



13 March 2023

Shrewsbury Public Schools Pre-K-12
Capital Inventory & Improvement Study



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EXECUTIVE SUMMARY

Executive Summary | Introduction

At the end of 2021, LPA|Architects was contracted to reassess the Shrewsbury Public School (SPS) District facilities inventory as it relates to long term programmatic goals. A similar study completed in 1997 was used as the basis for capital projects over the past 25 years and had fully run its course. The objective of the current report is to prepare the town for future improvements in a similar fashion.

The study process progressed with oversight from a Steering Committee including:

- Kevin Mizikar, Town Manager
- Joseph Sawyer, Superintendent of Schools
- Patrick Collins, Asst. Supt. Operations & Finance
- Keith Baldinger, Asst. Director of Public Works

and input from other district leaders and town representatives.

- Generally, the study is structured to include:
- Assessment of the pre-Kindergarten through Grade 12 and SPS Administration facilities
- Enrollment Projections and Program Objectives
- Synthesis of potential Options to address the facilities priorities to address sequenced goals.

The following is a general overview of the findings of the report based on the significant data, reports, and assessment included in each section.



Executive Summary | Facilities Assessment

The study of each building within the District was conducted by a team of architects and engineers that toured each building and site. A review of existing drawings, reports, and capital improvements was included in the overall assessment.

With building construction spanning almost a century from the 1920's original Coolidge School to the most recent Howard W. Beal School that opened in 2021, there is a predictably wide range of construction type extant. Through carefully planned capital improvements, many facilities have been provided with updates and replacement features. Each building was assessed relative to 21st century code and educational needs including the following factors:

- Climate control and indoor air quality
- Ability to meet current Massachusetts School Building Authority (MSBA) space recommendations
- Systems capabilities and expected life span
- Systems requirements to meet Climate Act with Net Zero target
- Site features including opportunities to separate bus and car vehicular circulation, provide full perimeter emergency access, and outdoor recreational and educational facilities

A few major conclusions of the Facilities Assessment include:

- The following facilities have limited cooling/climate control capabilities: Shrewsbury High School, Oak Middle School, Floral Street School, and Coolidge School
- Older facilities including Oak Middle School, Coolidge School, Paton School, and Spring Street School would require significant envelope (wall/window/roof) improvements to target Net Zero efficiencies
- Coolidge, Spring Street, and Paton Schools all have modular classroom additions that have outlived the anticipated life span of the construction
- The Parker Road pre-kindergarten facility is combined with other town and school administrative facilities

Additionally, while LPA|A did not assess the SPS Administration facilities, a Tecton report shows that it is housed at two sites (Town Hall and Parker Road) and is undersized.



Executive Summary | Educational Review

A multi-prong process was used to produce an educational program framework to evaluate the efficacy of the current existing facilities. The following tools were used:

- 10-year Enrollment Projections prepared by McKibben and Associates showing expected school population for 2031–2032
- District wide leadership workshop and survey input
- Steering Committee vision meetings
- MSBA space summary analysis for each school amended to consider:
 - School Committee policy for class sizes at each level
 - Special Education spaces using Beal School as a benchmark
 - Level of technical education spaces desired at the middle and high school

The program data was then used to develop Design Capacity analysis to gauge how many students could be supported in each existing school as well as the ability to meet the enrollment projections anticipated.

The basis of the analysis included the following parameters:

- Current District grade configuration would be maintained:
 - Pre-Kindergarten
 - Kindergarten through Grade 4 Elementary
 - Grades 5–8 Middle School
 - Grades 9 – 12 High School
- Provide 242 total seats for Pre-Kindergarten students with the assumption that a mix of part time and full time students would participate in the program
- To the greatest extent possible, provide an equitable learning and physical environment throughout the District including Special Education, climate control capabilities, and accessibility.



Executive Summary | Educational Review

From the Educational Review process, the following observations surfaced:

- Although the total District enrollment projections show a decrease in student population of about 250 students to 5637 from the current enrollment of 5891, the Design Capacity analysis shows the current K- 12 facilities are overcrowded by almost 600 students.
- As an individual building, the High School has the greatest enrollment pressures with about 500 students over capacity expected by 2031–2032.
- The Middle School level projected enrollment closely aligns with the Design Capacity with Oak Middle lacking some science classroom facilities.
- The K–4 grade level schools have wide variation in size and capacity. The recent Beal School can accommodate about 300 students more than the projected enrollment, while all other K–4 schools are under capacity especially when the modular classrooms are eliminated.
- Other than the two high school pre-K classrooms, the desire is to have a consolidated pre-K facility separate from other municipal functions.
- SPS Administration is currently split between Parker Road and the Town Hall



Executive Summary | Options

Using the existing facilities assessment and the educational program objectives, several options were developed to address the long-term District-wide goals. The following priorities were used to guide the options development:

- Provide Air Conditioning for Equity Across the District
- Address Overcrowding at the High School
- Replace Coolidge Elementary School & Expand District Wide Pre-K
- Parity Among the K-4 Schools
- Address Aging Building Stock & Provide 21st Century Learning Spaces
- Net Zero Upgrades
- Unify School Department Administration



FACILITY ASSESSMENTS

Introduction
Parker Road Preschool
Major Howard W. Beal School
Calvin Coolidge School
Floral Street School
Walter J. Paton School
Spring Street School
Sherwood Middle School
Oak Middle School
Shrewsbury High School
School District Administration

Facilities Assessment | Introduction

LPA|Architects and their consulting engineers toured and conducted visual inspections of all the School Department facilities in March of 2022. The information and evaluations included in this section were based on these visual inspections and documents/reports made available by the town, including the facilities condition assessments conducted by GLRA in 2016.

Buildings in the district span from the century old Calvin Coolidge School to the most recent Major Howard W. Beal School that opened in 2021. This construction technology and building systems over this time frame evolved significantly resulting in a wide range of construction building and system types. The town has been great stewards of these facilities and through well planned capital improvements, many facilities have been provided with updates and replacement features to the greatest extent possible.

Each building was assessed relative to current code and educational needs including the following factors:

- Site features including but not limited to: size & configuration, access, topography, soils and wetlands, utilities, parking, sidewalks, and recreation areas
- Accessibility in and around the facility
- Building features including but not limited to: building envelope, interior finishes, and structural system
- Condition of modular classroom additions
- Systems requirements to meet Climate Act with Net Zero target
- Condition of the Fire Protection, Plumbing, HVAC, and Electrical fixtures, systems, and controls



Facilities Assessment | Introduction

These conditions were assessed based on the following ranking system:

- “Good” typically is up to date with current codes and well suited for current and future needs
- “Fair” may have some features that are in need of some level of repair/replacement or portions not suited for current or future needs
- “Poor” past their useful life and/or requires complete replacement

There are many reasons fair or poor ratings, including but not limited to age, current code compliance, and maintenance.

A few major conclusions of the Facilities Assessment include:

- The following facilities have limited cooling/climate control capabilities: Shrewsbury High School, Oak Middle School, Floral Street School, and Coolidge School
- Older facilities including Oak Middle School, Coolidge School, Paton School, and Spring Street School would require significant envelope (wall/window/roof) improvements to target Net Zero efficiencies
- Coolidge, Spring Street, and Paton Schools all have modular classroom additions that have outlived the anticipated life span of the construction
- The Parker Road pre-kindergarten facility is combined with other town and school administrative facilities
- Additionally, while LPA|A did not assess the SPS Administration facilities, a Tecton report shows that it is housed at two sites (Town Hall and Parker Road) and is undersized.



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Parker Road Preschool | Facility Overview

Address:	15 Parker Road, Shrewsbury, MA 01545
Zoning:	Residence B-2
Gross Square Footage:	± 46,000 sq.ft.
Assessed Value 2021:	\$2,616,400 [Building Only]
Lot Size:	± 12.63 Acres
Constructed/Renovated:	1950/2004
Modulars:	N/A
Construction Type:	To be confirmed
Grade Configuration:	Preschool
Current Enrollment:	164

Overview

Parker Road Preschool is located on the western border of Shrewsbury on Parker Road. This district-wide preschool serves a current population of 164 students.

The original 1950 building has undergone significant renovations, including the demolition of an entire academic wing, and renovation of the remainder to support local access TV, town servers, and special education administration. A large addition was constructed in 2004 creating an additional four classrooms, entry, and administrative spaces for the preschool. The overall facility consists of three distinct levels: first floor, second floor, and basement. The main entry to the preschool is located on the southwestern face of the new addition and provides direct access to the first floor, which houses all of the preschool spaces.

The building's overall condition is fair for a facility that is over 70 years old and has served the town well during this time.



Parker Road Preschool | Existing Site Plan



Parker Road Preschool | Site Review

Size & Configuration | ● Fair

The overall plot has a good configuration, fairly rectilinear. The overall acreage of the site is good given the current enrollment.

Adjacent Land Use | ● Good

The school site is bordered by Residence B-2 use zones on all sides. The parcel is abutted by single-family residences on all sides.

Vehicular Access | ● Fair

The drive in front of the facility is not a public way but is part of the school's property, connecting two separate public ways – Parker Road and Oregon Avenue. Parent pick-up and drop-off is facilitated via the loop around the back side of the building. Buses drop off at the main entrance. There is not enough space for on-site queuing of parent cars during pick-up/drop-off. Currently, 24% of students take the bus to and from school while 76% are transported by their parents.

Pedestrian Access | ○ Poor

Pedestrian access to the site is poor. Sidewalk conditions are poor, steep, curvy, and there are no crosswalks between sidewalks at S. Quinsigamond or Parker Road. Pedestrian access for this age group is not a priority.

Topography | ● Good

The site is relatively flat with the exception of a small area in the eastern part of the parcel which is heavily wooded.

Soils & Wetlands | ● Good

The site's soils within the developed area are characterized as Urban fill with the remainder of the site being Hinckley soils, which are excessively drained [see soils mapping in the Appendix]. There are no known wetlands/water features on the site.

Utilities/Service Areas | ● Fair/ ○ Poor

The school is served by municipality-owned water, sewer, electric, and internet. The boilers run off of natural gas. The building does not have a convenient/accessible service area to provide deliveries to the building. There is also no loading dock for the building.



Parker Road Preschool | Site Review

Recreation Areas/Community Use | ● Good

The school's playground, baseball field, and basketball hoops are utilized by the neighborhood community outside of school hours and are in good condition.

Parking/Walkways/Curbs/Sidewalks/Drainage | ◐ Fair/ ○ Poor

There is sufficient parking for staff and visitors to support daily operations. However, the site has very little capacity in respect to special events and relies heavily on street parking. There are very few pedestrian walkways consisting of asphalt and concrete throughout the site. Overall condition of these features is fair to poor. The site appears to have sufficient drainage given its current configuration; however, there was some ponding observed due to low points.

Landscape Features | ● Good / ◐ Fair

The site landscaping would be best characterized as mature and well-established, with areas of over-growth that require some attention. There are also raised garden beds in an enclosed area that was very well maintained.

Site Furnishings | ● Good / ◐ Fair

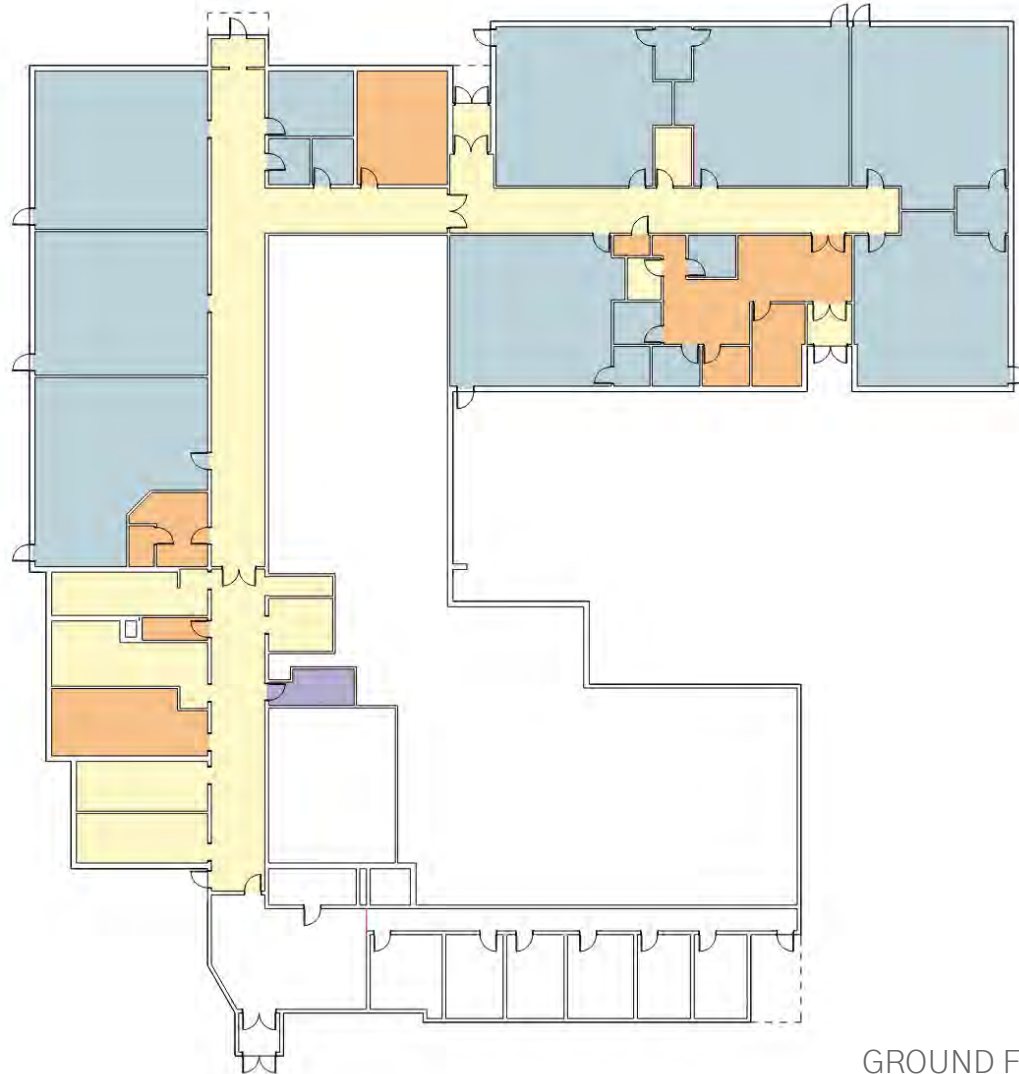
There are several site furnishings located on the site, including benches, book exchange, and signage. These site furnishings are in fair condition, given their age.

Accessibility | ● Good / ◐ Fair

As previously reported, there are several deficiencies regarding the site. There is a lack of accessible routes to some exterior amenities [running/cross slopes]. The following items do not meet the current accessibility guidelines: accessible parking [not provided], picnic tables [non-accessible], drop-off/pick-up [non-accessible], signage [not provided], and guardrails [not provided].



Parker Road Preschool | Existing Building Plans



LEGEND

NET FLOOR AREA

- ACADEMIC
- CORE
- ADMINISTRATIVE

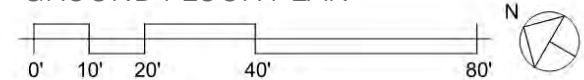
GROSS FLOOR AREA

- NON-PROGRAMMED

EXCLUDED AREA

- MODULAR/PORTABLE

GROUND FLOOR PLAN



Parker Road Preschool | Building Review

Exterior Walls | ● Fair

The exterior walls consist of brick masonry, concrete, vinyl siding, and wood siding. The vinyl and wood siding/trim is damaged/deteriorating in several locations and should be replaced. Many of the exterior joints where sealant was used have failed. The brick masonry requires repointing at several locations to ensure the envelope is watertight. There are some smaller concrete repairs that are also required to prevent further deterioration.

Roof System | ● Good / ● Fair

The roof is comprised of black EPDM over mechanically-fastened insulation with a asphalt gable roof over a portion of the original building. The EPDM roofing was recently replaced and resealed in 2021. The asphalt roofs were observed from the ground and appeared to be in fair condition.

Door & Windows | ● Fair

The building consists of aluminum-framed, vinyl, and wood windows. The doors consist of hollow metal & aluminum doors and frames. The metal and vinyl doors and windows are in good-to-fair condition with the exception of failed sealants and corroding lintels. The sealants and lintels should be replaced and maintained through a comprehensive maintenance plan. The wood windows show signs of deterioration and should be replaced.

Interior Finishes | ● Fair

The interior walls consist of painted concrete masonry units and painted gypsum walls. These walls are all in good condition and provide good acoustical separation between spaces. The ceiling primarily consists of acoustical ceiling tiles with some plaster ceilings, all of which are in good condition. The flooring consists of vinyl composite tile and carpet, which are in fair condition or have been replaced since the building has opened. The items that have the most amount of wear on them are the doors, frames, millwork [particularly around sinks], all of which are original to their construction.

Accessibility | ● Fair

As previously reported, there are several deficiencies regarding the building. The following items do not meet the current accessibility guidelines: toilet rooms [clearances], signage [no braille/accessible egress/not provided], protrusions along accessible routes, and reception desk [non-accessible].



Parker Road Preschool | Building Review

Means of Egress | ● Good

There are sufficient means of egress serving the building.

Structural System | ● Good

The original building structure consists of wide flange steel frame with concrete slabs. The preschool additional is wood frame structure. No issues observed during our site visit.

Hazardous Materials | ○ Fair

There are several potential and confirmed asbestos-containing materials within the building. Some have been removed/encapsulated during previous renovations. The building has a current AHERA plan; should future renovations be undertaken, it should be reviewed along with additional on-site sampling to confirm all visible asbestos-containing materials. There are several other items that require special disposal, including light fixtures, light ballasts, hydraulic door closers, and exit light batteries.

Modular Classrooms

There are no modular classrooms at this facility.



Parker Road Preschool | Fire Protection

Service | ○ Poor

The existing building has no fire sprinkler systems. If any additions are proposed or any substantial renovations, the code would require a building-wide suppression system be installed.



Parker Road Preschool | Plumbing

Fixtures | ● Fair

The existing building's plumbing systems appear adequate in quantity for the current occupancy, although review of adequate quantities of staff and student restrooms should be verified. There appears to be a mix of standard and ADA/MAAB accessible fixtures in the building. However, due to the very young age of some of the building occupants, lower height fixtures may be required to support the occupants.

Existing water closets are a mix of wall-hung and floor-mount flush valve type, with few instances of floor-mount models. Urinals are of the wall-hung type and lavatories are of the wall-hung and counter style with two-handle control.

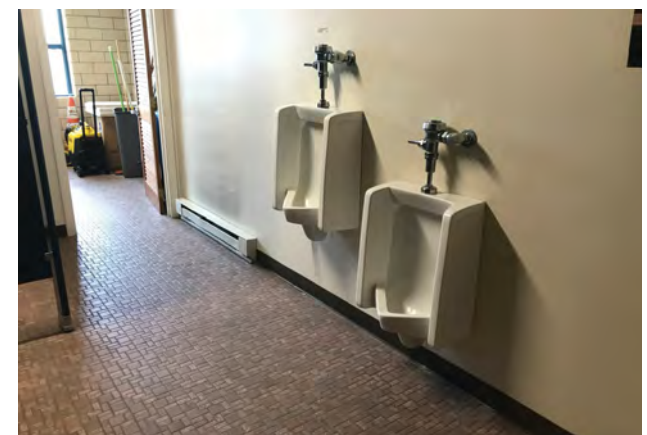
Public lavatory faucets vary, from metered (self-closing) to most being non-metered two-handle style. Public should be of the metered style to automatically shut off after use as required by current code. However, due to the occupant age, spring type self-closing fixtures should be avoided as they can be difficult to operate. The fixtures do not have limit stops or tempering valves to ensure hot water does not exceed 110°F for scald prevention. We suspect hot water to entire building may be reduced for scald preventing. Some lavatories which appeared to be ADA-compliant were missing protective insulation on the piping below.

There is at least one ADA-compliant wall-mounted electric water cooler drinking fountain located throughout in the classroom portion of the building.

At least one floor-mounted style janitor's sink was observed in the building.

Most fixtures (with limited exception) appear to be operational, and maintenance is routinely performed on faucets, toilet flush valves, etc. as needed

As renovations occur, the following items should be considered: replace all flushometers/faucets with automatic low flow flushometers/faucets.



Parker Road Preschool | Plumbing

Cold Water Service | ● Fair

A 4" cold water line enters the building in a lower level storage room. The service reduces to 1.5" prior to running through a water meter and feeding the building domestic water needs.

There is no backflow preventer on the main incoming water service. In facilities such as this where there could be various potential sources of cross contamination, a backflow preventer may be required to protect the municipal water supply. Local vacuum breaker backflow prevention on a janitor's sink was also noted.

Most of the piping in the building appears to be copper.

Domestic Hot Water Service | ● Fair

The domestic hot water needs of the building appear to be supported by several water heaters as follows:

- One (1) 28-gallon electric water heater with a nominal power input of 4,500 Watts. The water heater was located adjacent to a janitor sink. The water heater is manufactured by Rudd and was installed in 2018.
- One (1) 40-gallon electric water heater with a nominal power input of 4,500 Watts. The water heater was located on the mezzanine of a storage area on the lower floor. The water heater is manufactured by State Industries and was manufactured in 2007.
- One (1) 50-gallon electric water heater with a nominal power input of 4,500 Watts. The water heater was located on the mezzanine of a storage area on the lower floor. The water heater is manufactured by State Industries and was manufactured in 2007.

The water heaters have no active signs of leakage with the exception of some water staining at one of the pipes at the top of the 50-gallon water heater. At 15 years old, the 40 and 50-gallon water heaters are well past their useful service life of 10 years and are prime candidates for replacement.

We did not notice mixing valve stations on the building's domestic hot water supply. Current code would require differing water temperatures at different types of fixtures. Lavatory sinks and showers must not discharge hot water at a temperature exceeding 110–112°F for safety reasons, whereas service fixtures (janitor's sinks, kitchen sinks, etc.) are required to have hot water temperatures in excess of 120°F for sanitation reasons. In addition, domestic hot water storage tanks should be kept at approximately 140°F to prevent the possibility of bacteria growth within the tanks. It is recommended that the central mixing valve should be replaced with an electronic type.

There was no recirculation pump on the domestic hot water systems, which may be required as some fixtures appear to be located beyond 100 feet of the hot water source. The plumbing code requires hot water to be available within 100 feet of any hot water consuming fixture. The domestic hot water heaters should be replaced with high-efficiency condensing gas-fired style.



Parker Road Preschool | Plumbing

Drainage Systems | ● Fair

Most of the sanitary drainage piping is concealed from view; however what we were able to see was of the cast iron no-hub type. The sanitary sewer lines run below the slab and exit the building to a municipal sewer system.

Roof storm water is drained via roof drains connecting to internal leaders. The lines presumably exit to a municipal storm water system. The building does not appear to have any emergency roof overflow drains. These are required by current code as a clogged drain can lead to water build-up on the roof and structural failure due to weight. During any reroofing project or building upgrade, we highly recommend emergency roof drains be added. The emergency drains should be added near the current roof drains and run to discharge to the side of the building. The visible discharge location is required as it gives users an indication of a failed main drain system.

Besides those items noted herein and elsewhere in this report, we noticed no other outward signs of failure in either the sanitary sewer system or the storm drainage system during our site inspection.

Natural Gas Service | ● Good

A natural gas service entrance meter is located outside the building along the Parker Road side. The service rises up the outside of the building and feeds multiple gas-fired roof-top units. The gas service to the building is provided by Eversource.



Parker Road Preschool | HVAC

Ventilation, Exhaust, & Miscellaneous HVAC | ● Good / ◐ Fair

A majority of the building's cooling, tempered heating and ventilation needs are supported by multiple packaged DX cooling, gas-fired heating rooftop units. The rooftop units are manufactured by York/JCI and most incorporate a supply fan, filter sections, DX coil with condenser section, and gas-fired heating section. The units provide cooling, heating and ventilation to the respective spaces.

Rooftop units RTU-1 through RTU-8 serving the classroom portion of the building have all been replaced in 2021. RTU-1, 2, 3, 4 & 6 each have a cooling capacity of 3-tons. RTU-5 has a cooling capacity of 5-tons. RTU-8 has a cooling capacity of 10-tons.

The Shrewsbury Electric Company (SELCO) portion of the building is supported by two (2) packaged rooftop units. RTU-9 was recently replaced in 2021 and RTU-10 was replaced within the last few years. RTU-9 has a cooling capacity of 6.5-tons and RTU-10 has a cooling capacity of 12.5-tons. There is also a small 3.5-ton ducted split system which serves a portion of the SELCO administration area. This system appears to have been installed circa 2014.

The SELCO data center has multiple split-style cooling systems of varying age and type. There are four (4) Liebert floor-standing computer room cooling units as well as four (4) ductless split-type cooling units. System vary in age from 2014 and older.

The SELCO data center is not optimally configured for hot aisle/cold aisle airflow control. Consideration should be given to include this to improve data center cooling and efficiency.

All restrooms have ducted exhaust systems. The systems connect to exhaust fans located on the roof.

Most of the HVAC equipment is in good condition and is within its useful service life of 15 years, as defined in ASHRAE.

It is recommended to update the configuration of the SELCO data center to incorporate hot and cold aisles and improve air distribution. Review overall capacity of cooling systems compared to actual load.

Controls | ◐ Fair

The building appears to have a hybrid control system with local controls being able to communicate via wifi for remote control energy management system throughout. Besides scheduling, the controls appear to have limited advanced capability.

Sequences should be reviewed further as additional indoor air quality and energy saving routines may be possible, such as demand ventilation reset based on CO2 sensors as well as intelligent recovery.



Parker Road Preschool | Electrical

Service | ● Good

The preschool electrical service is rated 400 Amperes, 208/120V Volt, 3-phase, 4-wire. The preschool is fed from a 1600A, 208/120V, 3-phase, 4-wire main electrical service switchboard in the basement. The main electrical service feeds seven other services for CATV head-ends and public building departments. The service consists of a utility company pad-mount transformer on the exterior of the building and underground feeds to the electrical service equipment. The electrical distribution equipment is by Square D. Maintenance of the switchboard is recommended by the manufacturer and NETA.

Normal Distribution | ○ Poor

The panelboards in the building are by several different manufacturers. The panelboards are located throughout the building in electrical rooms, corridors, etc. and are circuit breaker type. Some panelboards are original to the building and others were added over the years. Several different types of wiring methods were observed: namely, wires in raceway, metal clad (MC) cable, and armored cable (AC). Electrical distribution equipment should be replaced.

General Purpose Power | ○ Poor

The general-purpose power in the building is inadequate. The classrooms have inadequate number of receptacle outlets. Additional outlets have been installed in some rooms over the years in surface raceways. New wiring devices and branch wiring is recommended.

Emergency /Standby Power | ○ Poor

There is a generator for the building, but it appears to be dedicated to backing up the CATV head-end equipment and not the preschool.

Egress & Exit Lighting | ● Fair

The egress and exit lighting are through battery-powered exit signs and emergency lighting units. Emergency lighting is provided at building egresses, public and common areas, and in classrooms. The overall coverage of emergency lighting and exit signs appears to be adequate. It is not known if the system has been recently tested. It is recommended to test the emergency egress and exit lighting system and rectify any discrepancies.

Lighting & Controls | ● Fair

The ambient lighting system in the building consists of various types of fixtures (recessed, surface, pendant, etc.) with fluorescent lamps. The lighting system is inefficient and does not meet current energy codes. The lighting throughout the facility is controlled with snap switches. Recommended to provide ambient lighting system consisting of LED light fixtures. Networking lighting controls including occupancy, vacancy, and daylight sensors should also be provided.



Parker Road Preschool | Electrical

Telecommunications Cabling Infrastructure | ● Fair

The telecommunications system comprises mostly of Category 5e cables for data and voice communications. The system appears to meet the current programming needs of the facility.

The data communications equipment is by Cisco. Wi-Fi access points by Aerohive have been provided in the building. The voice communications equipment is NEC Univerge SV 9300 with digital handsets.

Telecommunications infrastructure that complies with current BICSI standard should be provided.

Fire Alarm System | ● Fair

The fire alarm system is addressable tone-visual type; the fire alarm panel is by Gamewell. The fire alarm system does not comply with current codes. It is recommended to provide new voice evacuation type fire alarm system with initiating and signaling devices to comply with current codes and standards.

Public Address (PA) and Clock Systems | ● Fair

PA speakers are located in public and common areas as well as in classrooms. The PA and clock systems appear to be in good working condition and meet the current programming needs. The PA system is Telecenter by Rauland Borg.

Audio-Video Systems | ● Fair

Short throw projectors are provided in classrooms.

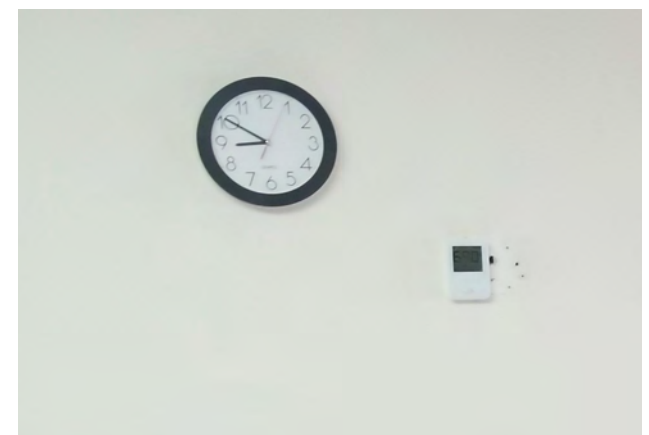
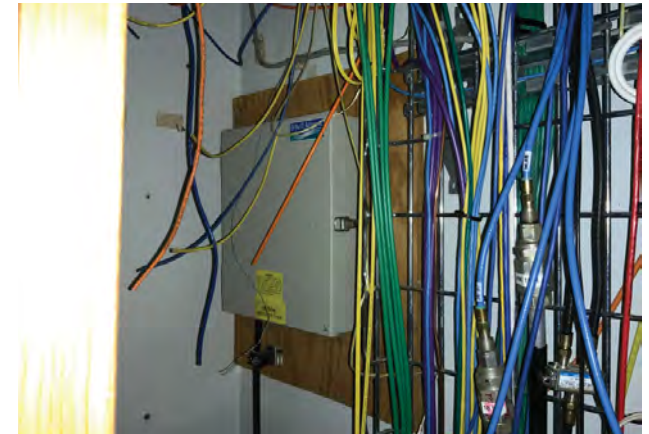
Hand-held radios are by Motorola.

The existing system is operational and meets current programming needs.

Video Surveillance & Access Control | ● Fair

The video surveillance system is by Exacq with Axis cameras. The access control system is by Brivo. Card readers are provided at the exterior door entries. Building entry is through Aiphone video entry station.

The existing systems are operational and meet current programming needs.



Parker Road Preschool | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Site

Size & Configuration		◐	
Adjacent Land Use	●		
Vehicular Access		◐	
Pedestrian Access			○
Topography	●		
Soils & Wetlands	●		
Utilities/Service Areas		◐	○
Recreation Area/Community Use	●		
Parking/Walkways/Curbs/ Sidewalks/Drainage		◐	○
Landscape Features	●	◐	
Site Furnishings	●	◐	
Accessibility	●	◐	

Building

Exterior Walls		◐	
Roof Systems	●	◐	
Doors & Windows		◐	
Interior Finishes		◐	
Accessibility		◐	
Means of Egress	●	◐	
Structural System	●	◐	
Hazardous Materials		◐	
Modular Classrooms			

Fire Protection

Service			○
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Parker Road Preschool | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Plumbing

Fixtures		◐	
Cold Water Service		◐	
Domestic Hot Water Service		◐	
Drainage Systems		◐	
Natural Gas Service		◐	

HVAC

Ventilation, Exhaust, & Miscellaneous HVAC	●	◐	
Controls		◐	

Electrical

Service	●		
Normal Distribution			○
General Purpose Power			○
Emergency /Standby Power			○
Egress & Exit Lighting		◐	
Lighting & Controls		◐	
Telecommunications Cabling Infrastructure		◐	
Fire Alarm System		◐	
Public Address (PA) and Clock Systems		◐	
Audio-Video Systems		◐	
Video Surveillance & Access Control		◐	

Major Howard W Beal School | Facility Overview

Address:	214 Lake Street, Shrewsbury, MA 01545
Zoning:	Limited Commercial-Business
Gross Square Footage:	± 142,000 sq.ft.
Assessed Value:	\$4,242,900
Lot Size:	± 20.94 acres
Constructed/Renovated:	2021
Modulars:	N/A
Construction Type:	I-B
Grade Configuration:	K-4
Current Enrollment:	583

Overview

Major Howard W. Beal School is located in the south central portion of town on Lake Street. This neighborhood school serves a current population of 582 students in grades K-4.

The building was constructed in 2021. The building consists of two levels: ground floor and main floor. The main entry to the building is located on the eastern side of the building, leading guests to the main floor, which houses all the major core spaces. The ground floor is accessible via an elevator off the main lobby and is also accessible via exterior grade entries due to the topography of the site.

The building's overall condition is excellent, given its recent completion.



Major Howard W Beal School | Existing Site Plan



Major Howard W Beal School | Site Review

Size & Configuration | ● Good

The overall plot has a good configuration given the layout and siting of the building. It has ample frontage on Lake Street.

Adjacent Land Use | ● Good

The school site is bordered by Residence B-1 use to the west, Rural AA to the south, Limited Commercial-Business to the east, and a combination of Commercial-Business, and Residence B-1 to the north. There are play fields operated by Shrewsbury Youth Soccer to the south, single family residences to the west and north, and agricultural fields to both the southeast and north.

Vehicular Access | ● Good

The main vehicular entrances are off Lake Street. The driveway to the south is restricted to buses only during pick-up and drop-off, while parents and faculty use the northern driveway. This allows for ample on site queuing since pick-up/drop-off is facilitated through the use of the paved play area with vehicle entering and exiting the northern driveway.

Pedestrian Access | ● Good / ○ Fair

Lake Street has a sidewalk on the school side of the street that heads south to neighboring residential neighborhoods. This was installed as part school construction project. In addition to the sidewalk there is also pedestrian access through town owned property providing access to the residential neighborhood to the east. Given the age group served by this school and the distances to the nearest residences the number of walkers to the school is expected to be limited.

Topography | ● Good

The site slopes down hill approximately 60 feet from northeast to southwest. Nearly all of this grade change is outside of the developable area and has no impact on school's ability to function.

Soils & Wetlands | ● Good / ○ Fair

The site is characterized by Paxton fine sandy loam[see soils mapping in the Appendix]. There are no wetlands. The soil did test positive for naturally occurring arsenic and was replaced and/or mitigated through encapsulation and removal to both on site and off site locations in accordance with all regulations governing soils with the levels of arsenic recorded.



Major Howard W Beal School | Site Review

Utilities/Service Areas | ● Good

The school is well served by municipality-owned water, sewer, electric, and internet. The boilers run off of natural gas. The building does have a convenient/accessible service area with a loading dock to provide deliveries to the building.

Recreation Areas/Community Use | ● Good

The school has two playgrounds, a play field, and a paved play area that are utilized by the neighborhood community outside of school hours and are in good condition.

Parking/Walkways/Curbs/Sidewalks/Drainage | ● Good

There is sufficient parking for staff and visitors to support daily operations. The site has the ability to support the parking needs for special events through the use of parallel parking along the ring road and parking on the paved play area. There are several pedestrian walkways throughout the site. Overall condition of these features is good. The site has sufficient drainage and utilized several low impact development measure, including a bio-swale and rain garden.

Landscape Features | ● Good

All new landscaping was established for this site when it was constructed with the exception of some mature trees and vegetation along the borders of the site. Temporary and permanent drip irrigation was installed to ensure establishment and support of these features.

Site Furnishings | ● Good

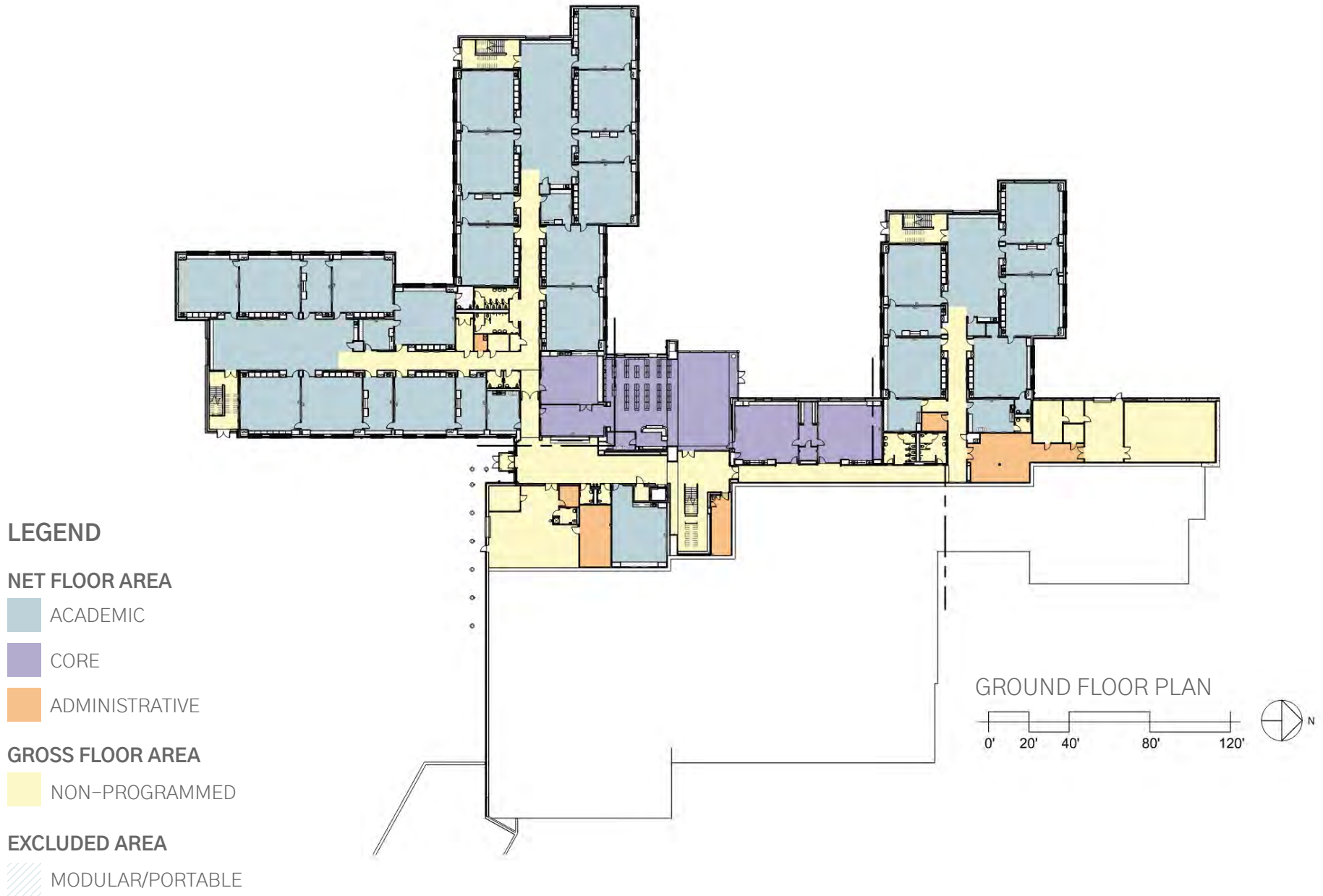
There are several site furnishings located on the site, including trash receptacles, benches, tables, signage, flag pole, bicycle racks, and raised planters. There are also two dual electrical vehicle charging stations. These site furnishings are in good condition.

