the Arlington County Stormwater Management Ordinance, the total phosphorus runoff pollution load for the proposed areas shall be reduced by no less than 0.26 pounds per acre, per year.
- In order to meet this requirement, land cover analyses were performed, quantifying the increase in impervious area. This information was entered
 into the Virginia Runoff Reduction Method spreadsheet, and best management practices were selected and designed to meet the phosphorus
 removal requirements.

Stormwater - Quality

• Two bioretention planter boxes and two manufactured filtering devices are proposed to treat the increase in impervious area created by the building addition, parking lot, and fire access roads in the northeast. Two bioretention planter boxes and a hydrodynamic separator are proposed to treat the southwest building addition. The southwest building addition will impact an existing bioretention that currently serves the Alice West Fleet Elementary site. Additional phosphorus removal is provided with this study to offset the treatment lost with the removal of that bioretention. Virginia Runoff Reduction Method spreadsheet outputs are provided on the following slides.

Stormwater - Quantity

• Stormwater quantity requirements were determined using the Energy Balance equation per section 9VAC25-875-600.B.3 of Virginia Code. Energy Balance calculations are provided on the following slides. The stormwater storage will be achieved with three pipe storage systems – one in the parking lot north of the northeast addition, one in the fire access road south of the northeast addition, and one in the loading area east of the southwest addition. Additional stormwater storage is provided with this study to offset the storage lost with the removal of the existing bioretention.

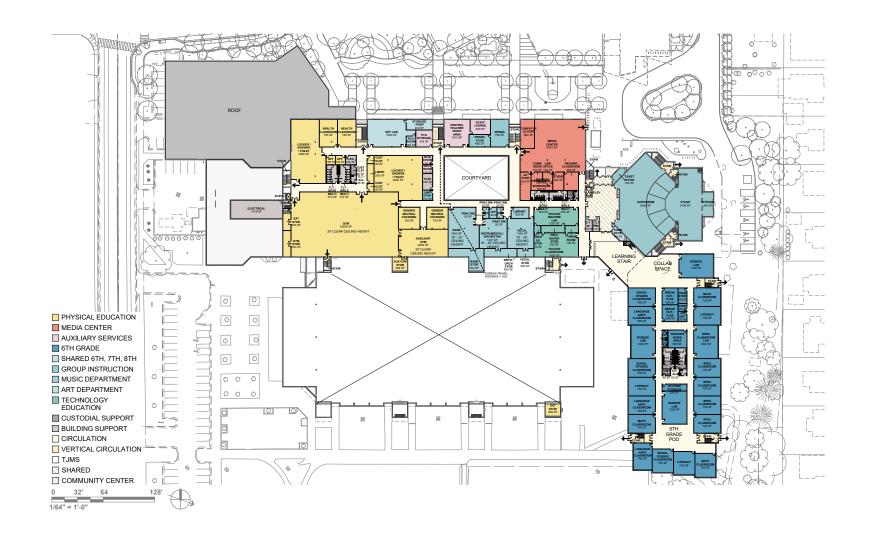
5.4 OPTION 2 – IDEALIZED ADDITION Structural



architecture incorporated

Existing Building Structural Modifications Summary

- Major structural modifications
- Existing column relocations require large / deep transfer girders
 - Not limited to one area all over building approximately 20 locations
 - At least 24" deep transfer girders
 - Ceiling and MEP interferences at all existing columns to be relocated
- Existing structure at 2nd floor gym floor will need reinforcement and supplemental structure
 - Reinforce all floor framing including thickening concrete slab
 - New columns to shorten spans for vibration control
 - o Reinforce all existing floor joists and floor framing
- Existing structure at 2nd floor gym will need to be physically separated
 - New double columns
- New courtyard open to roof
 - New columns and framing around required to support existing levels
- PV System would require at least 50% of the existing roof framing system to be reinforced in order to support it
- Mechanical system upgrades to be done within existing roof penthouse areas which should not require structural upgrades or reinforcement



5.4 OPTION 2 – IDEALIZED ADDITION Structural



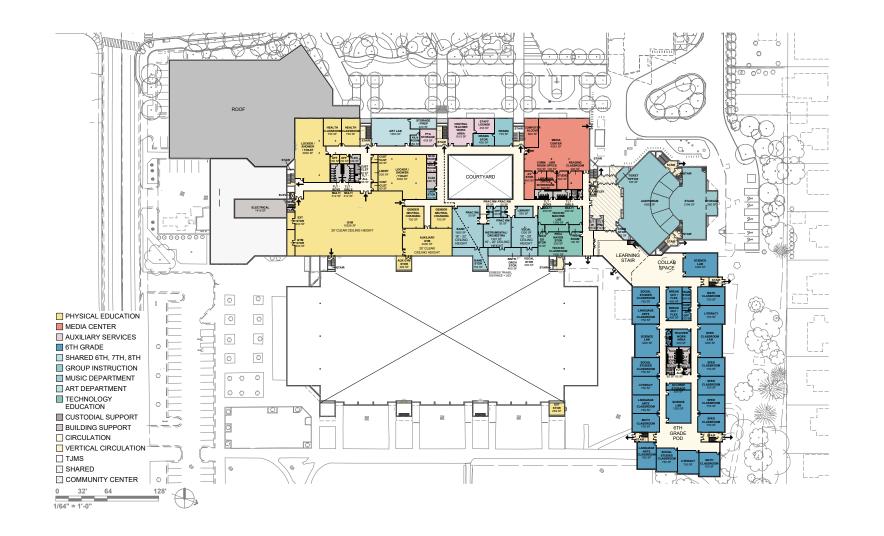
architecture incorporated

New One-Story Addition Structural Summary

- New VUSBC requires ground snow load of 64 psf. Increased from 25 psf.
- Foundation 4" slab on grade and conventional spread footings
- Roof framing
 - 1 ½" Type B roof deck
 - Typical framing 36" deep long span joists at 5 ft OC
 - Cafeteria framing 72" deep long span joists at 5 ft OC (no columns req'd)

New Three-Story Addition Structural Summary

- Foundation 4" slab on grade and conventional spread footings
- Floor framing
 - o 3.5" Thick concrete slab on 9/16" form deck
 - Typical framing 20" deep joists at 24" OC supported on 24" deep beams
- Roof framing
 - o 1 ½" Type B roof deck
 - Typical framing 28" deep joists at 5 ft OC and supported on 21" deep beams



Pros:

- Addition allows for coordinated structure with other disciplines
- New roof structure can accommodate a new PV system

Cons:

- Transferring columns is complicated and expensive work
- Transfer girders reduce ceiling space and may lead to bulkheads
- Transfer girders will interfere with MEP layouts and modifications
- New gym structure will be complicated reinforcement
- New gym structural work will involve complete temporary loss of community center

5.4 OPTION 2 – IDEALIZED ADDITION Mechanical

SUMMER CONSULTANTS

architecture incorporated

MECHANICAL

This option is similar to the design approach of Option 1 and 1A. The approach in these areas will be to provide new building systems to serve these spaces and connect to the hydronic cooling and heating building loops.

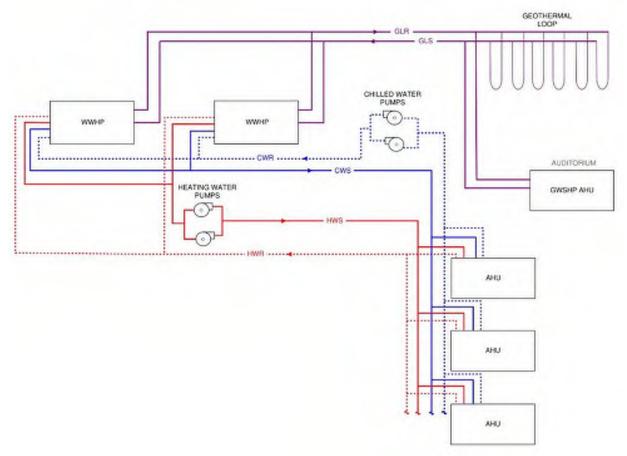
The cooling and heating design approach will be to maximize geothermal performance in accordance with the APS design standards, to meet the project energy goals. The possible Option 2 geothermal wellfield is shown in green in the figure. Based upon the extent of the proposed addition areas it is recommended to consider locating the new geothermal wellfield under one of the existing ballfields (shown in yellow).

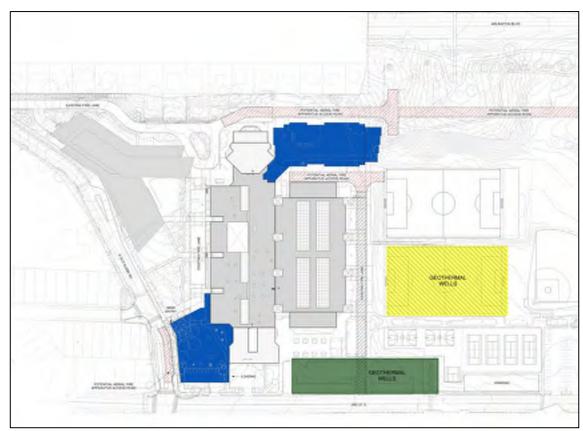
The building envelope will be improved with a new roof and improved wall and window performance which will lower the overall block cooling and heating required.

In a phased occupied renovation, existing systems will be maintained and converted to new systems. All of the existing building ductwork and piping mains would be replaced as part of the phased renovation.

It is envisioned that all 29 constant volume air handling units would be converted to variable volume systems. All classrooms would be served by single duct variable volume air handling units, removing the existing inefficient dual duct system, and providing variable volume fan powered boxes to serve all the classrooms. This approach will maximize the energy performance with the geothermal performance and by centralized water source heat pumps with compressors, will minimize noise and acoustic concerns in the classroom.