Accessibility | ● Good

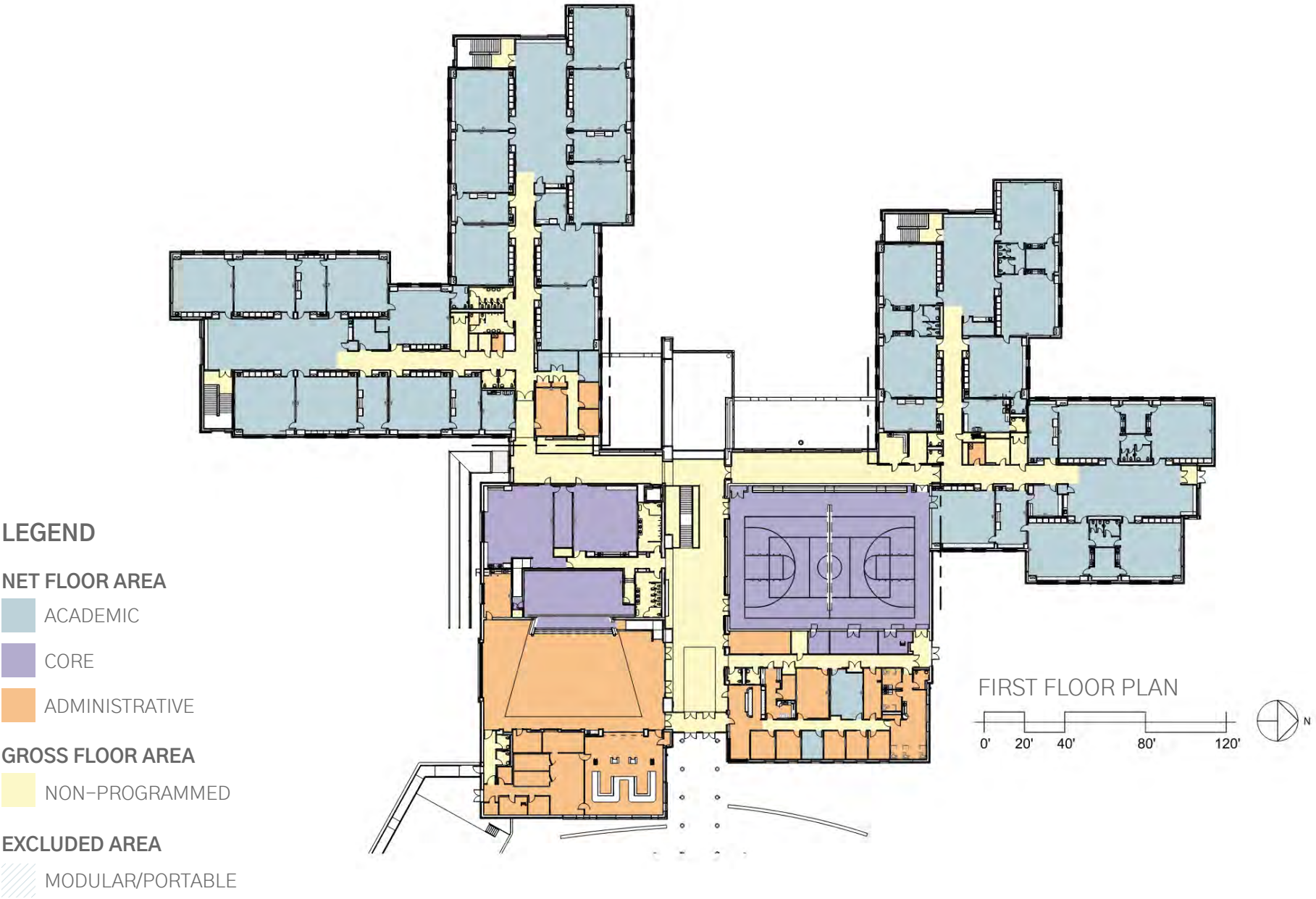
There are several accessible parking spaces along the east side of the building, meeting the schools requirements under MAAB CMR 521. There are accessible routes out to all of the site features, including the outdoor classroom on top of the knoll in the northeast corner of the site.



Major Howard W Beal School | Existing Building Plans



Major Howard W Beal School | Existing Building Plans



Major Howard W Beal School | Building Review

Exterior Walls | ● Good

The exterior walls consist of brick masonry, precast concrete, aluminum composite metal panels, and corrugated metal panels.

Roof System | ● Good

The roof is comprised of black EPDM over mechanically-fastened insulation.

Door & Windows | ● Good

The building consists of aluminum-framed windows and hollow metal doors and frames. The doors and windows are in good condition.

Interior Finishes | ● Good

The interior walls consist of painted gypsum wall board, ceramic wall tile, terrazzo tile, vinyl composite tile, and safety flooring in the toilet rooms and kitchen. The walls are all in good condition and provide good acoustical separation between spaces. The ceiling primarily consists of acoustical ceiling tiles with some plaster ceilings and specialty metal ceilings, all of which are in good condition.

Accessibility | ● Good

All the building features are accessible and in compliance in Massachusetts Architectural Access Board CMR 521 regulations.

Means of Egress | ● Good

There are sufficient means of egress serving the building with all floors having grade level exits.

Structural System | ● Good

The main structural system consists of a wide-flange steel frame with concrete floor slabs and frost walls. The structure is protected through the use of spray fireproofing, thickened concrete floor slabs, and some limited use of intumescent paint.

Hazardous Materials | ● Good

There are no asbestos-containing materials within the building.

Modular Classrooms

There are no modular classrooms at this facility.



Major Howard W Beal School | Fire Protection

Service | ● Good

The fire suppression system serving the building is a wet pipe type system which provides essentially complete coverage throughout the building.

There is an 8" main sprinkler water service which enters the building in a ground level utility service room adjacent to the main mechanical/boiler room. The service runs through supervised valves and a double check style backflow preventer. The service supports multiple wet pipe risers zoning the ground and main floors each with flow and tamper switches.

There are two single port Storz fire department connections provided on the exterior wall of the building. In addition, the stage area has hose connections.

The kitchen hood did have chemical-based suppression over equipment requiring such.

In general, the building's fire sprinkler coverage appears to be comprehensive and compliant with current code.



Major Howard W Beal School | Plumbing

Fixtures | ● Good

The existing building's plumbing systems appear adequate in quantity for the current occupancy. Most restrooms appear to comply with ADA/MAAB requirements for accessible fixtures.

Existing water closets are primarily of the wall-hung flush-valve type. Urinals are of the wall-hung type and lavatories are of the wall-hung and counter style, with either two-handle or single-lever handle faucets, many of which are of the metered style.

Many public use lavatory sinks have metered (self-closing) faucets as required by code. In addition, many appear to have limit stops to ensure hot water does not exceed 110F for scald prevention. Most of the classrooms have sinks, most of which appear to be of the ADA-compliant type.

The main kitchen appears to have the minimum configuration and number of fixtures to satisfy current code and Board of Health requirements for a commercial kitchen. The current fixtures consist of the following:

- One (1) three-bay pot sink connected to a grease trap
- Two (2) two-bay food prep sinks – one bay with a garbage disposer and one bay indirectly wasted to a floor sink below
- One (1) single-bay sink with garbage disposer at dishwasher area
- Five (5) hand wash sinks

There are several ADA-compliant wall-mounted electric water cooler drinking fountains located throughout the building.

Janitor sinks had faucet trim with vacuum breakers to limit backflow contamination caused by siphonage.



Major Howard W Beal School | Plumbing

Cold Water Service | ● Good

A 4” cold water line enters the building in a utility service room located adjacent to the main mechanical/boiler room. The service runs through a water meter, parallel-reduced pressure zone style (RPZ) backflow preventer, and parallel-pressure reducers prior to feeding the building domestic water needs.

Domestic Hot Water Service | ● Good

The domestic hot water needs of the building are supported by three (3) gas-fired tank style water heaters. The water heaters are each 90 gallons in capacity and have a rated input capacity of 199,999 BTUH. Units are manufactured by Lochnivar and are of the high-efficiency condensing type.

There is a central mixing valve station on the main hot water system which is required to support the varying water temperature needs of a building such as this, as well as keep the tank water at an elevated point for sanitation (140°F). Current code would require differing water temperatures at different types of fixtures. Lavatory sinks and showers must not discharge hot water at a temperature exceeding 110–112°F for safety reasons, whereas service fixtures (janitor’s sinks, kitchen sinks, etc.) are required to have hot water temperatures in excess of 120°F for sanitation reasons. The current system appears to supply a single temperature water to the building. After that, proper water supply to lavatories should be accomplished by local mixing valves and/or fixtures with appropriate mixing limit stops.

There are two (2) recirculation pumps on the domestic hot water system, which is required per the current plumbing code since there are fixtures located beyond 100 feet of the hot water source.

Drainage Systems | ● Good

Most of the sanitary drainage piping is concealed from view; however, what we were able to see was primarily of the cast iron no-hub type. The sanitary sewer lines run below the slab and exit the building to a municipal sewer system.

Roof storm water is drained via roof drains connecting to internal leaders. The lines exit to an on-site storm water system. The roof also has emergency overflow drains which discharge through the wall of the building at visible locations above grade.

Natural Gas Service | ● Good

A natural gas service enters the building near the main kitchen. The exterior service is an intermediate gas pressure line which runs through a pressure regulator and a gas meter prior to increasing in size to 5” to feed the building’s gas loads. These include the heating boilers, water heaters, and cookline equipment. The gas service to the building is supported by Eversource.



Major Howard W Beal School | HVAC

Boiler Plant | ● Good

The heating needs for the building are supported by two (2) Lochnivar #FBN-1500 fire-tube style gas-fired boilers. Each boiler has a rated input capacity of 1,500,000 BTUH. The boilers are high-efficiency condensing style.

Piping Distribution System | ● Good

Hot water from the heating plant is distributed to the building via a two-pipe supply and return distribution system consisting of a hot water loop to support interior heating terminals and a hot water glycol loop to support heating coils in exterior rooftop units. The respective hydronic pumps circulate hot water or glycol to rooftop unit coils, cabinet heaters, unit heaters, and fin-tube radiation located throughout the building.

The pumps and their current service are as follows:

- P-1A, B, C: (lead/lag/stand-by) variable speed hot water secondary loop; Grundfos vertical skid mount style
- P-2A, B, C: (lead/lag/stand-by) variable speed hot water glycol secondary loop; Grundfos vertical skid mount style
- P-3 & P-4: variable speed boiler primary pumps; Grundfos in-line style
- P-5: variable speed radiant heat loop; Grundfos in-line style

Ventilation, Exhaust, & Miscellaneous HVAC | ● Good

A majority of the building's cooling, heating, or tempered heating and ventilation needs are supported by sixteen (16) packaged DX cooling, hot water heating rooftop units. The rooftop units are manufactured by Aaon and most incorporate a supply fan, exhaust fan, filter sections, energy recovery wheel (no wheel on RTU-12 serving kitchen & server), DX coil with condenser section, hot water coil, and a hot gas reheat coil for active dehumidification control. There is also a gas-fired heat-only make-up air unit that supports the kitchen hood make-up air needs.

A summary of the RTU and MAU systems, their nominal capacity, and unit configurations are as follows:

- Abbreviations: H&V – Heating & Ventilation; HVAC – Heating, Ventilation, & Air Conditioning; ERV – Energy Recovery Ventilation; VAV – Variable Air Volume
- MAU-1: Kitchen Make-Up Air & Ventilation Unit – 2,970 CFM variable flow; H&V control
- RTU-1: Section B Main Floor South Classrooms – 10,815 CFM VAV; HVAC with ERV and dehumidification control
- RTU-2: Section B Ground Floor South Classrooms – 10,175 CFM VAV; HVAC with ERV and dehumidification control



Major Howard W Beal School | HVAC

- RTU-3: Section B Main Floor West Classrooms – 10,700 CFM VAV; HVAC with ERV and dehumidification control
- RTU-4: Section B Ground Floor West Classrooms – 9,445 CFM VAV; HVAC with ERV and dehumidification control
- RTU-5: Section C Main Floor West Classrooms – 7,670 CFM VAV; HVAC with ERV and dehumidification control
- RTU-6: Section C Ground Floor West Classrooms – 7,430 CFM VAV; HVAC with ERV and dehumidification control
- RTU-7: Section C Main Floor North Classrooms – 7,370 CFM VAV; HVAC with ERV and dehumidification control
- RTU-8: Art Classrooms – 2,940 CFM VAV; HVAC with ERV and dehumidification control
- RTU-9: Gymnasium South – 5,905 CFM single zone VAV; HVAC with ERV and dehumidification control
- RTU-10: Gymnasium North – 5,905 CFM single zone VAV; HVAC with ERV and dehumidification control
- RTU-11: Offices – 4,225 CFM VAV; HVAC with ERV and dehumidification control
- RTU-12: Servery/Kitchen – 2,885 CFM VAV; HVAC and dehumidification control
- RTU-13: Cafeteria – 9,800 CFM single zone VAV; HVAC with ERV and dehumidification control
- RTU-14: Main Lobby – 3,000 CFM single zone VAV; HVAC with ERV and dehumidification control
- RTU-15: Music Classrooms & Corridors – 6,305 CFM VAV; HVAC with ERV and dehumidification control
- RTU-16: Media Center – 7,045 CFM VAV; HVAC with ERV and dehumidification control

There is one (1) kitchen hood over the cookline with a chemical-based suppression system provided where required over equipment requiring such. A UL-listed roof exhaust fan addresses the kitchen hood needs.

All restrooms and such have ducted exhaust systems. The systems connect to exhaust fans located on the roof.

Controls | ● Good

The building appears to have a building-wide DDC energy management system throughout. The system is manufactured by Johnson Controls. The controls appear to incorporate many energy-saving routines, such as demand ventilation reset based on CO2 sensors as well as intelligent recovery.



Major Howard W Beal School | Electrical

Service | ● Good

The building electrical service is rated 2000 Amperes, 480/277 Volt, 3-phase, 4-wire. The electrical service is fed from a utility company pad-mount transformer on the exterior of the building. The primary electrical service originates at a riser pole on Lake Street and runs underground around the back of the building to the transformer. Underground secondary conductors run from the transformer to the electrical switchboard in the Main Electrical Room C120A. The electrical service equipment is by General Electric.

Normal Distribution | ● Good

The building electrical distribution equipment is located in the following rooms:

- Main Electrical Room C120A
- Electrical Room B106
- Mechanical A102
- Electrical Room A241
- Electrical Room B206
- Electrical Room C225
- Kitchen A203

The distribution equipment consists of 480/277 volt and 208/120 volt panelboards, and 480 volt to 208/120 volt stepdown transformers. A multi-point sub-metering system capable of providing electrical consumption data for lighting, general purpose power, and HVAC power loads has been provided. The electrical distribution equipment is by General Electric.

Emergency/Standby Power | ● Good

The backup emergency generator is diesel engine-driven, rated 250kW/312.5kVA, 480/277 volt, 3-phase, 4-wire. The weatherproof sound-attenuated enclosure is aluminum with level 2 acoustics. The backup generator is equipped with a roof-mounted 100kW load bank for testing purposes. The generator is manufactured by Generac.

The backup emergency generator feeds two automatic transfer switches (ATS) for life safety and standby power loads. The life safety ATS is rated 400A, and the standby power ATS is rated 600A. The ATS are ASCO Series 300.

The life safety electrical distribution equipment is located in the following two-hour rated electrical rooms:

- Emergency Electrical Room C120E
- Emergency Electrical Room B106A
- Emergency Electrical Room A246
- Emergency Electrical Room A248



Major Howard W Beal School | Electrical

The emergency distribution equipment consists of 480/277 volt and 208/120 volt fusible panelboards, and 480 volt to 208/120 volt stepdown transformers. The fusible panelboards are manufactured by Eaton.

The standby electrical distribution equipment is located in the following rooms:

- Mechanical A102
- Telecom B141
- Telecom C120C
- Main Electrical Room C120A
- Kitchen A203
- Electrical Room A241
- Server A233

The standby distribution equipment consists of 480/277 volt and 208/120 volt fusible panelboards, and 480 volt to 208/120 volt stepdown transformers. The electrical distribution equipment is by General Electric.

Lighting & Controls | ● Good

The ambient lighting system in the building consists of light fixtures with energy-efficient LED lamps. The interior lighting design is 24% more efficient than code; the exterior lighting design is 10% more efficient than code. The lighting fixture package is by Boston Light Source and consists of products by Peerless, Juno, Lithonia, Lumenwerx, Kelvix, Mark Lighting, LLI Architectural, etc.

The lighting control system is nLight Wired. nLight Wired is a distributed, intelligent digital lighting controls solution that integrates time-based, daylight-based, and manual lighting control through its low-voltage connected devices. The system provides functionality while aiding in reducing energy consumption. The interior and exterior lighting system is controlled with an automatic control device to turn on or shut off building lighting in all spaces. Each space enclosed by ceiling-height partitions has at least one control device to independently control the general lighting within the space. Each control device is activated either manually by an occupant or automatically by sensing an occupant. Each perimeter office space enclosed by ceiling-height partitions has a manual control to allow the occupant to uniformly reduce the connected lighting load by at least 50% or is provided with automatic daylighting controls. Each perimeter classroom space has a manual control to allow the occupant to uniformly reduce the connected lighting load by at least 50% and is provided with automatic daylighting controls. The classrooms have the ability to dim or switch off lights at the presentation/teaching front wall. The lighting controls system is integrated with the building automation system to further reduce energy consumption.



Major Howard W Beal School | Electrical

Telecommunications Cabling Infrastructure | ● Good

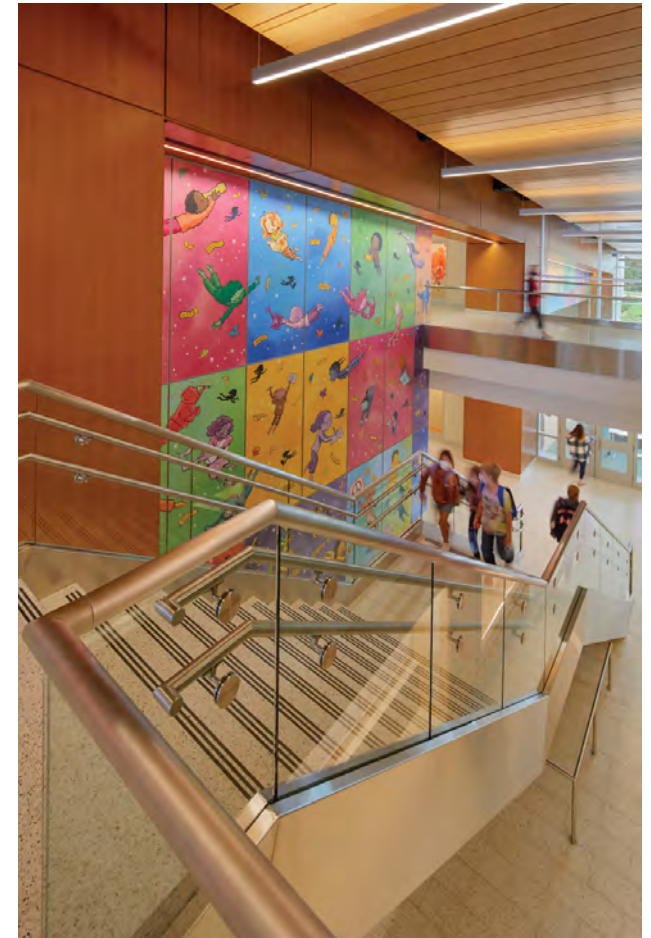
The telecommunications system comprises a Category 6A horizontal cabling plant, and a backbone cabling plant consisting of 24-strand single mode fiber, 12-strand multi-mode fiber, and twelve (12) Category 6A copper cables. The utility company services are terminated in a Telecommunications Room C120C and extended to Server Room A233. The backbone cabling plant originates in Server Room A233 and runs to Telecom Room C120C, Telecom Room B141, and Telecom Room A246 in star configuration. All cables are terminated in racks, labeled, and tested per BISC1 standards.

The voice communications equipment is NEC Univerge SV9300. The system is integrated with the Town's existing voicemail system. The system comprises the following types of handsets:

- NEC UT880 IP handsets
- NEC DT830 IP handsets, model no. ITZ-8LDG (DESI-less), 8-line display self-labelling
- NEC DT820 IP handsets, model no. ITY-8LDX-1 (BK) Tel, 8-line key self-labelling
- Polycom® SoundStation® IP 6000 conference handsets

The wired data communications equipment is by Cisco. The wireless data communications equipment is by Aerohive. The system comprises the following models:

- Fiber Aggregation: Cisco Catalyst C9500-16x, each with two (2) C9500-NM-8x module and redundant power supply
- Wired Network: Cisco Catalyst 9200-48P 48-port POE+ switches, and Cisco Catalyst 9200-48T 48-port switches
- Wireless Network: Aerohive AP650 access points (interior), and Aerohive AP1130 access points (exterior)



Major Howard W Beal School | Electrical

Fire Alarm System | ● Good

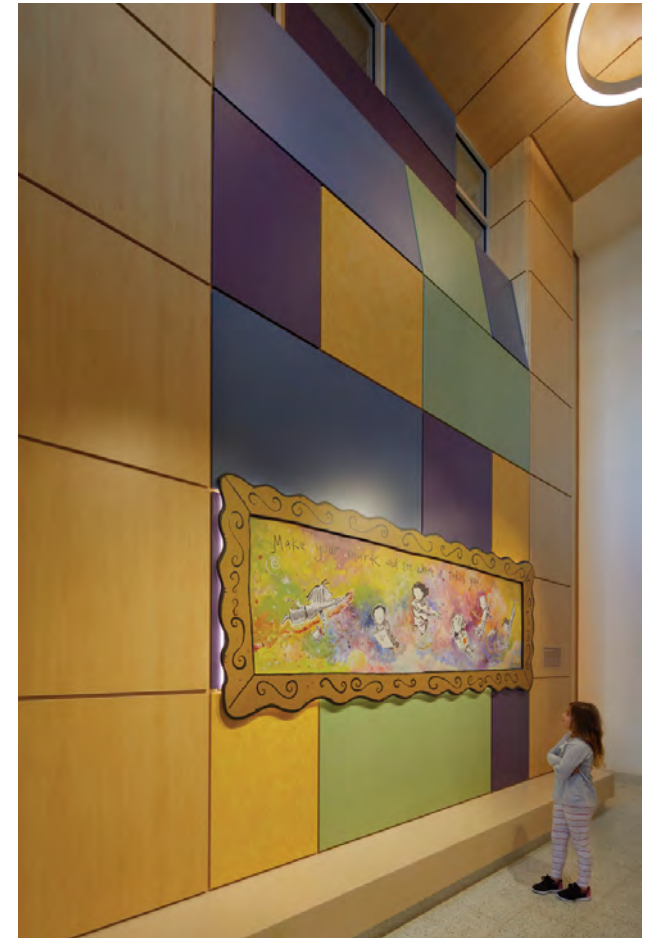
The fire alarm system is EST3 with voice evacuation and FireWorks Incident Management Platform. The design is based on engineering criteria as defined by NFPA 72 and the Massachusetts State Building Code 780 CMR. The system is supported by standby batteries for 24 hours of full supervisory operation followed by 15 minutes of alarm.

Combination audiovisual signaling appliances are provided as required per NFPA 72. Standalone devices are used to augment combination units when necessary. The audiovisual notification appliances are located in all egress pathways, classrooms, public, and common areas. Manual pull stations are located within five feet of each means of egress. Photoelectric smoke detectors are in all egress pathways, at the top and bottom of each stairway, mechanical equipment, electrical transformer, telephone equipment, elevator machine room, or similar rooms. Sprinkler flow and tamper switches as well as the kitchen Ansul system is connected to the fire alarm system. Carbon monoxide detectors are provided in spaces with fossil-burning fuels and in air handling units exceeding 2000 CFM. The fire alarm panel is in Emergency Electrical Room C120E. Fire alarm annunciator is provided in Vestibule A100, Reception A251, and Vestibule A200. A knock box, beacon, and sprinkler bell is provided on the exterior of Vestibule A100 and Vestibule A200.

A public safety radio-distributed antenna system is provided throughout the school. The system amplifies the fire department and police radio signals inside the building. The head-end equipment is in Emergency Electrical Room B106A.

Public Address (PA) and Clock Systems | ● Good

A public address (PA) and clock system is provided throughout the building. Clocks are PoE-powered. Speakers are located in classrooms, administration areas, assembly areas, and in public and common areas. Classroom speakers are talk-back type. Two emergency call stations are provided in each classroom and in all instructional and public areas. Dome lights are provided in public assembly areas. The system will provide the front office with the ability to make announcements throughout the building premises, to a limited area, or to an individual room. Any telephone handset in the building can initiate a page. In the front office, the administrative staff can select whether they want to initiate or respond to a call via the PA attendant handset, make announcements, or play background music through the speakers. The installed system is Telecenter U by Rauland-Borg Corporation.



Major Howard W Beal School | Electrical

Audio-Video Systems | ● Good

Local sound systems are provided in the Media Center, Cafeteria, and Gymnasium.

The media center sound system is comprised of Shure wired and wireless microphones, Denon CD player/iPod dock, RDL stereo mixer, Symetrix DSP, Crown CDi4000 amplifier, JBL 26CT and 65P/T speakers, and Listen Tech assistive listening system.

The cafeteria sound system is comprised of Shure wired and wireless microphones, Denon CD player/iPod dock, Allen & Heath mixing console, Symetrix DSP, Crown CDi2000 and CDi4000 amplifiers, QSC AD-820 and QSC AD-S282H-W speakers, and Listen Tech assistive listening system.

The gymnasium sound system is comprised of Shure wired and wireless microphones, Denon CD player/iPod dock, Allen & Heath mixing console, Symetrix DSP, Crown CDi 8/300 amplifier, EAW VFR129i speakers, and Listen Tech assistive listening system.

In-Ceiling Classroom Audio System | ● Good

An in-ceiling classroom audio system has been provided in each classroom and instructional space. The system is comprised of a wireless speaker, pendant-style teacher microphone, and a wireless media connector. The system amplifies teacher speech and multimedia sound throughout the classroom. The system is integrated with the public address system and the short throw projector in the classroom. The installed system is Flexcat + Topcat by LightSpeed.

In-Building Cellular Amplification System | ● Good

An in-building cellular amplification system has been provided in the building. The system takes the existing source signal from the provider (Verizon, T-Mobile, etc.) and distributes it throughout the building with the intent to make cell service available. Modern construction materials and low-E glass inhibits cellular signals inside the building. The system is comprised of antennas on the roof, antennas within the building, and amplifiers in the telecommunications rooms. The installed system is by WilsonPro.



Major Howard W Beal School | Electrical

Video Surveillance & Access Control | ● Good

The security system comprises video surveillance, access control, and intrusion detection systems. The video surveillance system monitors parking lots, building entry and exits, building perimeter, public spaces, and corridors. The access control system at building entry and egress doors allows access through valid credentials presented at the card readers. A video entry system with intercom is provided at the building entrance and at the kitchen entrance, with the ability to release the doors from the video master stations at the reception desk, principal's office, assistant principal's office, and kitchen office. The intrusion detection system monitors all exterior doors and ground floor windows. Door position switches are provided on all exterior doors. Motion detectors are provided in all rooms with windows accessible from the ground.

The installed video surveillance system is by Exacq with Axis cameras. The access control system is by Brivo. The video entry system is by Aiphone. The intrusion detection system is by Bosch.

Electric Vehicle Charging Station | ● Good

Two (2) electric vehicle charging stations are provided on the site for charging electric vehicles. The charging station is model CT4021-GW1 by ChargePoint.



Major Howard W Beal School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Site

Size & Configuration	●		
Adjacent Land Use	●		
Vehicular Access	●		
Pedestrian Access	●	◐	
Topography	●		
Soils & Wetlands	●	◐	
Utilities/Service Areas	●		
Recreation Area/Community Use	●		
Parking/Walkways/Curbs/ Sidewalks/Drainage	●		
Landscape Features	●		
Site Furnishings	●		
Accessibility	●		

Building

Exterior Walls	●		
Roof Systems	●		
Doors & Windows	●		
Interior Finishes	●		
Accessibility	●		
Means of Egress	●		
Structural System	●		
Hazardous Materials	●		
Modular Classrooms			

Fire Protection

Service	●		
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Major Howard W Beal School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Plumbing

Fixtures	●
Cold Water Service	●
Domestic Hot Water Service	●
Drainage Systems	●
Natural Gas Service	●

HVAC

Boiler Plant	●
Piping Distribution System	●
Ventilation, Exhaust, & Miscellaneous HVAC	●
Controls	●

Electrical

Service	●
Normal Distribution	●
Emergency /Standby Power	●
Lighting & Controls	●
Telecommunications Cabling Infrastructure	●
Fire Alarm System	●
Public Address (PA) and Clock Systems	●
Audio-Video Systems	●
In-Ceiling Classroom Audio System	●
In-Building Cellular Amplification System	●
Video Surveillance & Access Control	●
Electric Vehicle Charging Station	●

Calvin Coolidge School | Facility Overview

Address:	1 Florence Street, Shrewsbury, MA 01545
Zoning:	Residence B-2
Gross Square Footage:	± 49,600 sq.ft.
Assessed Value 2021:	\$5,917,800 [Building Only]
Lot Size:	± 6.39 Acres [±10.0 Acres]
Constructed/Renovated:	1927/1940/1968/1985
Modulars:	1995
Construction Type:	II-B
Grade Configuration:	K-4
Current Enrollment:	255

Overview

Calvin Coolidge School is located in the southwestern portion of town on Florence Street. This neighborhood school serves a current population of 255 students in grades K-4.

The original building has been added onto several times over the years since it was constructed with the last major renovation occurring in 1985. Following the last renovation four modular classrooms were added in 1995. The building consists of three distinct levels: first floor, second floor, and third floor. The main entry located on the southern-facing elevation provides direct access to the first floor, which houses all of the major core spaces. The upper floors are accessible via an elevator off the main corridor leading to the original three story school building.

The building's overall condition is fair for a facility that is almost 100 years old and has served the town well during this time.



Calvin Coolidge School | Existing Site Plan



Calvin Coolidge School | Site Review

Size & Configuration | ● Fair

The overall plot is divided over several parcels that create an L-shaped parcel currently designated for school use. It also has ample frontage on Florence Street along with smaller access points to May Street and Jordan Road. The overall acreage of the site is fair, given the current enrollment.

Adjacent Land Use | ● Good

The school site is bordered by Residence B-2 use zones on all sides. Along the north, west, and south edges of the property are single-family residences. To the east there are several undeveloped town-owned parcels along the banks of Jordan Pond. This undeveloped land has the potential to be used for school use, greatly increasing the amount of developable land at this site.

Vehicular Access | ○ Poor

All vehicles access the site via Florence Street. Parent pick-up/drop-off is facilitated by the loop around the staff parking along the south side of the building. Buses utilize an entry and turnaround on the north side with all traffic exiting the site on May Street. Both of these loops are lined with parking spots for staff and visitors. There is not enough space for on site queuing of parent cars during pick-up/drop-off. Currently, 58% of students take the bus to and from school while 36% are transported by their parents.

Pedestrian Access | ● Fair

Pedestrian access to the site is fair. South Quinsigamond Avenue has sidewalks on both sides of the street, allowing students safe passage from all directions to the side. There is a crosswalk located at the intersection of May and S. Quinsigamond. There is a pedestrian loop around Jordan Pond that also provides access to the site from the north, east, and south. It should be noted that South Quinsigamond Avenue is curvy and traffic travels at high speeds. Only 6% of the students walk to and from school.

Topography | ● Good

The site is relatively flat and only slopes approximately 10 feet downhill from east to west. Towards the north and east the site does have clearly defined ridges that drop off ± 10 feet to the north and ± 20 feet to the east, leading down to Jordan Pond.

Soils & Wetlands | ● Good

The site's soils within the developable area are characterized as Hinckley soils [excessively drained] with a limited area of Urban fill [see soils mapping in the Appendix]. Jordan Pond to the east has limited impact on the future development of this site for school purposes.



Calvin Coolidge School | Site Review

Utilities/Service Areas | ● Good

The school is well-served by municipality-owned water, sewer, electric, and internet. The mechanical systems run off of natural gas. The building does have a service area with a loading dock to provide deliveries to the building.

Recreation Areas/Community Use | ● Good

The school's playground, paved play area, and baseball field are utilized by the neighborhood community outside of school hours and are in good condition.

Parking/Walkways/Curbs/Sidewalks/Drainage | ● Fair / ○ Poor

There is not sufficient parking for staff and visitors to support daily operations, leading to the use of street parking on neighboring streets. Additionally, the site has very little capacity in respect to special events, even when the paved play area is utilized. There are several pedestrian walkways throughout the site consisting of concrete and asphalt. Overall condition of these features is fair. The site appears to have sufficient drainage given its current configuration.

Landscape Features | ● Good / ● Fair

The site landscaping would be best characterized as mature and well-established, with areas of over-growth that require some attention.

Site Furnishings | ● Good / ● Fair

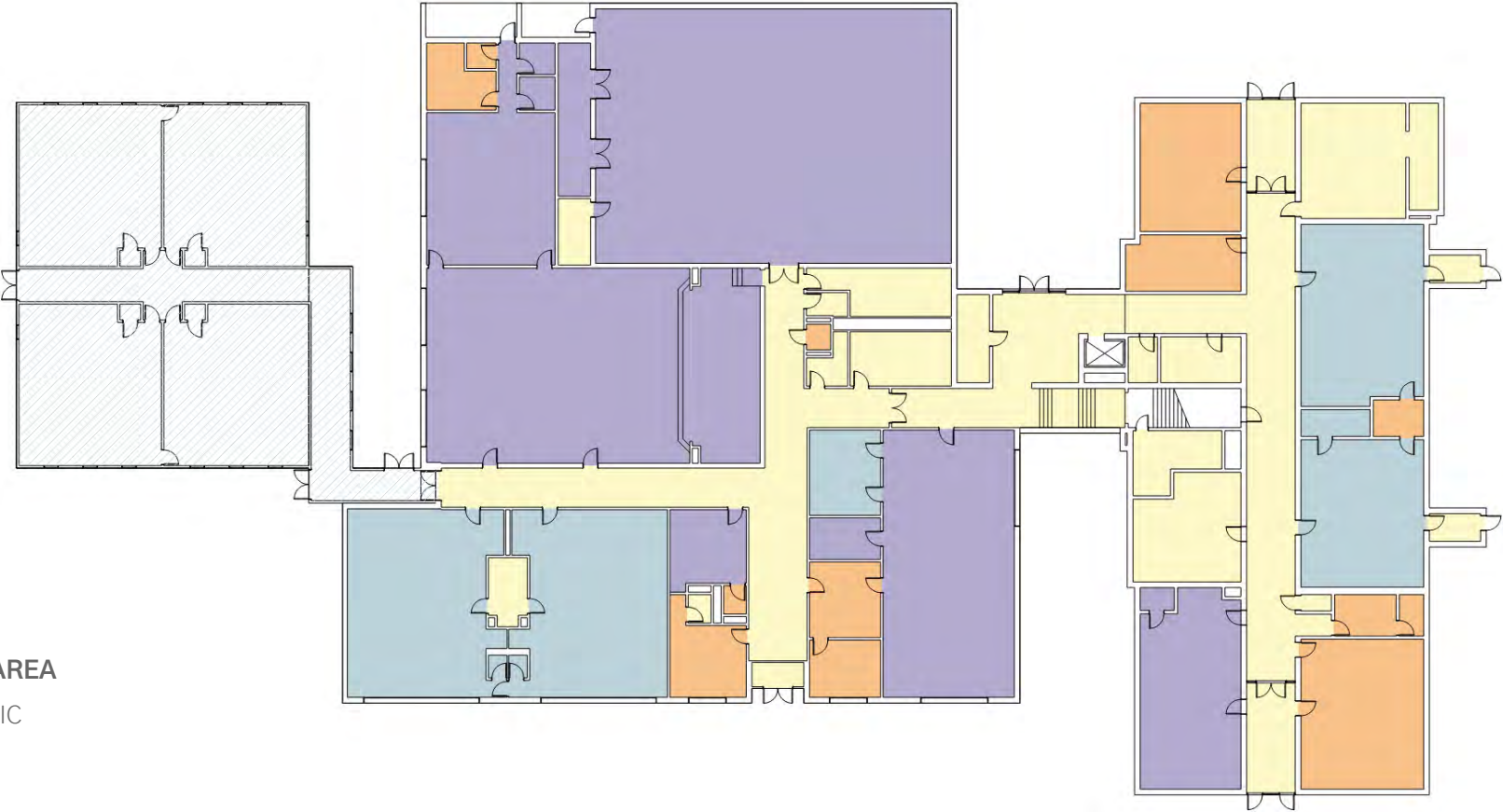
There are several site furnishings located on the site, including benches, signage, flag pole, and bicycle racks. These site furnishings are in good to fair condition, given their age.

Accessibility | ○ Poor

As previously reported, there are several deficiencies regarding the site. There is a lack of accessible routes to exterior amenities [running/cross slopes]. The following items do not meet the current accessibility guidelines: main entrance [non-accessible], accessible parking [not provided], picnic area [route], picnic tables [non-accessible], playground [surface/route], drop-off/pick-up [non-accessible], signage [not provided], and handrails [not provided].



Calvin Coolidge School | Existing Building Plans



LEGEND

NET FLOOR AREA

- ACADEMIC
- CORE
- ADMINISTRATIVE

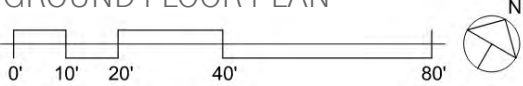
GROSS FLOOR AREA

- NON-PROGRAMMED

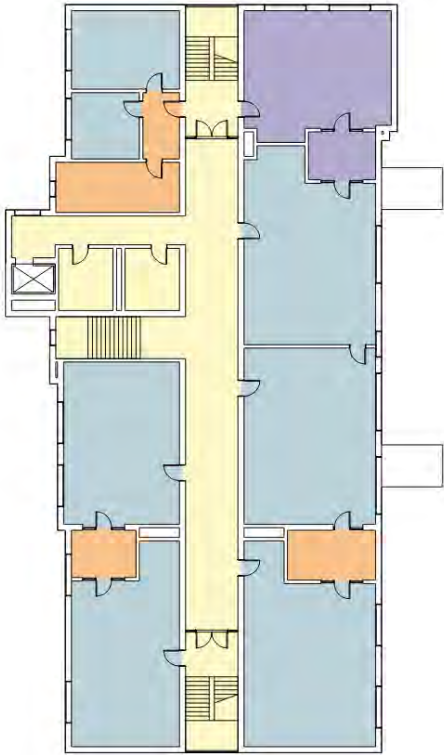
EXCLUDED AREA

- MODULAR/PORABLE

GROUND FLOOR PLAN



Calvin Coolidge School | Existing Building Plans



SECOND FLOOR PLAN



THIRD FLOOR PLAN

LEGEND

NET FLOOR AREA

ACADEMIC

CORE

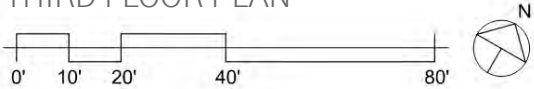
ADMINISTRATIVE

GROSS FLOOR AREA

NON-PROGRAMMED

EXCLUDED AREA

MODULAR/PORABLE



Calvin Coolidge School | Building Review

Exterior Walls | ● Fair / ○ Poor

The exterior walls consist of brick masonry, concrete, exterior insulation and finish systems [EIFS], and metal panels. As previously reported, the exterior joints where sealant was used have failed. LPA|A observed some replacement/repairs of these joints, but many still require attention. The brick masonry requires repointing throughout and resetting/re-anchoring/replacement of bricks at several locations to ensure the envelope is watertight. There are also several corroded steel lintels that should be replaced. There are some smaller concrete repairs that are also required to prevent further deterioration.

Roof System | ● Fair

The roof is comprised of black EPDM over mechanically-fastened insulation. Based on previous reports, the roofing has several deficiencies, including open seams, unadhered membrane, leaking drains, damaged down spots and flashing. These deficiencies are minor in nature but should be addressed before they lead to significant water infiltration. There are smaller, lower roofs that have asphalt shingles on the east side of the building.

Door & Windows | ● Fair

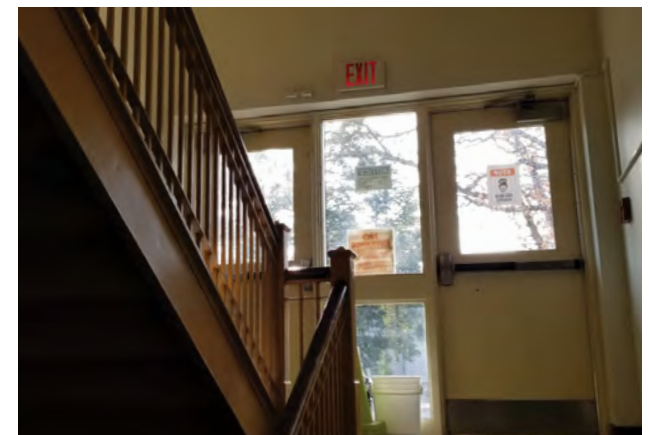
The building consists of aluminum-framed windows and hollow metal doors and frames. The doors and windows are in fair condition with the exception of failed sealants, corroded lintels, and failed insulated glazing units. The sealants, lintels, and insulated glazing units should be replaced and maintained through a comprehensive maintenance plan.