Some of the larger systems, like the gymnasium air handling units, could be provided as single zone variable volume heat pumps connected directly to the geothermal wells if more cost effective than providing these systems as 4 pipe air handling units.





SUMMER CONSULTANTS

architecture incorporated

5.4 OPTION 2 – IDEALIZED ADDITION Plumbing

PLUMBING

Both Option 2 and 2A utilize reconfigured existing Ground Level and Level 1 layouts coupled with a one-story, 23,500 GSF 1-story addition to the SW corner of the existing school building as well as a 3-story, 85,000 GSF addition directly east of the existing Auditorium and north of the existing community gymnasium.

Storm and Sanitary Systems

The existing below grade stormwater and sanitary waste piping serving the existing school can be reconfigured, relined, and / or replaced to serve the proposed layout.

- The ability to use the existing underground stormwater and sanitary waste piping depends on the new layout. Existing infrastructure piping will be extended to reach new areas of drainage.
- Existing below-grade piping being reused should be either CIPP or epoxy lined, if it is not replaced outright.

The proposed 1-story addition to the SW of the existing school may require relocation of some existing stormwater and sanitary waste piping to facilitate construction of the building.

The 3-story addition to the NE of the existing school can be accommodated by extending the existing underground stormwater infrastructure to the addition and providing a new sanitary waste pipe from the south side of the existing community gymnasium to the building.

Rainwater Harvesting

The SW 1-story and NE 3-story school additions add approximately 50,000 GSF to the proposed available 70,000 GSF of the original school roof, bringing the total to 120,000 GSF available for potential rainwater harvesting.

Arlington County, VA receives an average annual rainfall of 41.82 inches. Assuming 100,000 ft2 of the roof available for harvesting, the annual potential harvested rainwater over 100,000 GSF is equal to: $100,000 \text{ ft2} \times 41.82 \text{ in/yr} \times 0.623 = 2,605,386 \text{ gallons of water over the course of a year.}$

- The average efficiency of commercial rainwater harvesting systems is between 70-90%.
- Assuming the system is 70% efficient, it equates to approximately 2,605,386 gallons x 0.70 = 1,823,770 gallons per year potentially available for flush valve supply, irrigation of athletic fields and landscaping, and/or for potential cooling tower makeup water.
- Because of fluctuations in month-to-month rainfall and rainfall rates, capturing all the potential rainwater would require excessively large underground tanks or cisterns.

Domestic Water

Because there are 1-story and 3-story additions to the existing structure, the existing Ground Level distribution piping will not be large enough to extend new piping to serve the proposed 3-story addition to the NE of the school.

 A separate domestic water piping distribution system originating in the Ground Level Boiler / Mechanical Room will run north, parallel with the existing plumbing piping, to the 3-story building. This allows for phased construction of the original school building's reconfiguration.

5.4 OPTION 2 – IDEALIZED ADDITION

Plumbing & Electrical



architecture incorporated

Domestic Hot Water

It is recommended that the domestic water heating plant be moved to the Ground Level Boiler / Mechanical Room to facilitate system maintenance.

Moving the domestic hot water plant to the existing Ground Level Boiler / Mechanical Room will require new domestic hot water and hot water recirculating distribution piping.

While the existing domestic heating water system continues to serve the existing school areas during the phased construction, a separate domestic water heating system can be built and a parallel distribution piping system can be installed prior to demolition of the existing system, so that when a portion of the building phase is under construction, old pipe can be removed and new pipe can be installed to the relocated plumbing fixtures provided under the given phase of construction.

As is the case with Options 1 & 1A, in Options 2 & 2A solar water heating could be added to a geothermal heat pump domestic water heating system to augment the building's domestic hot water system demand.

Main Electric Service

The replacement of the main electrical service under this option is similar to that of option 1. The complications of the multiweek outage to replace the main incoming service would remain as an obstacle to overcome. The amperage of the mechanical, power, and lighting switchboards/distribution panelboards would likely be reduced in size for the original footprint of the building and a second set of mechanical and power switchboards and lighting panelboard would be provided within a medium sized electrical room located within the northeast addition. This would localize power distribution to the loads, concentrate the voltage drop mitigation to the feeders to the power distribution equipment and maintain branch circuits and feeders to the distribution equipment a more manageable length.

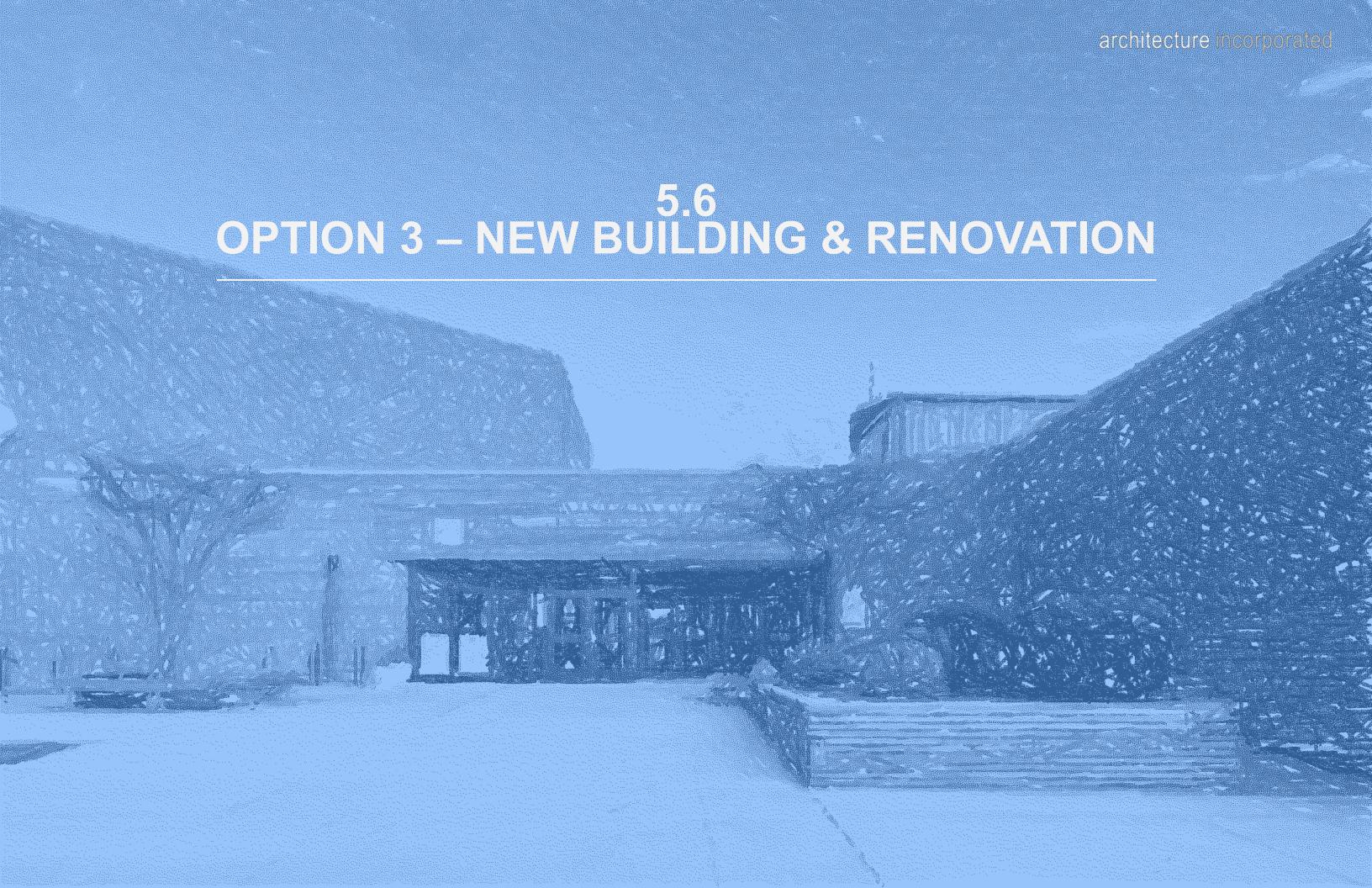
Photovoltaics

The new addition would be designed with the structural capacity to support an optimized layout of photovoltaics across the entire facility while maintaining a ~10' clear perimeter for roof access on the north side. Additional photovoltaics on the existing structure would be considered and evaluated on a LCCA basis.

Lighting

The lighting approach under this option is the same as Option 1 with the caveat that lighting within the addition would not be limited by existing structural or architectural features.

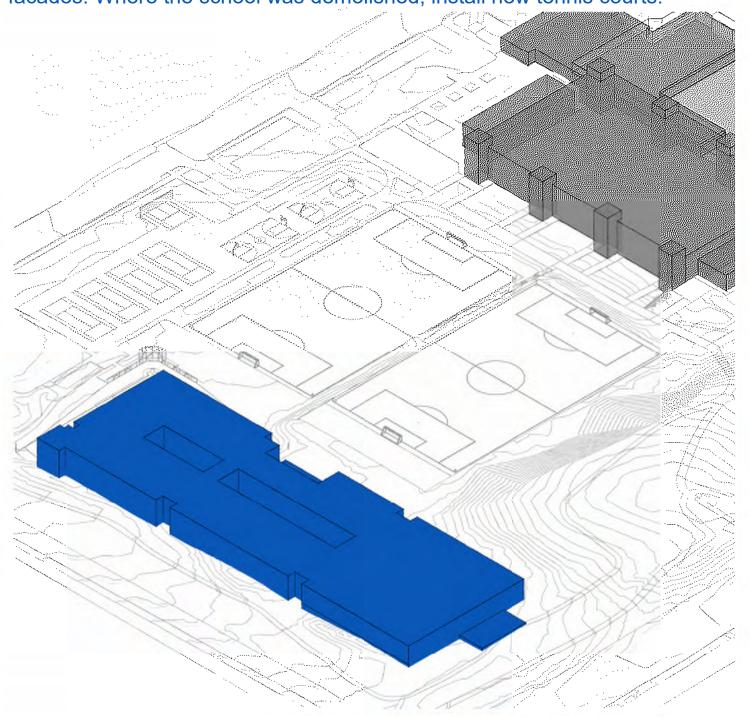
See Additional Systems information per Option 1.