Interior Finishes | ● Fair

The interior walls consist of painted concrete masonry units, plaster finish walls, and ceramic tile. These walls are all in good condition and provide good acoustical separation between spaces. The ceiling primarily consists of acoustical ceiling tiles with some plaster ceilings, all of which are in good condition except where leaks have occurred. The flooring consists of vinyl composite tile, ceramic tile, and carpet, which have been well maintained and/or replaced since the building has opened. The items that have the most amount of wear on them are the doors, frames, and casework, many of which are original to the building. The gymnasium floor is vinyl composite tile.

Accessibility | ● Fair / ○ Poor

As previously reported, there are several deficiencies regarding the building. The following items do not meet the current accessibility guidelines: classroom sinks [non-accessible], stage [non-accessible], cafeteria tables [non-accessible], toilet rooms [fixtures, hardware & flushometers], signage [no braille/accessible egress/not provided], protrusions along accessible routes, drinking fountains [standing user height], and handrails/guardrails [non-accessible/not provided].



Calvin Coolidge School | Building Review

Means of Egress | ● Fair

There are sufficient means of egress serving the building. The egress paths themselves have several items that do not meet the requirements of the current code, including handrails, guardrails, landings, fire protection, and fire ratings. These items are permitted to remain as is until one of the several thresholds for upgrading these items is triggered. Additionally, the corridors on the second and third floor exceed the distance allowed by code for a dead end corridor.

Structural System | ● Fair

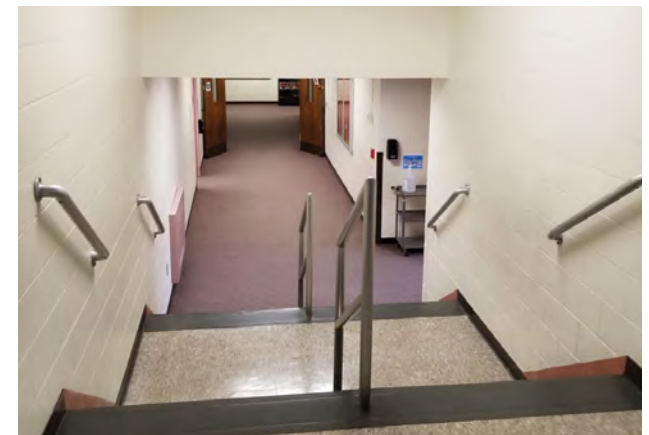
The main structural system consists of a steel frame with concrete floor slabs and frost walls. There appears to have been some settling in certain areas that should be investigated and remediated prior to any masonry repairs. Corroded lintels should also be remediated in conjunction with any masonry repairs.

Hazardous Materials | ● Fair

There are several potential and confirmed asbestos-containing materials within the building. Some have been removed/encapsulated during previous renovations. The building has a current AHERA plan; should future renovations be undertaken, it should be reviewed along with additional on-site sampling to confirm all visible asbestos-containing materials. There are several other items that require special disposal, including light fixtures, light ballasts, hydraulic door closers, and exit light batteries.

Modular Classrooms | ● Fair / ○ Poor

The modular classrooms have served the district well for many years and are not intended for long-term utilization, as is seen here. We recommend removal of these structures.



Calvin Coolidge School | Fire Protection

Service | ○ Poor

There is currently no fire suppression system serving the building. The kitchen hood also had no chemical-based suppression system; however, the equipment below the hood would not require such a system. If any additions are proposed or any substantial renovations, the code would require a building-wide suppression system be installed.



Calvin Coolidge School | Plumbing

Fixtures | ● Fair / ○ Poor

The existing building's plumbing systems appear adequate in quantity for the current occupancy, although review of adequate quantities of staff and student restrooms should be verified. At least one fixture in the boys' and girls' main restrooms in the older portion of the structure are ADA/MAAB accessible; otherwise, most other fixtures are not.

Existing water closets are primarily of the wall-hung flush valve type, with a few instances of floor-mount models. Urinals are of the wall-hung type and lavatories are of the wall-hung and counter style with two-handle control.

Most public faucets should be of the metered style to automatically shut off after use, as required by current code. The fixtures do not have limit stops to tempering valves to ensure hot water does not exceed 110°F for scald prevention.

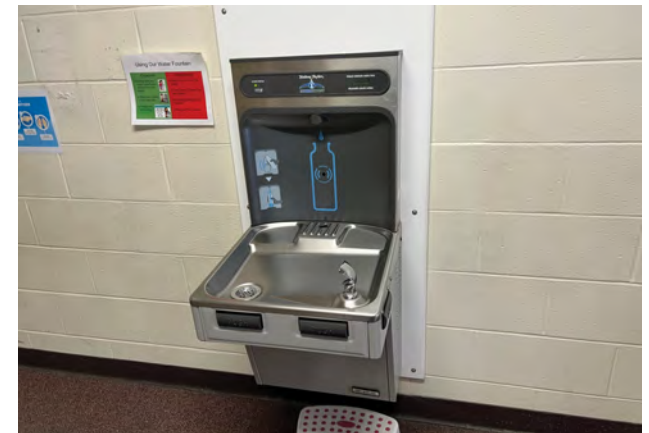
The main kitchen appears to have at least the minimum configuration and number of fixtures to satisfy current code and Board of Health requirements for a commercial kitchen. The fixtures consist of a three-bay pot sink, a two-bay prep sink, a hand sink and a single-bay sink. The prep sink is directly wasted and would require an indirect waste connection to comply with code.

There are several ADA-compliant wall-mounted electric water cooler drinking fountains located throughout the building.

Janitor sinks inspected during our walk-through had faucet trim with vacuum breakers to limit backflow contamination caused by siphonage.

Most fixtures (with limited exception) appear to be operational, and maintenance is routinely performed on faucets, toilet flush valves, etc. as needed

As renovations occur, the following items should be considered: replace all flushometers/faucets with automatic low flow flushometers/faucets.



Calvin Coolidge School | Plumbing

Cold Water Service | ● Fair

A 2.5" cold water line enters the building in a lower level mechanical room. The service reduces to 2" prior to running through a water meter and parallel pressure reducing valves, where it then feeds the building domestic water needs.

There is no backflow preventer on the main incoming water service. In facilities such as this where there could be various potential sources of cross contamination, a backflow preventer may be required to protect the municipal water supply. We did note localized reduced pressure zone (RPZ) type backflow prevention on the water supply to the boilers as well as vacuum breakers on janitor sinks. Local backflow prevention on hazards such as these is required and outlined in the Commonwealth of Massachusetts Plumbing Code.

Most of the piping in the building appears to be copper however there may be brass piping present as well. Due to the age of the building there is a high probability that the water service could have lead containing solder in the fittings or old brass piping as well as drinking fountains that may have lead containing components. Although not a large source of lead contamination it should be tested and monitored and if found to be a problem, components should be replaced. In general, there were no outward signs of failure during the day of our site inspection. We also recommend a pipe sample from both the cold and hot water system be taken to verify pipe condition.

Domestic Hot Water Service | ● Fair

The domestic hot water needs of the building are supported by two (2) electric water heaters and one (1) gas-fired tank style water heater. The water heaters are as follows:

- 1) 75-gallon, 75,100 BTUH input gas water heater as manufactured by Ruud, install date 2019. This unit supports the older multi-story portion of the buildings general domestic hot water needs.
- (2) 80-gallon, 4,500 Watt electric water heaters as manufactured by Ruud, install date of 2013. One of these units supports the kitchen domestic hot water needs and the other supports the addition portion of the school's general hot water needs.

The water heaters have no active signs of leakage; however, the gas-fired unit is near the end of its useful expected service life at near 10 years of age. There are no mixing valve station on the building's domestic hot water supply.

Current code would require differing water temperatures at different types of fixtures. Lavatory sinks and showers must not discharge hot water at a temperature exceeding 110-112°F for safety reasons, whereas service fixtures (janitor's sinks, kitchen sinks, etc.) are required to have hot water temperatures in excess of 120°F for sanitation reasons. In addition, domestic hot water storage tanks should be kept at approximately 140°F to prevent the possibility of bacteria growth within the tanks. It is recommended that the central mixing valve should be replaced with an electronic type.



Calvin Coolidge School | Plumbing

There are multiple recirculation pumps on the domestic hot water system, which is required since there are fixtures located beyond 100 feet of the hot water source. The plumbing code requires hot water to be available within 100 feet of any hot water consuming fixture. The domestic hot water heaters should be replaced with high efficiency condensing gas-fired style.

Drainage Systems | ● Fair

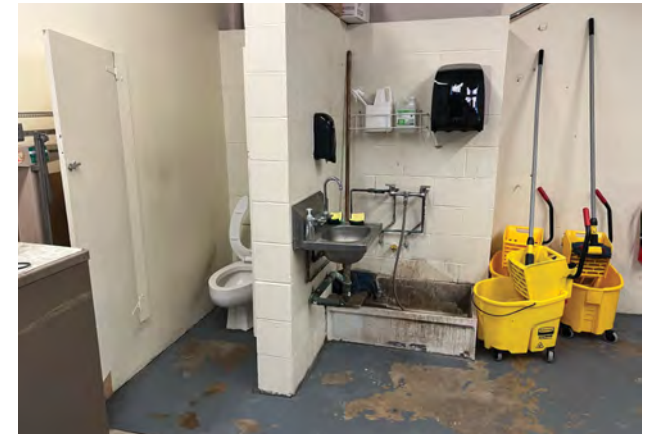
Most of the sanitary drainage piping is concealed from view; however what we were able to see was a mix of the cast iron hub & spigot and no-hub type. The sanitary sewer lines run below the slab and exit the building to a municipal sewer system.

Roof storm water is drained via roof drains connecting to internal leaders. The lines presumably exit to a municipal storm water system. The building does not appear to have any emergency roof overflow drains. These are required by current code as a clogged drain can lead to water build-up on the roof and structural failure due to weight. During any reroofing project or building upgrade we highly recommend emergency roof drains be added. The emergency drains should be added near the current roof drains and run to discharge to the side of the building. The visible discharge location is required as it gives users an indication of a failed main drain system.

Besides those items noted herein and elsewhere in this report, we noticed no other outward signs of failure in either the sanitary sewer system or the storm drainage system during our site inspection.

Natural Gas Service | ● Good

A natural gas service enters the building in a lower-level boiler room of the older portion of the building. The gas line enters as a 4" low pressure service and supports the building loads. The service feeds the gas loads in the building, which include the heating boilers and the domestic hot water heater for the older 3-story section of the building.



Calvin Coolidge School | HVAC

Boiler Plant | ● Fair

The heating needs for the building are supported by two (2) HB Smith #3500 Mills series cast iron section boilers. The boilers are fitted with Power Flame dual fuel gas/oil burners. The boilers have a manufacture year of circa 1984. Each boiler has a rated input capacity of 3,080,000 BTUH. The condition and type of the fuel oil tank is unknown, but it is suspected it is not of the double wall type as there are no signs of an interstitial leak detection monitoring system. According to facility personnel, they only use natural gas and there are future plans to remove the underground fuel oil supply tank(s). Estimated size of the tank is 2,000 GPM based on an old fuel level gauge.

The boilers, at 38 years of age, have exceeded their useful expected service life of 30-years according to ASHRAE. A plan to replace these boilers in the near future is recommended. The domestic hot water heaters should be replaced with high efficiency condensing gas-fired style.

Piping Distribution System | ● Fair

Hot water from the heating plant is distributed to the building via a two-pipe hot water supply and return distribution system. The hot water system circulates hot water to air handlers, fin-tube radiation and classroom unit ventilators units located throughout the older three-story section of the building. This hydronic system was installed circa 1984. The 1969 addition section of the building has no hydronic heating system as it is heated by electric-based systems.

There are two (2) constant speed heating pumps located adjacent to the boilers and are piped and controlled in a lead/stand-by configuration. The pumps are in good condition and relatively new being installed circa 2020.

Ventilation, Exhaust, & Miscellaneous HVAC | ● Good / ● Fair

Classroom unit ventilators are located throughout the classroom segments of the building as well as in the cafeteria. These units are located along exterior walls, and each has an outdoor air louver and associated control dampers to allow outdoor air to enter the classroom space through the unit ventilator. During occupied periods, the unit fans run continuously to provide space ventilation.

The unit ventilators in the older three-story building section are fed with hot water and have electric valves which modulate hot water flow through the units to maintain space temperature. The unit ventilators located in the addition portion of the building have multi-stage electric heaters which stage to support the heating needs of the space. The unit ventilators in both sections of the building are manufactured by Trane. Classroom exhaust in much of the building is supported by a centralized exhaust fans located on the building roof. In most cases the fans serve multiple rooms and are of the fixed speed and volume type.



Calvin Coolidge School | HVAC

A majority of the non-classroom areas of the building, such as the interior rooms and the gym, are served by ducted heating, ventilation units complete with fan section, filter sections, and either electric heat sections (in addition portion) or hydronic coil sections (in three-story older building portion). The following air handlers and the spaces they serve are as follows:

- MAU located in storage room adjacent to kitchen serves the 100% outdoor air needs of the kitchen space when the kitchen hood is enabled.
- AHU located in storage room adjacent to kitchen serves the heating and ventilation needs of the gymnasium space.
- AHU located in a lower-level storage room of the 3-story section of the building serves the heating and ventilation needs of the interior spaces of this structure.

A packaged rooftop gas-electric rooftop unit installed circa 2010 serves the library space and adjoining teacher's room. The unit has a cooling capacity of 6-tons and appears to be in fair condition.

It is recommended to replace all unit ventilators and air handlers. Coils should be sized for low temperature (140F or less) hot water. This lower temperature hot water will maximize efficiency of the condensing gas boilers as well as also allow opportunity for possible future implementation of air to water heat pumps to assist the building hydronic heating loop. Additionally, evaluation and consideration could be given to either extending the hydronic heating system into the electrically heated portion of the building or replacing these electric based systems with a heat pump style systems.

The systems appear to be configured to supply the code-required ventilation levels required at the time of its construction, many of which comply with current ventilation standards. However, further review would be required, especially for the art room(s) which require higher outdoor air ventilation and exhaust rates when compared to normal classrooms. It is also recommended to incorporate energy recovery ventilation systems on new and supplemental systems where feasible.

The kitchen hood over the oven equipment appears to miss compliance with current NFPA 96 and IMC standards based on the use of improper style grease filters. However, if the hood is just used for heat capture with no grease producing cooling equipment under it, these type filters are not required. Review of the ductwork above the ceiling as well as the fan on the roof would be required to further review compliance. The hood has no chemical-based suppression system which is not needed with the current cook-line arrangement, but would be required if a range top or other equipment requiring such were installed under the hood.



Calvin Coolidge School | HVAC

All restrooms appear to have ducted exhaust systems. The systems connect to exhaust fans located on the roof.

A majority of the air handlers, exhaust fans and classroom unit ventilators are well past the end of their useful service life of 20 to 25 years as defined in ASHRAE and as such are prime candidates for replacement in the coming years.

Controls | ● Good

The building appears to have a building-wide DDC energy management system throughout. The system is manufactured and supported by Johnson Controls. Sequences should be reviewed further as additional indoor air quality and energy-saving routines may be possible.



Calvin Coolidge School | Electrical

Service | ○ Poor

The building is served by two electrical services. The electrical service for the original building is rated 1600 amperes, 480/277 volt, 3-phase, 4-wire; and the electrical service for the modular building is rated 400 amperes, 480/277 volt, 3-phase, 4-wire. The service consists of a utility company pad-mount transformer on the exterior of the building and underground feeds to the electrical service equipment. The electrical distribution equipment is by FPE and ITE. Equipment by both FPE and ITE is no longer being manufactured.

Electrical service equipment should be replaced. Additionally, the electrical room does not have two means of egress. In order to have a single means of egress, the working clearance should be doubled with non-obstructed egress path; this condition is not met. The code requires electrical rooms with equipment rated 1200A or more to have egress doors with panic hardware. The existing door does not have panic hardware.

Normal Distribution | ○ Poor

The panelboards in the building are by FPE and ITE. The panelboards are located throughout the building in electrical rooms and are circuit breaker type. The branch circuit panelboards by both are past their useful life, the distribution equipment is no longer being manufactured or supported. Several different types of wiring methods were observed namely wires in raceway, metal clad (MC) cable, and armored cable (AC). Electrical distribution equipment should be replaced.

General Purpose Power | ○ Poor

The general-purpose power in the building is inadequate. The classrooms have inadequate number of receptacle outlets. Additional outlets have been installed in some rooms over the years in surface raceways. New wiring devices and branch wiring is recommended.

Emergency/Standby Power | ○ Poor

The building does not have an emergency/standby generator.

Egress & Exit Lighting | ○ Poor

The egress and exit lighting are through battery-powered exit signs and emergency lighting units. ART observed that emergency lighting was not installed at all the exit discharge leading to a public way. The overall coverage of emergency lighting and exit signs appears to be inadequate. Emergency egress and exist lighting in compliance with 780 CMR should be provided.



Calvin Coolidge School | Electrical

Lighting & Controls | ○ Poor

The ambient lighting system in the building consists of various types of fixtures (recessed, surface, pendant, etc.) primarily with fluorescent lamps. The lighting system is inefficient and does not meet current energy codes. Lighting control is primarily by wall mounted switches. Automatic control of lighting is not provided. Networking lighting controls including occupancy, vacancy, and daylight sensors should also be provided.

Telecommunications Cabling Infrastructure | ● Fair

The telecommunications system comprises mostly of Category 5e cables for data and voice communications. The system appears to meet the current programming needs of the facility.

The data communications equipment is by Cisco. Wi-Fi access points by Aerohive have been provided in the building. The voice communications equipment is NEC Univerge SV 9300 with digital handsets. Telecommunications infrastructure that complies with current BICSI standard should be provided.

Fire Alarm System | ○ Poor

The fire alarm system is a conventional 12-zone fire alarm panel by FCI. The system is tone-visual type. The fire alarm does not comply with current codes. The initiating and visual signaling devices are inadequate and do not comply with NFPA-72 standards. The height and location of manual pull stations do not comply with current codes. An addressable voice evacuation fire alarm system in compliance with 780 CMR and NFPA-72 should be provided.

Public Address (PA) and Clock Systems | ● Fair

PA Speakers are located in public and common areas as well as in classrooms. The PA and clock systems appear to be in good working condition and meet the current programming needs. The PA system is Telecenter by Rauland Borg.

Audio-Video Systems | ● Fair

Short throw projectors are provided in classrooms. Local sound systems are provided in the cafeteria/gym. Hand-held radios are by Motorola. The existing system is operational and meets current programming needs.

Video Surveillance & Access Control | ● Fair

The video surveillance system is by Exacq with Axis cameras. The access control system is by Brivo. Card readers are provided at the exterior door entries. Building entry is through Aiphone video entry station. The existing systems are operational and meet current programming needs.



Calvin Coolidge School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Site

Size & Configuration		◐	
Adjacent Land Use	●		
Vehicular Access			○
Pedestrian Access		◐	
Topography	●		
Soils & Wetlands	●		
Utilities/Service Areas	●		
Recreation Area/Community Use	●		
Parking/Walkways/Curbs/ Sidewalks/Drainage		◐	○
Landscape Features	●	◐	
Site Furnishings	●	◐	
Accessibility			○

Building

Exterior Walls		◐	○
Roof Systems		◐	
Doors & Windows		◐	
Interior Finishes		◐	
Accessibility		◐	○
Means of Egress		◐	
Structural System		◐	
Hazardous Materials		◐	
Modular Classrooms		◐	○

Fire Protection

Service			○
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Calvin Coolidge School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Plumbing

Fixtures		◐	○
Cold Water Service		◐	
Domestic Hot Water Service		◐	
Drainage Systems		◐	
Natural Gas Service		◐	

HVAC

Boiler Plant		◐	
Piping Distribution System		◐	
Ventilation, Exhaust, & Miscellaneous HVAC	●	◐	
Controls	●		

Electrical

Service			○
Normal Distribution			○
General Purpose Power			○
Emergency /Standby Power			○
Egress & Exit Lighting			○
Lighting & Controls			○
Telecommunications Cabling Infrastructure		◐	
Fire Alarm System			○
Public Address (PA) and Clock Systems		◐	
Audio-Video Systems		◐	
Video Surveillance & Access Control		◐	

Floral Street School | Facility Overview

Address: 57 Floral Street, Shrewsbury, MA 01545
Zoning: Residence A / Residence B-1
Gross Square Footage: ± 93,500 sq.ft.
Assessed Value 2021: \$19,174,900 [Building Only]
Lot Size: ± 38.62 acres
Constructed/Renovated: 1997
Modulars: N/A
Construction Type: II-B
Grade Configuration: K-4
Current Enrollment: 508

Overview

Floral Street School is located in the eastern portion of town on Floral Street. This neighborhood school serves a current population of 508 students in grades K-4.

The original building configuration has not been altered in any way since it was constructed. The building consists of three distinct levels: ground floor, first floor, and second floor. The main entry located on the southern-facing elevation provides direct access to the first floor, which houses all the major core spaces. The upper floor and lower portion of the first floor are accessible via an elevator off the main corridor leading into the academic wings.

The building's overall condition is good for a facility that is now over 25 years old and has served the town well during this time.



Floral Street School | Existing Site Plan



Floral Street School | Site Review

Size & Configuration | ● Good

The overall plot has a good configuration. Its frontage is limited with several small access points along Floral Street, Honeysuckle Lane, Boston Drive, and Cooks Street, of which only the ones along Floral and Honeysuckle offering any meaningful/potential connection to a public right of way. The overall acreage of the site is good given the current enrollment.

Adjacent Land Use | ● Good

The school site is bordered by Residence A zones to the west and south and Residence B-2 zones to the north and east. All properties abutting the property are single-family residences.

Vehicular Access | ● Good

The main vehicular entrance is along Floral Street and is utilized by both buses and parents. During arrival and dismissal, parents are instructed to use the Honeysuckle entry to line up for drop-off and pick-up, which occurs on the paved play area to the east of the building. Parents will leave the site using either of the exits. This allows for buses to have uninterrupted access to the site from Floral Street to the bus loop located at the main entrance. There is not enough space for on-site queuing of parent cars during pick-up/drop-off. Currently, 68% of students take the bus to and from school while 27% are transported by their parents.

Pedestrian Access | ● Good

Pedestrian access to the site is good. All neighboring streets have sidewalks on both side of the road, allowing students safe passage from all directions to the site. There are crosswalks at each intersection leaving the site. Only 5% of the students walk to and from school.

Topography | ● Fair

The southern developed portion of the site slopes gently towards the north and traverses a full story change in grade through the use of walkways and outdoor learning spaces. From the rear of the building, the grade drops off even further to a low point before it start sloping up hill approximately 25 feet from northwest. The site is very low, sloping off to the north east.

Soils & Wetlands | ● Fair / ○ Poor

The site's soils within the developable area are characterized by Hinckley and Agawam soils, which are best described as excessively drained [see soils mapping in the Appendix]. There is a stream and associated wetlands that run east-west through the middle of the parcel that limit any opportunity to expand the facility to the north or west.



Floral Street School | Site Review

Utilities/Service Areas | ● Good

The school is well served by municipality-owned water, sewer, electric, and internet. The mechanical systems run off of natural gas. The building does have a convenient service area that includes a loading dock to provide deliveries to the building.

Recreation Areas/Community Use | ● Good / ◐ Fair

The school's playground, play field, and basketball hoops are utilized by the neighborhood community outside of school hours and are in good to fair condition. There are damaged/missing components of the playground structures.

Parking/Walkways/Curbs/Sidewalks/Drainage | ◐ Fair / ○ Poor

There is sufficient parking for staff and visitors to support daily operations. However, the site has limited capacity in respect to special events and relies on the paved play area and street parking. There are several pedestrian walkways throughout the site consisting of concrete, pavers, and asphalt. Overall condition of these features is fair to poor. The site appears to have sufficient drainage given its current configuration.

Landscape Features | ● Good

The site landscaping would be best characterized as mature and well-established. There is a student garden area with raised beds that appears to be well-maintained.

Site Furnishings | ● Good / ◐ Fair

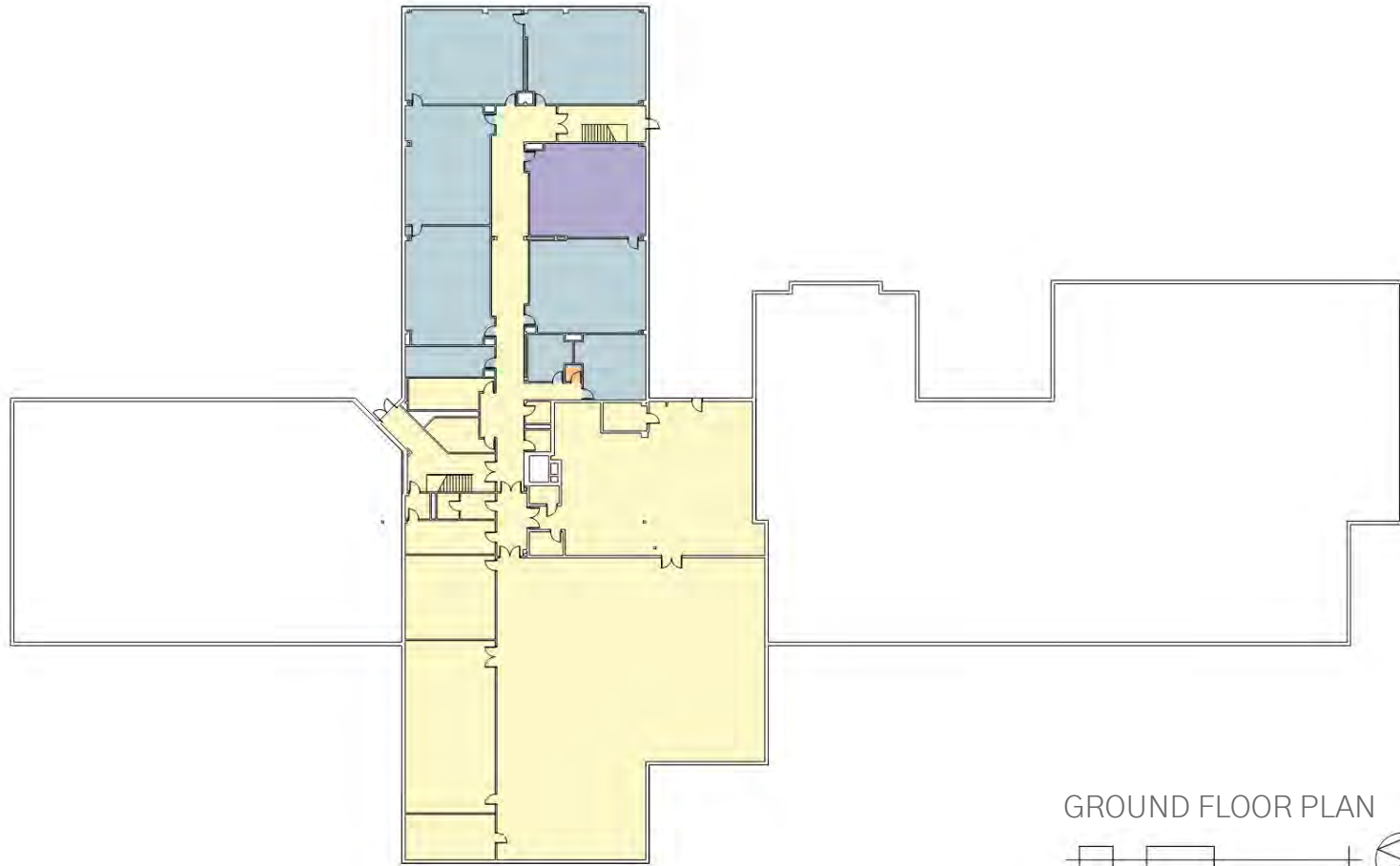
There are several site furnishings located on the site, including trash receptacles, benches, signage, flag pole, and bicycle racks. These site furnishings are in good to fair condition, given their age.

Accessibility | ◐ Fair / ○ Poor

As previously reported, there are several deficiencies regarding the site's accessibility. There is a lack of accessible routes to exterior amenities [running/cross slopes/maintenance]. The following items do not meet the current accessibility guidelines: playground [surface/route], amphitheater [slopes], multipurpose field [route], garden [route], benches [route], van parking [not provided], and handrails/landings [not provided].



Floral Street School | Existing Building Plans



LEGEND

NET FLOOR AREA

- ACADEMIC
- CORE
- ADMINISTRATIVE

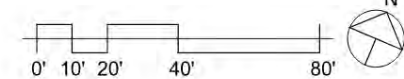
GROSS FLOOR AREA

- NON-PROGRAMMED

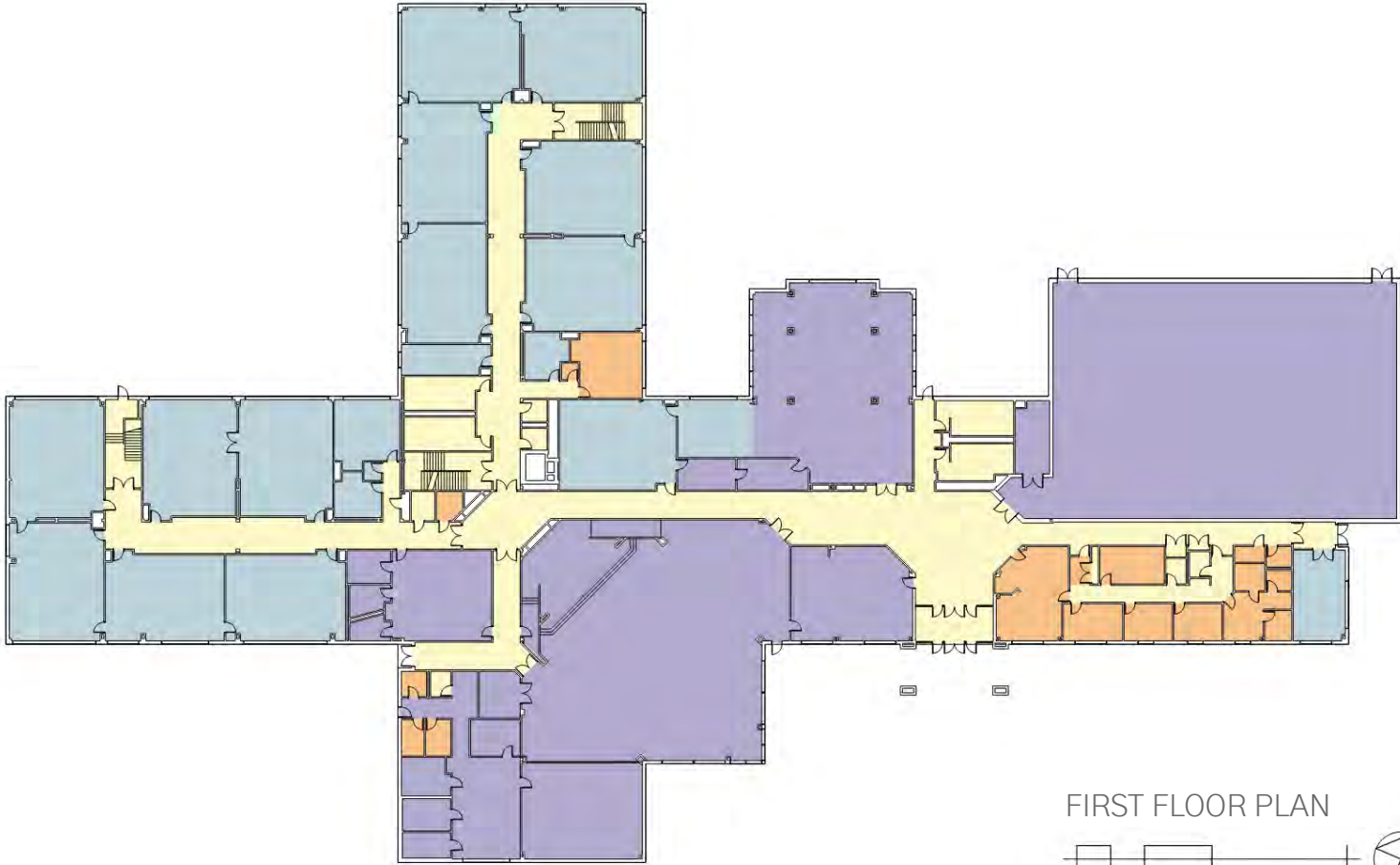
EXCLUDED AREA

- MODULAR/PORABLE

GROUND FLOOR PLAN



Floral Street School | Existing Building Plans



LEGEND

NET FLOOR AREA

- ACADEMIC
- CORE
- ADMINISTRATIVE

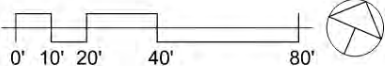
GROSS FLOOR AREA

- NON-PROGRAMMED

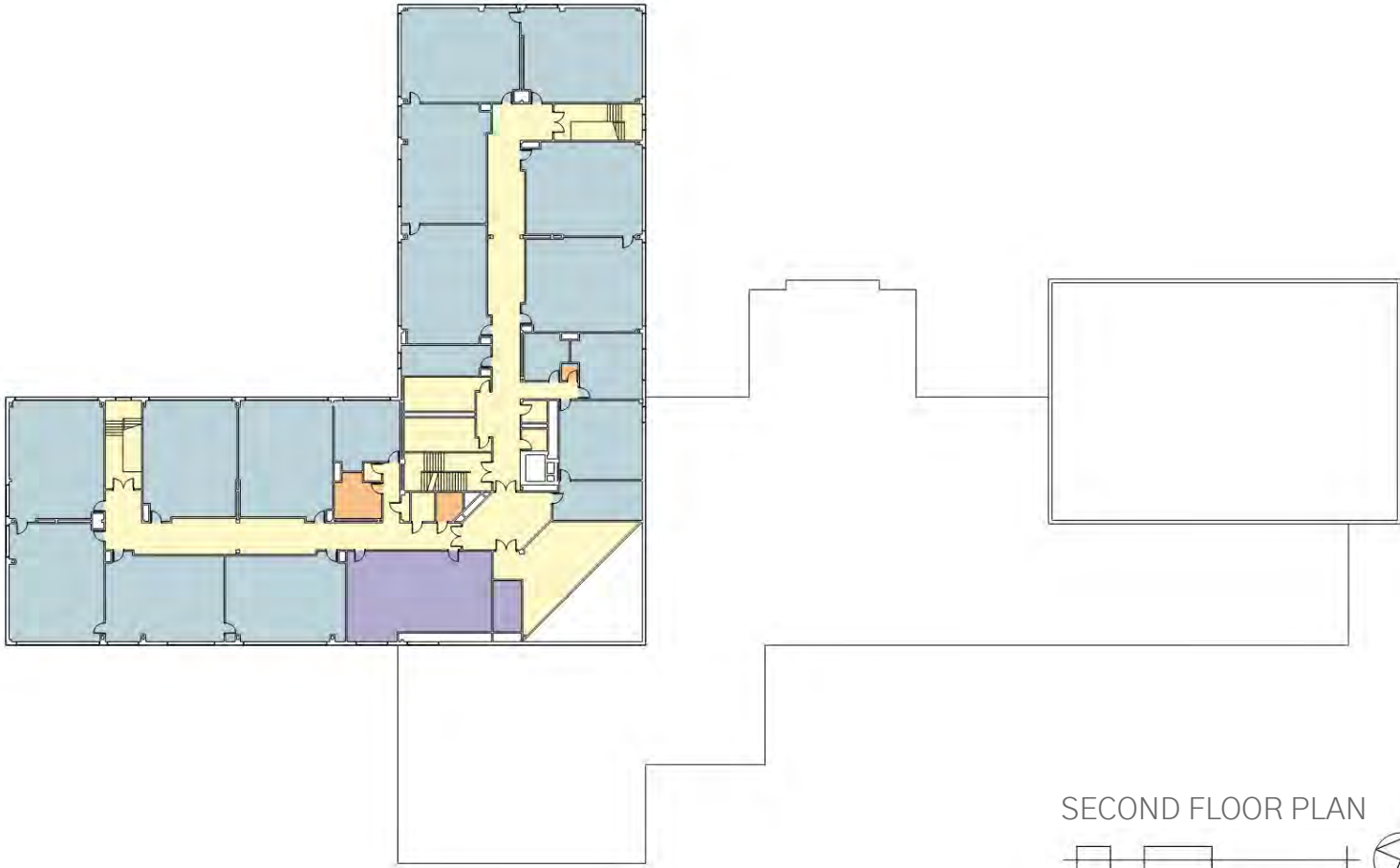
EXCLUDED AREA

- MODULAR/PORABLE

FIRST FLOOR PLAN



Floral Street School | Existing Building Plans



LEGEND

NET FLOOR AREA

- ACADEMIC
- CORE
- ADMINISTRATIVE

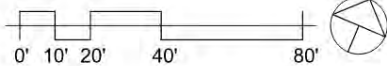
GROSS FLOOR AREA

- NON-PROGRAMMED

EXCLUDED AREA

- MODULAR/PORTABLE

SECOND FLOOR PLAN



Floral Street School | Existing Building Plans

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Floral Street School | Building Review

Exterior Walls | ● Good / ◐ Fair

The exterior walls consist of brick masonry, cast stone, and fiberglass-reinforced polymer panels. As previously reported, the exterior joints where sealant was used have failed. LPA|A observed some replacement/repairs of these joints, but many still require attention. The brick masonry requires repointing/resetting/re-anchoring of bricks at several locations to ensure the envelope is watertight. There are some smaller concrete repairs that are also required to prevent further deterioration.

Roof System | ◐ Fair / ○ Poor

The roof is comprised of asphalt shingles. Based on previous reports, the roofing has several deficiencies, including cracking, granule loss, broken/missing shingles, and exposed/face nailed shingles. Isolated damage should be repaired in the interim. The roof has reached the end of its useful life and is currently scheduled for replacement.

Door & Windows | ● Good / ◐ Fair

The building consists of aluminum-framed windows and hollow metal doors and frames. The doors and windows are in good-to-fair condition with the exception of failed sealants and some hardware adjustments. The sealants should be replaced and maintained through a comprehensive maintenance plan.

Interior Finishes | ● Good / ◐ Fair

The interior walls consist mostly of painted gypsum walls. Toilet rooms and areas of high abuse have ceramic wall tile finish. These walls are all in good condition and provide good acoustical separation between spaces. The ceiling primarily consists of acoustical ceiling tiles with some gypsum ceilings, all of which are in good condition. The flooring consists of vinyl composite tile, ceramic tile, and carpet, which have been well maintained and/or replaced since the building has opened. The items that have the most amount of wear on them are the doors, cubbies, and millwork, which are all original to the building. The millwork additionally had some significant delamination of wood veneers due to cleaning products used during the COVID-19 pandemic.

Accessibility | ● Good / ◐ Fair

As previously reported, there are several deficiencies regarding the building's accessibility. The following items do not meet the current accessibility guidelines: classroom sinks [non-accessible], signage [accessible means of egress], coat hooks [height] protrusions along accessible routes, reception desk [non-accessible], media center computer [non-accessible], and drinking fountains [standing user height].



Floral Street School | Building Review

Means of Egress | ● Good / ○ Fair

There are sufficient means of egress serving the building. The egress paths themselves have several items that do not meet the requirements of the current code, including fire/smoke rating compliance and the use of wired glass.

Structural System | ● Good / ○ Fair

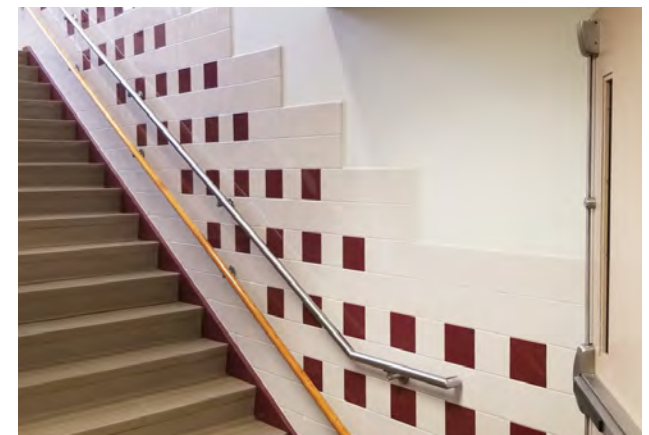
The main structural system consists of a wide-flange steel frame with concrete floor slabs and frost walls. There appears to have been some settling in certain areas that should be investigated and remediated prior to any masonry repairs.