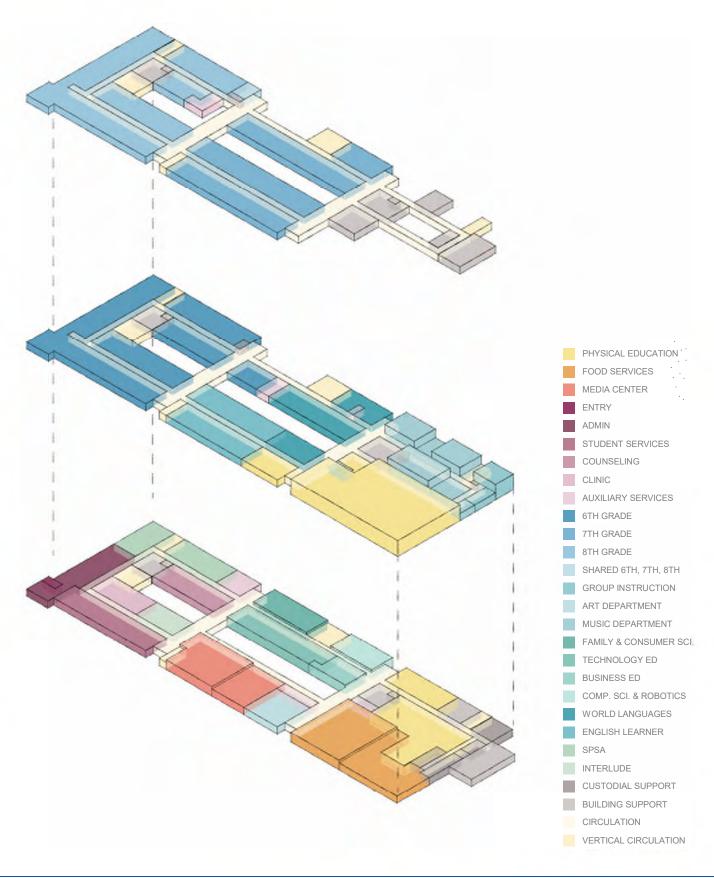


5.6 OPTION 3 – NEW BUILDING

Overview:

Utilize the planned square footage developed as part of this study to construct a new building. The baseball field displaced by the new school would be relocated to the SE of the overall site. The existing tennis courts are removed to provide parking for the school. The existing school would be demolished. The community center, gymnasium, and theater would remain and receive new facades. Where the school was demolished, install new tennis courts.





Narrative:

Option 3 proposes a new building. All spaces meet APS planned square footage and utilize the higher allowable square footage. All spaces meet APS required ceiling heights. The building is organized into three zones on each floor separated by 20' circulation bars. The distinct zones allow for program organization and spatial identity – especially in the 6th, 7th, and 8th grade pods on levels 1 and 2. The circulation bars serve as gathering space outside the cafeteria and media center on the ground level and outside the gym on level 1. The circulation bars provide easily observed spaces for student lockers and visually connect to the exterior bringing in daylight and enhancing student experience. Vertical circulation is served by an open circulation stair that is large enough to serve as a learning stair and / or breakout learning space. An open-air terrace provides secure outdoors space adjacent to the pods on levels 1 and 2

The existing school is demolished in this option. The community center is minorly reorganized to provide a regular façade. Currently, the spaces are highly intertwined. No program space is taken away from the community center and any spaces impacted by construction are renovated, including HVAC, sprinkler system, ceiling, lights, flooring, and painting for both the community center and theater. The theater receives a new façade on the south side of its lobby. The theater would effectively be a standalone building at the end of construction. The existing gymnasium does not need a reroof nor reflooring but will require a new western facade. The former school space is now outdoor space for tennis courts – there is space to add more than were demolished on the site.

At the end of construction, the middle school uses are almost completely removed from the elementary and community center area. Being on the same site, there can be connection when desired. The middle school can use the theater for specific events as they do now.

Pros:

- Staff and students remain in the existing building while new building is constructed. No modulars needed, no phasing plan needed for students.
- Accommodates required student capacity

- Equity of spaces (size, access to daylight, organization)
 Court yards allow daylight in all learning spaces and most offices
 Complete separation of community and school for ideal safety & security
- Separate all traffic between elementary and middle school
- Easily understandable program organization
 Food services / loading dock / fire lane easily accessible from S Irving St.
 Short utility connections from S Irving St.

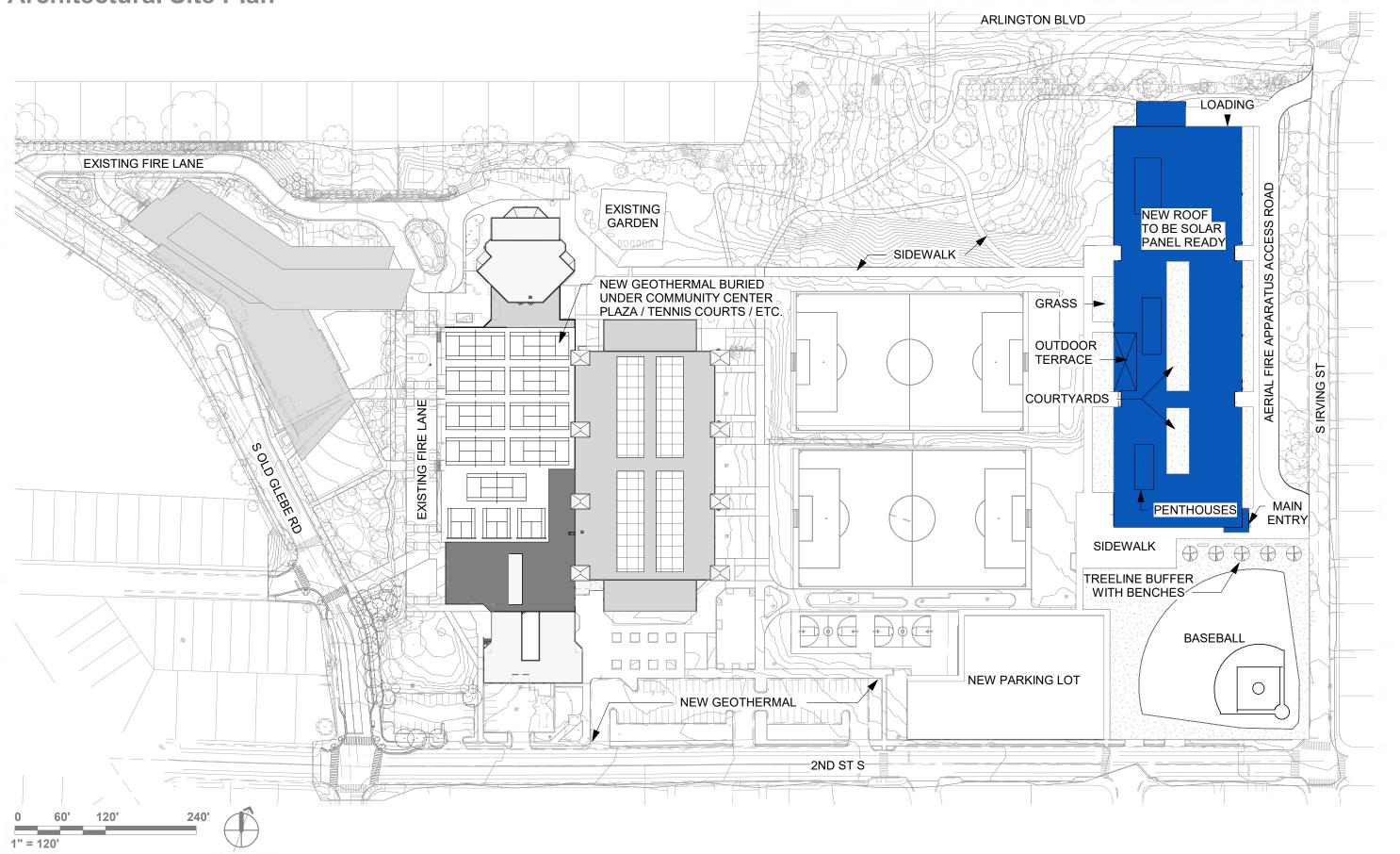
New building would be on county owned land and require leasing agreement

Changes to GSF

•	Middle School Grossing Factor (GSF [225,779] / Program SF [164,4 Joint-use theater & associated spaces	Existing 128,292* 06]) = 1.37 13,697	Option 3 225,779 27,344
•	Community Center gymnasium	67,033	67,033
	Community Center (includes service spaces)	19,391	30,291
	Community Center Total GSF	86,424	97,324