Hazardous Materials | ● Good

The potential for any asbestos-containing materials within the building is unlikely given the age of the building. There are several other items that may require special disposal, including light fixtures, light ballasts, hydraulic door closers, and exit light batteries.

Modular Classrooms

There are no modular classrooms at this facility.



Floral Street School | Fire Protection

Service | ● Good

The fire suppression system serving the building is a wet pipe system which provides essentially complete coverage throughout the building.

There is a 6” main sprinkler water service which enters the building’s lower-level mechanical room. The 6” pipe runs through supervised valves, a double check style backflow preventer, and an alarm check valve prior to serving the building.

There is a dual port Siamese style fire department connection provided on the exterior wall of the building. In addition, we noted 2.5” standpipe hose valves located in the egress stair(s).

The kitchen hood did have chemical-based suppression over equipment requiring such.

In general, the building’s fire sprinkler coverage appears to be fairly comprehensive and compliant with current code.

Where quick response type sprinklers are utilized, testing and/or replacement will be required for these types of sprinklers at 25 years of age. The current age of the sprinklers is approximately 25 years.



Floral Street School | Plumbing

Fixtures | ● Good

The existing building's plumbing systems appear adequate in quantity for the current occupancy. Due to the building's age being 25 years, most restrooms do comply with ADA/MAAB requirements for accessible fixtures.

Existing water closets are primarily of the wall-hung flush valve type. Urinals are of the wall-hung type and lavatories are of the wall-hung and counter style with either two-handle or single-lever handle faucets, many of which are of the metered style. Most fixtures do appear to comply with current codes and standards.

Many public use lavatory sinks have metered (self-closing) faucets as required by code. In addition, many appear to have limit stops to ensure hot water does not exceed 110°F for scald prevention. There was a bucket placed under one lavatory sink to address an active leak.

Several of the classrooms have sinks, some of which are ADA-compliant.

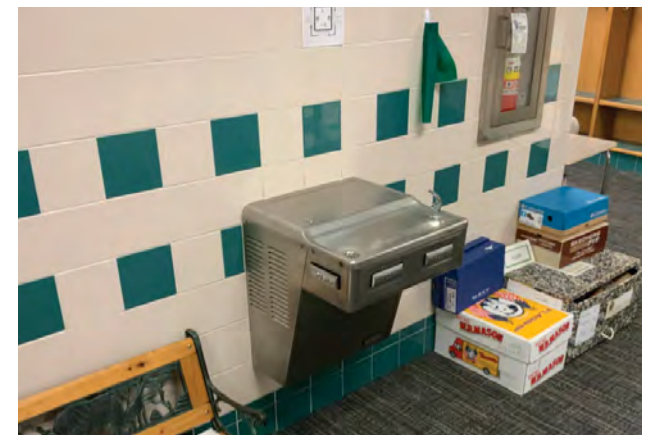
The main kitchen appears to have at least the minimum configuration and number of fixtures to satisfy current code and Board of Health requirements for a commercial kitchen. The fixtures consist of a three-bay pot sink which appears to connect to a grease trap, a two-bay prep sink, and one (1) hand sink. A dishwasher room had two (2) sinks and a hand sink. The dishwasher equipment was covered in storage boxes and may not be actively used. The prep sink is directly wasted and would require an indirect waste connection to comply with current code.

There are several ADA-compliant wall-mounted water cooler drinking fountains (both non-electric and electric) located throughout the building.

Janitor sinks inspected during our walk-through had faucet trim with vacuum breakers to limit backflow contamination caused by siphonage. Based on the age of the building we expect that all are code compliant.

Most of the fixtures are of the water-saving type for the code enforced at the time of the building's construction. Apparently, maintenance is routinely performed on faucets, toilet flush valves, etc. as needed.

As renovations occur, the following items should be considered: replace all flushometers/faucets with



Floral Street School | Plumbing

automatic low flow flushometers/faucets.

Cold Water Service | ● Good

A 4" cold water line enters the building in a lower-level mechanical room. The service splits and runs through two (2) water meters prior to feeding the building domestic water and irrigation needs. The irrigation feed has one backflow preventer and the building domestic water main has two (2) parallel backflow preventers. There is also a pressure reducer located on the domestic water supply main.

We noted most of the piping in the building appears to be copper, and, based on its age, should be in good condition; however, this can vary based on water quality. We recommend a pipe sample from both the cold and hot water system be taken to verify pipe condition.

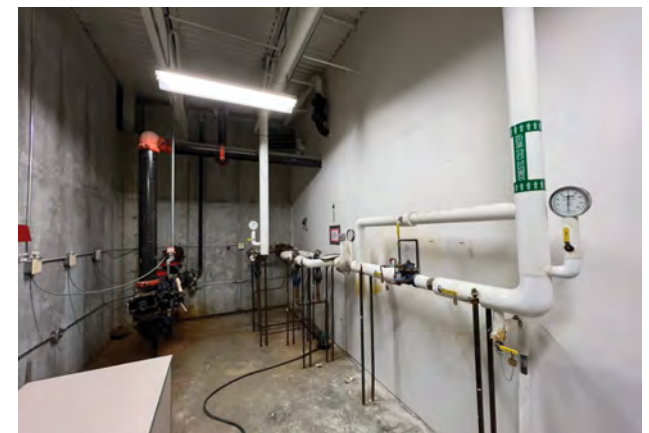
Domestic Hot Water Service | ○ Fair

The domestic hot water needs of the building are supported by a gas-fired tank style water heater. The water heater is a 100-gallon, 199,000 BTUH input gas-fired unit as manufactured by the American Water Heater Company, manuf. date 5/2010. The unit appears to have been installed in July of 2010.

The water heater has no active signs of leakage; however, it has exceeded its useful expected service life at over 10 years of age and as such should be considered a candidate for replacement in the near future.

There is a high/low mixing valve station as manufactured by Leonard on the main hot water supply which serves most of the building fixtures. It appears there may be a higher temperature water line that runs to the kitchen for dishwash use. Current code would require differing water temperatures at different types of fixtures. Lavatory sinks and showers must not discharge hot water at a temperature exceeding 110–112°F for safety reasons, whereas service fixtures (janitor's sinks, kitchen sinks, etc.) are required to have hot water temperatures in excess of 120°F for sanitation reasons. The current system appears to supply a single temperature water to the building. After that, proper water supply to lavatories and showers should be accomplished by local mixing valves and/or fixtures with appropriate mixing limit stops. It appears the domestic hot water storage tanks are kept at approximately 140°F which is essential to prevent the possibility of bacteria growth within the tanks. It is recommend that the central mixing valve should be replaced with an electronic type.

There is one recirculation pump on the domestic hot water system, which is required per the current plumbing code since there are fixtures located beyond 100 feet of the hot water source. The domestic hot water heaters should be replaced with high efficiency condensing gas-fired style.



Floral Street School | Plumbing

Drainage Systems | ● Good

Most of the sanitary drainage piping is concealed from view; however what we were able to see was primarily of the cast iron no-hub type. The sanitary sewer lines run below the slab and exit the building to a municipal sewer system.

Roof storm water is drained via roof drains connecting to internal leaders. The lines presumably exit to a municipal storm water system. The building does not appear to have any emergency roof overflow drains. These are required by current code as a clogged drain can lead to water build-up on the roof and structural failure due to weight. During any reroofing project or building upgrade, we highly recommend emergency roof drains be added. The emergency drains should be added near the current roof drains and run to discharge to the side of the building. The visible discharge location is required as it gives users an indication of a failed main drain system.

Besides those items noted herein and elsewhere in this report (bucket under lavatory sink), we noticed no other outward signs of failure in either the sanitary sewer system or the storm drainage system during our site inspection.

Natural Gas Service | ● Good

A natural gas service enters the buildings in the lower-level mechanical room. The service is a 4" main and feeds the gas loads in the building which include the heating boilers, domestic hot water boilers and kitchen cooking loads.



Floral Street School | HVAC

Boiler Plant | ● Fair

The heating needs for the building are supported by two (2) Cleaver Brooks #CB-200 fire-tube dual fuel gas/oil fired boilers with a manufactured year of 1996. Each boiler has a rated input capacity of 4,185,000 BTUH. According to facility personnel, the underground fuel oil supply tank(s) were removed in 2019 and as such the boilers only operate on natural gas.

According to ASHRAE, the life expectancy of these types of boilers is 25 years, although with proper maintenance they have been known to operate for a longer service life. A 5+ year plan to replace these boilers is recommended. Although the boilers are in fair working order, when the time comes to replace them, consideration could be given to replacement with high-efficiency condensing style boilers.

Piping Distribution System | ● Fair

Hot water from the heating plant is distributed to the building via a 2-pipe supply and return distribution system. The hot water system circulates hot water to air handlers, fin-tube radiation and classroom unit ventilators units located throughout the building.

The pumps and their current service are as follows:

- P-1 & P-2: (lead/stand-by) constant speed hot water loop; Taco FE251 base mounted end-suction-style.
- P-3 & P-4: (lead/stand-by) constant speed hot water loop; Taco FE301 base mounted end-suction-style.
- P-5 & P-6: constant speed boiler primary loop; Taco vertical in-line style.

The pumps are all manufactured by Taco and appear to be in fair operational order with signs of bearing assembly and motor replacement. Some pumps do show signs of external corrosion. Except for the boiler primary pumps which appear to have been recently replaced, all the pumps are at the end of their useful service life of 20-years as defined in ASHRAE and as such are prime candidates for replacement in the coming years.

Ventilation, Exhaust, & Miscellaneous HVAC | ● Good / ● Fair

Classroom unit ventilators are located throughout the classroom segments of the building. These units are located along exterior walls and each has an outdoor air louver and associate control dampers to allow outdoor air to enter the classroom space through the unit ventilator. During occupied periods, the unit fans run continuously to provide space ventilation and electric valves modulate hot water flow through the units to maintain space temperature. The unit ventilators are manufactured by Trane. Classroom exhaust in much of the building is supported by a centralized exhaust fans located on the building roof. In most cases the fans serve multiple rooms.



Floral Street School | HVAC

As unit ventilators and air handlers are replaced, it is recommended that coils be sized for low temperature (140°F or less) hot water. This lower temperature hot water will maximize efficiency of the condensing gas boilers and also allow opportunity for possible future implementation of air to water heat pumps to assist the building hydronic heating loop.

A majority of the non-classroom areas of the building such as the gym, cafeteria, etc. are served by ducted heating, ventilation units complete with fan section, filter sections and hydronic coil sections. For areas where air conditioning is supplied, such as the administration area, media center and computer room, the units also have DX cooling coils connecting to exterior remote air cooled condensers.

The systems appear to be configured to supply the code-required ventilation levels required at the time of its construction, many of which comply with current ventilation standards. However, further review would be required, especially for the science, art and woodworking spaces, all of which require higher outdoor air ventilation and exhaust rates when compared to normal classrooms.

It is recommended to incorporate energy recovery ventilation systems on new and supplemental systems where feasible.

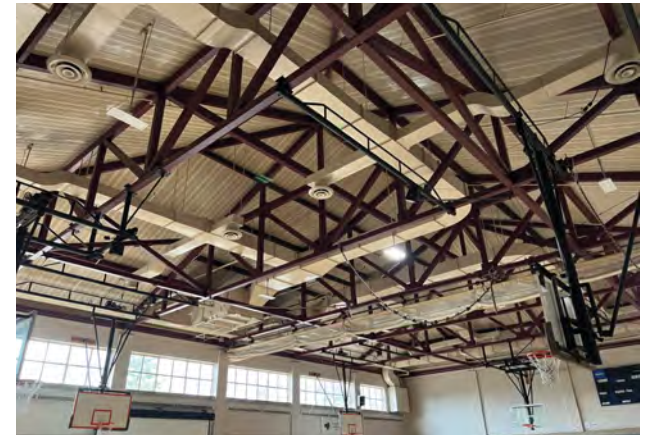
The kitchen hood over the range and oven equipment appears to comply with current NFPA 96 and IMC standards. A chemical-based suppression system is provided over the cooking equipment requiring such.

All restrooms have ducted exhaust systems. The systems connect to exhaust fans located on the roof.

A majority of the air handlers, exhaust fans, classroom unit ventilators and the like are at the end of their useful service life of 20 to 25 years as defined in ASHRAE and, as such are prime candidates for replacement in the coming years.

Controls | ● Good

The building appears to have a building-wide DDC energy management system throughout. The system is manufactured and supported by Siemens. The controls appear to incorporate many energy saving routines such as demand ventilation reset based on CO2 sensors as well as intelligent recovery. Sequences should be reviewed further as additional indoor air quality and energy-saving routines may be possible.



Floral Street School | Electrical

Service | ● Good

The electrical service for the building is rated 1600 amperes, 480/277 volt, 3-phase. The service consists of a utility company pad-mount transformer on the exterior of the building and underground feeds to the electrical service equipment. The electrical distribution equipment is by General Electric. The main switchboard feeds 277/480V panelboards throughout the building as well as a 500KVA transformer located in the main electrical room. The transformer feeds a 1600A 120/208V switchboard which feeds 120/208V panels throughout the building. Maintenance of the switchboard is recommended by the manufacturer and NETA.

Normal Distribution | ● Good

The panelboards in the building are by General Electric. The panelboards are located throughout the building in electrical rooms and are circuit breaker type. Several different types of wiring methods were observed, namely wires in raceway, metal clad (MC) cable, and armored cable (AC). Maintenance of the panel boards is recommended by the manufacturer and NETA.

General Purpose Power | ○ Poor

The general-purpose power in the building is inadequate. The classrooms have inadequate number of receptacle outlets. Additional outlets have been installed in some rooms over the years in surface raceways. It is recommended to provide new wiring devices and branch wiring.

Emergency /Standby Power | ● Fair

The emergency/standby generator is rated 150kW/125kVA, 480/277V, 3-phase, 4-wire, manufactured by Superior. The generator fuel is diesel. The generator feeds an automatic transfer switches (ATS) for life safety and standby power loads. The life safety ATS is located in a 2-hour rated emergency electrical room. The emergency distribution feeds both life safety and standby loads. This does not comply with current codes. It is recommended to provide separate life safety and standby branches with separate transfer switches and distribution. Locate the life safety branch transfer and distribution equipment in 2-hour rated room.

Egress & Exit Lighting | ● Good

The emergency egress and exit lighting are powered from the life safety branch fed by the generator. The overall coverage appears to be adequate; ART could not confirm whether the exit discharge leading to a public way was powered from the life safety branch. The existing signs are self-contained battery type; the overall coverage of exit signs appears to be adequate.



Floral Street School | Electrical

Lighting & Controls | ○ Poor

The ambient lighting system in the building consists of various types of fixtures (recessed, surface, pendant, etc.) primarily with fluorescent lamps. The lighting system is inefficient and does not meet current energy codes. Lighting control is primarily by wall-mounted switches and occupancy sensors. An ambient light system consisting of LED light fixtures should be provided. Networking lighting controls including occupancy, vacancy, and daylight sensors should also be provided.

Telecommunications Cabling Infrastructure | ● Fair

The telecommunications system is comprised mostly of Category 5e cables for data and voice communications. The system appears to meet the current programming needs of the facility.

The data communications equipment is by Cisco. Wi-Fi access points by Aerohive have been provided in the building. The voice communications equipment is NEC Univerge SV 9300 with digital handsets. Telecommunications infrastructure that complies with current BICSI standard should be provided.

Fire Alarm System | ● Fair

The fire alarm system is addressable with voice evacuation, fire alarm panel is FCI-7200. The fire alarm system appears to comply with current codes. The fire alarm system may require to be upgraded due to age. It is recommended to replace the initiating devices over 10 years old.

Public Address (PA) and Clock Systems | ● Fair

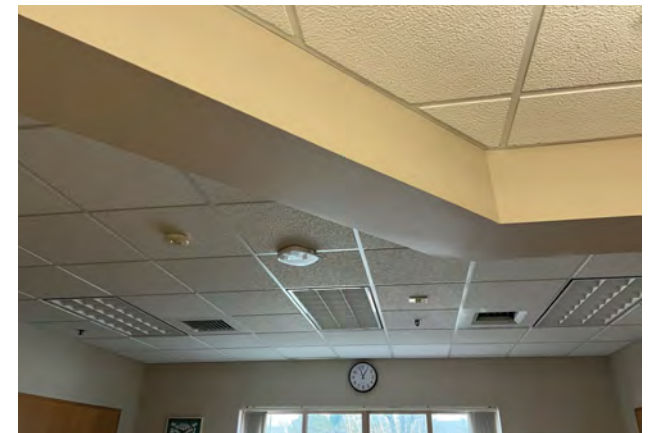
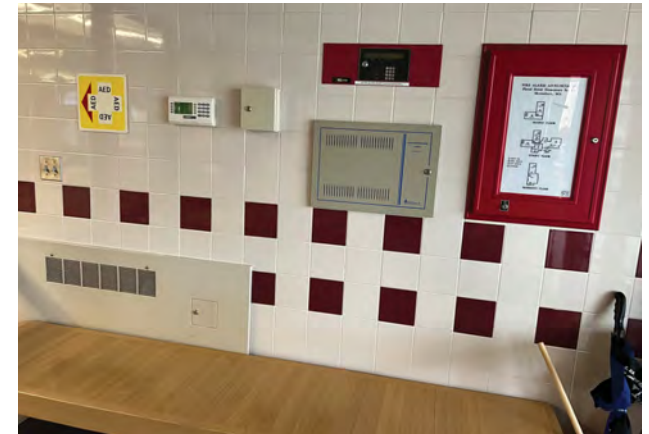
PA Speakers are located in public and common areas as well as in classrooms. The PA and clock systems appear to be in good working condition and meet the current programming needs. The PA system is Telecenter by Rauland Borg.

Audio-Video Systems | ● Fair

Short throw projectors are provided in classrooms.
Local sound systems are provided in the cafeteria/gym.
Hand-held radios are by Motorola.
The existing system is operational and meets current programming needs.

Video Surveillance & Access Control | ● Fair

The video surveillance system is by Exacq with Axis cameras. The access control system is by Brivo. Card readers are provided at the exterior door entries. Building entry is through Aiphone video entry station. The existing systems are operational and meet current programming needs.



Floral Street School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Site

Size & Configuration	●		
Adjacent Land Use	●		
Vehicular Access	●		
Pedestrian Access	●		
Topography		◐	
Soils & Wetlands		◐	○
Utilities/Service Areas	●		
Recreation Area/Community Use	●	◐	
Parking/Walkways/Curbs/ Sidewalks/Drainage		◐	○
Landscape Features	●		
Site Furnishings	●	◐	
Accessibility		◐	○

Building

Exterior Walls	●	◐	
Roof Systems		◐	○
Doors & Windows	●	◐	
Interior Finishes	●	◐	
Accessibility	●	◐	
Means of Egress	●	◐	
Structural System	●	◐	
Hazardous Materials	●		
Modular Classrooms			

Fire Protection

Service	●		
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Floral Street School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Plumbing

Fixtures	●		
Cold Water Service	●		
Domestic Hot Water Service		◐	
Drainage Systems	●		
Natural Gas Service	●		

HVAC

Boiler Plant		◐	
Piping Distribution System		◐	
Ventilation, Exhaust, & Miscellaneous HVAC	●	◐	
Controls	●		

Electrical

Service	●		
Normal Distribution	●		
General Purpose Power	●		
Emergency /Standby Power		◐	
Egress & Exit Lighting	●		
Lighting & Controls			○
Telecommunications Cabling Infrastructure		◐	
Fire Alarm System		◐	
Public Address (PA) and Clock Systems		◐	
Audio-Video Systems		◐	
Video Surveillance & Access Control		◐	

Spring Street School | Facility Overview

Address:	123 Spring St, Shrewsbury, MA 01545
Zoning:	Rural A
Gross Square Footage:	± 39,500 sq.ft.
Assessed Value 2021:	\$4,308,700 [Building Only]
Lot Size:	± 14.39 Acres
Constructed/Renovated:	1965
Modulars:	1995/2000
Construction Type:	II-B
Grade Configuration:	K-4
Current Enrollment:	297

Overview

Spring Street School is located in the northeast quadrant of the town on Spring Street. This neighborhood school serves a current population of 297 students in grades K-4.

The original building configuration has not been altered in any significant way except for the addition of an elevator, window replacement, and the addition of a total of 6 modular classrooms to the north side of the building in 1995 and 2000. The building consists of two distinct levels: first floor [split-level], and second floor. The main entry located on the west facing elevation provide direct access to the upper portion of the first floor, which houses all the major core spaces. The second floor and lower portion of the first floor are accessible via an elevator off the main lobby.

The building's overall condition is as expected for a facility that is now over 57 years old and has served the town well during this time.



Spring Street School | Existing Site Plan



Spring Street School | Site Review

Size & Configuration | ● Fair

The overall plot has a fair configuration, Best characterize as triangular in shape. It also has frontage Spring Street, Vista Place, and Lantern Lane. The overall acreage of the site is fair given the current enrollment.

Adjacent Land Use | ● Good

The school site is bordered by Residence B-1 use zones to the south and west. The east and north sides are comprised of Rural A use group. The property is abutted exclusively by single family residences with a large undeveloped lot along the eastern edge of the property

Vehicular Access | ● Fair / ○ Poor

The main vehicular entrance is off Spring Street and is shared by both buses and parents. Parent pick-up and drop-off is facilitated via the loop through the southern parking lot. Buses have a dedicated loop at the main entrance of the school. Spring Street is a narrow public way which is very hilly and curvy. There is not enough space for on site queuing of parent cars during pick-up/drop-off. Currently, 56% of students take the bus to and from school while 41% are transported by their parents.

Pedestrian Access | ● Fair

Pedestrian access to the site is fair. Spring Street has sidewalks going both east and west but only extend the next residential street and no further. There are three paths for students to gain access to the neighborhoods north of the school parcel. Only 3% of the students walk to and from school.

Topography | ● Fair

The site slopes down hill approximately 80 feet from northwest to southeast. The topography present challenges that will add to the overall site development cost were it to be expanded and developed.

Soils & Wetlands | ● Fair

The site is characterized by Paxton and Canton soils, which are best described as being very well-drained till with rock fragments [see soils mapping in the Appendix]. There is a stream that runs north-south through the eastern portion of the property, which would require further investigation to clearly delineate the limits; however, impact on potential development of the site to the east of the current building would be significant.



Spring Street School | Site Review

Utilities/Service Areas | ● Good

The school is well served by municipality-owned water, sewer, electric, and internet. The mechanical systems off of natural gas. The building does have a service area with a loading dock along the eastern side of the building to provide deliveries to the building.

Recreation Areas/Community Use | ● Good / ◐ Fair

The school's playground, play field, and basketball hoops are utilized by the neighborhood community outside of school hours and are in good condition. There is a basketball court in the wooded area to the north of the building that is no longer used since the addition of a new court at the southern portion of the site. There is a grass play area along the eastern side of the site that is accessed by traversing a ±16 foot change in grade. The one feature that is missing that many of the other schools have is a large open paved play area for students.

Parking/Walkways/Curbs/Sidewalks/Drainage | ◐ Fair / ○ Poor

There is sufficient parking for staff and visitors to support daily operations. However, the site has very limited capacity in respect to special events. There are several pedestrian walkways throughout the site. Overall condition of these features immediately around the building is fair. However the pedestrian pathways and court in the woods to the north are in poor condition. The site appears to have sufficient drainage given its current configuration, further development would likely require additional storm water measures.

Landscape Features | ● Good / ◐ Fair

The site landscaping would be best characterized as mature and well-established.

Site Furnishings | ◐ Fair

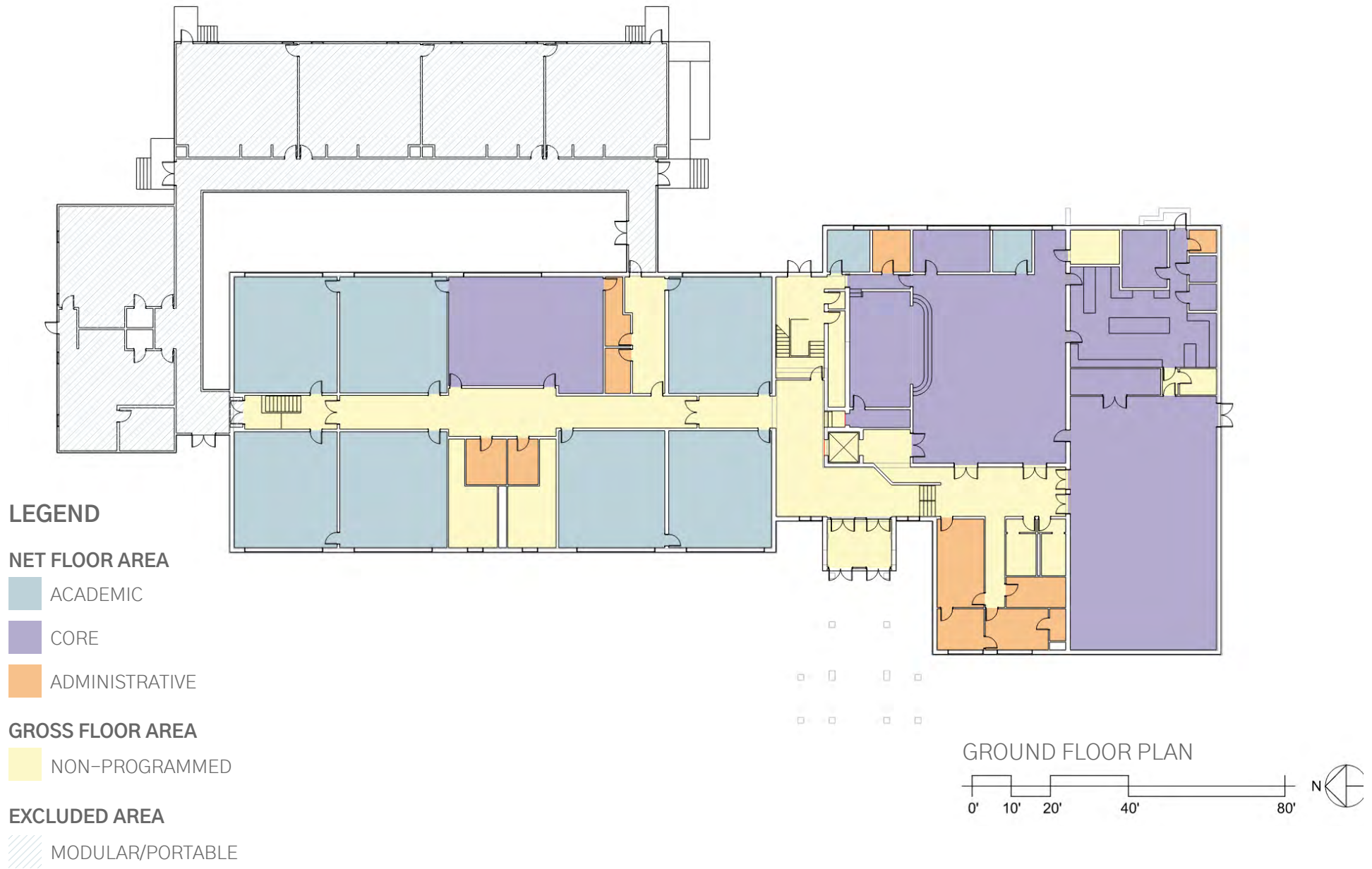
There are several site furnishings located on the site, including trash receptacles, benches, signage, flag pole, and bicycle racks. These site furnishings are in fair condition, given their age.

Accessibility | ◐ Fair / ○ Poor

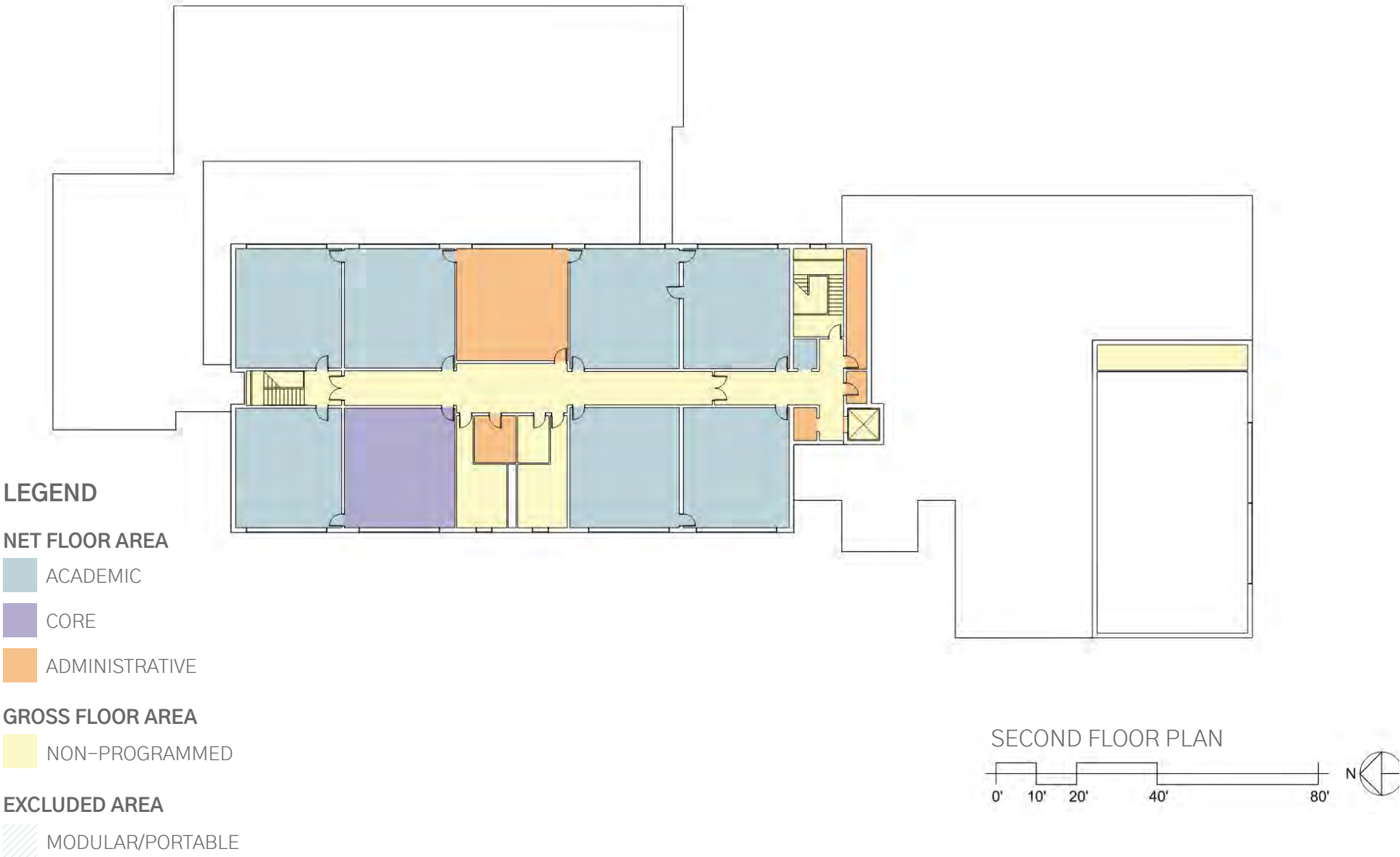
As previously reported, there are several deficiencies regarding the site. There is a lack of accessible routes to exterior amenities [running/cross slopes/maintenance]. The following items do not meet the current accessibility guidelines: playground [surface/route], open field [route], benches [route], parking signage [height], and handrails [not provided].



Spring Street School | Existing Building Plans



Spring Street School | Existing Building Plans



Spring Street School | Building Review

Exterior Walls | ● Fair

The exterior walls consist of brick masonry and stucco. As previously reported, several of the exterior joints where sealant was used have failed. LPA|A observed some replacement/repairs of these joints, but many still require attention. The brick masonry requires repointing/resetting/re-anchoring of bricks at several locations to ensure the envelope is watertight. Stucco panels at several locations require repairs/replacements due to deterioration. Corroded steel lintels have led to spalling/shifting bricks and should be replaced. There are some smaller concrete repairs that are also required to prevent further deterioration.

Roof System | ● Fair

The roof is comprised of white EPDM over mechanically-fastened insulation. Based on previous reports, the roofing has several deficiencies, including blistered strip flashing, damaged counter-flashing, and EPDM extending too far into drain bowls. These deficiencies are minor in nature but should be addressed before they lead to water infiltration.

Door & Windows | ● Good / ● Fair

The building consists of aluminum-framed windows and hollow metal doors and frames. The doors and windows are in good-to-fair condition with the exception of failed sealants. The sealants should be replaced and maintained through a comprehensive maintenance plan. Some of the window hardware requires attention to ensure windows properly seal when closed.

Interior Finishes | ● Fair / ○ Poor

The interior walls consist of painted concrete masonry units, ceramic tile, and some painted gypsum wall board. These walls are all in good condition and provide good acoustical separation between spaces. The flooring is best characterized as in fair condition and consists of carpet, VCT, wood, and ceramic tile. The ceiling primarily consists of acoustical ceiling tiles with some plaster ceilings, all of which are in good condition except where leaks have occurred. The items that have the most amount of wear on them are the doors, frames, and casework, all of which are original to the building.

Accessibility | ● Fair / ○ Poor

As previously reported, there are several deficiencies regarding the building's accessibility. The following items do not meet the current accessibility guidelines: classroom sinks [non-accessible], stage [non-accessible], cafeteria tables [non-accessible], toilet rooms [hardware & flushometers], plumbing fixtures [non-accessible], signage [not provided], protrusions along accessible routes, drinking fountains [standing user height], reception desk [non-accessible], and handrails/guardrails/nosings [non-accessible/not provided].



Spring Street School | Building Review

Means of Egress | ● Fair

There are sufficient means of egress serving the building. The egress paths themselves have several items that do not meet the requirements of the current code, including handrails, guardrails, landings, fire protection, and fire ratings. These items are permitted to remain as is until one of the several thresholds for upgrading these items is triggered.

Structural System | ● Good / ● Fair

The main structural system consists of a steel frame with concrete floor slabs and frost walls. There are some cracks in the masonry that should be re-pointed and monitored for future cracking. Corroded lintels and steel members should also be remediated in conjunction with any masonry repairs.

Hazardous Materials | ● Fair

There are several potential and confirmed asbestos-containing materials within the building. Some have been removed/encapsulated during previous renovations. The building has a current AHERA plan; should future renovations be undertaken, it should be reviewed along with additional on-site sampling to confirm all visible asbestos-containing materials. There are several other items that require special disposal, including light fixtures, light ballasts, hydraulic door closers, and exit light batteries.

Modular Classrooms | ● Fair / ○ Poor

The modular classrooms are of two separate vintages, both consisting of wood frame construction with membrane roofing. One is clad in vinyl brick siding while the other is clad in wood battens. The modulares have served the district well for many years and are not intended for long-term utilization, as is seen here. We recommend removal of these structures.



Spring Street School | Fire Protection

Service | ○ Poor

There is currently no fire suppression system serving the building. The kitchen hood also had no chemical-based suppression system; however, the equipment below the hood would not require such a system. If any additions or substantial renovations are proposed, the code would require a building-wide suppression system to be installed.



Spring Street School | Plumbing

Fixtures | ● Good

The existing building's plumbing systems appear adequate in quantity for the current occupancy. Most restrooms appear to comply with ADA/MAAB requirements for accessible fixtures, having at least one ADA-compliant fixture in each of the main restroom groups.

Existing water closets are primarily of the wall-hung flush valve type. Urinals are of the wall-hung type and lavatories are of the wall-hung and counter style with either two-handle or single lever handle faucet, many of which are of the metered style. Most fixtures do appear to comply with current codes and standards.

Many public use lavatory sinks have metered (self-closing) faucets as required by code. In addition, many appear to have limit stops to ensure hot water does not exceed 110°F for scald prevention.

Several of the classrooms have sinks, some of which appear to be of the non-ADA-compliant type.

The main kitchen does not appear to have the minimum configuration and number of fixtures to satisfy current code and Board of Health requirements for a commercial kitchen. The current fixtures consist of a three-bay pot sink and a single-bay wash sink, both of which are connected to their respective grease traps, as well as a hand sink. The hand sink is deep enough where it would require a grease trap, unless used for food preparation in which case it would need to be indirectly wasted. Current Board of Health regulations would require an indirectly wasted food preparation sink.

There are several ADA-compliant wall-mounted electric water cooler drinking fountains located throughout the building.

Janitor sinks inspected during our walk-through had faucet trim with vacuum breakers to limit backflow contamination caused by siphonage.

Fixtures are a mix of vintage with some restrooms renovated with water-saving-type fixtures compliant with the code enforced at the time of the upgrade. Apparently, maintenance is routinely performed on faucets, toilet flush valves, etc. as needed

As renovations occur, the following items should be considered: replace all flushometers/faucets with automatic low flow flushometers/faucets.



Spring Street School | Plumbing

Cold Water Service | ● Good

A 3" main cold water line enters the building through the floor of a storage area. The service runs through a water meter prior to feeding the building domestic water needs. There is no central backflow preventer nor pressure reducing valve station on the service. Typically, in facilities such as this where there are potential multiple sources of water contamination, a central backflow preventer is required to protect the municipal water supply. A pressure reducer would only be required if the municipal water supply pressure exceeded 80 psig.

We noted most of the piping in the building appears to be copper, and, based on its age, should be in good condition; however, this can vary based on water quality. We recommend a pipe sample from both the cold and hot water system be taken to verify pipe condition.

Domestic Hot Water Service | ○ Fair

The domestic hot water needs of the building are supported by two (2) electric tank style water heaters. The water heaters are each 80-gallon in capacity and have a rated power input of 4,500 Watts. Units are manufactured by Vaughn with a manufacture date of 3/2011 and 6/2013, respectively. Installation was within two months of those dates.

The water heaters have no active signs of leakage; however, they have both either met or exceeded their useful expected service life at near or over 10 years of age, and as such should be considered a candidate for replacement in the near future.

During our inspection, we did not locate a central mixing valve station which would generally be required to support the varying water temperature needs of a building such as this. Current code would require differing water temperatures at different types of fixtures. Lavatory sinks and showers must not discharge hot water at a temperature exceeding 110–112°F for safety reasons, whereas service fixtures (janitor's sinks, kitchen sinks, etc.) are required to have hot water temperatures in excess of 120°F for sanitation reasons. The current system appears to supply a single temperature water to the building. After that, proper water supply to lavatories should be accomplished by local mixing valves and/or fixtures with appropriate mixing limit stops. Due to the absence of tempering mixing valve, it appears the domestic hot water storage tanks are kept below the temperature typically required to prevent the possibility of bacteria growth within the tanks (140°F required for sanitation). It is recommended that the central mixing valve should be replaced with an electronic type.

There is one recirculation pump on the domestic hot water system, which is required per the current plumbing code since there are fixtures located beyond 100 feet of the hot water source.



Spring Street School | Plumbing

Drainage Systems | ● Good / ◐ Fair

Most of the sanitary drainage piping is concealed from view; however, what we were able to see was primarily of the cast iron no-hub type. The sanitary sewer lines run below the slab and exit the building to a municipal sewer system.

Roof storm water is drained via roof drains connecting to internal leaders. The lines presumably exit to a municipal storm water system. The building does not appear to have any emergency roof overflow drains. These are required by current code as a clogged drain can lead to water build-up on the roof and structural failure due to weight. During any reroofing project or building upgrade, we highly recommend emergency roof drains be added. The emergency drains should be added near the current roof drains and run to discharge to the side of the building. The visible discharge location is required as it gives users an indication of a failed main drain system.

We noticed no other outward signs of failure in either the sanitary sewer system or the storm drainage system during our site inspection.

Natural Gas Service | ● Good

A natural gas service enters the buildings in the main-level mechanical room. The exterior service is a 1.25" intermediate gas pressure line which runs through a pressure regulator, a gas meter and an additional pressure reducer prior to increasing to 4" to feed the building's gas loads which include the heating boilers and packaged rooftop equipment. The gas service to the building is supported by Eversource.



Spring Street School | HVAC

Boiler Plant | ● Good

The heating needs for the building are supported by two (2) Lochinvar #FTX850N fire-tube gas-fired boilers installed in 2016. Each boiler has a rated input capacity of 850,000 BTUH. The boilers are high-efficiency condensing style, and, at 6 years old, are in good condition and well within their useful service life.

Chiller Plant | ● Good

An air-cooled chiller with pump package supports a majority of the building classrooms' air conditioning needs. The chiller is a York/JCI #YLAA0070SE series rotary scroll unit with an approximate capacity of 70-tons. The chiller uses R-134A refrigerant. At 6 years of age, the chiller is well within its useful service life of 20 years as defined by ASHRAE. The chiller includes dual pumps in a lead/stand-by configuration.

Piping Distribution System | ● Good

Chilled water and hot water from the heating and cooling plant is distributed to the building via a two-pipe supply and return distribution system. The system circulates chilled or hot water to classroom unit ventilators located throughout the building. Hot water flow is restricted to fin-tube radiation, unit heaters and cabinet unit heaters via automatic isolation valves.

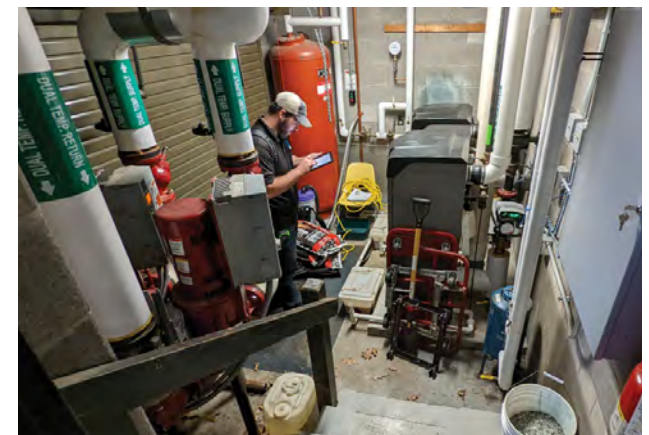
The pumps and their current service are as follows:

- P-1 & P-2: (lead/stand-by) variable speed hot/chilled water secondary loop; Bell & Gossett #e-80SC vertical in-line style.
- BP-1 & BP-2: variable speed boiler primary pumps; Bell & Gossett Ecocirc #XL 40-120.
- A set of in-line pumps are integral to the chiller and establish a primary/secondary interface between the chiller and system.

The system and boiler pumps are manufactured by Bell & Gossett and appear to be in good operational order. At 6 years old, all pumps are well within their useful service life of 20-years as defined in ASHRAE.

Ventilation, Exhaust, & Miscellaneous HVAC | ● Good / ◐ Fair

Classroom unit ventilators are located throughout the classroom segments of the building. These units are located along exterior walls, and each has an outdoor air louver and associate control dampers to allow outdoor air to enter the classroom space through the unit ventilator. During occupied periods, the unit fans run continuously to provide space ventilation, and electric valves modulate hot water flow through the units to maintain space temperature. The unit ventilators are manufactured by JCI/York with most having a nominal supply airflow capacity of 1,500 CFM. Classroom exhaust in much of the building is supported by a centralized exhaust fans located on the building roof. In most cases, the fans serve multiple rooms.



Spring Street School | HVAC

The cafeteria and the gym space are heated, cooled, and ventilated through the use of packaged roof-top units tagged as RTU-1 for the cafeteria and RTU-2 for the gym. Each unit includes filter sections, gas-fired heating section, DX cooling coil & condenser section, supply fan, and exhaust fan. In addition, the cafeteria unit has an energy recovery wheel to pretreat outdoor air with recaptured energy from the exhaust air. Both units have a nominal cooling capacity of 14-tons.

The administration area's cooling and heating needs are supported by a variable refrigerant flow (VRF) style heat pump system with indoor fan coil units coupled to an exterior grade mount heat pump. These areas also have hot water fin-tube radiation. The VRF system is manufactured by York/JCI and has a nominal cooling capacity of 12-tons. The administration areas are ventilated through a small energy recovery unit located above the ceiling of a storage room. The unit exhausts air from the bathrooms in the area and uses that air to temper the incoming outdoor air for the office and lobby spaces.

The modular addition portion of the building is supported by packaged rooftop gas-fired heating and electric cooling units. All the units are manufactured by JCI and have a nominal cooling capacity of 3-tons. Units are tagged RTU-3 through RTU-8.

The systems appear to be configured to supply the code-required ventilation levels required at the time of their construction in 2016, all of which comply with current ventilation standards. However, further review would be required, especially for the art spaces which require higher outdoor air ventilation and exhaust rates when compared to normal classrooms.

The kitchen hood over the oven equipment appears to comply with standard for heat capture but not fully with current NFPA 96 and IMC standards. There is no chemical-based suppression system provided; though none is required based on the current equipment under the hood.

All restrooms have ducted exhaust systems. The systems connect to exhaust fans located on the roof.

Most of the HVAC equipment, including the rooftop units, exhaust fans, classroom unit ventilators and the like, are all in good condition and being only 6 years old are well within their useful service life of 20 to 25 years, as defined in ASHRAE.

Controls | ● Good

The building appears to have a building-wide DDC energy management system throughout. The system is manufactured and supported by Johnson Controls. According to facility personnel, the system has undergone and continues to undergo upgrades. Sequences should be reviewed further as additional indoor air quality and energy-saving routines may be possible.



Spring Street School | Electrical

Service | ● Fair

The building electrical service is rated 1000 amperes, 480/277 volt, 3-phase, 4-wire. The service consists of a utility company pad-mount transformer on the exterior of the building and underground feeds to the electrical service equipment. The electrical distribution equipment is by Square D. Maintenance of the switch board is recommended by the manufacturer and NETA.

Normal Distribution | ● Fair

The panelboards in the building are by General Square D. The panelboards are located throughout the building in electrical rooms and are circuit breaker type. Several different types of wiring methods were observed, namely wires in raceway, metal clad (MC) cable, and armored cable (AC). Maintenance of the panelboards is recommended by the manufacturer and NETA.

General Purpose Power | ● Fair

The general-purpose power in the building appears to be adequate. Wiring devices may need to be replaced due to age.

Emergency /Standby Power | ○ Poor

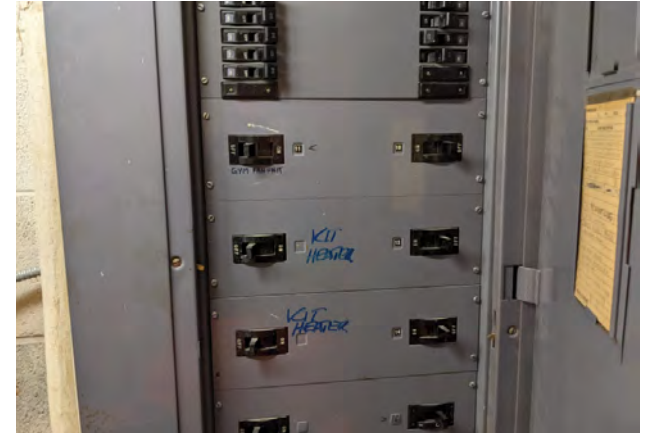
The building does not have an emergency/standby generator.

Egress & Exit Lighting | ● Fair

The egress and exit lighting are through battery-powered exit signs and emergency lighting units. ART observed that emergency lighting was not installed at all the exit discharge leading to a public way. It is recommended to test the emergency egress and exit lighting system and rectify any discrepancies.

Lighting & Controls | ● Fair

The ambient lighting system in the building consists of various types of fixtures (recessed, surface, pendant, etc.) primarily with fluorescent lamps. The lighting system is inefficient and does not meet current energy codes. The lighting throughout the facility is controlled with snap switches. Ambient light system consisting of LED light fixtures should be provided. Networking lighting controls including occupancy, vacancy, and daylight sensors should also be provided.



Spring Street School | Electrical

Telecommunications Cabling Infrastructure | ● Fair

The telecommunications system comprises mostly of Category 5e cables for data and voice communications. The system appears to meet the current programming needs of the facility.

The data communications equipment is by Cisco. Wi-Fi access points by Aerohive have been provided in the building. The voice communications equipment is NEC Univerge SV 9300 with digital handsets. Telecommunications infrastructure that complies with current BICSI standard should be provided.

Fire Alarm System | ● Fair

The fire alarm system is addressable tone-visual type; the fire alarm panel is by Simplex. The fire alarm system does not comply with current codes. Provide new voice evacuation type fire alarm system with initiating and signaling devices to comply with current codes and standards.

Public Address (PA) and Clock Systems | ● Fair

PA speakers are located in public and common areas as well as in classrooms. The PA and clock systems appear to be in good working condition and meet the current programming needs. The PA system is Telecenter by Rauland Borg.

Audio-Video Systems | ● Fair

Short throw projectors are in the process of being installed in the classrooms.

Local sound system is provided in the gym.

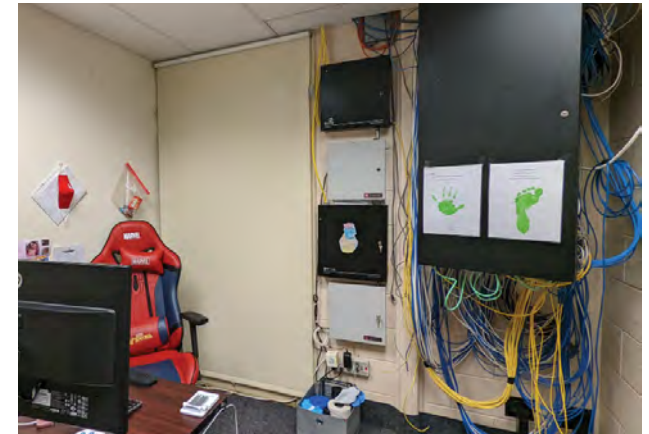
Hand-held radios are by Motorola.

The existing system is operational and meets current programming needs.

Video Surveillance & Access Control | ● Fair

The video surveillance system is by Exacq with Axis cameras. The access control system is by Brivo. Card readers are provided at the exterior door entries. Building entry is through Aiphone video entry station.

The existing systems are operational and meet current programming needs.



Spring Street School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Site

Size & Configuration		◐	
Adjacent Land Use	●		
Vehicular Access		◐	○
Pedestrian Access		◐	
Topography		◐	
Soils & Wetlands		◐	
Utilities/Service Areas		◐	
Recreation Area/Community Use	●	◐	
Parking/Walkways/Curbs/ Sidewalks/Drainage		◐	○
Landscape Features	●	◐	
Site Furnishings		◐	
Accessibility		◐	○

Building

Exterior Walls		◐	
Roof Systems		◐	
Doors & Windows	●	◐	
Interior Finishes		◐	○
Accessibility		◐	○
Means of Egress		◐	
Structural System	●	◐	
Hazardous Materials		◐	
Modular Classrooms		◐	○

Fire Protection

Service			○
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Spring Street School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Plumbing

Fixtures	●		
Cold Water Service	●		
Domestic Hot Water Service		◐	
Drainage Systems	●	◐	
Natural Gas Service	●		

HVAC

Boiler Plant	●		
Chiller Plant	●		
Piping Distribution System	●		
Ventilation, Exhaust, & Miscellaneous HVAC	●	◐	
Controls	●		

Electrical

Service		◐	
Normal Distribution		◐	
General Purpose Power		◐	
Emergency /Standby Power			○
Egress & Exit Lighting		◐	
Lighting & Controls		◐	
Telecommunications Cabling Infrastructure		◐	
Fire Alarm System		◐	
Public Address (PA) and Clock Systems		◐	
Audio-Video Systems		◐	
Video Surveillance & Access Control		◐	

Walter J Paton School | Facility Overview

Address:	58 Grafton St, Shrewsbury, MA 01545
Zoning:	Residence B-2
Gross Square Footage:	± 34,000 sq.ft.
Assessed Value:	\$4,242,900
Lot Size:	± 6.52 acres
Constructed/Renovated:	1950
Modulars:	2000
Construction Type:	II-B
Grade Configuration:	K-4
Current Enrollment:	312

Overview

Paton Elementary School is centrally located in town on Grafton Street. This neighborhood school serves a current population of 312 students in grades K-4.

The original building configuration has not been altered in any significant way except for the renovation of the main entry to address accessibility, window replacement, and the addition of modulars to the north side of the building in 2000. The building consists of three levels: basement floor, first floor [split-level], and second floor. The main entry to the building is accessed via a ramp and/or stairs on the south side of the building, leading guests to the lower portion of the first floor, which houses all the major core spaces. The upper floor is accessible via an elevator off the main lobby, while the basement staff/utility spaces are only accessible via stairs at the west end of the main corridor.

The building's overall condition is as expected for a facility that is now over 70 years old and has served the town well during this time.



Walter J Paton School | Existing Site Plan



Walter J Paton School | Site Review

Size & Configuration | ● Fair

The overall plot has a good configuration, fairly rectilinear. It also has ample frontage on both Grafton Street and Municipal Drive. The overall acreage of the site is fair given the current enrollment.

Adjacent Land Use | ● Good

The school site is bordered by Residence B-2 use zones on all sides. Along the northern edge of the property are single-family residences; to the east lies Grafton Street and single-family residences; municipal play fields and single-family residences are located to the south, and the SELCO Operations Center is to the west.

Vehicular Access | ● Fair

The main vehicular entrance is along Grafton Street and is restricted to buses only during pick-up and drop-off. Parent pick-up and drop-off is facilitated via two of the three curb cuts off of Municipal Drive. Departing pick-up/drop-off vehicles are required to turn right to help alleviate traffic issues. There is not enough space for on-site queuing of parent cars during pick-up/drop-off. Currently, 50% of students take the bus to and from school while 45% are transported by their parents.

Pedestrian Access | ● Good

Pedestrian access to the site is good. Grafton Street has sidewalks on both sides of the street, allowing students safe passage from all directions to the side. There is a crosswalk located immediately in front of the building. It should be noted that Grafton Street has high volumes of traffic that travels at high speeds. Only 5% of the students walk to and from school.

Topography | ● Fair

The site slopes down hill approximately 22 feet from northeast to southwest.

Soils & Wetlands | ● Fair

The site is characterized by Paxton and Urban soils to the east and poorly drained Whitman soils west of the existing paved area [see soils mapping in the Appendix]. There are wetlands in the western portion of the property, which would require further investigation to clearly delineate the limits; however, impact on potential development of the site would be significant given the limits of the current site improvements.



Walter J Paton School | Site Review

Utilities/Service Areas | ● Fair

The school is well served by municipality-owned water, sewer, electric, and internet. The boilers run off of natural gas. The building does not have a convenient/accessible service area to provide deliveries to the building. There is also no loading dock for the building.

Recreation Areas/Community Use | ● Good / ● Fair

The school's playground, paved play area, and basketball hoops are utilized by the neighborhood community outside of school hours and are in good condition. The play field utilized by the school is located across the street on Municipal Drive.

Parking/Walkways/Curbs/Sidewalks/Drainage | ● Good / ● Fair

There is sufficient parking for staff and visitors to support daily operations. However, the site has very little capacity in respect to special events and relies heavily on street parking. There are several pedestrian walkways throughout the site. Overall condition of these features is good to fair. The site appears to have sufficient drainage given its current configuration.

Landscape Features | ● Good / ● Fair

The site landscaping would be best characterized as mature and well-established, with areas of overgrowth that require some attention.

Site Furnishings | ● Fair

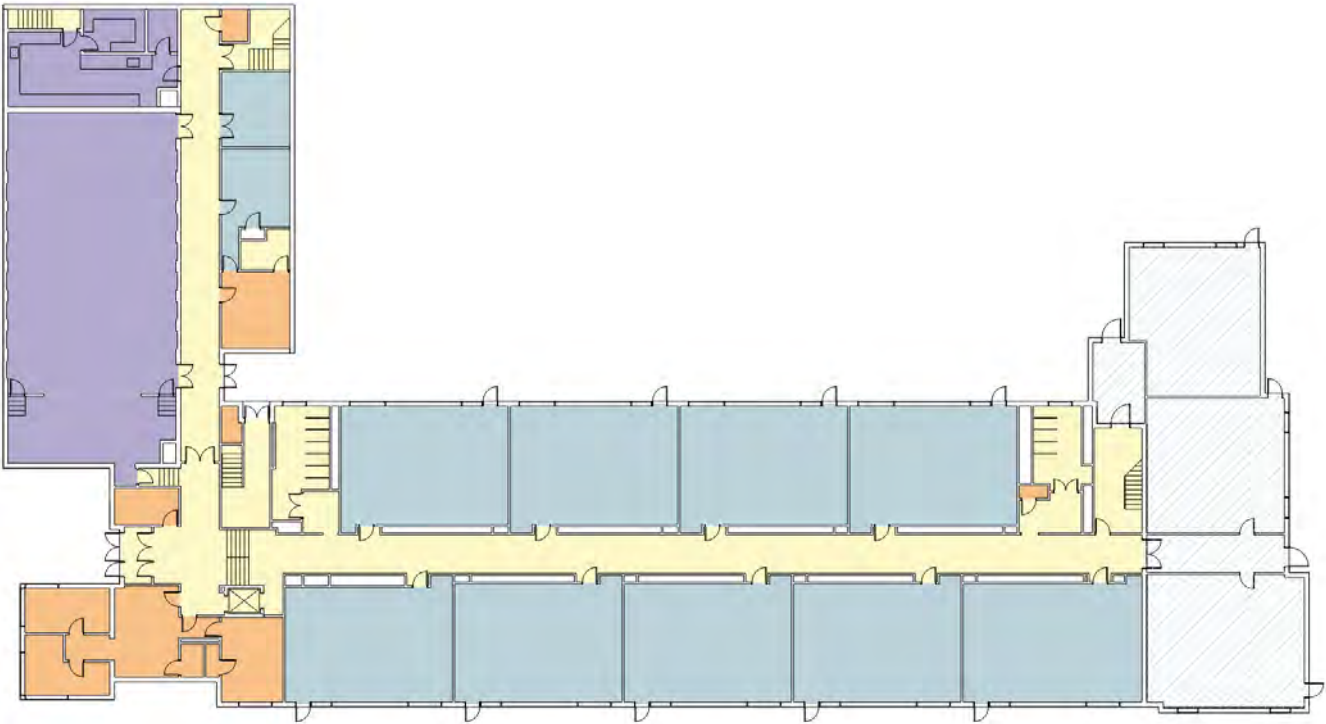
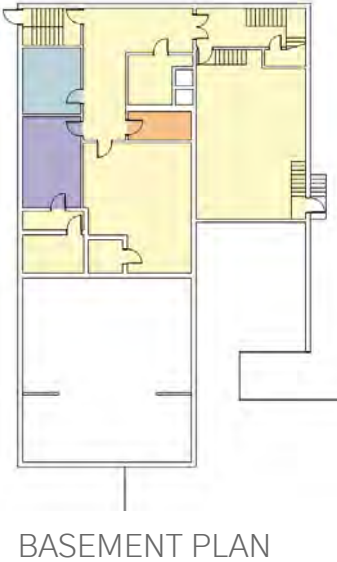
There are several site furnishings located on the site, including trash receptacles, benches, signage, flag pole, and bicycle racks. These site furnishings are in fair condition, given their age.

Accessibility | ● Fair / ○ Poor

As previously reported, there are several deficiencies regarding the site's accessibility. There is a lack of accessible routes to exterior amenities [running/cross slopes]. The following items do not meet the current accessibility guidelines: playground [surface], picnic tables [non-accessible parking spots, cross slope], parking signage [height], and handrails [not provided].



Walter J Paton School | Existing Building Plans



LEGEND

NET FLOOR AREA

- ACADEMIC
- CORE
- ADMINISTRATIVE

GROSS FLOOR AREA

- NON-PROGRAMMED

EXCLUDED AREA

- MODULAR/PORTABLE

FIRST FLOOR PLAN



Walter J Paton School | Existing Building Plans



LEGEND

NET FLOOR AREA

- ACADEMIC
- CORE
- ADMINISTRATIVE

GROSS FLOOR AREA

- NON-PROGRAMMED

EXCLUDED AREA

- MODULAR/PORABLE

SECOND FLOOR PLAN



Walter J Paton School | Building Review

Exterior Walls | ● Fair / ○ Poor

The exterior walls consist of brick masonry, stone veneer, and stucco. As previously reported, the exterior joints where sealant was used have failed. LPA|A observed some replacement/repairs of these joints, but many still require attention. The brick masonry requires repointing/resetting/re-anchoring of bricks at several locations to ensure the envelope is watertight. Corroded steel lintels have led to spalling/shifting bricks and should be replaced. There are some smaller concrete repairs that are also required to prevent further deterioration.

Roof System | ● Fair / ○ Poor

The roof is comprised of black EPDM over mechanically-fastened insulation. Based on previous reports, the roofing has several deficiencies, including splits in flashing, damaged metal roof edge, unadhered membrane, and raised insulation fasteners. These deficiencies are minor in nature but should be addressed before they lead to water infiltration. The roof has approximately 5 more years before full replacement will be needed.

Door & Windows | ● Fair

The building consists of aluminum-framed windows and hollow metal doors and frames. The doors and windows are in good-to-fair condition with the exception of failed sealants and corroded lintels. The sealants and lintels should be replaced and maintained through a comprehensive maintenance plan.

Interior Finishes | ● Fair / ○ Poor

The interior walls consist of painted & glazed concrete masonry units and gypsum block walls with plaster finish. These walls are all in good condition and provide good acoustical separation between spaces. The flooring is best characterized as in fair condition and consists of carpet, VCT, wood, and ceramic tile. The ceiling primarily consists of acoustical ceiling tiles with some plaster ceilings, all of which are in good condition except where leaks have occurred. The items that have the most amount of wear on them are the doors, frames, and lockers, all of which are original to the building.

Accessibility | ● Fair / ○ Poor

As previously reported, there are several deficiencies regarding the building's accessibility. The following items do not meet the current accessibility guidelines: classroom doors [clearances], classroom sinks [non-accessible], stage [non-accessible], cafeteria tables [non-accessible], toilet rooms [hardware & flushometers], signage [not provided], protrusions along accessible routes, drinking fountains [standing user height], and handrails/guardrails [non-accessible/not provided].



Walter J Paton School | Building Review

Means of Egress | ● Fair

There are sufficient means of egress serving the building. The egress paths themselves have several items that do not meet the requirements of the current code, including handrails, guardrails, landings, fire protection, and fire ratings. These items are permitted to remain as is until one of the several thresholds for upgrading these items is triggered.

Structural System | ● Good / ● Fair

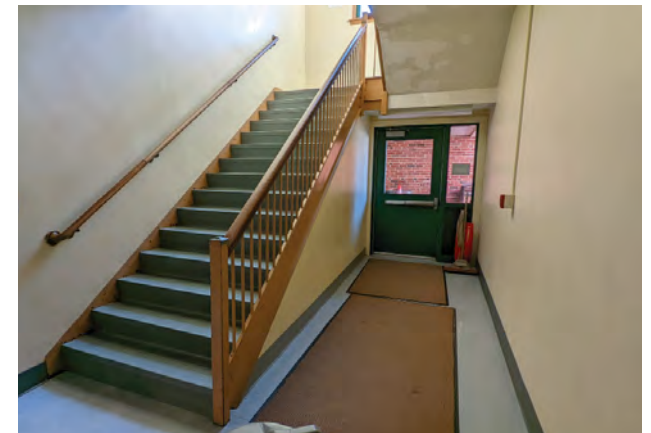
The main structural system consists of a wide-flange steel frame with concrete floor slabs and frost walls. There appears to have been some settling in certain areas that should be investigated and remediated prior to any masonry repairs. Corroded lintels and steel members should also be remediated in conjunction with any masonry repairs.

Hazardous Materials | ● Fair

There are several potential and confirmed asbestos-containing materials within the building. Some have been removed/encapsulated during previous renovations. The building has a current AHERA plan; should future renovations be undertaken, it should be reviewed along with additional on-site sampling to confirm all visible asbestos-containing materials. There are several other items that require special disposal, including light fixtures, light ballasts, hydraulic door closers, and exit light batteries.

Modular Classrooms | ● Fair / ○ Poor

The modular classrooms are of wood frame construction with vinyl brick siding and membrane roofing. The modulares have served the district well for many years and are not intended for long-term utilization, as is seen here. We recommend removal of these structures



Walter J Paton School | Fire Protection

Service | ○ Poor

There is currently no fire suppression system serving the building. The kitchen hood also had no chemical-based suppression system, however, the equipment below the hood would not require such a system. If any additions are proposed or any substantial renovations, the code would require a building wide suppression system be installed.



Walter J Paton School | Plumbing

Fixtures | ● Good

The existing building's plumbing systems appear adequate in quantity for the current occupancy. Most restrooms appear to comply with ADA/MAAB requirements for accessible fixtures having at least one ADA-compliant fixture in each of the main restroom groups.

Existing water closets are primarily of the wall-hung flush valve type. Urinals are of the wall-hung type and lavatories are of the wall-hung and counter style with either two-handle or single lever handle faucet, many of which are of the metered style. Most fixtures do appear to comply with current codes and standards.

Many public use lavatory sinks have metered (self-closing) faucets as required by code. In addition, many appear to have limit stops to ensure hot water does not exceed 110°F for scald prevention.

Several of the classrooms have sinks, some of which appear to be of the non-ADA-compliant type.

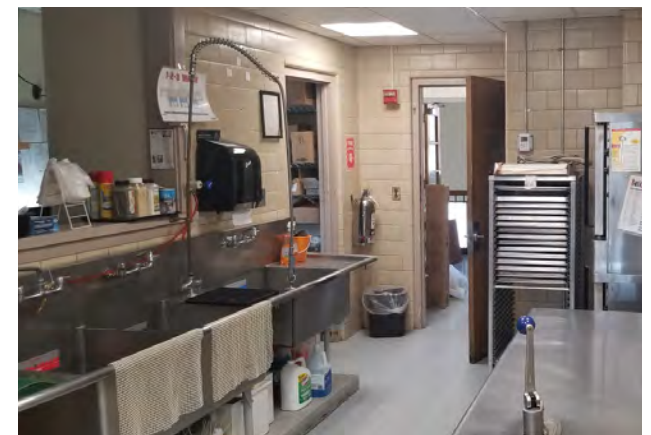
The main kitchen appears to have the minimum configuration and number of fixtures to satisfy current code and Board of Health requirements for a commercial kitchen. The fixtures consist of a three-bay pot sink, two bowls of which are connected to a grease trap, one (1) single-bay prep sink, and one (1) hand sink. It does not appear that the prep sink is indirectly wasted as required by current code.

There are several ADA-compliant wall-mounted electric water cooler drinking fountains located throughout the building.

Janitor sinks inspected during our walk-through had faucet trim with vacuum breakers to limit backflow contamination caused by siphonage. Based on the age of the building renovations, we expect that all are code compliant.

Fixtures are a mix of vintage with most in restrooms from a 1999/2000 renovation and, as such, are of the water-saving type for the code enforced at the time of the upgrade. Apparently, maintenance is routinely performed on faucets, toilet flush valves, etc. as needed.

As renovations occur, the following items should be considered: replace all flushometers/faucets with automatic low flow flushometers/faucets.



Walter J Paton School | Plumbing

Cold Water Service | ● Good

A 3” cold water line enters the building in a lower-level storage room. The service runs through a water meter and prior to feeding the building domestic water needs. There is no central backflow preventer nor pressure reducing valve station on the service. Typically, in facilities such as this where there are potential multiple sources of water contamination, a central backflow preventer is required to protect the municipal water supply. A pressure reducer would only be required if the municipal water supply pressure exceeded 80 psig.

We noted most of the piping in the building appears to be copper and based on its age should be in good condition however, this can vary based on water quality. We recommend a pipe sample from both the cold and hot water system be taken to verify pipe condition.

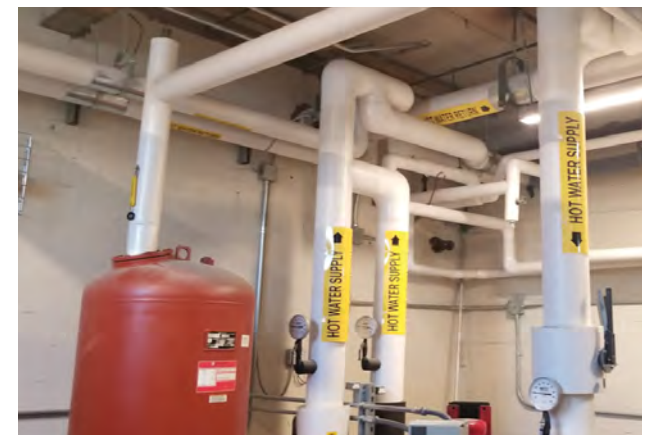
Domestic Hot Water Service | ○ Fair

The domestic hot water needs of the building are supported by a gas-fired tank style water heater. The water heater is manufactured by the AO smith and was installed in 5/2014.

The water heater has no active signs of leakage; however, it is nearing the end of its useful expected service life of 10 years of age and as such should be considered a candidate for replacement in the near future.

There is a central mixing valve station on the main hot water supply which serves most of the building fixtures. It appears there may be a higher temperature water line that runs to the kitchen. Current code would require differing water temperatures at different types of fixtures. Lavatory sinks and showers must not discharge hot water at a temperature exceeding 110–112°F for safety reasons, whereas service fixtures (janitor’s sinks, kitchen sinks, etc.) are required to have hot water temperatures in excess of 120°F for sanitation reasons. The current system appears to supply a single temperature water to the building. After that, proper water supply to lavatories and showers should be accomplished by local mixing valves and/or fixtures with appropriate mixing limit stops. It appears the domestic hot water storage tanks are kept at approximately 140°F which is essential to prevent the possibility of bacteria growth within the tanks. It is recommend that the central mixing valve should be replace with an electronic type.

There is one recirculation pump on the domestic hot water system, which is required per the current plumbing code since there are fixtures located beyond 100 feet of the hot water source. The domestic hot water heaters should be replaced with high efficiency condensing gas-fired style.



Walter J Paton School | Plumbing

Drainage Systems | ● Good

Most of the sanitary drainage piping is concealed from view; however what we were able to see was primarily of the cast iron no-hub type. The sanitary sewer lines run below the slab and exit the building to a municipal sewer system.

Roof storm water is drained via roof drains connecting to internal leaders. The lines presumably exit to a municipal storm water system. The building does not appear to have any emergency roof overflow drains. These are required by current code as a clogged drain can lead to water build-up on the roof and structural failure due to weight. During any reroofing project or building upgrade, we highly recommend emergency roof drains be added. The emergency drains should be added near the current roof drains and run to discharge to the side of the building. The visible discharge location is required as it gives users and indication of a failed main drain system.

We noticed no other outward signs of failure in either the sanitary sewer system or the storm drainage system during our site inspection.

Natural Gas Service | ● Good

A natural gas service meter is located outside the building along the front/street side of the building. A 1.25" intermediate line fed by Eversource exits grade and serves a rotary style gas meter, then runs through a pressure reducer prior to increasing to 4" and entering a building crawl space. The 4" service main feeds the gas loads in the building which include the heating boilers, domestic hot water boilers, and kitchen cooking loads.



Walter J Paton School | HVAC

Boiler Plant | ● Good

The heating needs for the building are supported by two (2) Lochinvar #FBN1001 fire-tube gas fired boilers installed in 2016. Each boiler has a rated input capacity of 1,000,000 BTUH. The boilers are high efficiency condensing style and at 6 years old are in good condition and well withing their useful service life.

Chiller Plant | ● Good

An air-cooled chiller with pump package supports a majority of the building classrooms' air conditioning needs. The chiller is a York/JCI #YLAA0070SE series rotary scroll unit with an approximate capacity of 70 tons. The chiller uses R-134A refrigerant. At 6 years of age, the chiller is well within its useful service life of 20 years as defined by ASHRAE. The chiller includes dual pumps in a lead/stand-by configuration.

Piping Distribution System | ● Good

Chilled water and hot water from the heating and cooling plant is distributed to the building via a two-pipe supply and return distribution system. The system circulates chilled or hot water to classroom unit ventilators located throughout the building. Hot water flow is restricted to fin-tube radiation, gym air handler, unit heaters and cabinet unit heaters via automatic isolation valves.

The pumps and their current service are as follows:

- P-1 & P-2: (lead/stand-by) variable speed hot/chilled water secondary loop; Bell & Gossett #e-80SC vertical in-line style.
- A set of in-line pumps are integral to the chiller and establish a primary/secondary interface between the chiller and system.

The system pumps are manufactured by Bell & Gossett and appear to be in good operational order. At 6 years old, all pumps are well within their useful service life of 20-years as defined in ASHRAE.

Ventilation, Exhaust, & Miscellaneous HVAC | ● Good

Classroom unit ventilators are located throughout the classroom segments of the building. These units are located along exterior walls, and each has an outdoor air louver and associate control dampers to allow outdoor air to enter the classroom space through the unit ventilator. During occupied periods, the unit fans run continuously to provide space ventilation and electric valves modulate hot or chilled water flow through the units to maintain space temperature. The unit ventilators are manufactured by JCI/York with most having a nominal supply airflow capacity of 1,000 CFM. Classroom exhaust in much of the building is supported by a centralized exhaust fans located on the building roof. In most cases the fans serve multiple rooms.



Walter J Paton School | HVAC

The cafeteria/gym space is heated, cooled, and ventilated with an indoor air handling unit with fan section, filter sections, hydronic heating coil section and DX cooling coil section. An exterior grade mounted condensing unit supports the cooling needs of this air handling unit. The split AHU system is manufactured by York/JCI and has a nominal cooling capacity of 20 tons.

The administration area's cooling and heating needs are supported by a variable refrigerant flow (VRF) style heat pump system with indoor fan coil units coupled to an exterior grade mount heat pump. These areas also have hot water fin-tube radiation. The VRF system is manufactured by York/JCI and has a nominal cooling capacity of 10 tons.

The modular addition portion of the building is supported by packaged rooftop heating and cooling units. The units are nearing the end of their useful service life and are candidates for replacement.

The systems appear to be configured to supply the code-required ventilation levels required at the time of their construction in 2016, all of which comply with current ventilation standards. However, further review would be required, especially for the art spaces which require higher outdoor air ventilation and exhaust rates when compared to normal classrooms.

The kitchen hood over the oven equipment appears to comply with standards for heat capture but not fully with current NFPA 96 and IMC standards. There is no chemical-based suppression system provided, and none is required based on the current equipment under the hood.

All restrooms have ducted exhaust systems. The systems connect to exhaust fans located on the roof.

With the exception of the modular addition rooftop units, most of the HVAC equipment including the air handlers, exhaust fans, classroom unit ventilators and the like are all in good condition, and, being only 6 years old, are well within their useful service life of 20 to 25-years as defined in ASHRAE.

Controls | ● Good

The building appears to have a building wide DDC energy management system throughout. The system is manufactured and supported by Siemens. The controls appear to incorporate many energy-saving routines such as demand ventilation reset based on CO2 sensors as well as intelligent recovery. Sequences should be reviewed further as additional indoor air quality and energy-saving routines may be possible.



Walter J Paton School | Electrical

Service | ● Good

The building electrical service is rated 1200 amperes, 208/120 volts, 3-phase, 4-wire. The service consists of a utility company pad-mount transformer on the exterior of the building and underground feeds to the electrical service equipment. The 1200A distribution is on the exterior of the building. The electrical distribution equipment is by General Electric. Maintenance of the switch board is recommended by the Manufacturer and NETA.

Normal Distribution | ○ Fair

The panelboards in the building installed as part of the mechanical systems upgrades are by General Electric. Panelboards original to the building are by Trumbull Elec. Co., Federal Pacific, etc. which are no longer supported. Panelboards by other manufacturers have been installed over the years. The panelboards are located throughout the building in electrical rooms and are circuit breaker type. Several different types of wiring methods were observed, namely wires in raceway, metal clad (MC) cable, and armored cable (AC). Electrical distribution equipment should be replaced.

General Purpose Power | ○ Fair

The general-purpose power in the building appears to be adequate. Wiring devices may need to be replaced due to age.

Emergency /Standby Power | ○ Poor

The building does not have an emergency/standby generator.

Egress & Exit Lighting | ○ Fair

The egress and exit lighting are through battery powered exit signs and emergency lighting units. ART observed that emergency lighting was not installed at all the exit discharge leading to a public way. It is recommended to test the emergency egress and exit lighting system and rectify any discrepancies.

Lighting & Controls | ○ Fair

The ambient lighting system in the building consists of various types of fixtures (recessed, surface, pendant, etc.) primarily with fluorescent lamps. The lighting system is inefficient and does not meet current energy codes. The lighting throughout the facility is controlled with snap switches. Ambient light system consisting of LED light fixtures should be provided. Networking lighting controls including occupancy, vacancy, and daylight sensors should also be provided.



Walter J Paton School | Electrical

Telecommunications Cabling Infrastructure | ● Fair

The telecommunications system comprises mostly of Category 5e cables for data and voice communications. The system appears to meet the current programming needs of the facility.

The data communications equipment is by Cisco. Wi-Fi access points by Aerohive have been provided in the building. The voice communications equipment is NEC Univerge SV 9300 with digital handsets. Telecommunications infrastructure that complies with current BICSI standard should be provided.

Fire Alarm System | ● Fair

The fire alarm system is addressable tone-visual type; the fire alarm panel is by Gamewell. The fire alarm system does not comply with current codes. Provide new voice evacuation type fire alarm system with initiating and signaling devices to comply with current codes and standards.

Public Address (PA) and Clock Systems | ● Fair

PA Speakers are located in public and common areas as well as in classrooms. The PA and clock systems appear to be in good working condition and meet the current programming needs. The PA system is Telecenter by Rauland Borg.

Audio-Video Systems | ● Fair

Short throw projectors are in the process of being installed in the classrooms.

Local sound system is provided in the gym.

Hand-held radios are by Motorola.

The existing system is operational and meets current programming needs.

Video Surveillance & Access Control | ● Fair

The video surveillance system is by Exacq with Axis cameras. The access control system is by Brivo. Card readers are provided at the exterior door entries. Building entry is through Aiphone video entry station. The existing systems are operational and meet current programming needs.



Walter J Paton School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Site

Size & Configuration		◐	
Adjacent Land Use	●		
Vehicular Access		◐	
Pedestrian Access	●		
Topography		◐	
Soils & Wetlands		◐	
Utilities/Service Areas		◐	
Recreation Area/Community Use	●	◐	
Parking/Walkways/Curbs/ Sidewalks/Drainage	●	◐	
Landscape Features	●	◐	
Site Furnishings		◐	
Accessibility		◐	○

Building

Exterior Walls		◐	○
Roof Systems		◐	○
Doors & Windows		◐	
Interior Finishes		◐	○
Accessibility		◐	○
Means of Egress		◐	○
Structural System	●	◐	
Hazardous Materials		◐	
Modular Classrooms		◐	○

Fire Protection

Service			○
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Walter J Paton School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Plumbing

Fixtures	●		
Cold Water Service	●		
Domestic Hot Water Service		◐	
Drainage Systems	●		
Natural Gas Service	●		

HVAC

Boiler Plant	●		
Chiller Plant	●		
Piping Distribution System	●		
Ventilation, Exhaust, & Miscellaneous HVAC	●		
Controls	●		

Electrical

Service	●		
Normal Distribution		◐	
General Purpose Power		◐	
Emergency /Standby Power			○
Egress & Exit Lighting		◐	
Lighting & Controls		◐	
Telecommunications Cabling Infrastructure		◐	
Fire Alarm System		◐	
Public Address (PA) and Clock Systems		◐	
Audio-Video Systems		◐	
Video Surveillance & Access Control		◐	

Sherwood Middle School | Facility Overview

Address:	28 Sherwood Ave., Shrewsbury, MA 01545
Zoning:	Residence A / Residence B-1
Gross Square Footage:	± 130,000 sq.ft.
Assessed Value 2021:	\$26,391,100 [Building Only]
Lot Size:	± 46.69 acres
Constructed/Renovated:	2011
Modulars:	N/A
Construction Type:	II-B
Grade Configuration:	5-6
Current Enrollment:	952

Overview

Sherwood Middle School is centrally located in town on Sherwood Ave. This district-wide school serves a current population of 952 students in grades 5-6.