^{*}does not include building service spaces

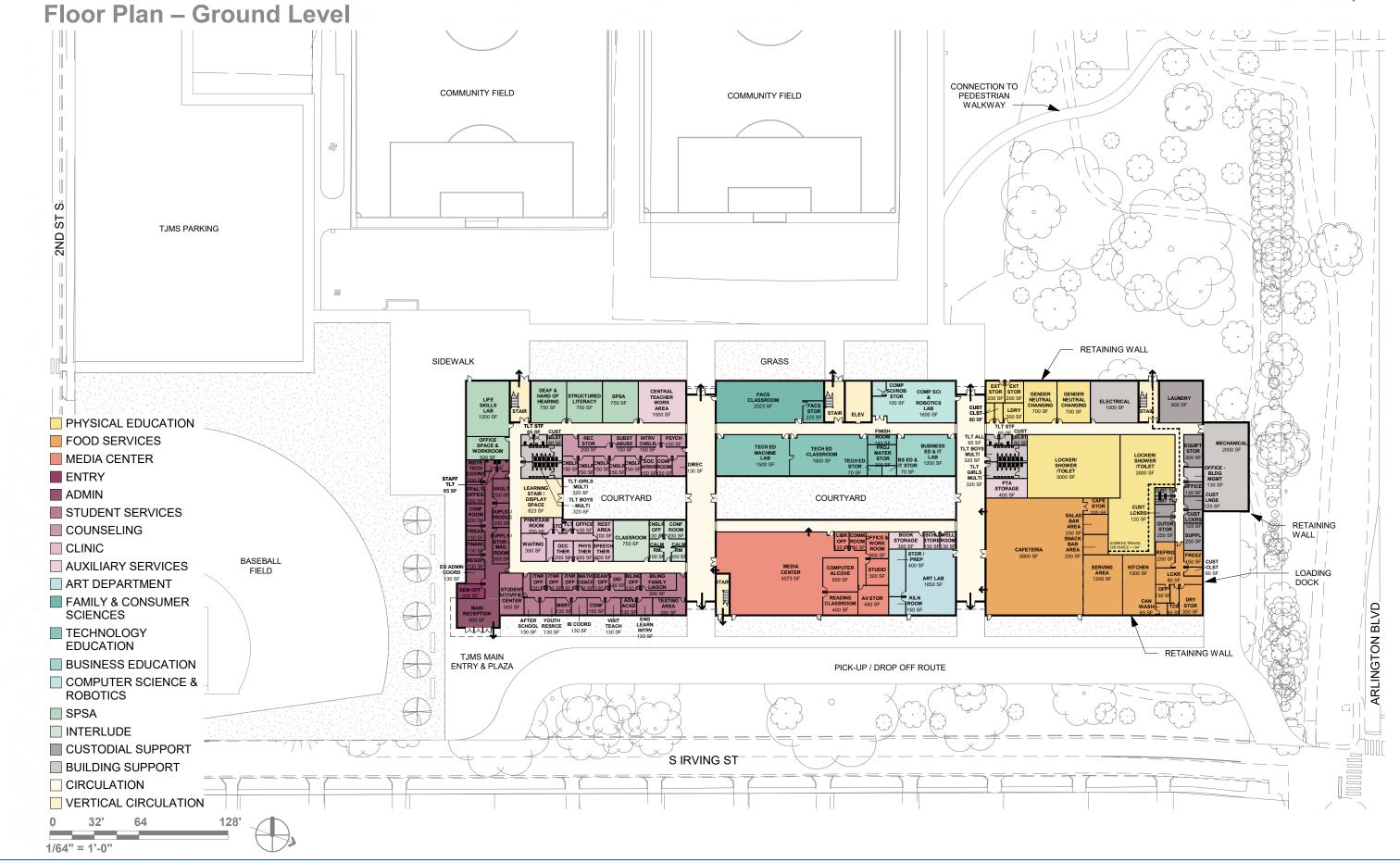
5.6 OPTION 3 – NEW BUILDING Architectural Site Plan

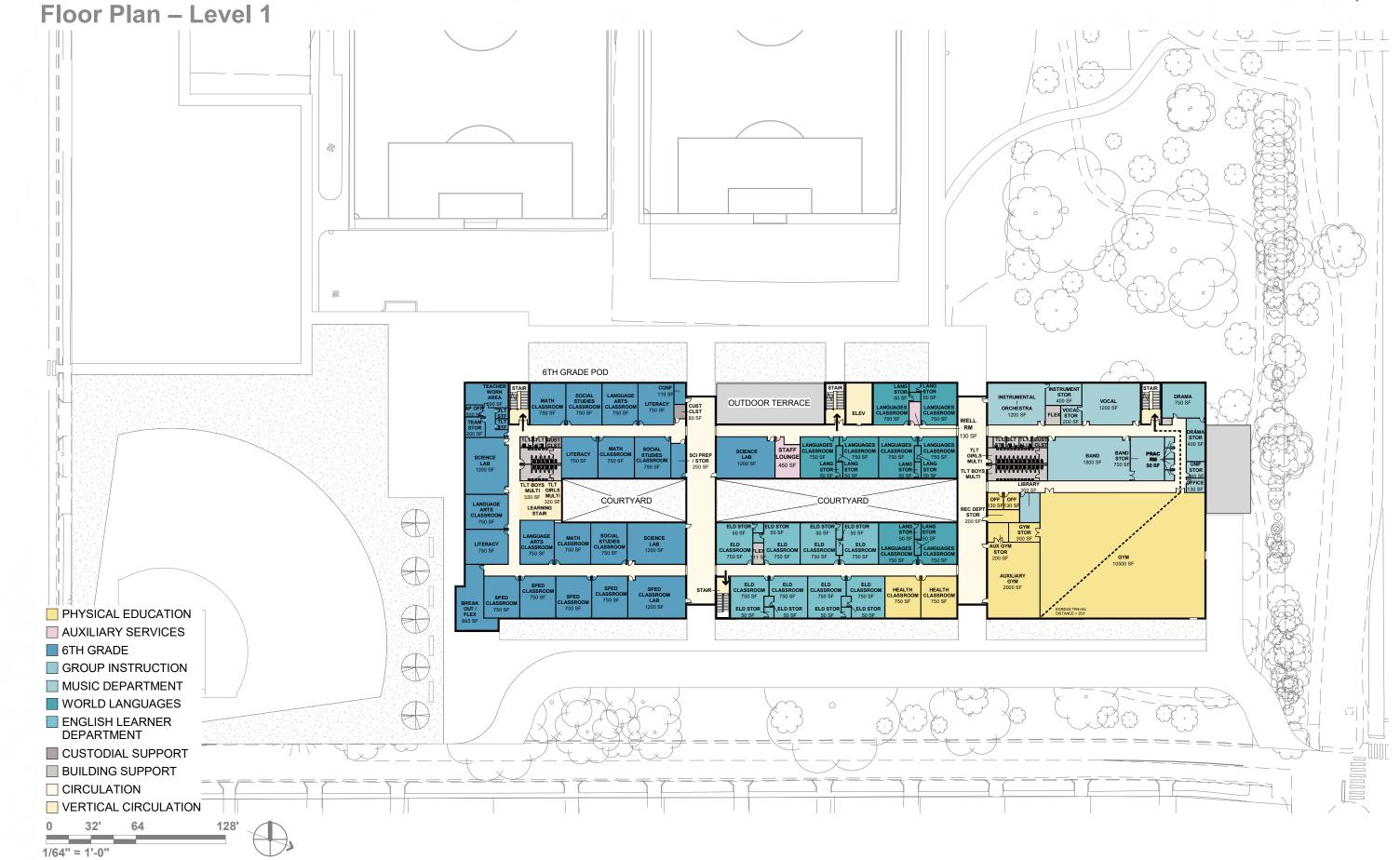


5.6 OPTION 3 – NEW BUILDING **Graphic Program**

This graphic represents the square footage of Option 3 school spaces, meeting the highest allowable planned square footage.







■ VERTICAL CIRCULATION

1/64" = 1'-0"

5.6 OPTION 3 – NEW BUILDING County Impact

Theater

The theater will be renovated during phase 2 of construction, which will require the community theater production to temporarily use a different stage to be coordinated by the county. The theater and associated spaces will increase from 13,697 to 27,344 SF.

Community Center

The community center will need to be leased for the duration of phase 2 of construction. The community center will be renovated and reskinned on the behalf of TJMS, and square footage will increase from 19,391 to 30,291 SF.

Baseball Field

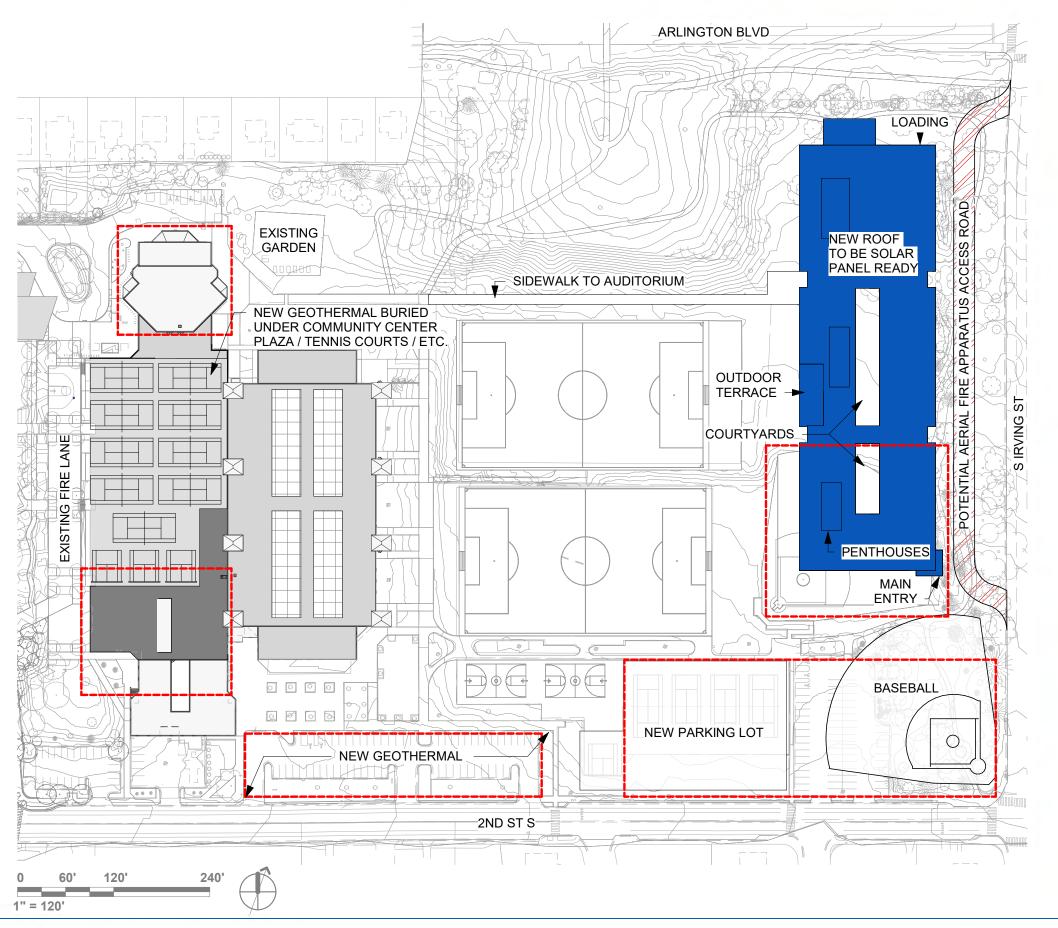
The construction of the new building will temporarily prevent the use of the baseball field, but a new baseball field will be provided by TJMS.

Tennis Courts

The construction of the new parking lot will temporarily prevent the use of the tennis courts, but new tennis courts will be provided by TJMS.

Parking

The new baseball field will result in the loss of the plan-southeast parking lot. Additionally, the installation of geothermal wells will temporarily prevent the community's use of the plan-south parking lot. After construction, the community will be provided new parking lots on behalf of TJMS.



Demolition Summary

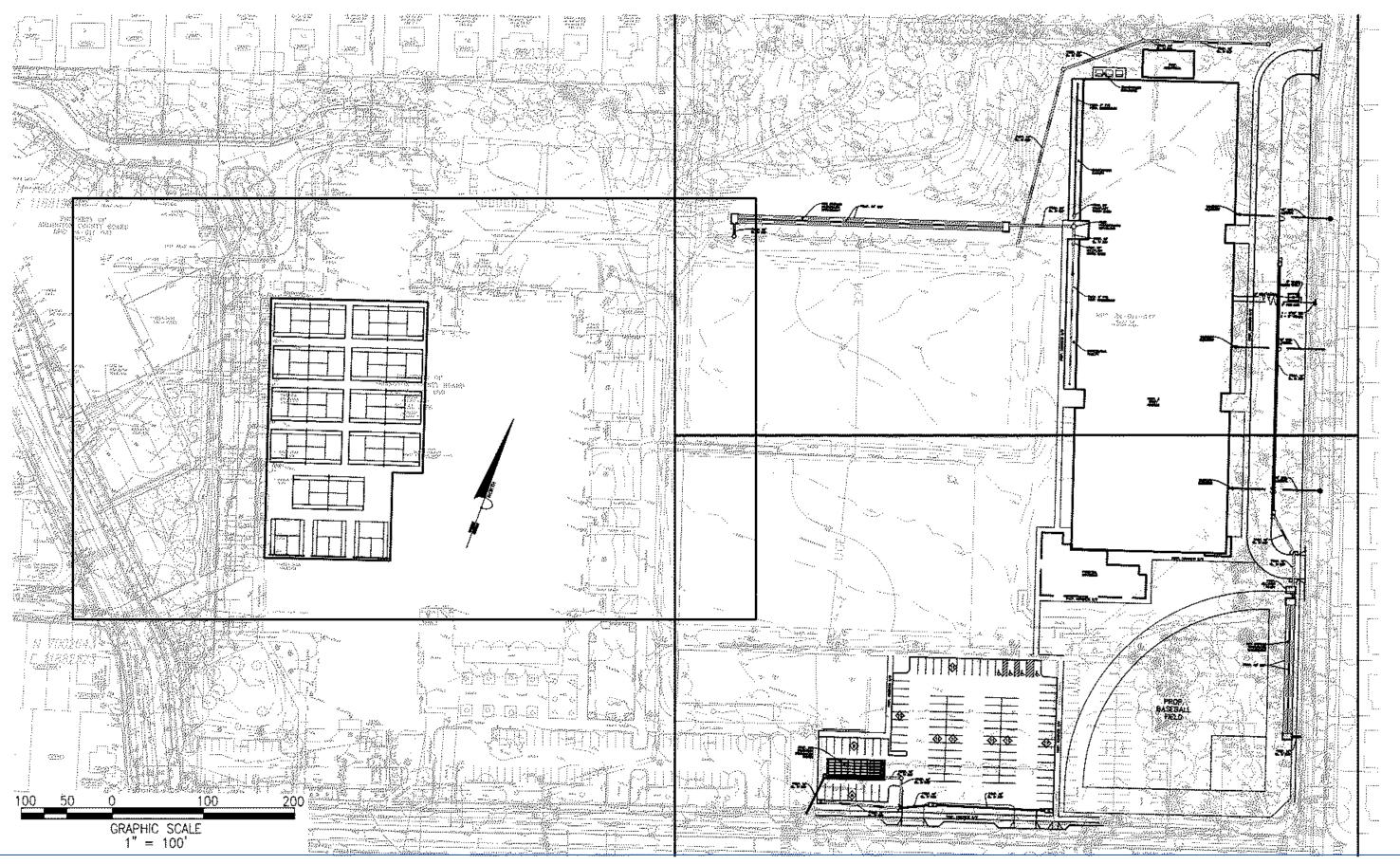
- Approximately 1.5 acres of tree canopy area will need to be cleared for this project, in addition to 50 smaller individual trees that will need to be removed
- Approximately 46,000 square feet of the existing building will be demolished
- Existing baseball field and concrete dugouts will be demolished
- Parking lot will be demolished
- Tennis courts will be relocated, however, the nets, fencing, and lights will likely be demolished rather than relocated
- Existing storm pipes within the footprint of the building will be demolished
- The asphalt trail and associated lighting will be demolished

Bowman architecture incorporated

Site Plan Summary

- The new building will be constructed in the northeast corner of the site with a new private access road that will allow for school pick-up and drop-off and will also service as a fire access road. In order to maintain pedestrian connectivity, a new sidewalk is proposed along the entire western side of S Irving Street. Sidewalks are also shown surrounding the school, tying into the tennis courts and parking lot to the southwest.
- Three new sanitary lateral connections will connect to the existing main in S Irving Street. A new fireline and water service with associated meter box connecting to the existing water main in S Irving Street will provide water for the new building. Final sizing and location of these utilty connections will be determined by an MEP at the time of final design. The existing storm network that traverses the northeast of the site will be impacted by the construction of the new building and will need to be relocated around the building.
- The existing baseball field is in direct conflict with the new building and will need to be replaced. Due to the importance of the network of paths connecting to the pedestrian bridge in the north of the site, the baseball field cannot be reconstructed in that location. The only other option that could accommodate a field of that size is the southeast corner, which requires of the removal of the existing parking lot in that location. A portion of the existing middle school building will be demolished, and the existing tennis courts will be relocated to the space made available by that demolition. As a result, the displaced parking lot in the southeast will be reconstructed where the tennis courts are located today.
- Two proposed bioretention planter boxes are located along the western face of the new building. Both bioretention outfalls will flow through a hydrodynamic separator prior to a system of 48" CMP pipes to store the stormwater. A manufactured filtering device is proposed just south of the new private access road, upstream of another system of 48" CMP pipes for stormwater storage. Finally, a system of storm inlets and a pipe arch chamber system is proposed underneath the new parking lot.

Civil - Site Plan - Overall



Civil – Stormwater Management

Stormwater Management

- Due to the increase in impervious area as a result of the new building and parking lot, stormwater quality and quantity control is required. Per the Virginia Stormwater Management Handbook and the Arlington County Stormwater Management Ordinance, the total phosphorus runoff pollution load for the proposed areas shall be reduced by no less than 0.26 pounds per acre, per year.
- In order to meet this requirement, land cover analyses were performed, quantifying the increase in impervious area. This information was entered into the Virginia Runoff Reduction Method spreadsheet, and best management practices were selected and designed to meet the phosphorus removal requirements.

Stormwater - Quality

• Two bioretention planter boxes and a hydrodynamic separator are proposed to treat the new building. A manufactured filtering device is proposed to treat the drop-off and fire access lane east of the new building. The isolator row of the proposed arch pipe chamber system will treat the new parking lot. Virginia Runoff Reduction Method spreadsheet outputs are provided on the following slides.

Stormwater - Quantity

• Stormwater quantity requirements were determined using the Energy Balance equation per section 9VAC25-875-600.B.3 of Virginia Code. Energy Balance calculations are provided on the following slides. The stormwater storage requirements will be achieved with two pipe storage systems – one west of the new building and one running south along the western edge of S Irving Street. An arch pipe chamber system will store runoff from the new parking lot.