The building was constructed in 2011. The overall facility consists of three distinct levels: ground floor, first floor, and second floor. The main entry to the preschool is located on the northern face on the building and provides direct access to the first floor. From there the upper and lower levels are accessed via stairs/elevator off the main lobby.

The building's overall condition is good.



Sherwood Middle School | Existing Site Plan



Sherwood Middle School | Site Review

Size & Configuration | ● Good

The overall plot has a good configuration. The site is shared with Oak Middle School, allowing the two schools to leverage each others' amenities. It also has frontage/access to Oak Street, Sherwood Avenue, Hutchins Street, and Crescent Street.

Adjacent Land Use | ● Good

The school site is bordered by a Residence B-2 zone to the northeast and Residence B-1 zones on all other sides. The site is abutted by single-family residences on all sides, with the exception of the Shrewsbury Montessori School and municipal water tank which are located on the southwest edge.

Vehicular Access | ● Good

There are several entry points for vehicular traffic to access the site. Buses enter the site via Sherwood Avenue and loop down to Oak, then proceed to Sherwood, and ultimately exit the site on Hutchins Street. Parents enter and exit the site via Crescent Street making a loop through the eastern parking lot. These routes allow for clear separate of vehicular traffic ensuring student safety. There is not enough space for on site queuing of parent cars during pick-up/drop-off. Currently, 82% of students take the bus to and from school while 16% are transported by their parents.

Pedestrian Access | ● Good

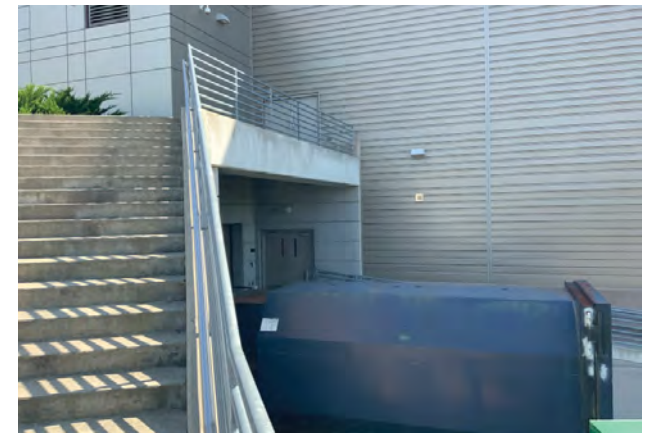
Pedestrian access to the site is good. All connecting streets to the site have sidewalks and crosswalks, allowing students safe passage from all directions to the site. Only 2% of the students walk to and from school.

Topography | ○ Fair

The site slopes approximately 50 feet from the north to the south. The site is best described as a collection of low sloping terraces. Both middle school buildings take advantage of these grade changes by constructing lower/ground level spaces built into the slope.

Soils & Wetlands | ○ Fair

The site is characterized by Urban fill and Woodbridge soils, from well-drained friable conditions which cover most of the site to poorly drained pockets to the east and southeast [see soils mapping in the Appendix]. There is a wetland in the eastern portion of the property that would have limited impact on any future development of the site.



Sherwood Middle School | Site Review

Utilities/Service Areas | ● Good

The school is well served by municipality-owned water, sewer, electric, and internet. The mechanical systems run off of natural gas. The building does have a convenient/accessible service area with a loading dock to provide service/deliveries to the building.

Recreation Areas/Community Use | ● Good / ◐ Fair

The school's paved play area and basketball hoops are utilized by the neighborhood community outside of school hours and are in good condition. The school, however, does not have any type of age-appropriate play structures.

Parking/Walkways/Curbs/Sidewalks/Drainage | ● Good / ◐ Fair

There is sufficient parking for staff and visitors to support daily operations. During special events, parking at the neighboring middle school and use of the paved play area meets the need. There are several pedestrian walkways throughout the site consisting of asphalt, concrete, and pavers. Overall condition of these features is good to fair. The site appears to have sufficient drainage given its current configuration.

Landscape Features | ● Good / ◐ Fair

The site landscaping would be best characterized as mature and well-established. There were some dead trees observed during our visit that should be removed and replaced. There are raised garden beds along the north side of the property that are maintained by the students.

Site Furnishings | ● Good

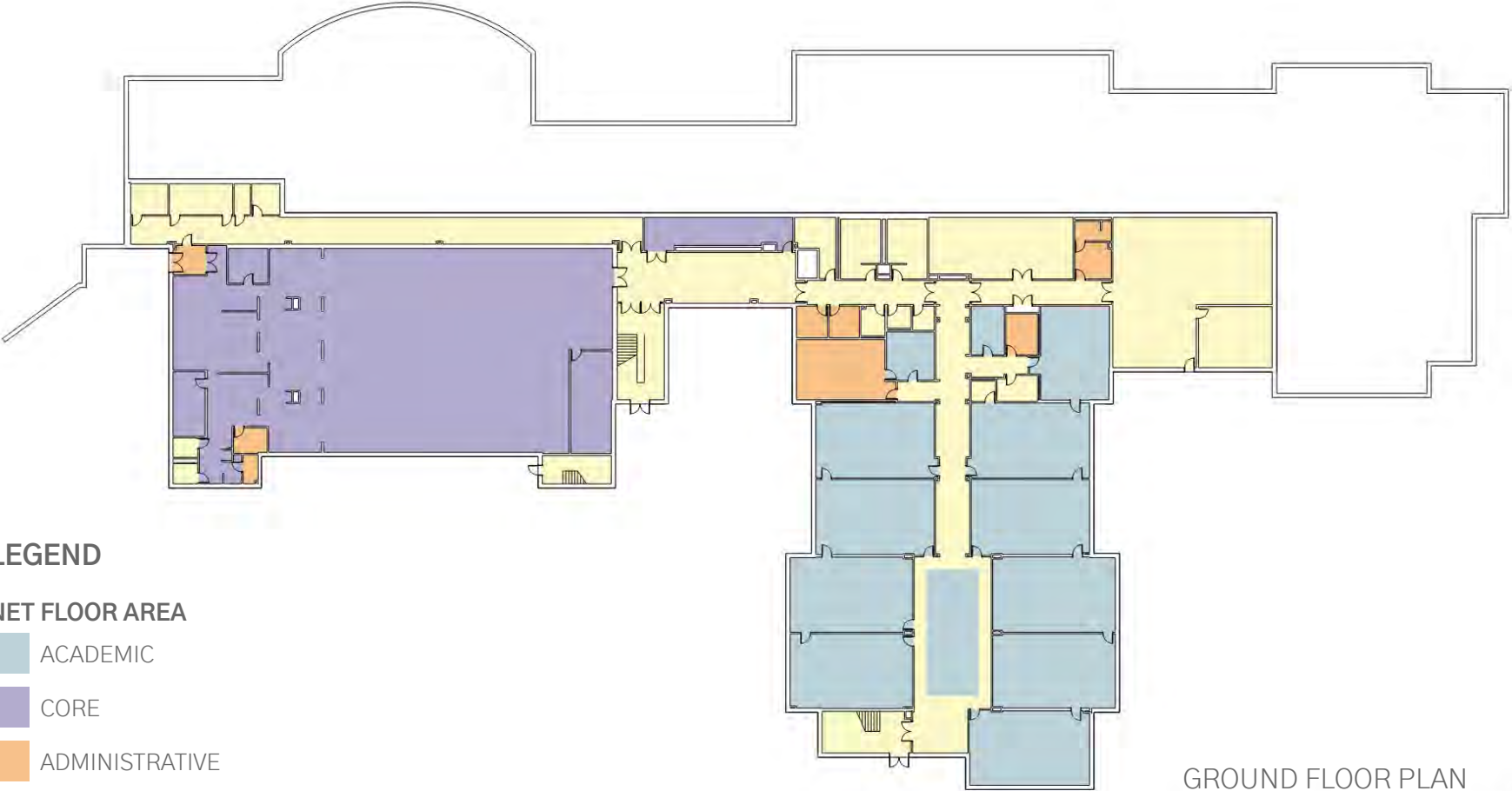
There are several site furnishings located on the site, including trash receptacles, benches, signage, flag pole, and bicycle racks. These site furnishings are in good condition.

Accessibility | ● Good

As previously reported, there are very few deficiencies regarding the site. The following items do not meet the current accessibility guidelines: picnic table [non-accessible], garden [surface/route], and fields/bleachers [route].



Sherwood Middle School | Existing Building Plans



LEGEND

NET FLOOR AREA

- ACADEMIC
- CORE
- ADMINISTRATIVE

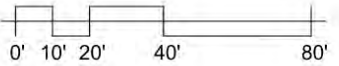
GROSS FLOOR AREA

- NON-PROGRAMMED

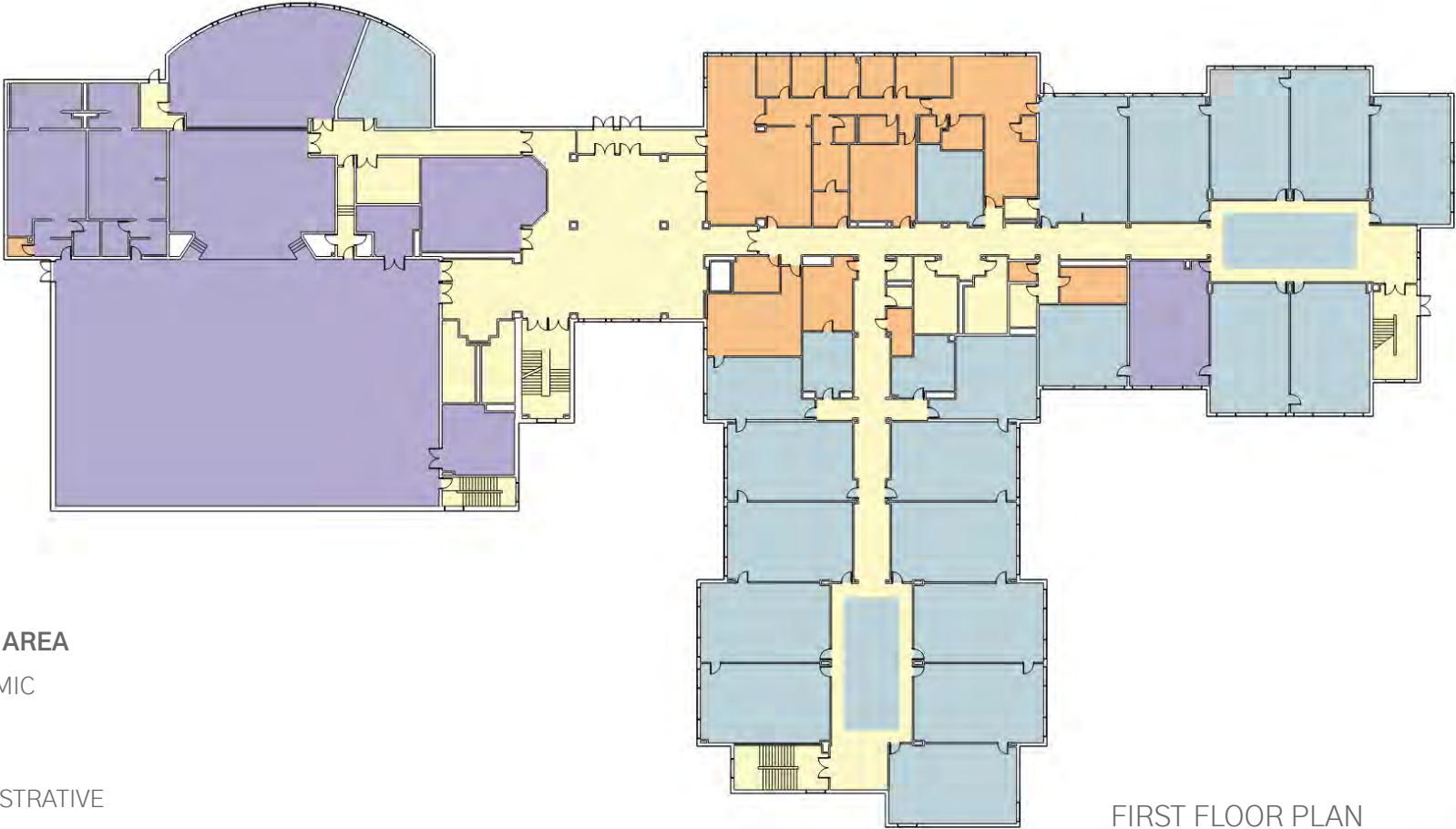
EXCLUDED AREA

- MODULAR/PORABLE

GROUND FLOOR PLAN



Sherwood Middle School | Existing Building Plans



LEGEND

NET FLOOR AREA

- ACADEMIC
- CORE
- ADMINISTRATIVE

GROSS FLOOR AREA

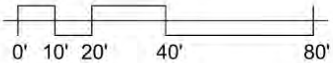
- NON-PROGRAMMED

EXCLUDED AREA

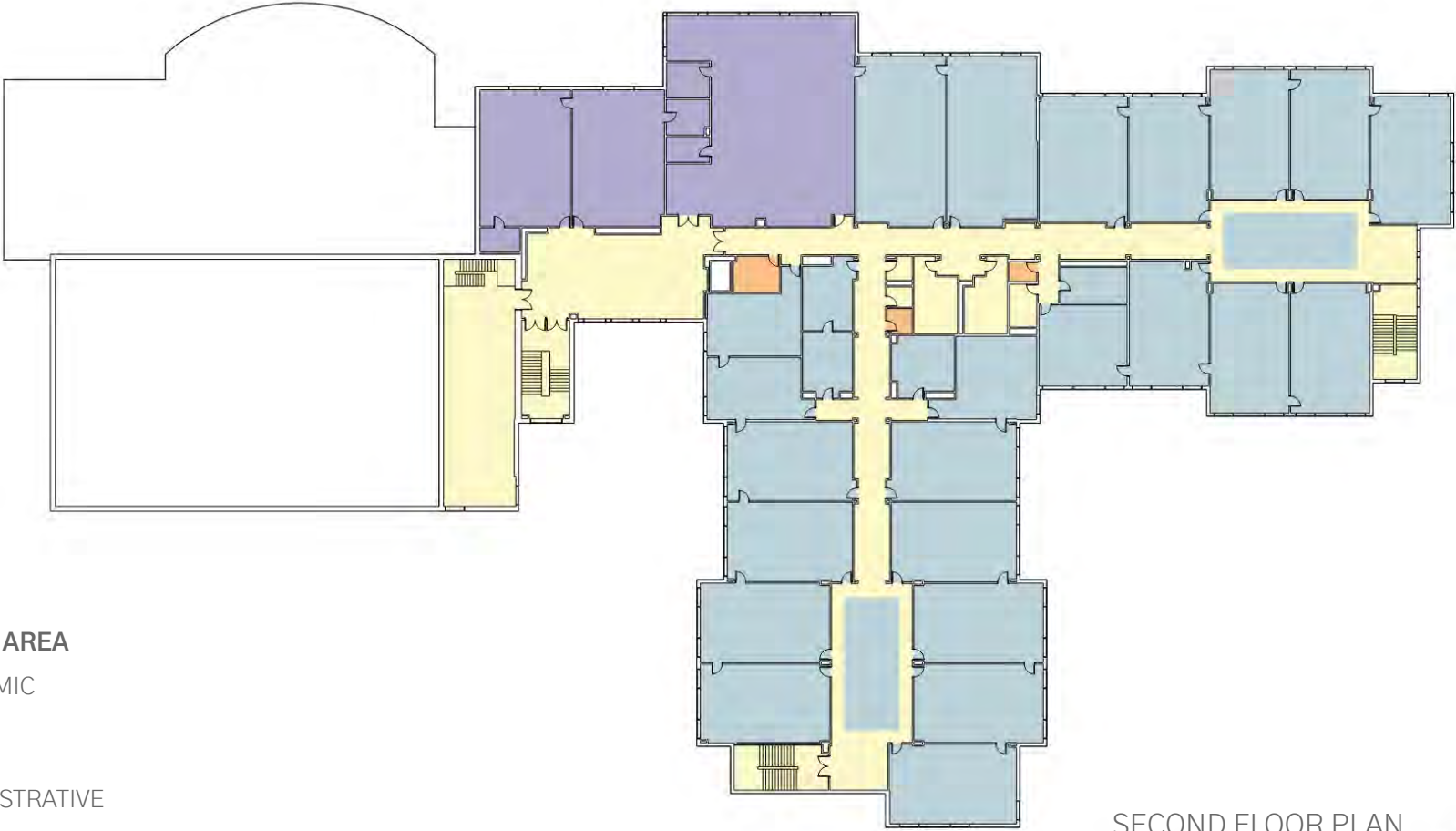
- MODULAR/PORABLE



FIRST FLOOR PLAN



Sherwood Middle School | Existing Building Plans



LEGEND

NET FLOOR AREA

- ACADEMIC
- CORE
- ADMINISTRATIVE

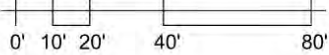
GROSS FLOOR AREA

- NON-PROGRAMMED

EXCLUDED AREA

- MODULAR/PORABLE

SECOND FLOOR PLAN



Sherwood Middle School | Building Review

Exterior Walls | ● Good

The exterior walls consist of aluminum composite metal [ACM] panels, precast concrete, concrete, and corrugated metal rain-screen siding. There are some small concrete repairs that are required to prevent further deterioration. Other than the issues with the concrete, no other deficiencies were observed. Exterior joint sealants should be monitored via a comprehensive maintenance plan and replaced as needed.

Roof System | ● Good

The roof is comprised of white EPDM over mechanically-fastened insulation. There are no known deficiencies with the roofing system.

Door & Windows | ● Good

The building consists of aluminum-framed windows and hollow metal doors and frames. The doors and windows are in good condition.

Interior Finishes | ● Good

The interior walls consist of painted gypsum walls, ceramic tile, and plastic laminate paneling. These walls are all in good condition and provide good acoustical separation between spaces. The ceiling primarily consists of acoustical ceiling tiles with some gypsum ceilings, all of which are in good condition. The flooring consists of sheet linoleum, ceramic tile, and carpet, which are in good condition. Other than some large scrapes in the corridor flooring, there were no other items that showed signs of wear and tear.

Accessibility | ● Good

As previously reported, there are very few deficiencies regarding the building. The following items do not meet the current accessibility guidelines: classroom sink skirts [non-accessible due to installation], media center work surface [non-accessible], signage [accessible means of egress], cane-detectable barriers under stairs [not provided], toilet compartment hardware [not provided], and accessible shower stall [clearances].



Sherwood Middle School | Building Review

Means of Egress | ● Good

There are sufficient means of egress serving the building.

Structural System | ● Good

The main structural system consists of a wide-flange steel moment frame with concrete floor slabs, roof joists, and frost walls. There are no signs of structural issues.

Hazardous Materials | ● Good

The potential for any asbestos-containing materials within the building is unlikely given the age of the building. There are several other items that may require special disposal, including light fixtures, light ballasts, hydraulic door closers, and exit light batteries, should renovations/replacements be considered.

Modular Classrooms

There are no modular classrooms at this facility.



Sherwood Middle School | Fire Protection

Service | ● Good

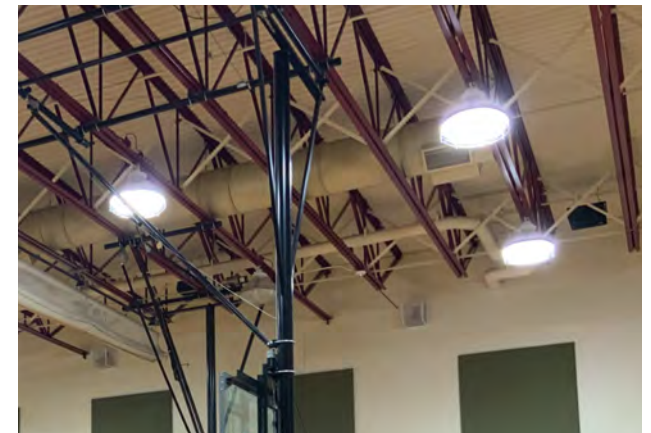
The fire suppression system serving the building is a wet pipe type system which provides essentially complete coverage throughout the building except as otherwise noted herein.

There is a 6" main sprinkler water service which enters the building in a fire service room in the vicinity of the kitchen. The 6" line runs through supervised valves and a double check style backflow preventer. The service supports two (2) risers, one 4" and one 6", each with alarm check valves and flow and tamper switches.

There is a single port Storz fire department connection provided on the exterior wall of the building.

The kitchen hood did have chemical-based suppression over equipment requiring such.

In general, the building's fire sprinkler coverage appears to be fairly comprehensive and compliant with current code.



Sherwood Middle School | Plumbing

Fixtures | ● Good

The existing building's plumbing systems appear adequate in quantity for the current occupancy. Most restrooms appear to comply with ADA/MAAB requirements for accessible fixtures.

Existing water closets are primarily of the wall-hung flush valve type. Urinals are of the wall-hung type and lavatories are of the wall-hung and counter style with either two-handle or single lever handle faucets, many of which are of the metered style. Most fixtures do appear to comply with current codes and standards.

Many public use lavatory sinks have metered (self-closing) faucets as required by code. In addition, many appear to have limit stops to ensure hot water does not exceed 110°F for scald prevention.

Several of the classrooms have sinks, most of which appear to be of the ADA-compliant type. The main kitchen appears to not have the minimum configuration and number of fixtures to satisfy current code and Board of Health requirements for a commercial kitchen. The current fixtures consist of the following:

- One (1) three-bay pot sink connected to a grease trap
- Two (2) two-bay food prep sinks with one bay having a garbage disposer and the other bay being indirectly wasted to a floor sink below
- One (1) single-bay sink with garbage disposer at dishwash area
- Four (4) hand wash sinks

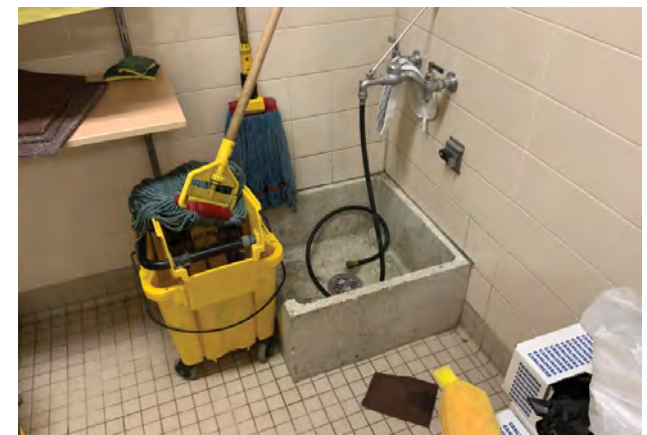
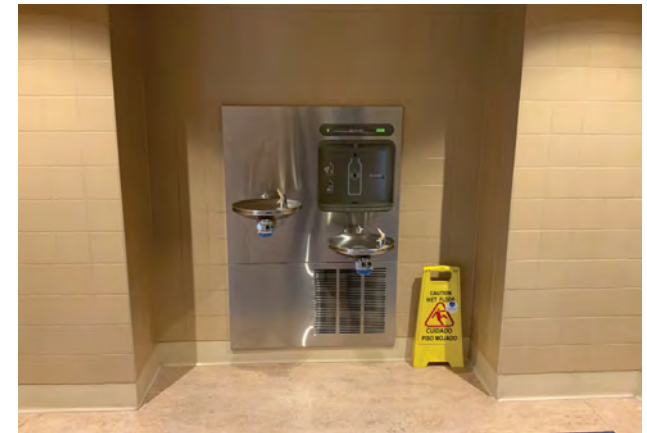
There are several ADA-compliant wall-mounted electric water cooler drinking fountains located throughout the building.

Janitor sinks inspected during our walk-through had faucet trim with vacuum breakers to limit backflow contamination caused by siphonage.

The boys' and girls' locker rooms each have a single-user shower stall. The units each have a pressure balanced valve for temperature, flow, and scald protection.

Fixtures are all of the same age as the building being installed in 2012. Apparently, maintenance is routinely performed on faucets, toilet flush valves, etc. as needed.

As renovations occur the following items should be considered: replace all flushometers/faucets with automatic low flow flushometers/faucets.



Sherwood Middle School | Plumbing

Cold Water Service | ● Good

A 4" main cold water line enters the building through the floor of the receiving/boiler room area. The service runs through a water meter, a reduced pressure zone style (RPZ) backflow preventer, and three (3) 2" pressure reducers piped in parallel prior to feeding the building's domestic water needs.

We noted most of the piping in the building appears to be copper, and, based on its age of only 10 years, should be in good condition.

Domestic Hot Water Service | ● Good

The domestic hot water needs of the building are supported by two (2) gas-fired tank style water heaters. The water heaters are each 130 gallons in capacity and have a rated input capacity of 399,900 BTUH. Units are manufactured by State Industries with a manufacture date of 11/2011.

There is an instantaneous gas-fired water heater located in the sprinkler service room near the kitchen. The unit appears to serve the high temperature water needs of the kitchen area. The unit is manufactured by Rinnai and has a rated input capacity of 199,000 BTUH. The unit was installed in 5/2019.

The water heaters have no active signs of leakage; however, the tank units have either met or exceeded their useful expected service life at 10 years of age and as such should be considered a prime candidate for replacement in the near future. Life expectancy of the units is highly dependent on water quality.

There is a central mixing valve station on the main building tank system which is required to support the varying water temperature needs of a building such as this as well as keep the tank water at an elevated point for sanitation (140°F). Current code would require differing water temperatures at different types of fixtures. Lavatory sinks and showers must not discharge hot water at a temperature exceeding 110–112°F for safety reasons, whereas service fixtures (janitor's sinks, kitchen sinks, etc.) are required to have hot water temperatures in excess of 120°F for sanitation reasons. The current system appears to supply a single temperature water to the building. After that proper water supply to lavatories should be accomplished by local mixing valves and/or fixtures with appropriate mixing limit stops. It is recommend that the central mixing valve should be replace with an electronic type.

The temperature/pressure gauge located at the outlet of the mixing valve has water in the gauge glass and should be replaced.

There is one recirculation pump on the domestic hot water system, which is required per the current plumbing code since there are fixtures located beyond 100 feet of the hot water source.

The domestic hot water heaters should be replaced with high efficiency condensing gas-fired style.



Sherwood Middle School | Plumbing

Drainage Systems | ● Good / ◐ Fair

Most of the sanitary drainage piping is concealed from view; however what we were able to see was primarily of the cast iron no-hub type. The sanitary sewer lines run below the slab and exit the building to a municipal sewer system.

Roof storm water is drained via roof drains connecting to internal leaders. The lines presumably exit to a municipal storm water system.

We noticed no other outward signs of failure in either the sanitary sewer system or the storm drainage system during our site inspection.

Natural Gas Service | ● Good

A natural gas service enters the building in the main-level mechanical room. The exterior service is a 2" intermediate gas pressure line which runs through a pressure regulator and a gas meter prior to increasing to 6" to feed the building's gas loads, which include the heating boilers, water heaters, and packaged rooftop equipment. The gas service to the building is supported by Eversource.



Sherwood Middle School | HVAC

Boiler Plant | ● Good

The heating needs for the building are supported by three (3) CleaverBrook #CFC-700-1800 fire-tube gas fired boilers installed in 2012. Each boiler has a rated input capacity of 1,800,000 BTUH. The boilers are high efficiency condensing style and, at 10 years old, are in good condition and well within their useful service life.

Piping Distribution System | ● Good

Hot water from the heating plant is distributed to the building via a two-pipe supply and return distribution system. The system circulates hot water to air handlers, rooftop unit coils, cabinet heaters, unit heaters and fin-tube radiation located throughout the building.

The pumps and their current service are as follows:

- P-1 & P-2: (lead/stand-by) variable speed hot water secondary loop; Bell & Gossett horizontal end-suction style.

The system pumps are manufactured by Bell & Gossett and appear to be in good operational order. At 10 years old, all pumps are well within their useful service life of 20 years as defined in ASHRAE.

Ventilation, Exhaust, & Miscellaneous HVAC | ● Good / ◐ Fair

A majority of the building's cooling, tempered heating and ventilation needs are supported by ten (10) packaged DX cooling, hot water heating rooftop units. The rooftop units are manufactured by Aaon and most incorporate a supply fan, exhaust fan, filter sections, DX coil with condenser section, hot water coil and a hot gas reheat coil for active dehumidification control. These units provide either full cooling or tempered cooling to the respective spaces.

There are five (5) heating and ventilation air handlers which support the heating and ventilation needs of areas such as the gym, café, lobby, locker rooms and kitchen. The air handlers are located in mechanical rooms within the building. Air handlers consist of a filter section, supply fan, hot water coil and in some cases a return/exhaust fan and energy recovery wheel. The units are manufactured by Aaon.

A summary of the RTU and AHU systems, their nominal capacity and unit configurations are reflected as follows:

Abbreviations:

H&V – Heating & Ventilation; HVAC – Heating, Ventilation and Air Conditioning; ERV – Energy Recovery Ventilation; VAV – Variable Air Volume



Sherwood Middle School | HVAC

- AHU-1: Kitchen Make-up Air, 6,000 CFM
- AHU-2: Café, 6,000 CFM, H&V with ERU & CO2 control
- AHU-3: Gymnasium, 12,000 CFM, H&V with CO2 control
- AHU-4: Lobbies, 8,000 CFM, H&V
- AHU-5 Locker Room 2,400 CFM, H&V with ERV
- RTU-1 Art Rooms, 1,900 CFM VAV, H&V with ERV and Dehum. Control
- RTU-2 Media & Tech., 8,000 CFM VAV, HVAC with ERV
- RTU-3 Office, 8,000 CFM VAV, HVAC with ERV
- RTU-4 Classrooms, 4,100 CFM VAV, H&V with ERV and Dehum. Control
- RTU-5 Classrooms, 3,000 CFM VAV, H&V with ERV and Dehum. Control
- RTU-6 Classrooms, 6,300 CFM VAV, H&V with ERV and Dehum. Control
- RTU-7 Classrooms, 5,400 CFM VAV, H&V with ERV and Dehum. Control
- RTU-8 Band, 810 CFM, H&V with ERV and Dehum. Control
- RTU-9 Music/Drama, 945 CFM VAV, H&V with ERV and Dehum. Control
- RTU-10 Core Restrooms, 2,700 CFM, H&V with ERV

The lobby and the gymnasium air handling systems also have the capability to preheat the incoming outdoor air through the use of a passive solar wall. When used in the cooler months, the outdoor air for the units is pulled through a southerly-facing metal panel wall system to allow for some preheating of the outdoor air when solar conditions allow.

The systems appear to be configured to supply the code required ventilation levels required at the time of their construction in 2012 all of which comply with current ventilation standards.

There are two (2) kitchen hoods that appear to comply with NFPA 96 and IMC standards. There is a chemical-based suppression system provided where required over equipment. A UL listed in-line fan exhausts the kitchen hoods out the sidewall.

All restrooms have ducted exhaust systems. The systems connect to exhaust fans located on the roof.

Most of the HVAC equipment including the rooftop units, air handlers, exhaust fans and the like are all in good condition and, being only 10 years old, are within their useful service life of 15 to 25 years as defined by ASHRAE.

Controls | ● Good

The building appears to have a building wide DDC energy management system throughout. The system is manufactured and supported by Automated Building Systems. The controls appear to incorporate many energy saving routines such as demand ventilation reset based on CO2 sensors as well as intelligent recovery. Sequences should be reviewed further as additional indoor air quality and energy saving routines may be possible.



Sherwood Middle School | Electrical

Service | ● Good

The building electrical service is rated 1600 amperes, 480/277 volt, 3-phase, 4-wire. The service consists of a utility company pad-mount transformer on the exterior of the building and underground feeds to the electrical service equipment. The electrical distribution equipment is by General Electric. Maintenance of the switchboard is recommended by the manufacturer and NETA.

Normal Distribution | ● Good

The panelboards in the building are by General Electric. The panelboards are located throughout the building in electrical rooms and are circuit breaker type. Several different types of wiring methods were observed, namely wires in raceway, metal clad (MC) cable, and armored cable (AC). Maintenance of the panelboards is recommended by the manufacturer and NETA.

General Purpose Power | ● Good

The general-purpose power in the building is adequate.

Emergency /Standby Power | ● Good

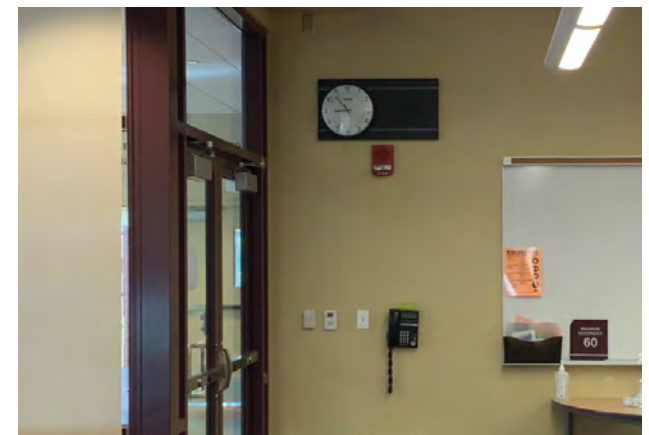
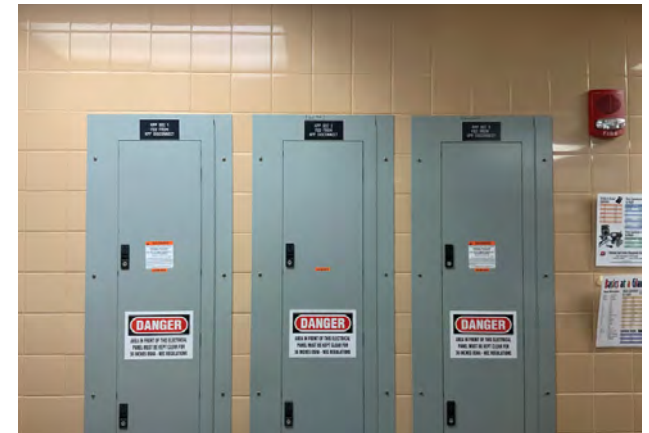
The emergency/standby generator is rated 175kW/218kVA, 480/277V, 3-phase, 4-wire, manufactured by Caterpillar. The generator fuel is diesel. The generator feeds four automatic transfer switches (ATS) for life safety and standby power loads. The life safety ATS is located in a 2-hour rated emergency electrical room.

Egress & Exit Lighting | ● Good

The emergency egress and exit lighting are powered from the life safety branch fed by the generator. The overall coverage appears to be adequate. The exist signs are LED self-contained battery type; the overall coverage of exit signs appears to be adequate.

Lighting & Controls | ● Fair

The ambient lighting system in the building consists of various types of fixtures (recessed, surface, pendant, etc.) primarily with fluorescent lamps. The lighting system is inefficient and does not meet current energy codes. Lighting control is primarily by wall mounted switches, occupancy sensors and relay panels. Ambient light system consisting of LED light fixtures should be provided. Networking lighting controls including occupancy, vacancy, and daylight sensors should also be provided.



Sherwood Middle School | Electrical

Telecommunications Cabling Infrastructure | ● Fair

The telecommunications system comprises mostly of Category 6 cables for data and voice communications. The system appears to meet the current programming needs of the facility.

The data communications equipment is by Cisco. Wi-Fi access points by Aerohive have been provided in the building. The voice communications equipment is NEC Univerge SV 9300 with digital handsets. Provide telecommunications infrastructure to comply with current BICSI standards.

Fire Alarm System | ● Good

The fire alarm system is addressable with voice evac; the fire alarm panel is JCI (Simplex) 4100ES. The fire alarm complies with current codes. Recommended to replace the initiating devices over 10-years old.

Public Address (PA) and Clock Systems | ● Good

PA Speakers are located in public and common areas as well as in classrooms. The PA and clock systems appear to be in good working condition and meet the current programming needs. The PA system is by Valcom.

Audio-Video Systems | ● Good

Short throw projectors are provided in classrooms.

Local sound systems are provided in the cafeteria/gym.

Hand-held radios are by Motorola.

The existing system is operational and meets current programming needs.

Video Surveillance & Access Control | ● Good

The video surveillance system is by American Dynamics. The access control system is by Kantech. Card readers are provided at the exterior door entries. Building entry is through Aiphone video entry station. The existing systems are operational and meet current programming needs.



Sherwood Middle School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Site

Size & Configuration	●		
Adjacent Land Use	●		
Vehicular Access	●		
Pedestrian Access	●		
Topography		◐	
Soils & Wetlands		◐	
Utilities/Service Areas	●		
Recreation Area/Community Use	●	◐	
Parking/Walkways/Curbs/ Sidewalks/Drainage	●	◐	
Landscape Features	●	◐	
Site Furnishings	●		
Accessibility	●		

Building

Exterior Walls	●		
Roof Systems	●		
Doors & Windows	●		
Interior Finishes	●		
Accessibility	●		
Means of Egress	●		
Structural System	●		
Hazardous Materials	●		
Modular Classrooms			

Fire Protection

Service	●		
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Sherwood Middle School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Plumbing

Fixtures	●	
Cold Water Service	●	
Domestic Hot Water Service	●	
Drainage Systems	●	◐
Natural Gas Service	●	

HVAC

Boiler Plant	●	
Piping Distribution System	●	
Ventilation, Exhaust, & Miscellaneous HVAC	●	◐
Controls	●	

Electrical

Service	●	
Normal Distribution	●	
General Purpose Power	●	
Emergency /Standby Power	●	
Egress & Exit Lighting	●	
Lighting & Controls		◐
Telecommunications Cabling Infrastructure		◐
Fire Alarm System	●	
Public Address (PA) and Clock Systems	●	
Audio-Video Systems	●	
Video Surveillance & Access Control	●	

Oak Middle School | Facility Overview

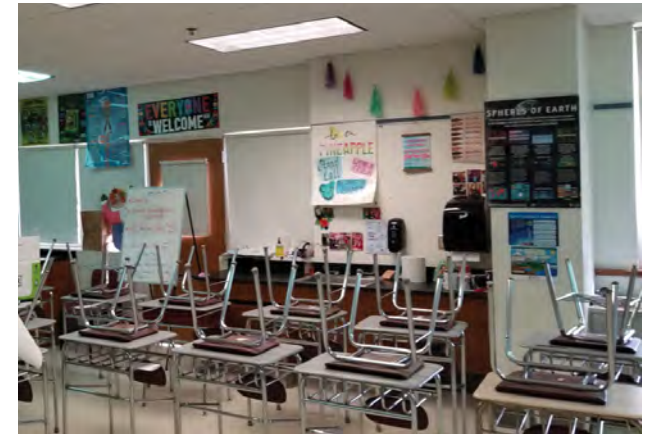
Address:	45 Oak Street, Shrewsbury, MA 01545
Zoning:	Residence B-1 / Residence B-2
Gross Square Footage:	± 166,400 sq.ft.
Assessed Value 2021:	\$21,894,600 [Building Only]
Lot Size:	± 46.69 acres
Constructed/Renovated:	1957/1981/2004
Modulars:	N/A
Construction Type:	II-B
Grade Configuration:	7-8
Current Enrollment:	979

Overview

Oak Middle School is centrally located in town on Oak Street. This district-wide school serves a current population of 979 students in grades 7-8.

The original building configuration has been altered over the years with an addition in 1981 and a major renovation converting the building from a high school to the middle school it is today in 2004. The building consists of four levels: first floor and ground floor, and the Boys and Girls Locker Rooms which are on split levels off the first floor. The main entry to the building is located on the west facing elevation and provides an the south side of the building provides direct access to the first floor, which houses all of the major core spaces. The ground floor is accessible via an elevator off the main corridor that connects the academic wings.

The building's overall condition is as expected for a facility that is now over 75 years old and has served the town well during this time.



Oak Middle School | Existing Site Plan



Oak Middle School | Site Review

Size & Configuration | ● Good

The overall plot has a good configuration. The site is shared with Sherwood Middle School, allowing the two schools to leverage each others' amenities. It also has frontage/access to Oak Street, Sherwood Avenue, Hutchins Street, and Crescent Street.

Adjacent Land Use | ● Good

The school site is bordered by a Residence B-2 zone to the northeast and Residence B-1 zones on all other sides. The site is abutted by single-family residences on all sides, with the exception of the Shrewsbury Montessori School and municipal water tank which are located on the southwest edge.