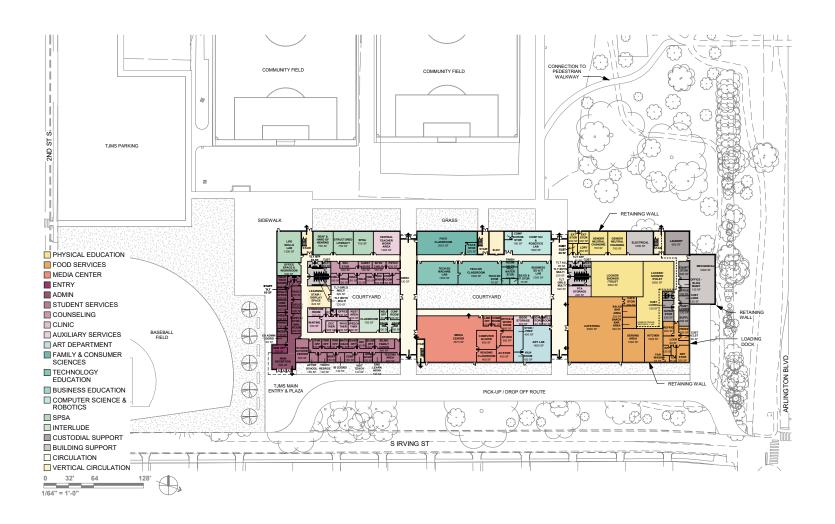
5.6 OPTION 3 – NEW BUILDING Structural



architecture incorporated

New Three-Story Building Structural Summary

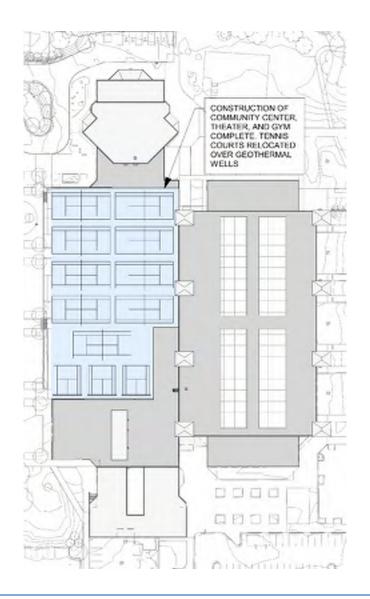
- Foundation 4" slab on grade and conventional spread footings
- Floor framing
 - 5.5" Thick concrete slab on 2" composite metal deck
 - Typical framing 21" deep beams at 10 ft OC supported by 24" deep girders
 - Composite beam designs requires studs to be welded to beams
- Roof framing
 - 1 ½" Type B roof deck
 - Typical framing 28" deep joists at 5 ft OC and supported on 21" deep beams
- New framing challenge gym over ground floor cafeteria
- Cafeteria space will require a line of columns to support floor above
- Will require a double line of columns around gym and aux-gym to prevent floor vibrations from propagating to adjacent spaces
- Heavier floor framing required
 - 5.5" Thick concrete slab on 2" composite metal deck
 - Typical framing 45 ft long 27" deep beams at 8ft
 OC supported by 27" deep girders
 - Composite beam designs requires studs to be welded to beams
- Roof framing
 - 1 ½" Type BA Acoustic Deck
 - Typical joists 60" deep long span at 5 ft OC





Existing Building Structural Modifications Summary

- Mostly demolition to provide for new plaza and geothermal areas
- · Modifications to involve
 - New columns and framing along the new perimeter around the plaza
 - New concrete retaining walls likely required at new perimeter of plaza due to lower existing floor slab elevation for portions to remain



Pros:

- New building allows for coordinated structure with other disciplines
- New roof structure can accommodate a new PV system

Cons:

- 2nd floor gym structure is heavier and deeper than balance of floor spaces
- Double line of structure required around gyms
- Gym roof framing will need to be 25 ft high structure

5.6 OPTION 3 – NEW BUILDING Mechanical

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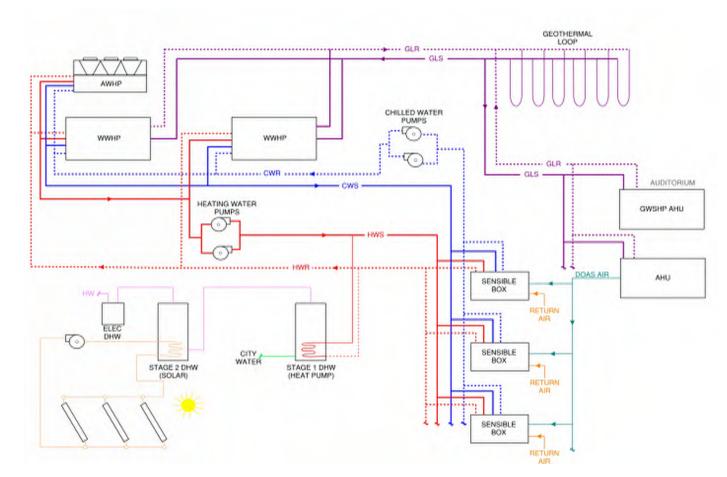
MECHANICAL

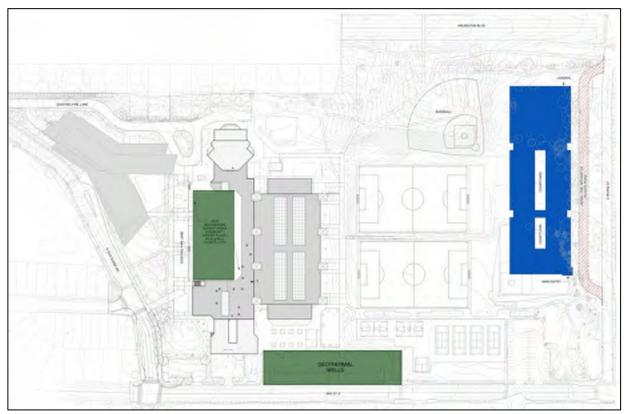
Similar to Options 1 and 2, geothermal would be maximized to the extent possible with an estimated 200 geothermal wells required to meet the peak heating and cooling building requirements. Since the building envelope would be new, the roof and exterior walls would be well insulated with a proper vapor barrier along with modern, low-E glazing which would result in low air infiltration rates significantly reducing the amount of heating and cooling required in the occupied space.

Life cycle analysis will be performed to identify the most cost-effective solution that meets the APS design guidelines and considers the overall system required maintenance. One system that is recommended is fan powered sensible cooling (DLSC) terminals with DOAS utilizing enthalpy energy recovery wheels for heat recovery from exhaust air and desiccant wheels for final supply air dehumidification.

The ventilation air would be of sufficient capacity to meet all the classroom space ventilation requirements as well as the dehumidification load in the spaces. The DLSC terminal fan would draw additional air from the ceiling plenum, approximately 8 to 10 times the ventilation air quantity, through the unit cooling coil to provide space sensible cooling. DLSC terminals serving exterior zones would also be equipped with heating coils. The terminal unit cooling coils would be used to meet the sensible heat load in the space selected to use chilled water that is above the dew-point of the space, preventing condensation on the coil. The lack of condensation eliminates the need for historically troublesome drain pans and drain piping.

Similar to Options 1 and 2, centralized water to water heat pumps would be located in the main mechanical room to produce the building chilled and heating water feeding the air distribution systems and terminal units in the building. Larger systems serving the gymnasium would be variable volume heat pumps connected directly to the geothermal loop. Waste heat from the loop will be utilized for the domestic hot water system as seen in the figure.





5.6 OPTION 3 – NEW BUILDING Mechanical



MECHANICAL

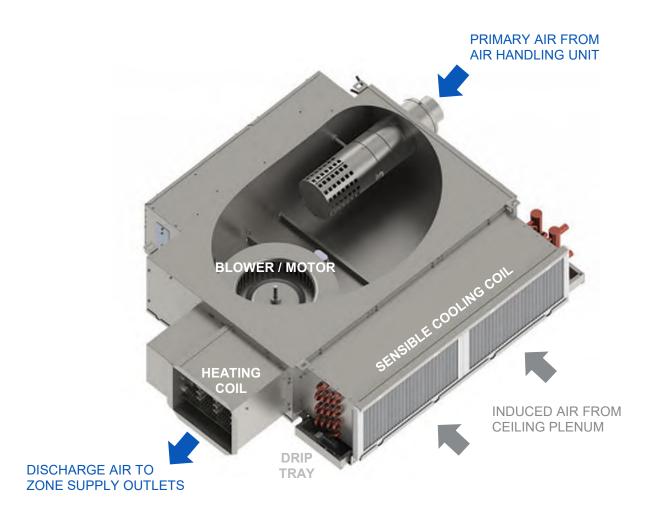
The mechanical design approach for the spaces remaining in the existing building including the community center and auditorium would be replaced with new systems similar to the approach in Options 1 and 2. The auditorium, stage and band areas would be replaced with single zone, 4-pipe variable volume AHUs to serve the spaces on both the ground and upper levels. The eight total air handling units serving the community center and gymnasium would be provided as single zone variable volume heat pumps connected directly to the geothermal wells to replace the eight existing AHUs.

Three separate dedicated outside air system (DOAS) air handling units located on the roof in the penthouse, each sized at approximately 7,000 cfm of outside air to serve the spaces. The DOAS air handling units would supply ventilation air to the DLSC terminals through the duct shafts on either end of the building. The DOAS would be equipped with enthalpy energy recovery wheels for heat recovery from exhaust air and desiccant wheels for final supply air dehumidification. DLSC terminals, ranging in size from 200 cfm to 1000 cfm each would be provided to condition the spaces. Chilled water piping runouts would be extended to each of the DLSC terminals. Heating water piping would be routed around the exterior to the exterior zones.

This proposed approach would result in significantly less ductwork than a traditional variable volume air distribution system since the only primary air distribution ductwork would be what is required from the DOAS air handling units to each of the DLSC terminals. In addition, since there is less air circulating throughout the school, there will be lower overall fan noise levels resulting in a better acoustical environment.

The proposed system uses two exhaust duct systems, one for toilet and locker room exhaust and the other a general building exhaust. During normal operation, the air from the two-exhaust system are combined and used by the energy recovery wheels to extract heat and humidity from the outside air prior to being cooled by the DOAS cooling coil. During system "morning start-up"

when the building requires a "cool-down" operation, the DOAS outside air damper will remain closed and the general exhaust duct system will be used to allow the DOAS to recirculate building air. The DLSC fans will operate to circulate the dehumidified air throughout the building. The DOAS will operate in this manner until the building dewpoint is below the temperature of the chilled water being supplied to the DLSC terminals. When the building dewpoint is less than chilled water temperature, the DLSC cooling coils will be permitted to operate. When the building temperature is at setpoint, the DOAS will open the outside air damper and operate in its normal manner.



Fan Powered Sensible Cooling Terminals (DLSC) (Trane)

5.6 OPTION 3 – NEW BUILDING Plumbing

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PLUMBING

Both Option 3 and 3A provide an entirely new 3-story, 268,000 GSF middle school located approximately 530 feet due east of the existing community gymnasium.

The schools are similarly sized. Both Options 3 and 3A will construct the new school prior to the demolition of the old school.

Domestic Water Piping

Located directly south of the proposed new school location there is an existing 8" water main buried under Second Street South that will be tapped to supply domestic water to the school.

Recommended domestic water piping for use in new construction is soldered Type L copper piping.

 An alternative strategy would be the use of Type L copper horizontal mains and risers with the use of PEX-A, NSF 61 certified pipe for branch piping to plumbing fixtures and classrooms.

Recommended insulation for use with Type L copper domestic water pipe is closed-cell elastomeric foam (e.g. Armaflex, K-flex) or fiberglass with vapor barrier and all-service jacket.

Both insulation types meet ASHRAE 90.1, IECC, NSF 61.

PEX-A branch pipe recommended insulation is also closed cell elastomeric foam due to its elastic characteristics allowing it to flex with PEX-A pipe.

Domestic Hot Water System

The recommended domestic water heating plant is geothermal heat pumps with gas-fired storage water with 100% back-up capability to meet the domestic hot water requirements for the school.

- The 100% backup capability of the gas-fired storage water heater(s) will
 provide the new school with domestic hot water while the old school is
 demolished, and the new heat pump geothermal field is installed.
- After the heat pumps are installed and commissioned into service, the storage domestic water heater will receive pre-heated water from the heat pumps waste heat generated through its operation thereby reducing the gas requirement to heat domestic water.
- Solar water heating could also be implemented to provide a further reduction in natural gas reliance.

Stormwater System

The proposed school stormwater removal system would incorporate a rainwater harvesting system component into the design. Rainwater from the school's primary roof drains would be diverted to underground rainwater collection tank(s) for later use as non-potable supply water for flushvalve operation, irrigation of athletic fields and landscaping, and / or cooling tower makeup water.

- Rainwater storage tank sizes range in size from 200 to 60,000 gallons and their use is only limited by available on-site space to bury one or more tanks.
- The storage tank(s) would have emergency overflow outlet capability to provide for high water levels encountered when tank(s) are full and rain events are encountered. Emergency overflow would be piped underground to the on-site existing stormwater removal system.

5.6 OPTION 3 – NEW BUILDING Plumbing

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Stormwater System

A code-required secondary (emergency) roof drainage system will be provided to limit roof stormwater ponding in the event a primary roof drain becomes blocked. Stormwater from the secondary overflow drains will be piped separately and have a discharges above grade in a conspicuous locations.

Hubless cast iron piping with CISPI couplings is recommended for use inside the school. All horizontal storm pipe in the school will be insulated with closed-cell elastomeric foam insulation or fiberglass with service jacket to prevent condensation formation on the pipe.

• Cast iron pipe, although more expensive as compared to PVC, is chosen because it is stronger and quieter than PVC or steel.

PVC SDR 35 is recommended for buried stormwater piping.

Sanitary System

The proposed sanitary sewer pipe for use above-grade inside the building is hubless cast iron pipe with CISPI couplings.

The proposed below grade buried sanitary piping serving the building is PVC SDR 35 (schedule 40) pipe or hub and spigot cast iron pipe.

Natural Gas

There is an existing natural gas transmission line buried under Second Street South directly south of the proposed school location that could be tapped to supply natural gas to the new school building.

Proposed natural gas piping for use inside the building is schedule 40 threaded black steel. Low pressure gas (2 psig) would be distributed inside the building to natural gas-fired equipment.

5.6 OPTION 3 – NEW BUILDING Electrical

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MAIN ELECTRIC SERVICE

The new building provided under option 3 would necessitate a service request be initiated and coordinated with Virginia Dominion Power for a completely new medium voltage service lateral. This would entail a new ductbank to a new 15kV to 480/277V transformer provided by the utility. In parallel to the new electrical service a new telecommunications handhole and service lateral to the building would be coordinated with the counties preferred telephone/internet/cable providers.

An exterior emergency generator enclosure with integral subbase fuel tank would be provided in proximity to the new utility transformer. Care would be taken to screen the equipment from view in addition to mitigating the noise associated with the generator operation. An exterior mounted transfer switch with temporary docking station would be included similar to option 1.

Interior power distribution equipment would be similar to that of options 1 and

The main service would include a nominally sized 4000A switchgear but would be arranged in a more traditional front and rear access assembly given it would not be limited by the physical space constraints of the existing main electrical room. In-lieu of one large mechanical switchboard consideration would be given to three smaller switchboards or distribution panelboards co-located with the air-handlers in the roof mounted penthouses. These would be anticipated to be fed directly from the main switchgear of the building.

Dedicated switchboards for power and lighting distribution would be incorporated to facilitate metering by load classification. Power and lighting panelboards would be distributed throughout the building providing a flexible distribution system with localized power to the loads being served.

The need for phased replacement of electrical service equipment or temporary power for outdoor classrooms is eliminated in this option.

LIGHTING

The lighting approach under this option is the same as Option 1 and Option 2 from the standpoint of utilizing best in class energy efficient LEDs with the counties preferred control schemes of local control being limited to the classroom. A greater emphasis of daylight utilization would be likely, given the full building height courtyard.

PHOTOVOLTAICS

The new building would be designed to have complete coverage of photovoltaics except for limitations of mechanical equipment and maintenance access

FIRE ALARM, TELECOMMUNICATIONS

Provide a modern supported and maintainable system that meets current APS requirements.

ELECTRONIC SAFETY & SECURITY

Provide a complete system of the electronic safety and security equipment with the latest hardware and firmware on the head-end system, field panels, power supplies and all field devices.

CCTV cameras shall be coordinated with the approved floorplan and locations of the cameras vetted through engagement with the APS security coordinator.

COMMUNICATION & SPECIAL SYSTEMS

All low voltage communications system to include public address, clocks, classroom audio visual, and telephone should be provided new to meet the most up to date APS requirements. Telecommunication infrastructure will be coordinated with the various other communication and special system to provide IP connectivity where needed for the devices function.

The existing community center and theater electrical system would need to be significantly renovated to align with the replacement of mechanical systems. It should be expected that the electrical service for the community center would be replaced and right sized for the remaining building.

A separate electrical service would be required for the theater as the existing structure connecting the two facilities would be demolished and developed into the tennis courts under this option. This would entail a new medium voltage feed, utility transformer and secondary electrical feed to the theater to serve the new service.

New power distribution and branch panelboards will be provided to each the facilities to coordinate with the renovated electrical service at the community center and the new service at the theater. The interior renovations to both facilities would also include all new LED lighting, new fire alarm systems (one for each building) and new telecommunication systems and MDF rooms for each facility.



6.0 SUMMARY & RECOMMENDATIONS

Summary of Major Building Concerns

Throughout this feasibility study, Architecture, Incorporated has explored many potential solutions to meet the educational requirements for the students and staff at Thomas Jefferson Middle School. These solutions were shared with the Arlington Public Schools (APS) feasibility study team and the final options presented in this study are a result of the effective collaboration between the stakeholders involved in this study. As a result of these efforts, we are confident that this report will provide the information that APS leadership needs to make an informed decision as to what comes next for this building and the exceptional community it serves.

While the existing building is currently serving the school and community population, Thomas Jefferson Middle School is a substandard building that has lived beyond its life expectancy. The list of major building concerns is summarized below:

- The school entrance is not located on a main street and is hard to find.
- There is no visitor parking directly adjacent to the main entrance.
- The main entrance cannot control the flow of visitors through a security vestibule.
- Significant lack of surveillance, access control, and territorial reinforcement exemplified by a remote kitchen in community center; a gymnasium shared with the public with no secure separation.
- No sprinkler system.
- The building does not meet the code requirements under which it was constructed.
- Structural steel is not fireproofed in all locations.
- The building does not comply with accessibility codes in several locations.
- The exterior walls have no air cavity, insulation, or vapor barrier.
- · Column layout interferes with learning spaces.
- Severely undersized spaces do not adequately serve the student and staff population.
- Low ceilings in over half of school spaces are below VDOE standards.
- Poor acoustics due to below acceptable STC ratings.
- · An open cafeteria is located directly adjacent to learning spaces.
- Poor access to natural light. Approximately 75% of the teaching spaces do not have windows or access to daylight or borrowed light.
- Extensive hazardous materials throughout the facility.
- Poor ventilation in school, specifically in the lab spaces.
- Significant lack of natural surveillance, access control, and territorial reinforcement exemplified by remote kitchen in community center, gymnasium shared with public (with a non-secure separation), and a main reception space than cannot control the flow of visitors.

Summary of Major Building Concerns (cont)

- The mechanical system is largely antiquated and uses significantly more energy when compared to modern options.
- Existing roof drainage system is in disrepair (missing dome stainers, areas of ponding water, and non-code compliant stormwater drainage system).
- Existing domestic water storage tanks have reached the end of their useful life.
- Existing copper heat exchangers have reached the end of their useful life.
- Much of the exterior gas piping on the roof shows signs of wear with external pipe oxidation and flaking paint.
- The condition of the incoming switchboard equipment is poor and verging on hazardous
- The 3-phase motor control center supporting the mechanical plant is in poor condition.
- The distribution and branch panelboards need replacement.
- Lighting throughout the building is inconsistent and not aligned with the needs or arrangement of the spaces for which it was installed. The majority appeared to be various versions of fluorescent fixtures which have reached the end of their serviceable life and are significantly deficient in energy efficient operation.