Vehicular Access | ● Good

There are several entry points for vehicular traffic to access the site. Buses enter the site via Sherwood Avenue and loop down to Oak, then proceed to Sherwood, and ultimately exit the site on Hutchins Street. Parents enter the site via Oak Street making a loop in front of the school, and then exit through the northern parking lot in front of the school. These routes allow for clear separate of vehicular traffic ensuring student safety. There is not enough space for on site queuing of parent cars during pick-up/drop-off. Currently, 77% of students take the bus to and from school while 21% are transported by their parents.

Pedestrian Access | ● Good

Pedestrian access to the site is good. All connecting streets to the site have sidewalks and crosswalks, allowing students safe passage from all directions to the site. Only 2% of the students walk to and from school.

Topography | ○ Fair

The site slopes approximately 50 feet from the north to the south. The site is best described as a collection of low sloping terraces. Both middle school buildings take advantage of these grade changes by constructing lower/ground level spaces built into the slope.

Soils & Wetlands | ○ Fair

The site is characterized by Urban Fill and Woodbridge soils, from well-drained friable conditions which cover most of the site to poorly drained pockets to the east and southeast [see soils mapping in the Appendix]. There is a wetland in the eastern portion of the property that would have limited impact on any future development of the site.



Oak Middle School | Site Review

Utilities/Service Areas | ● Fair

The school is well served by municipality-owned water, sewer, electric, and internet. The mechanical systems run off of natural gas. The building does have a service area with a loading dock to provide service/deliveries to the building; however, its location is not the most convenient.

Recreation Areas/Community Use | ● Good / ● Fair

The school's baseball field, football field, softball field, tennis courts, and track are utilized by the neighborhood community outside of school hours and are in good to fair condition.

Parking/Walkways/Curbs/Sidewalks/Drainage | ● Fair / ○ Poor

There is sufficient parking for staff and visitors to support daily operations. During special events, parking at the neighboring middle school and use of the paved play area meets the needs. There are several pedestrian walkways throughout the site consisting of asphalt, concrete, and pavers. Overall condition of these features is fair to poor. The asphalt at the front of the building is in poor condition. The site appears to have sufficient drainage given its current configuration.

Landscape Features | ● Fair

The site landscaping is limited and would be best characterized as mature and well-established.

Site Furnishings | ● Good

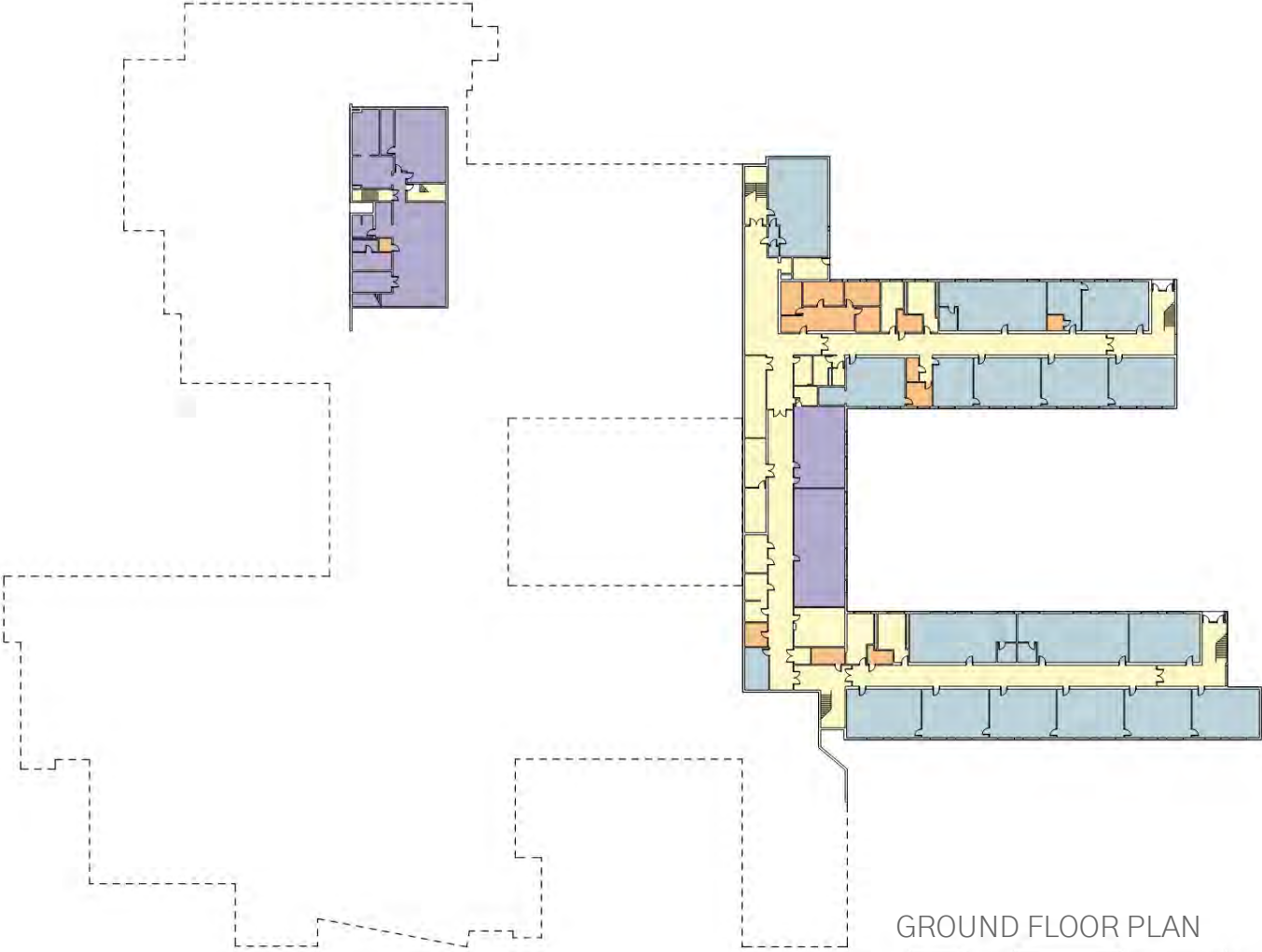
There are several site furnishings located on the site, including trash receptacles, benches, bike racks, signage, and a flag pole. These site furnishings are in good condition.

Accessibility | ● Good

As previously reported, there are only a few deficiencies regarding the site. The following items do not meet the current accessibility guidelines: athletic fields/bleachers [route], tennis courts [maintenance], and concession stand counter [non-accessible].



Oak Middle School | Existing Building Plans



LEGEND

NET FLOOR AREA

- ACADEMIC
- CORE
- ADMINISTRATIVE

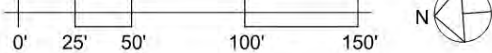
GROSS FLOOR AREA

- NON-PROGRAMMED

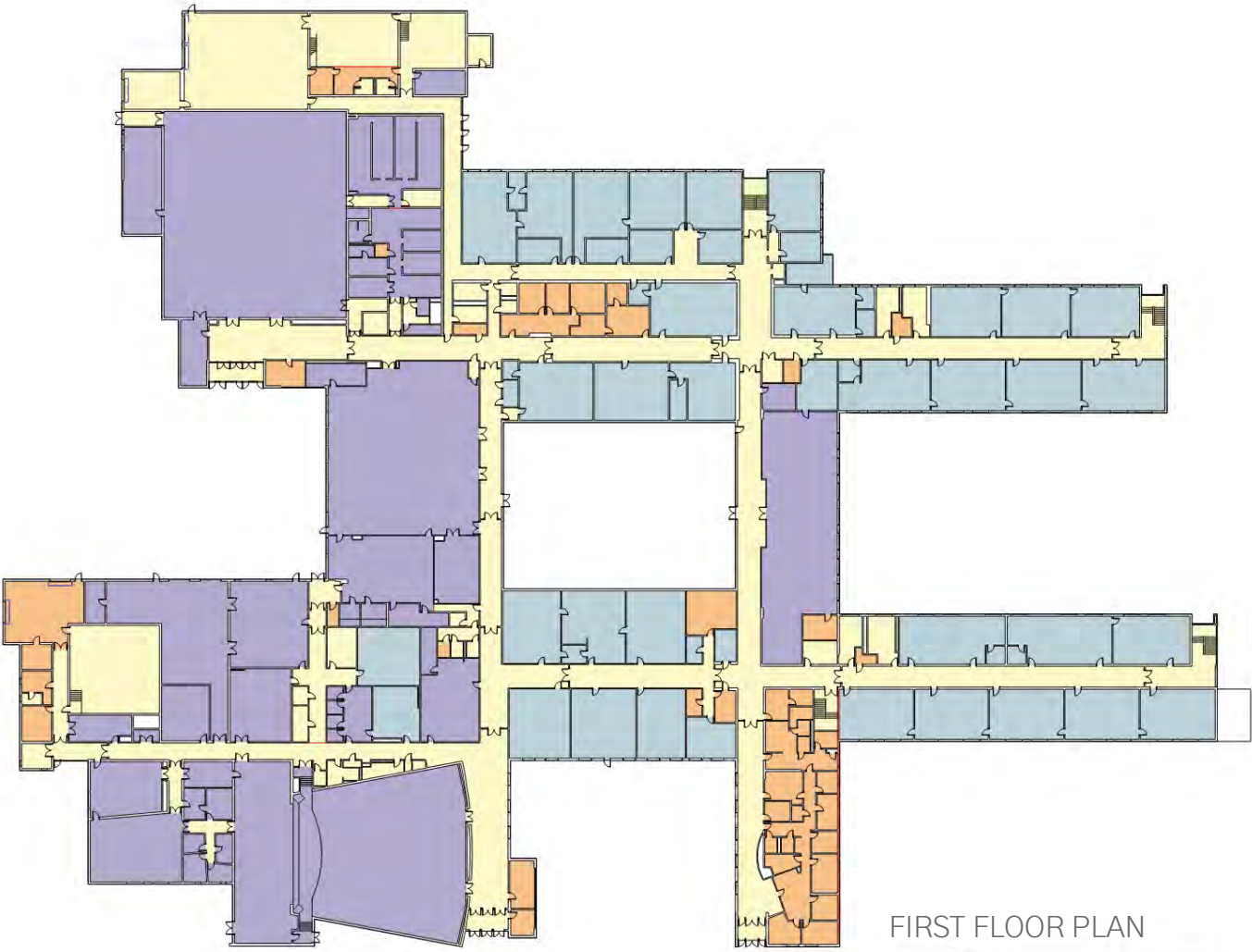
EXCLUDED AREA

- MODULAR/PORABLE

GROUND FLOOR PLAN



Oak Middle School | Existing Building Plans



LEGEND

NET FLOOR AREA

ACADEMIC

CORE

ADMINISTRATIVE

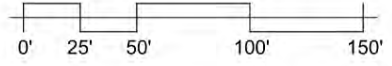
GROSS FLOOR AREA

NON-PROGRAMMED

EXCLUDED AREA

MODULAR/PORABLE

FIRST FLOOR PLAN



Oak Middle School | Building Review

Exterior Walls | ● Fair / ○ Poor

The exterior walls consist of brick masonry, concrete, and metal panels. As previously reported, the exterior joints where sealant was used have failed. The brick masonry requires repointing/resetting/re-anchoring of bricks at several locations to ensure the envelope is watertight. The entire building will require repointing in the next few years. Corroded steel lintels have led to spalling/shifting bricks and should be replaced. There are several smaller concrete repairs that are also required to prevent further deterioration. There were also several areas where organic growth is occurring that should be remediated as soon as possible.

Roof System | ● Fair / ○ Poor

The roof is comprised of black EPDM over mechanically-fastened insulation. Based on previous reports, the roofing had several deficiencies, including splits in flashing, damaged metal roof edge, unadhered membrane, open seams, and blisters. Many of these deficiencies were addressed via the stop-gap measure of using a liquid roof patch material. The roof is nearing the end of its useful life. Additionally, the inner courtyard also does not have a guard rail around it as is required by current codes.

Door & Windows | ● Fair / ○ Poor

The building consists of aluminum-framed windows and hollow metal doors and frames. The majority of the doors and windows are in fair condition with the exception of failed sealants and corroding lintels. The sealants and lintels should be replaced and maintained through a comprehensive maintenance plan. The hollow metal doors, frames, and windows that were not replaced during the 2004 renovation are in poor condition and require replacement.

Interior Finishes | ● Fair / ○ Poor

The interior walls consist of painted & glazed concrete masonry units, painted gypsum walls, ceramic tile, and brick masonry. These walls are all in good condition with the exception of some cracks in the CMU walls. The ceiling primarily consists of acoustical ceiling tiles with some gypsum ceilings, all of which are in good condition except where leaks have occurred. The flooring consists of vinyl composite tile [VCT], ceramic tile, and carpet, which are in fair condition with the exception of a few locations. VCT was being replaced during our visit and should continue to be replaced on an as needed basis. The items that have the most amount of wear on them are the doors, frames, hardware, millwork, and lockers. The deteriorated exterior hollow metal windows and doors have allowed water infiltration which has damaged interior finishes in several locations. The wood veneers on the millwork have advanced delamination due to the use of cleaners during the COVID-19 pandemic.



Oak Middle School | Building Review

Accessibility | ● Good / ◐ Fair

As previously reported, there are several deficiencies regarding the building. The following items do not meet the current accessibility guidelines: stage [non-accessible], auditorium seats [insufficient amount], stage handrails [non-accessible], locker rooms showers [clearances], sink pipe insulation [not provided], protrusions along accessible routes, toilet compartments [hardware], signage [accessible egress/toilets], and cane-detectable barriers [not provided].

Means of Egress | ● Good / ◐ Fair

There are sufficient means of egress serving the building. The egress paths themselves have a few items that do not meet the requirements of the current code, including the use of wire glass and lack of gasketing to meet fire ratings.

Structural System | ● Good / ◐ Fair

The main structural system consists of a steel frame with concrete floor slabs and frost walls. There appears to have been some settling in certain areas that should be investigated and remediated prior to any masonry repairs. Corroded lintels and steel members should also be remediated in conjunction with any masonry repairs.

Hazardous Materials | ● Good / ◐ Fair

During the 2004 renovation, all asbestos-containing materials were removed from the building. However, there are several other items that require special disposal, including light fixtures, light ballasts, hydraulic door closers, and exit light batteries.

Modular Classrooms

There are no modular classrooms at this facility.



Oak Middle School | Fire Protection

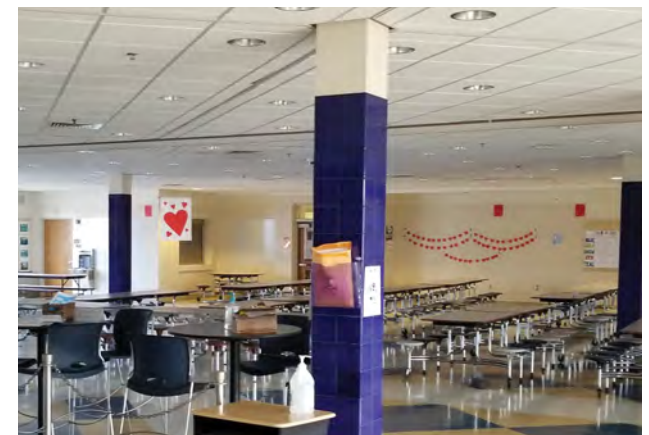
Service | ● Good

The fire suppression system serving the building is a wet pipe type system which provides essentially complete coverage throughout the building.

There is a 6" main sprinkler water service which enters the building main level sprinkler room. The 6" runs through supervised valves, a double check style backflow preventer valve prior to splitting to three (3) separate wet type risers serving the building. Each riser incorporates supervised valves and an alarm check valve and serve respective sections of the building.

There is a presumed fire department connection provided on the exterior wall of the building. The kitchen hood is equipped with a chemical-based suppression over equipment requiring such.

In general, the building's fire sprinkler coverage appears to be fairly comprehensive and compliant with current code. Where quick-response type sprinklers are utilized, testing and/or replacement will be required for these types of sprinklers at 25 years of age. The current age of the sprinklers appears to be near 25 years.



Oak Middle School | Plumbing

Fixtures | ● Good

The existing building's plumbing systems appear adequate in quantity for the current occupancy. Due to the building's age with major renovations in 2004, most restrooms do comply with ADA/MAAB requirements for accessible fixtures.

Existing water closets are primarily of the wall-hung flush valve type. Urinals are of the wall-hung type and lavatories are of the wall-hung and counter style with either two-handle or single lever handle faucets, many of which are of the metered style. Most fixtures do appear to comply with current codes and standards.

Many public use lavatory sinks have metered (self-closing) faucets as required by code. In addition, many appear to have limit stops to ensure hot water does not exceed 110°F for scald prevention.

Several of the classrooms have sinks, some of which are ADA-compliant.

The main kitchen appears to have at least the minimum configuration and number of fixtures to satisfy current code and Board of Health requirements for a commercial kitchen. The fixtures consist of a three-bay pot sink which appears to connect to a grease trap, a two-bay prep sink, and at least one (1) hand sink. The two-bay prep sink was indirectly wasted as required by current code.

There are several ADA-compliant wall mounted non-electric and electric water cooler drinking fountains located throughout the building.

Janitor sinks inspected during our walk-through had faucet trim with vacuum breakers to limit backflow contamination caused by siphonage. Based on the age of the building renovations, we expect that all are code compliant.

The boys' locker room has a gang shower arrangement with central floor drain. Per current plumbing code, this would not be allowed as occupants may be required to walk through the waste from another occupant.

Most of the fixtures are of the water-saving type for the code enforced at the time of the building's construction. Apparently, maintenance is routinely performed on faucets, toilet flush valves, etc. as needed.

As renovations occur, the following items should be considered: replace all flushometers/faucets with automatic low flow flushometers/faucets.



Oak Middle School | Plumbing

Cold Water Service | ● Good

A 4" cold water line enters the building in a main level maintenance area. The service runs through one (1) water meter as well as a backflow preventer prior to feeding the building domestic water needs. There is also a pressure reducer located on the domestic water supply main.

We noted most of the piping in the building appears to be copper, and, based on its age, should be in good condition; however, this can vary based on water quality. We recommend a pipe sample from both the cold and hot water system be taken to verify pipe condition.

Domestic Hot Water Service | ○ Fair

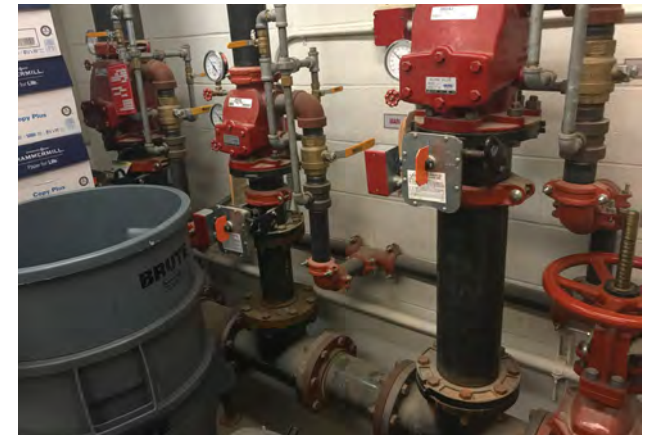
The domestic hot water needs of the building are supported by two (2) gas-fired tank style water heaters. Each water heater is a 100-gallon nominal capacity, 270,000 BTUH input gas-fired unit as manufactured by Rudd; manufacture date 6/2014 and 7/2014, respectively.

The water heaters have no active signs of leakage; however, they are nearing the end of their useful expected service life of 10 years and, as such, should be considered a candidate for replacement within the next 5 years.

There is a single mixing valve station on the main hot water supply which serves most of the building fixtures. Current code would require differing water temperatures at different types of fixtures. Lavatory sinks and showers must not discharge hot water at a temperature exceeding 110–112°F for safety reasons, whereas service fixtures (janitor's sinks, kitchen sinks, etc.) are required to have hot water temperatures in excess of 120°F for sanitation reasons. The current system appears to supply a single temperature water to the building. After that, proper water supply to lavatories and showers should be accomplished by local mixing valves and/or fixtures with appropriate mixing limit stops. It appears the domestic hot water storage tanks are kept at approximately 140°F which is essential to prevent the possibility of bacteria growth within the tank. It is recommend that the central mixing valve should be replace with an electronic type.

There is one recirculation pump on the domestic hot water system, which is required per the current plumbing code since there are fixtures located beyond 100 feet of the hot water source.

The domestic hot water heaters should be replaced with high efficiency condensing gas-fired style.



Oak Middle School | Plumbing

Drainage Systems | ● Good

Most of the sanitary drainage piping is concealed from view; however, what we were able to see was primarily of the cast iron no-hub type. The sanitary sewer lines run below the slab and exit the building to a municipal sewer system.

Roof storm water is drained via roof drains connecting to internal leaders. The lines presumably exit to a municipal storm water system. The building does not appear to have any emergency roof overflow drains. These are required by current code, as a clogged drain can lead to water build-up on the roof and structural failure due to weight. During any reroofing project or building upgrade we highly recommend emergency roof drains be added. The emergency drains should be added near the current roof drains and run to discharge to the side of the building. The visible discharge location is required as it gives users and indication of a failed main drain system.

We noticed no other outward signs of failure in either the sanitary sewer system or the storm drainage system during our site inspection.

Reconfiguration of the floor and drain system in the boys' locker room to ensure waste water does not cross between occupants is recommended. Stall configuration may be considered.

Natural Gas Service | ● Good

A 5" intermediate pressure natural gas service is located exterior to the building outside the main level maintenance area/mechanical room. The service splits to two (2) pressure reducers which each feed a gas meter. After each meter, the gas runs through another pressure reducer prior to increasing in size to serve a 4" gas line and an 8" gas line. The 8" gas line appears to serve the main heating boilers and domestic hot water heaters, with the 4" line serving the kitchen and other building gas loads.



Oak Middle School | HVAC

Boiler Plant | ● Fair

The heating needs for the building are supported by two (2) Cleaver Brooks #CB-200 fire-tube dual fuel gas/oil fired boilers with a manufactured year of 2003. Each boiler has a rated input capacity of 8,165,000 BTUH. According to facility personnel, the underground fuel oil supply tank(s) were removed in 2019 and as such the boilers only operate on natural gas.

According to ASHRAE, the life expectancy of these types of boilers is 25 years, although with proper maintenance they have been known to operate for a longer service life. A 10-year plan to replace these boilers is recommended. Although the boilers are in fair working order, when the time comes to replace them consideration could be given to replacement with high efficiency condensing style boilers.

Piping Distribution System | ● Fair

Hot water from the heating plant is distributed to the building via a two-pipe supply and return distribution system. The hot water system circulates hot water to air handlers, fin-tube radiation and classroom unit ventilators units located throughout the building.

The system is supported by two (2) constant speed hot water loop pumps as manufactured by Bell & Gossett. The pumps appear to be in fair operational order with signs of bearing assembly and motor replacement. The pumps are at nearing the end of their useful service life of 20-years as defined in ASHRAE and as such are prime candidates for replacement in the coming years.

Ventilation, Exhaust, & Miscellaneous HVAC | ● Good / ● Fair

Classroom unit ventilators are located throughout the classroom segments of the building. These units are located along exterior walls and each has an outdoor air louver and associate control dampers to allow outdoor air to enter the classroom space through the unit ventilator. During occupied periods, the unit fans run continuously to provide space ventilation, and electric valves modulate hot water flow through the units to maintain space temperature. The unit ventilators are manufactured by Trane.

As unit ventilators and air handlers are replaced, coils should be sized for low temperature (140°F or less) hot water. This lower temperature hot water will maximize efficiency of the condensing gas boilers and also allow opportunity for possible future implementation of air to water heat pumps to assist the building hydronic heating loop.

Classroom exhaust in much of the building is supported by a centralized exhaust fans located on the building roof. In most cases the fans serve multiple rooms. It is recommended to incorporate energy recovery ventilation systems on new and supplemental systems where feasible.



Oak Middle School | HVAC

In addition, large portions of the rest of the building are supported by a mix of packaged rooftop units and air handling units, some of which have air cooled DX cooling sections in either a packaged or split arrangement. The following is a brief summary of the major roof top air handling equipment types and configuration:

- RTU-1 through RTU-7: Heating and cooling units having filter sections, supply fans, hot water coils, air-cooled DX cooling sections, dampers, and, in some cases, exhaust fans. Serving a mix of constant volume and variable air volume systems. Units primarily manufacturer by York.
- RTU-8 through RTU-13: Heating units having filter sections, supply fans, hot water coils, dampers, and, in some cases, exhaust fans. Serving constant air volume systems. Units primarily manufacturer by Addison.
- AHU-1 and AHU-3 through 8: Heating units having filter sections, supply fans, hot water coils, dampers, and, in some cases, exhaust fans. Serving constant air volume systems. Units primarily manufacturer by York.
- AHU-2: Heating and cooling unit having filter section, supply fan, hot water coils, DX cooling coil, and dampers. The DX coil is connected to an air-cooled condensing unit located exterior to the building. Unit is a constant volume type serving the auditorium space. Unit is manufacturer by York.

The systems appear to be configured to supply the code-required ventilation levels required at the time of its construction, many of which comply with current ventilation standards. However, further review would be required especially for the science, art and/or woodworking spaces, all of which require higher outdoor air ventilation and exhaust rates when compared to normal classrooms.

The kitchen hood over the range and oven equipment appears to comply with current NFPA 96 and IMC standards. A chemical-based suppression system is provided over the cooking equipment requiring such.

All restrooms have ducted exhaust systems. The systems connect to exhaust fans located on the roof.

A majority of the air handlers, exhaust fans, classroom unit ventilators and the like are at the end of their useful service life of 20 to 25 years as defined in ASHRAE, and as such are prime candidates for replacement in the coming years.

Controls | ● Good

The building appears to have a building wide DDC energy management system throughout. The system is manufactured and supported by Johnson Controls. According to facility personnel, the system has undergone and continue to undergo upgrades. Sequences should be reviewed further as additional indoor air quality and energy-saving routines may be possible.



Oak Middle School | Electrical

Service | ● Good

The building electrical service is rated 3000 amperes, 480/277 volt, 3-phase, 4-wire. The service consists of a utility company pad-mount transformer on the exterior of the building and underground feeds to the electrical service equipment. The electrical distribution equipment is by General Electric. Maintenance of the switchboard is recommended by the manufacturer and NETA.

Normal Distribution | ● Good

The panelboards in the building are by General Electric. The panelboards are located throughout the building in electrical rooms and are circuit breaker type. Several different types of wiring methods were observed, namely wires in raceway, metal clad (MC) cable, and armored cable (AC). Maintenance of the panel boards is recommended by the manufacturer and NETA.

General Purpose Power | ○ Fair

The general-purpose power in the building appears to be adequate. Wiring devices may need to be replaced due to age.

Emergency /Standby Power | ○ Fair

The emergency/standby generator is rated 450kW/562.5kVA, 480/277V, 3-phase, 4-wire, manufactured by Caterpillar. The generator fuel is diesel. The generator feeds two automatic transfer switches (ATS) for life safety and standby power loads. The life safety transfer switch and distribution equipment are located in a 2-hour rated room. The main emergency electrical room housing the life safety transfer switch is being used as a storage room; this is a code violation and must be rectified as soon as possible.

Egress & Exit Lighting | ● Good

The emergency egress and exit lighting are powered from the life safety branch fed by the generator. The overall coverage appears to be adequate; ART could not confirm whether the exit discharge leading to a public way was powered from the life safety branch. The existing signs are LED self-contained battery type; the overall coverage of exit signs appears to be adequate.

Lighting & Controls | ○ Fair

The ambient lighting system in the building consists of various types of fixtures (recessed, surface, pendant, etc.) primarily with fluorescent lamps. The lighting system is inefficient and does not meet current energy codes. The lighting throughout the facility is controlled with motion sensors, snap switches, and relay panels. An ambient light system consisting of LED light fixtures should be provided. Networking lighting controls including occupancy, vacancy, and daylight sensors should also be provided.



Oak Middle School | Electrical

Telecommunications Cabling Infrastructure | ● Fair

The telecommunications system is comprised mostly of Category 6 cables for data and voice communications. The system appears to meet the current programming needs of the facility.

The data communications equipment is by Cisco. Wi-Fi access points by Aerohive have been provided in the building. The voice communications equipment is NEC Univerge SV 9300 with digital handsets. Telecommunications infrastructure that complies with current BICSI standard should be provided.

Fire Alarm System | ● Fair

The fire alarm system is addressable tone-visual type; the fire alarm panel is by Notifier. The fire alarm system does not comply with current codes. A new voice evacuation type fire alarm system with initiating and signaling devices to comply with current codes and standards should be provided.

Public Address (PA) and Clock Systems | ● Fair

PA Speakers are located in public and common areas as well as in classrooms. The PA and clock systems appear to be in good working condition and meet the current programming needs. The PA system is Telecenter by Rauland Borg.

Audio-Video Systems | ● Fair

Short throw projectors are in the process of being installed in the classrooms.

Local sound system is provided in the gym.

Hand-held radios are by Motorola.

The existing system is operational and meets current programming needs.

Video Surveillance & Access Control | ● Fair

The video surveillance system is by Exacq with Axis cameras. The access control system is by Brivo. Card readers are provided at the exterior door entries. Building entry is through Aiphone video entry station. The existing systems are operational and meet current programming needs.



Oak Middle School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Site

Size & Configuration	●		
Adjacent Land Use	●		
Vehicular Access	●		
Pedestrian Access	●		
Topography		◐	
Soils & Wetlands		◐	
Utilities/Service Areas		◐	
Recreation Area/Community Use	●	◐	
Parking/Walkways/Curbs/ Sidewalks/Drainage		◐	○
Landscape Features		◐	
Site Furnishings	●		
Accessibility	●		

Building

Exterior Walls		◐	○
Roof Systems		◐	○
Doors & Windows		◐	○
Interior Finishes		◐	○
Accessibility	●	◐	
Means of Egress	●	◐	
Structural System	●	◐	
Hazardous Materials	●	◐	
Modular Classrooms			

Fire Protection

Service	●		
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Oak Middle School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Plumbing

Fixtures	●		
Cold Water Service	●		
Domestic Hot Water Service		◐	
Drainage Systems	●		
Natural Gas Service	●		

HVAC

Boiler Plant			◐
Piping Distribution System			◐
Ventilation, Exhaust, & Miscellaneous HVAC	●		◐
Controls	●		

Electrical

Service	●		
Normal Distribution	●		
General Purpose Power			◐
Emergency /Standby Power			◐
Egress & Exit Lighting	●		
Lighting & Controls			◐
Telecommunications Cabling Infrastructure			◐
Fire Alarm System			◐
Public Address (PA) and Clock Systems			◐
Audio-Video Systems			◐
Video Surveillance & Access Control			◐

Shrewsbury High School | Facility Overview

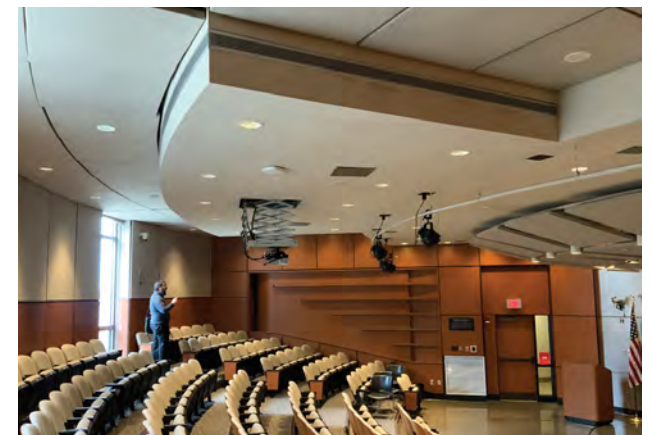
Address:	64 Holden Street, Shrewsbury, MA 01545
Zoning:	Rural B
Gross Square Footage:	± 290,000 sq.ft.
Assessed Value 2021:	\$42,215,800 [Building Only]
Lot Size:	± 194.17 acres
Constructed/Renovated:	2002
Modulars:	N/A
Construction Type:	II-B
Grade Configuration:	9-12
Current Enrollment:	1,835

Overview

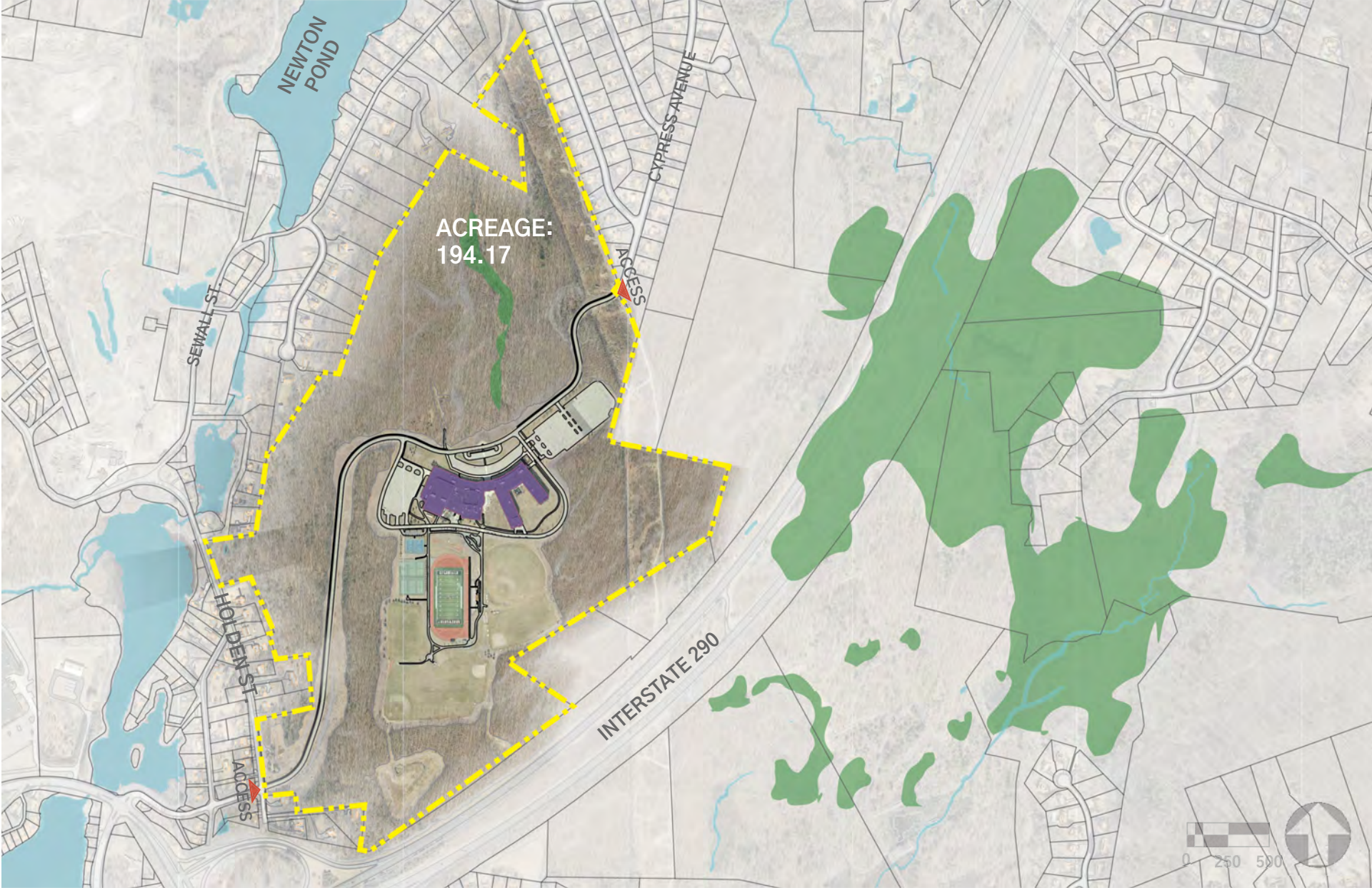
Shrewsbury High school is located in the northwest corner of town on Holden Street. This district-wide school serves a current population of 1,835 students in grades 9-12.

The building was constructed in 2002. The overall facility consists of four distinct levels: ground floor, first floor, second floor, and third floor. The main entry to the school is located on the northern face on the building and provides direct access to the first floor. From there, the upper and lower levels are accessed via stairs/elevators off the main corridor.

The building's overall condition is good to fair, given its age and use group.



Shrewsbury High School | Existing Site Plan



Shrewsbury High School | Site Review

Size & Configuration | ● Good

The overall plot has a good configuration. It has frontage on both Holden Street and Cypress Avenue.

Adjacent Land Use | ● Good

The school site is bordered by Rural B use zones on all sides except for the south, where it is bordered by Rural A. Abutting properties consist of single-family residences. The site is insulated from all of its neighboring properties by large wooded borders.

Vehicular Access | ● Good / ○ Fair

The main vehicular entrances are off Holden Street & Cypress Avenue, with most utilizing the Holden Street entrance. These access points are shared by buses, students, and parents. Buses utilize the loop at the front entrance to facilitate pick-up and drop-off, while parents utilize the loop around the southern side of the building and students who have transported themselves proceed directly to the student parking lot located to the northeast. There is not enough space for on-site queuing of parent cars during pick-up/drop-off. Currently, 60% of students take the bus to and from school while 40% are transported by themselves or their parents.

Pedestrian Access | ● Good / ○ Fair

There are pedestrian sidewalks along all access roads, allowing students safe passage from all directions to the site. The condition of these walks is good to fair; however, the remoteness of this site limits the usefulness of these features. Only 5 students currently walk to and from school.

Topography | ○ Fair

The site is best described as a collection of low sloping terraces. The building takes advantage of one of these grade changes by constructing a field house on the lower/ground level into the slope. Outside of the developed area, the site has significant changes in grade, uphill to the north and northeast and downhill to the south and southwest.

Soils & Wetlands | ○ Fair

The site is characterized by Canton soils and Chatfield Hollis-Rock Outcroppings, both of which are very stony and well draining [see soils mapping in the Appendix]. There are wetlands in the northern portion of the property, which would require further investigation to clearly delineate the limits; however, impact on potential development of the site would not be significant given the limits of the current site improvements. Any expansion outside of the current developed areas would likely encounter ledge that would require blasting.



Shrewsbury High School | Site Review

Utilities/Service Areas | ● Good

The school is well served by municipality-owned water, sewer, electric, and internet. The boilers run off of natural gas. The building does have a convenient/accessible service area to provide deliveries to the building. There is also no loading dock for the building.

Recreation Areas/Community Use | ● Good / ◐ Fair

The school's athletic fields, playground, tennis courts and basketball courts are utilized by the neighborhood community outside of school hours and are in good to fair condition.

Parking/Walkways/Curbs/Sidewalks/Drainage | ● Good / ◐ Fair

There is sufficient parking for staff and visitors to support daily operations. However, the site has limited capacity in respect to special events. There are several pedestrian walkways throughout the site consisting of asphalt and concrete. Overall condition of these features is good to fair. The site appears to have sufficient drainage given its current configuration.

Landscape Features | ● Good / ◐ Fair

The site landscaping would be best characterized as mature and well-established, with areas of over-growth that require some attention.