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OPTION 1 | Renovation Only

Student Capacity 393
Existing school reno SF: 130,501
New addition SF: 0

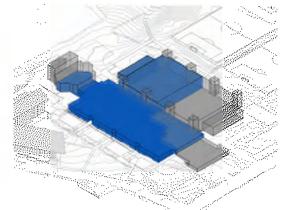
Total project cost per SF:

Meets APS ed spec:

Accommodates current enrollment:

NO

Construction adjacent to learning: YES



OPTION 1A

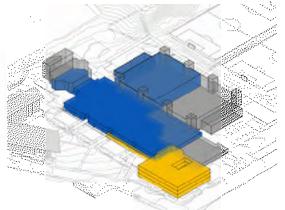
1 + Minimal Addition

Student Capacity per Updated Program

Student Capacity
1,123
Existing school reno SF:
130,501
New addition SF:
60,194
Total project cost per SF:
TBD

Meets APS ed spec: YES – but not ideal

Accommodates current enrollment: YES Construction adjacent to learning: YES



OPTION 2 | Idealized Renovation & Addition

Student Capacity

Existing school reno SF:

New additions (2) SF:

Total project cost per SF:

Meets APS ed spec:

Accommodates current enrollment:

Construction adjacent to learning:

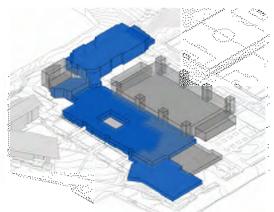
1,123

118,024

113,032

TBD

YES



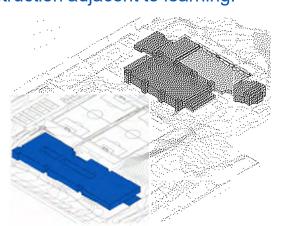
OPTION 2A | Idealized Renovation & Addition + Future 10% Capacity Increase

Student Capacity 1,231 Similar to Option 2



Student Capacity 1,123
Existing school reno SF: 0
New building SF: 225,779
Total project cost per SF: TBD

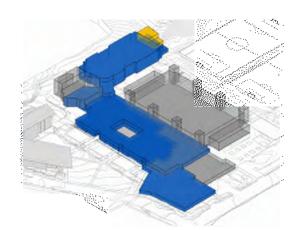
Meets APS ed spec: YES
Accommodates current enrollment: YES
Construction adjacent to learning: NO

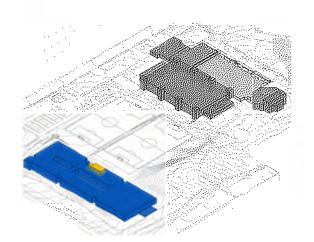


OPTION 3A | New Building & Renovation

+ Future 10% Capacity Increase

Student Capacity 1,231 Similar to Option 3



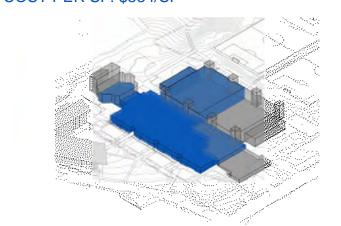


6.0 SUMMARY & RECOMMENDATIONS

Cost estimates shown below are a reconciled average provided by Downey & Scott LLC and Turner & Townsend Heery. Detailed cost estimates can be found in the appendix, section 7.5. Cost is derived from row M and include the cost of construction plus 25% for owner soft costs.

OPTION 1 | Renovation Only

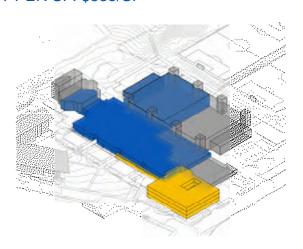
TOTAL PROJECT COST: \$125,600,000 COST PER SF: \$534/SF



OPTION 1A

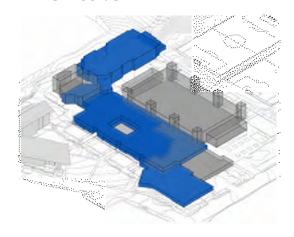
1 + Minimal Addition Student Capacity per Updated Program

TOTAL PROJECT COST: \$158,100,000 COST PER SF: \$535/SF



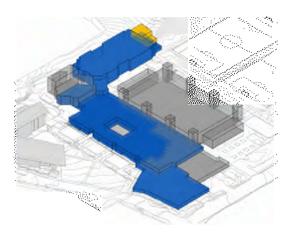
OPTION 2 | Idealized Renovation & Addition

TOTAL PROJECT COST: \$198,300,000 COST PER SF: 584/SF



OPTION 2A | Idealized Renovation & Addition + Future 10% Capacity Increase

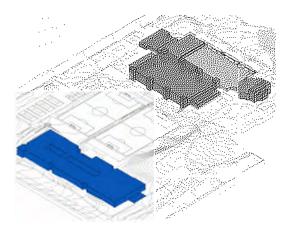
TOTAL PROJECT COST: \$201,000,000 COST PER SF: 584/SF



All costs are in 2025 dollars. Reference the Appendix for escalation costs

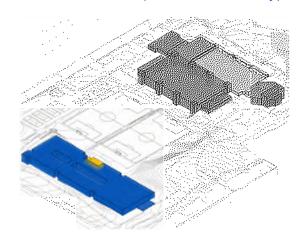
OPTION 3 | New Building & Renovation

TOTAL PROJECT COST: \$227,300,000 COST PER SF: 648/SF (new school sf only)



OPTION 3A | New Building & Renovation + Future 10% Capacity Increase

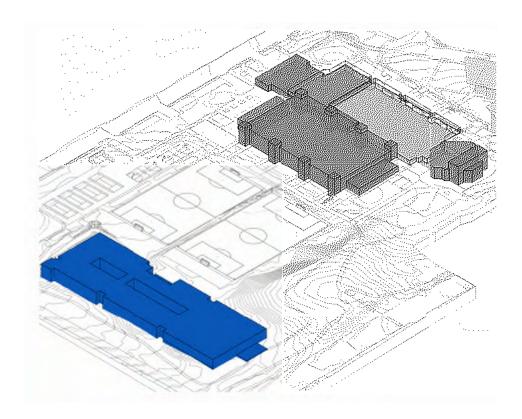
TOTAL PROJECT COST: \$230,600,00 COST PER SF: 650/SF (new school sf only)



Final Executive Summary & Recommendations

We know that APS aims to "provide fair access to resources, opportunities, and support, enabling every individual to reach their full potential" equitably to all schools serving the students of Arlington County. This report has shown that simply renovating the existing building will not provide an adequate educational environment for the students currently attending TJMS. While an adequate educational environment can be provided by renovating the existing 1970s building and constructing additions, the feasibility study team is not confident that this will be the best solution and investment for APS for the immediate and long-term future. In order to achieve the best educational environment for the TJMS students, we suggest leadership consider:

- Is investing a substantial amount of funding into a 60-year-old building the most effective solution?
- Since there is no available swing space for the building occupants, remaining at the school during construction will pose extreme challenges to the building occupants.
- Multiple phases that require a contractor to segment their work, while also having constricted access to the site, building and systems, drives up the cost of construction significantly. It can also prolong the schedule, which not only impacts cost but also the well-being of the building occupants.
- There are challenges fitting a new program (21st century learning environment) into an existing structure, which was designed where educational priorities were different (open floor plan).
- Alice West Elementary School was constructed on the same site at TJMS in 2019. These students will graduate from this school and will then attend TJMS.
- This community has gone through this feasibility study process before: in 2007, 2011, and 2014. After these studies, no improvements were made because of these studies



Final Executive Summary & Recommendations (cont)

While a phased occupied renovation and addition solution is possible, due to the challenges mentioned above it may not be the most ideal or efficient use of funding. As a result of these challenges, the TJMS feasibility study team recommends that Arlington Public Schools pursue **Option 3 – New Building** for the following reasons.

- Most, if not all, of the challenges described above would be eliminated or solved by providing a new building.
- With a new building, the need for additional CIP funding in the future for TJMS will be significantly increased as the average lifespan of a new school building is 40 to 50 years.
- A new building can be constructed on site while the existing building remains in operation. In this scenario, current school operations will be minimally impacted. Students can remain in the existing building. Disruptive noise, smells, air quality, safety, utility shut offs, site access are significantly less challenging.
- This also gives the contractor greater ability to control the construction schedule and the cost, which could mean a new building is returned to the school division sooner and with more money going directly back to the students in educational spaces rather than to the contractor for the coordination of multiple phases and need for temporary utilities.
- A new building is a clean slate which can be designed specifically to the current Educational Specifications and needs of the school by using the most appropriate and efficient structural, mechanical, and other building systems.
- It would be easier and more cost effective to attain net zero energy in a new building.
- A new building will provide clear separation between community and school use to give the students the safest learning environment possible.
- Per the November 19, 2024 meeting with school staff, they dislike have a shared facility.
- The new building will provide clear separation between elementary school and middle school car and bus vehicular access and disperse traffic on the surrounding residential streets.
- We expect a new building because of this feasibility study will be well received by the community.
- The community center building will receive upgrades, in addition to a new baseball field and tennis courts.
- The Auditorium will receive a new standalone HVAC system and main entrance.

We thank Arlington Publics Schools for the opportunity to learn more about Thomas Jefferson Middle School and ability offer our analysis and recommendations. Architecture, Incorporated is happy to provide further clarifications and / or respond to any questions that emerge during the review of this feasibility study.