Site Furnishings | ◐ Fair

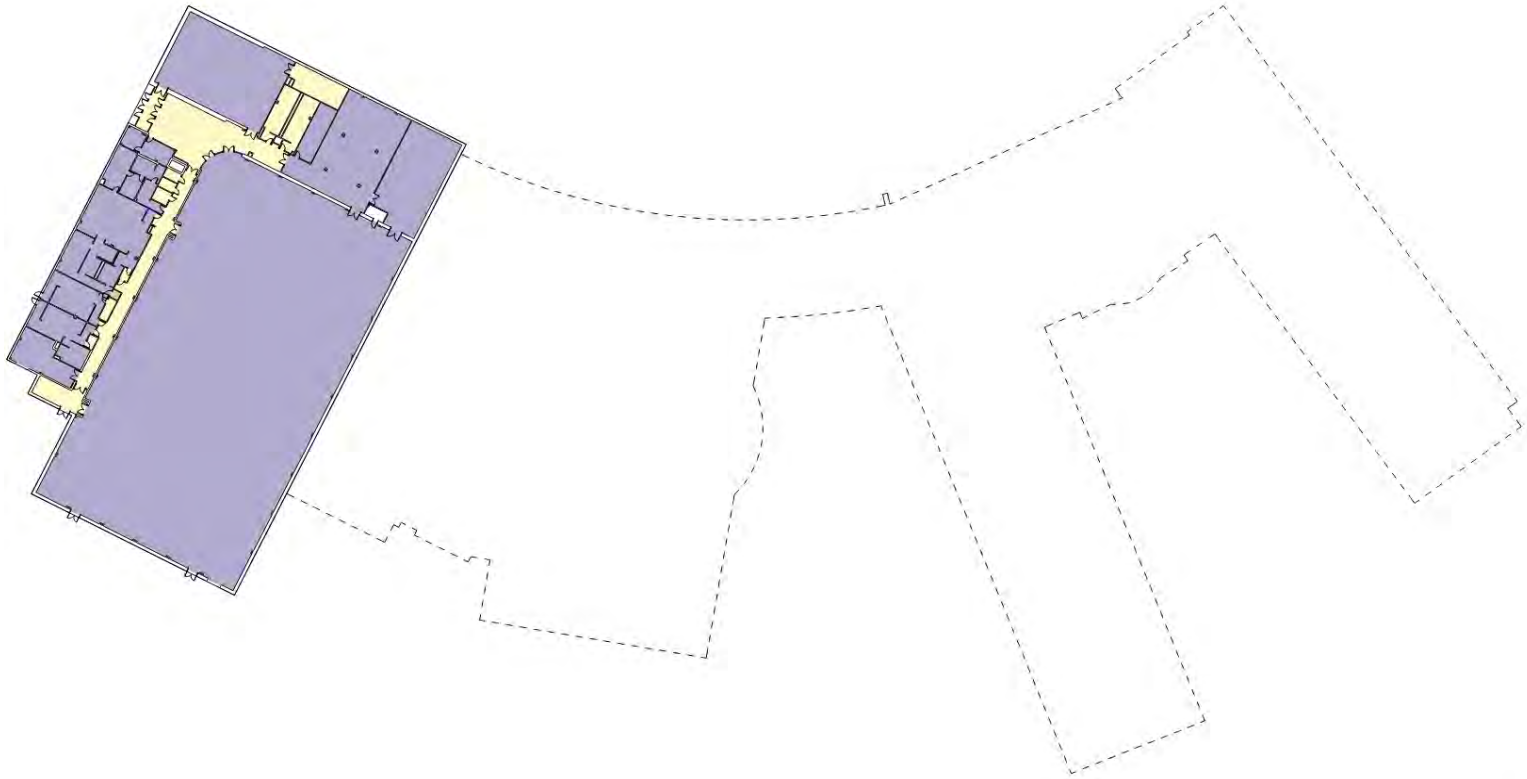
There are several site furnishings located on the site, including trash receptacles, benches, signage, flag pole, and bicycle racks. These site furnishings are in fair condition, given their age.

Accessibility | ● Good / ◐ Fair

As previously reported, there are only a few deficiencies regarding the site. The following items do not meet the current accessibility guidelines: athletic fields [route], bleachers [non-accessible], handrails [maintenance], playground surface [maintenance], parking lots [slopes], accessible parking [insufficient], and picnic tables [non-accessible].



Shrewsbury High School | Existing Building Plans



LEGEND

NET FLOOR AREA

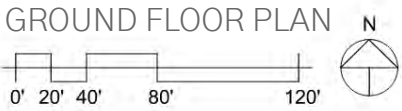
- ACADEMIC
- CORE
- ADMINISTRATIVE

GROSS FLOOR AREA

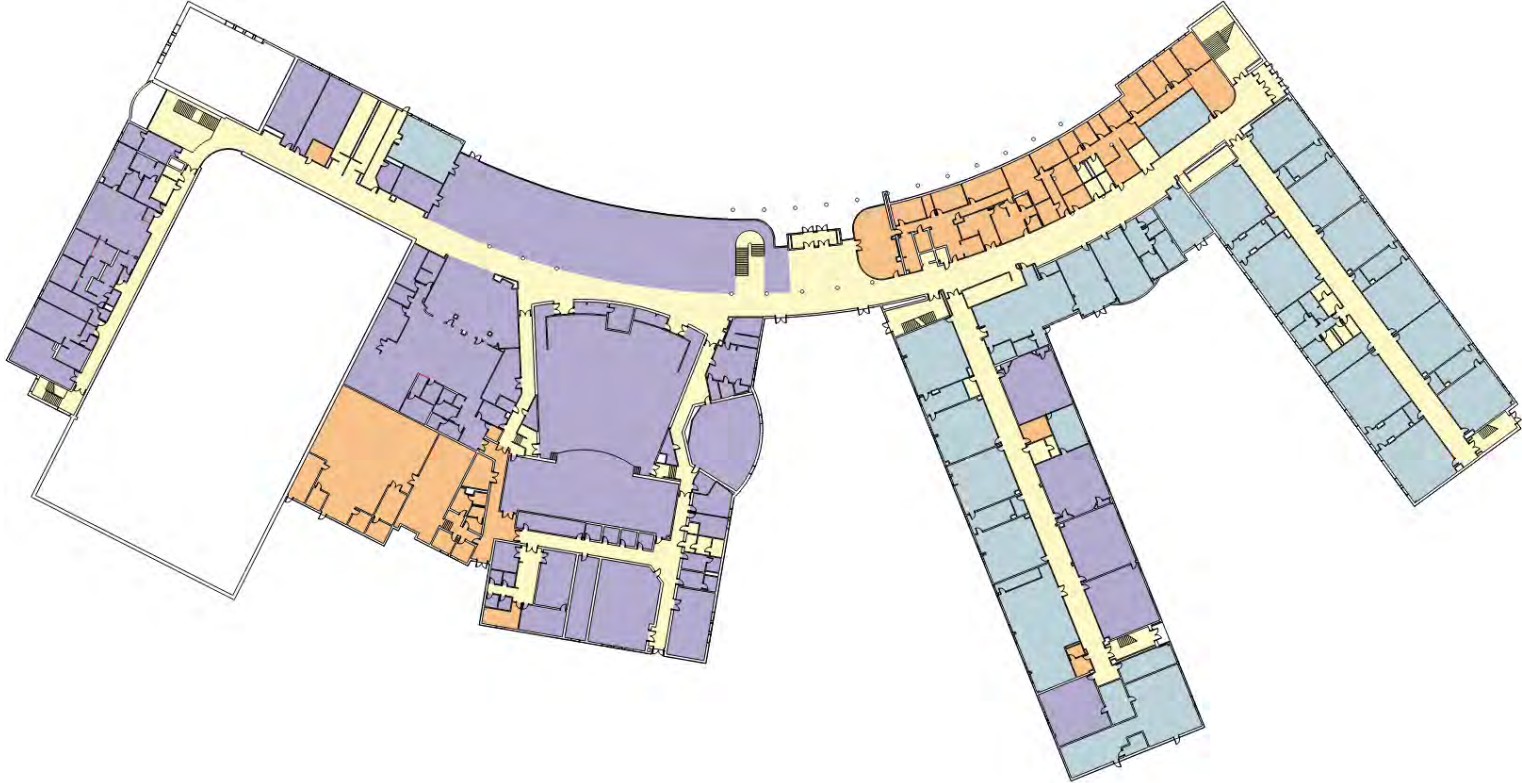
- NON-PROGRAMMED

EXCLUDED AREA

- MODULAR/PORTABLE



Shrewsbury High School | Existing Building Plans



LEGEND

NET FLOOR AREA

- ACADEMIC
- CORE
- ADMINISTRATIVE

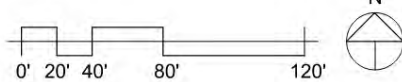
GROSS FLOOR AREA

- NON-PROGRAMMED

EXCLUDED AREA

- MODULAR/PORTABLE

FIRST FLOOR PLAN



Shrewsbury High School | Existing Building Plans



LEGEND

NET FLOOR AREA

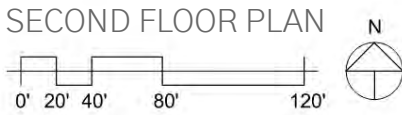
- ACADEMIC
- CORE
- ADMINISTRATIVE

GROSS FLOOR AREA

- NON-PROGRAMMED

EXCLUDED AREA

- MODULAR/PORTABLE



Shrewsbury High School | Existing Building Plans



LEGEND

NET FLOOR AREA

- ACADEMIC
- CORE
- ADMINISTRATIVE

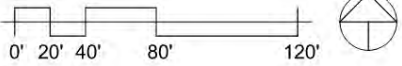
GROSS FLOOR AREA

- NON-PROGRAMMED

EXCLUDED AREA

- MODULAR/PORABLE

THIRD FLOOR PLAN



Shrewsbury High School | Building Review

Exterior Walls | ● Good / ◐ Fair

The exterior walls consist of brick masonry, aluminum composite panels, and concrete. As previously reported, the exterior joints where sealant was used have failed. LPA|A observed some replacement/repairs of these joints, but many still require attention. The brick masonry requires repointing/resetting/re-anchoring of bricks at several locations to ensure the envelope is watertight. There is some staining and organic growth at several locations. Several brick sills have been replaced with precast units due to deterioration and displacement. These should continue to be monitored and replaced on an as needed basis. There are also some smaller concrete repairs that are required to prevent further deterioration.

Roof System | ● Good / ◐ Fair

The roof is comprised of black EPDM over mechanically-fastened insulation. Based on previous reports, the roofing has several deficiencies, including ponding, splits in flashing, blistering, damaged metal roof edge, unadhered membrane, and raised insulation fasteners. These deficiencies are minor in nature but should be addressed before they lead to water infiltration. It was previously recommended to replace the gymnasium roof due to deficiencies. The roof should be monitored and maintained under a comprehensive maintenance plan to prolong its useful life.

Door & Windows | ◐ Fair

The building consists of aluminum-framed windows/ doors, and hollow metal doors and frames. The doors and windows are in fair condition with the exception of failed sealants, corroded hollow metal frames & doors, and failed insulated glazing units. The sealants, doors/frames, and insulated glazing units should be replaced and maintained through a comprehensive maintenance plan.

Interior Finishes | ● Good / ◐ Fair

The interior walls consist of painted concrete masonry units, painted gypsum walls, ceramic tile, and plastic laminate paneling. These walls are all in good condition with the exception of some cracks in the CMU walls. The ceiling primarily consists of acoustical ceiling tiles with some gypsum ceilings, and specialty metal ceilings, all of which are in good to fair condition except where leaks have occurred. The flooring consists of vinyl composite tile, ceramic tile, and carpet, which are in fair condition with the exception of a few locations. The items that have the most amount of wear on them are the doors, frames, hardware, millwork, and lockers. The wood veneers on the millwork have advanced delamination due to the use of cleaners during the COVID-19 pandemic.



Shrewsbury High School | Building Review

Accessibility | ● Good / ○ Fair

As previously reported, there are several deficiencies regarding the building. The following items do not meet the current accessibility guidelines: stage [non-accessible], stage handrails [non-accessible], workspace/sinks in specialty classrooms [non-accessible], locker rooms showers [clearances], sink pipe insulation [not provided], protrusions along accessible routes, toilet compartments [hardware], signage [accessible egress], administrative reception desks [non-accessible], and cane-detectable barriers [not provided].

Means of Egress | ● Good / ○ Fair

There are sufficient means of egress serving the building. Some of the rated doors are missing their gas-keting and should be provided to ensure compliance with fire ratings.

Structural System | ● Good / ○ Fair

The main structural system consists of a wide-flange steel moment frame with concrete floor slabs and frost walls. There appears to have been some settling in certain areas that should be investigated and remediated prior to any masonry repairs.

Hazardous Materials | ● Good

The potential for any asbestos-containing materials within the building is unlikely given the age of the building. There are several other items that may require special disposal, including light fixtures, light ballasts, hydraulic door closers, and exit light batteries, should renovations/replacements be considered.

Modular Classrooms

There are no modular classrooms at this facility.



Shrewsbury High School | Fire Protection

Service | ● Good

The fire suppression system serving the building is a wet pipe type system which provides essentially complete coverage throughout the building except as otherwise noted herein.

There is a 8" main sprinkler water service which enters the building in a fire service room adjacent to the boiler room. The 8" line reduces to 6" before running through supervised valves and a double check style backflow preventer. The service supports three (3) 6" zone risers each with alarm check valves with flow and tamper switches. Risers are labeled as follows:

- Gym/Bldg. #1
- Stair #6 Level #2 & #3
- Balcony Bldg. #2

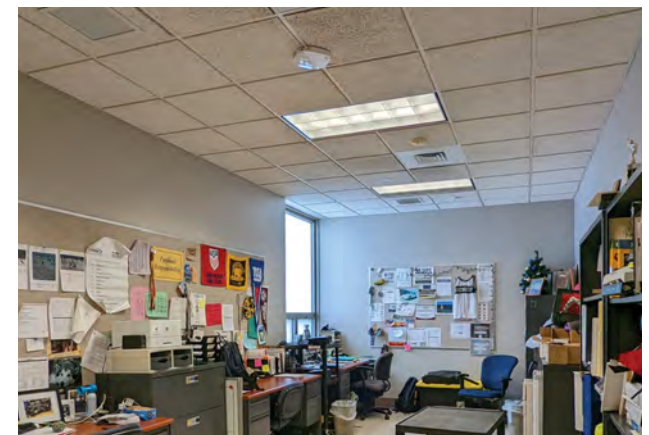
There are two fire department connections provided on the exterior wall of the building: one in the front of the building and one in the back. These connections interconnect to the 6" fire service main with 8" pipe.

There are fire standpipe connections with 2.5" hose valves at each landing in the main multi-story egress stairs. Further review of the system would be required to determine actual zoning and location of floor control stations for control of floor sprinkler zones if applicable.

The kitchen hood did have chemical-based suppression over equipment requiring such.

In general, the building's fire sprinkler coverage appears to be fairly comprehensive and compliant with current code.

Where quick response type sprinklers are utilized, testing and/or replacement will be required within the next 5 years as code requires this for these types of sprinklers at 25 years of age.



Shrewsbury High School | Plumbing

Fixtures | ● Good

The existing building's plumbing systems appear adequate in quantity for the current occupancy. Due to the building's age being 20 years, most restrooms do comply with ADA/MAAB requirements for accessible fixtures.

Existing water closets are primarily of the wall-hung flush valve type. Urinals are of the wall-hung type and lavatories are of the wall-hung and counter style with either two-handle or single lever handle faucets, many of which are of the metered style. Most fixtures do appear to comply with current codes and standards.

Many public use lavatory sinks have metered (self-closing) faucets as required by code. In addition, many appear to have limit stops to ensure hot water does not exceed 110°F for scald prevention.

Several classrooms have sinks, some of which are ADA-compliant. Sinks in science/chemistry rooms should connect to an acid waste neutralizing system; however, this system's location was undetermined during our walk-through and may involve local acid waste tanks in cabinetry under the sinks. Science rooms have emergency drench and eye wash showers which are presumed to be fed with tempered water as required by current code; however, this should be confirmed.

The main kitchen appears to have at least the minimum configuration and number of fixtures to satisfy current code and Board of Health requirements for a commercial kitchen. The fixtures consist of a four-bay pot sink with grease trap, a prep sink with garbage disposer, three (3) hand sinks and a dishwasher with indirect waste. The prep sink is directly wasted and would require an indirect waste connection to comply with current code.

There are several ADA-compliant wall-mounted electric water cooler drinking fountains located throughout the building.

Locker room showers were of the gang type in the men's locker rooms and single user stall type in the woman's locker rooms, all of which were of the push button operated type. These fixtures are supplied with single temperature tempered hot water via a central mixing valve located in the respective locker room offices.

Janitor sinks inspected during our walk-through had faucet trim with vacuum breakers to limit backflow contamination caused by siphonage. Based on the age of the building, we expect that all are code compliant.

Most of the fixtures are of the water-saving type for the code enforced at the time of the building's construction. Apparently, maintenance is routinely performed on faucets, toilet flush valves, etc. as needed.

As renovations occur, the following items should be considered: replace all flushometers/faucets with automatic low flow flushometers/faucets.



Shrewsbury High School | Plumbing

Cold Water Service | ● Good

A four inch cold water line enters the building in a lower-level mechanical room. The service runs through a water meter and prior to feeding the building domestic water needs. The 4" main splits to a 4" and a 3" for domestic water and irrigation water service both of which have backflow preventers.

We noted most of the piping in the building appears to be copper, and, based on its age, should be in good condition; however, this can vary based on water quality. We recommend a pipe sample from both the cold and hot water system be taken to verify pipe condition.

Domestic Hot Water Service | ○ Fair

The domestic hot water needs of the building are supported by (2) gas-fired tank style water heaters as well as one electric tanks style water heater. The water heaters are as follows:

- (2) 100-gallon, 270,000 BTUH input gas water heater as manufactured by Ruud, manuf. date 5/2010. These units appear to support the buildings general domestic hot water needs.
- (1) 250-gallon, 126,000 BTUH (36 kW) input electric water heater as manufactured by PVI, manuf. date est. 2002. This unit appears to support the buildings safety tempered water supply to emergency eye shower units.

The water heaters have no active signs of leakage; however, all have exceeded their useful expected service life at over 10 years of age for the gas water heaters and 20 years of age for the electric water heater. All should be considered good candidates for replacement.

There is a high/low mixing valve station as manufactured by Leonard on the main hot water supply which serves most of the building fixtures. It appears there may be a higher temperature water line that runs to the kitchen for dishwasher use. Current code would require differing water temperatures at different types of fixtures. Lavatory sinks and showers must not discharge hot water at a temperature exceeding 110–112°F for safety reasons, whereas service fixtures (janitor's sinks, kitchen sinks, etc.) are required to have hot water temperatures in excess of 120°F for sanitation reasons. The current system appears to supply a single temperature water to the building. After that, proper water supply to lavatories and showers should be accomplished by local mixing valves and/or fixtures with appropriate mixing limit stops. It appears the domestic hot water storage tanks are kept at approximately 140°F which is essential to prevent the possibility of bacteria growth within the tanks. It is recommended that the central mixing valve should be replaced with an electronic type.

There are multiple recirculation pumps on the domestic hot water system, which is required since there are fixtures located beyond 100 feet of the hot water source. The plumbing code requires hot water to be available within 100 feet of any hot water consuming fixture.

The domestic hot water heaters should be replaced with high efficiency condensing gas-fired style.



Shrewsbury High School | Plumbing

Drainage Systems | ● Good

Most of the sanitary drainage piping is concealed from view; however, what we were able to see was primarily of the cast iron no-hub type. The sanitary sewer lines run below the slab and exit the building to a municipal sewer system.

Roof storm water is drained via roof drains connecting to internal leaders. The lines presumably exit to a municipal storm water system. The building does not appear to have any emergency roof overflow drains. These are required by current code as a clogged drain can lead to water build-up on the roof and structural failure due to weight. During any reroofing project or building upgrade we highly recommend emergency roof drains be added. The emergency drains should be added near the current roof drains and run to discharge to the side of the building. The visible discharge location is required as it gives users and indication of a failed main drain system.

Sinks in science/chemistry rooms should connect to an acid waste neutralizing system; however, this systems location was undetermined during our walk-through and may involve local acid waste tanks in cabinetry under the sinks.

Besides those items noted herein and elsewhere in this report, we noticed no other outward signs of failure in either the sanitary sewer system or the storm drainage system during our site inspection

Natural Gas Service | ● Good

A natural gas service enters the building in the lower level sprinkler room. The exterior service entrance consists of an elevated gas pressure line serving a gas meter and gas pressure reducers, one of which feeds an 8" gas line while the other feeds a 6" service prior to entering the building and supporting the building loads, which include the heating boilers, domestic hot water boilers and kitchen cooking loads.

Both main lines have a thermally activated shut-off valve where it enters the building. This valve would shut the gas supply off to the building in the event there were a fire within the mechanical room. This device is typically required by the gas utility for pipes over 4" in size.



Shrewsbury High School | HVAC

Boiler Plant | ● Fair

The heating needs for the building are supported by three (3) Cleaver Brooks #CB-1200 fire-tube dual-fuel gas/oil fired boilers with a manufactured year of 2001. Each boiler has a rated input capacity of 8,164,600 BTUH. According to facility personnel, the underground fuel oil supply tank(s) were removed in 2019 and as such the boilers only operate on natural gas. The fuel oil transfer pumps and piping still reside inside the mechanical/boiler rooms.

According to ASHRAE, the life expectancy of these types of boilers is 25 years, although with proper maintenance they have been known to operate for a longer service life. A 5+ year plan to replace these boilers is recommended.

Chiller Plant | ● Fair / ○ Poor

A majority of the cooling needs for the areas of the building which are cooled is supported by one (1) water cooled chiller. The chiller is a Trane #RTHC series rotary screw unit with an approximate capacity of 180-tons. The chiller uses R-134A refrigerant. At 20 years of age, the chiller is approaching the end of its useful service life of 23 years as defined by ASHRAE. As such, we recommend replacement options be considered for this chiller within the next 5 years.

The cooling tower that supports the chiller is located at grade outside the mechanical room and is manufacturer by Baltimore Air Coil (BAC) #FXV series. The tower is in poor condition with visible exterior rot through the casing and failing fill media. The cooling tower must be replaced as soon as feasible as its failure is imminent.

The chiller plant room has a refrigerant monitoring system and an evacuation system. The room also has a self-contained breathing apparatus (SCBA) mounted within the room. This SCBA device should be mounted outside the room to allow for user access prior to entering a room that may have excessive levels of refrigerant.

Controls | ● Good

The building appears to have a building-wide DDC energy management system throughout. The system is manufactured and supported by Johnson Controls. According to facility personnel, the system has undergone and continues to undergo upgrades. Sequences should be reviewed further as additional indoor air quality and energy-saving routines may be possible.



Shrewsbury High School | HVAC

Piping Distribution System | ● Fair

Chilled water and hot water from the chiller and heating plant is distributed to the building via a 4-pipe hot water and chilled water supply and return distribution system. The hot water system circulates hot water to air handlers, fin-tube radiation and classroom unit ventilators units located throughout the building. Chilled water is sent to air handling equipment supporting sections of the building with air-conditioned cooling, including the main administration, the presentation room, the media center and the TV studio.

The pumps and their current service are as follows:

- P-1 & P-2: (lead/stand-by) variable speed secondary loop hot water, serving Gymnasium Wing; Taco FE300 base mounted end-suction style.
- P-3 & P-4: (lead/stand-by) variable speed secondary loop, hot water, serving Classroom & Other Wings; Taco FE300 base mounted end-suction style
- P-5 & P-6: (lead/stand-by) constant speed chilled water loop; Taco FE series base mounted end-suction style
- P-7 & P-8: (lead/stand-by) constant speed condenser water loop; Taco FE401 base mounted end-suction style
- P-9, P-10 & P-11: constant speed boiler primary loop Taco FE501 base mounted end-suction style

The pumps are all manufactured by Taco and appear to be in fair operational order with signs of bearing assembly and motor replacement. Some pumps do show signs of external corrosion. All the pumps are at the end of their useful service life of 20 years as defined in ASHRAE, and as such are prime candidates for replacement in the coming years.



Shrewsbury High School | HVAC

Ventilation, Exhaust, & Miscellaneous HVAC | ● Good / ◐ Fair

Classroom unit ventilators are located throughout the classroom segments of the building. These units are located along exterior walls and each has an outdoor air louver and associate control dampers to allow outdoor air to enter the classroom space through the unit ventilator. During occupied periods, the unit fans run continuously to provide space ventilation, and electric valves modulate hot water flow through the units to maintain space temperature. The unit ventilators are manufactured by Trane.

Classroom exhaust in much of the building is supported by a centralized exhaust fans located on the building roof. In most cases, the fans serve multiple rooms.

A majority of the non-classroom areas of the building, such as the gym, auditorium, offices, cafeteria, etc., are served by ducted rooftop heating, ventilation units complete with fan section, filter sections and hydronic coil sections. For areas where air conditioning is supplied, as noted previously, the units also have chilled water coils. The roof mounted air handlers are modular style Climate Changers as manufactured by Trane.

A packaged rooftop unit of newer vintage is serving a transition space.

The systems appear to be configured to supply the code-required ventilation levels required at the time of its construction, many of which comply with current ventilation standards. However, further review would be required, especially for the science, art and woodworking spaces all of which require higher outdoor air ventilation and exhaust rates when compared to normal classrooms.

The kitchen hood over the range and oven equipment appears to comply with current NFPA 96 and IMC standards. A chemical based suppression system is provided over the cooking equipment requiring such.

All restrooms, locker rooms and such have ducted exhaust systems. The systems connect to exhaust fans located on the roof.

A majority of the air handlers, exhaust fans, classroom unit ventilators and the like are at the end of their useful service life of 20 to 25 years as defined in ASHRAE and as such are prime candidates for replacement in the coming years.

As unit ventilators and air handlers are replaced, coils should be sized for low temperature (140F or less) hot water. This lower temperature hot water will maximize efficiency of the condensing gas boilers and also allow opportunity for possible future implementation of air to water heat pumps to assist the building hydronic heating loop. Incorporating energy recovery ventilation systems on new and supplemental systems where feasible is recommended.



Shrewsbury High School | Electrical

Service | ● Good

The building electrical service is rated 5000 amperes, 480/277 volt, 3-phase, 4-wire. The service consists of a utility company pad-mount transformer on the exterior of the building and underground feeds to the electrical service equipment. The electrical distribution equipment is by General Electric. Maintenance of the switchboard is recommended by the manufacturer and NETA.

Normal Distribution | ● Good

The panelboards in the building are by General Electric. The panelboards are located throughout the building in electrical rooms and are circuit breaker type. Several different types of wiring methods were observed namely wires in raceway, metal clad (MC) cable, and armored cable (AC). Maintenance of the panelboards is recommended by the manufacturer and NETA.

General Purpose Power | ● Good

The general-purpose power in the building is adequate.

Emergency /Standby Power | ● Good

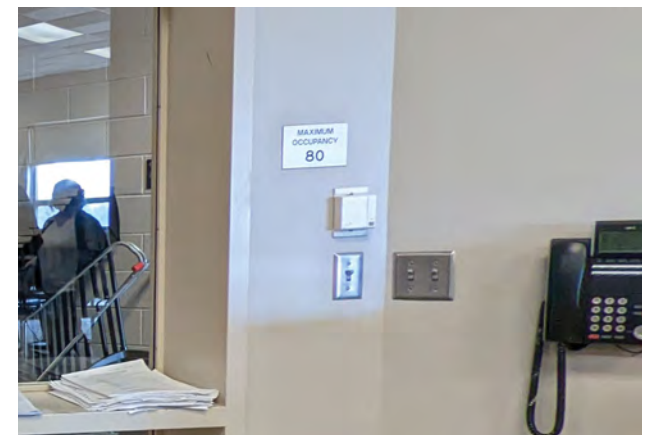
The emergency/standby generator is rated 300kW/125kVA, 480/277V, 3-phase, 4-wire, manufactured by Caterpillar. The generator fuel is diesel. The generator feeds four automatic transfer switches (ATS) for life safety and standby power loads. The life safety ATS is located in a 2-hour rated emergency electrical room.

Egress & Exit Lighting | ● Good

The emergency egress and exit lighting are powered from the life safety branch fed by the generator. The overall coverage appears to be adequate; ART could not confirm whether the exit discharge leading to a public way was powered from the life safety branch. The exit signs are LED self-contained battery type; the overall coverage of exit signs appears to be adequate.

Lighting & Controls | ● Fair

The ambient lighting system in the building consists of various types of fixtures (recessed, surface, pendant, etc.) primarily with fluorescent lamps. The lighting system is inefficient and does not meet current energy codes. Lighting control is primarily by wall mounted switches and occupancy sensors. Ambient light system consisting of LED light fixtures should be provided. Networking lighting controls including occupancy, vacancy, and daylight sensors should also be provided.



Shrewsbury High School | Electrical

Telecommunications Cabling Infrastructure | ● Fair

The telecommunications system comprises mostly of Category 5e/6 cables for data and voice communications. The system appears to meet the current programming needs of the facility.

The data communications equipment is by Cisco. Wi-Fi access points by Aerohive have been provided in the building. The voice communications equipment is NEC Univerge SV 9300 with digital handsets. Telecommunications infrastructure that complies with current BICSI standard should be provided.

Fire Alarm System | ● Good

The fire alarm system is addressable with voice evac; the fire alarm panel is JCI (Simplex) 4100. The fire alarm appears to comply with current codes. Initiating devices over 10-years old should be replaced

Public Address (PA) and Clock Systems | ● Good

PA Speakers are located in public and common areas as well as in classrooms. The PA and clock systems appear to be in good working condition and meet the current programming needs. The PA system is Telecenter by Rauland Borg.

Audio-Video Systems | ● Good

Short throw projectors are provided in classrooms.

Local sound systems are provided in the cafeteria/gym.

Hand-held radios are by Motorola.

The existing system is operational and meets current programming needs.

Video Surveillance & Access Control | ● Good

The video surveillance system is by Exacq with Axis cameras. The access control system is by Brivo. Card readers are provided at the exterior door entries. Building entry is through Aiphone video entry station. The existing systems are operational and meet current programming needs.



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Shrewsbury High School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Site

Size & Configuration	●	
Adjacent Land Use	●	
Vehicular Access	●	◐
Pedestrian Access	●	◐
Topography		◐
Soils & Wetlands		◐
Utilities/Service Areas	●	
Recreation Area/Community Use	●	◐
Parking/Walkways/Curbs/ Sidewalks/Drainage	●	◐
Landscape Features	●	◐
Site Furnishings	●	◐
Accessibility	●	◐

Building

Exterior Walls	●	◐
Roof Systems	●	◐
Doors & Windows		◐
Interior Finishes	●	◐
Accessibility	●	◐
Means of Egress	●	◐
Structural System	●	◐
Hazardous Materials	●	
Modular Classrooms		

Fire Protection

Service	●
---------	---

Shrewsbury High School | Facility Assessment Summary

● Good ◐ Fair ○ Poor

Plumbing

Fixtures	●		
Cold Water Service	●		
Domestic Hot Water Service		◐	
Drainage Systems	●		
Natural Gas Service	●		

HVAC

Boiler Plant		◐	
Chiller Plant		◐	○
Piping Distribution System		◐	
Ventilation, Exhaust, & Miscellaneous HVAC	●	◐	
Controls	●		

Electrical

Service	●		
Normal Distribution	●		
General Purpose Power	●		
Emergency /Standby Power	●		
Egress & Exit Lighting	●		
Lighting & Controls		◐	
Telecommunications Cabling Infrastructure		◐	
Fire Alarm System	●		
Public Address (PA) and Clock Systems	●		
Audio-Video Systems	●		
Video Surveillance & Access Control	●		

EDUCATIONAL REVIEW

Introduction
Parker Road Preschool
Major Howard W. Beal School
Calvin Coolidge School
Floral Street School
Walter J. Paton School
Spring Street School
Sherwood Middle School
Oak Middle School
Shrewsbury High School
School District Administration

Educational Review | Introduction

While the previous section sought to describe the existing conditions of each individual school and architecturally assess them from a maintenance standpoint, this section explores the programmatic and pedagogical needs of each school through multiple lenses. These two sections combined will inform the options development and prioritization in the final section.

For the educational review, consideration was given to each of the following elements.

Town of Shrewsbury Educational Plan

Per SPS Policy #521 (last amended 04/26/06), the Shrewsbury Public Schools shall have the following grade level organization:

- Preschool
- Early Childhood Center: Kindergarten–Grade 1
- Elementary School: Grades 1–4
- Middle School:
 - Sherwood Middle School: Grades 5 & 6
 - Oak Middle School: Grades 7 & 8
- High School: Grades 9–12

This study is based on maintaining the existing grade configuration and elementary-level neighborhood school model as a priority.

Recommended class sizes, as delineated in SPS Policy #525, will also stay the same. These values have been carefully vetted to best represent the school committee’s ideals; that is, the desire to minimize class sizes has been tempered by the realities of the district facilities and fiscal limitations. All options presented will reflect the 10-year enrollment values distributed per the following class size guidelines.



Educational Review | Introduction

- **Preschool:** 15 students/classroom
 - 8 typically-developing students + 7 students with disabilities
- **Kindergarten:** 17–19 students/classroom
- **Elementary Grades:**
 - Grades 1–2: 20–22 students/classroom
 - Grades 3–4: 22–24 students/classroom
- **Middle School (Grades 5–8):** 22–24 students/classroom
- **High School (Grades 9–12):** 18–20 students/classroom

District Leader Questionnaire

In May 2022, a questionnaire was distributed to the SPS District Leaders Group, in order to hear from the users of these spaces directly. The goal was to determine current programmatic spaces that limit curriculum delivery, as well as any new types and quantities of educational spaces that may be needed over the next 5–10 years. This was compiled and reviewed by school and grade level; however, certain universal themes emerged that begin to illustrate a holistic view of district needs. These themes include:

- Communal learning spaces/small breakout spaces; “neighborhoods”
- Flexible, collaborative, multi-functional spaces (and furnishings)
- Equity – both across the district and within individual schools
- Mental health/counseling/wellness spaces
- ELL spaces (forecasted to increase)
- Maker spaces/multimedia production spaces (i.e. video recording/editing)
- Technical spaces (engineering, robotics, medical, etc.)

MSBA Guidelines/Space Summary Template

The Massachusetts School Board Authority (MSBA) publishes regulations, known as the space summary template, that governs school design in the Commonwealth. These regulations serve as guidelines for state reimbursement for new and renovated school projects. The template identifies the recommended square footage for certain programmatic spaces within the school; this square footage is calculated based on the projected enrollment.



Educational Review | Introduction

For this study, the space summary templates were completed for each school based on the 10-year enrollment value, pro-rated Special Education spaces, and then compared to the existing square footage of the corresponding spaces in each school in order to identify deficiencies. This process drives option development in the next section.

Enrollment Forecasts & Design Capacity

The comparison of enrollment forecasts against design capacity is a critical aspect of option development, as it quickly illustrates an order of magnitude of need.

Enrollment numbers have been reprinted from the report titled “Population and Enrollment Forecasts, 2022–23 Through 2031–32” by McKibben Demographic Research, March 2022; as commissioned by the School Committee. Key takeaways from this report (included in full in the Appendix) include:

- Total district enrollment will decrease by 254 students over the next 10 years.
 - As the existing schools are currently operating well above their design capacity in most cases, this decrease does not provide significant relief.
 - While a decrease in middle school and high school enrollment is projected, an increase in the elementary level is anticipated.
 - With the forecast of universal pre-kindergarten, 242 seats were allotted with the expectation that the programs will be a mix of full and half day.

Design capacity refers to the optimal student body population that a given school can support as it currently exists. Core facilities as well as classrooms are reflected in this figure; undersized classrooms are pro-rated according to MSBA standards as well as SPS School Committee policy guidelines for class size. All portable classrooms are excluded.

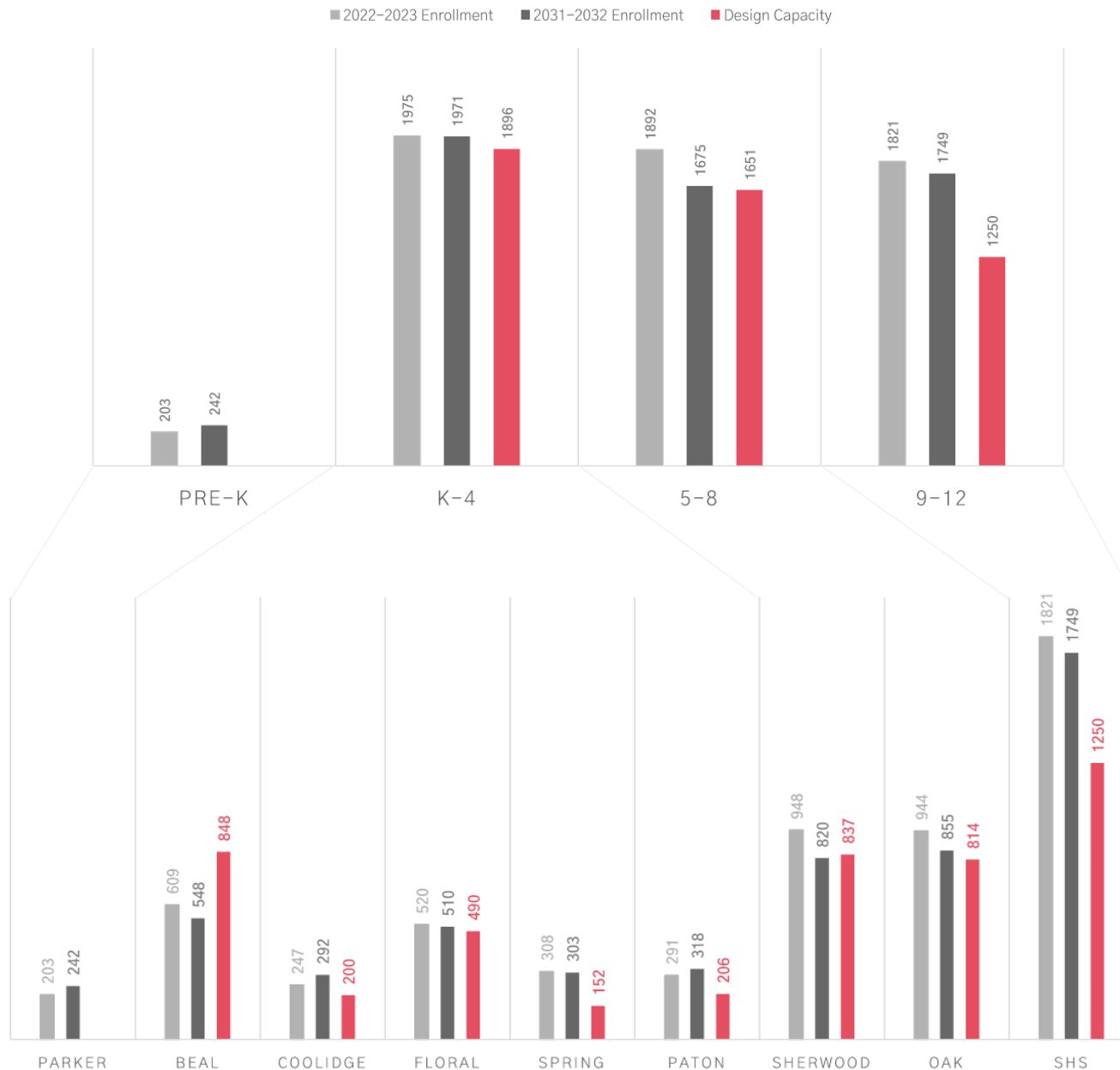


Educational Review | Enrollment/Design Capacity Summary Table

	ENROLLMENT			DESIGN CAPACITY			
	2022–2023	2031–2032	10-YR DELTA	MIN.	MEAN	MAX.	10-YR DELTA*
PRE-K							
PARKER ROAD	203	242	39	--	--	--	--
ELEMENTARY (K-4)	1,975	1,971	(4)	1,806	1,896	1,988	(75)
MAJOR HOWARD BEAL	609	548	(61)	808	848	888	300
CALVIN COOLIDGE	247	292	45	190	200	210	(92)
FLORAL STREET	520	510	(10)	467	490	514	(20)
SPRING STREET	308	303	(5)	145	152	160	(151)
WALTER J PATON	291	318	27	196	206	216	(112)
MIDDLE SCHOOL (5-8)	1,892	1,675	(217)	1,578	1,651	1,722	(24)
SHERWOOD (5-6)	948	820	(128)	800	837	873	17
OAK (7-8)	944	855	(89)	778	814	849	(41)
HIGH SCHOOL (9-12)							
SHREWSBURY HIGH	1,821	1,749	(72)	1,185	1,250	1,316	(499)

*10-YR DESIGN CAPACITY DELTA = (MEAN DESIGN CAPACITY) - (2031-2032 ENROLLMENT)

Educational Review | Enrollment/Design Capacity Charts



These graphs document the data for enrollment and design capacity by grade level (above), and then by individual school (below).

Key takeaways include the following:

- The greatest need is clearly demonstrated at the high school level, where enrollment far exceeds design capacity.
- While the elementary school level does not appear to highlight a great need in the first graph, the second clearly shows disparity amongst the individual schools. Work needs to be done to create a more equitable distribution.
- If pre-K students are to be incorporated at the elementary level, space needs to be found for 242 students for a full-day offering, or 121 students for a half-day offering.
- The middle schools, while currently overburdened by enrollment, constitute the lowest priority for large-scale intervention as they will return to near-design capacity levels over the next ten years.

Educational Review | Gross Square Footage Summary Tables

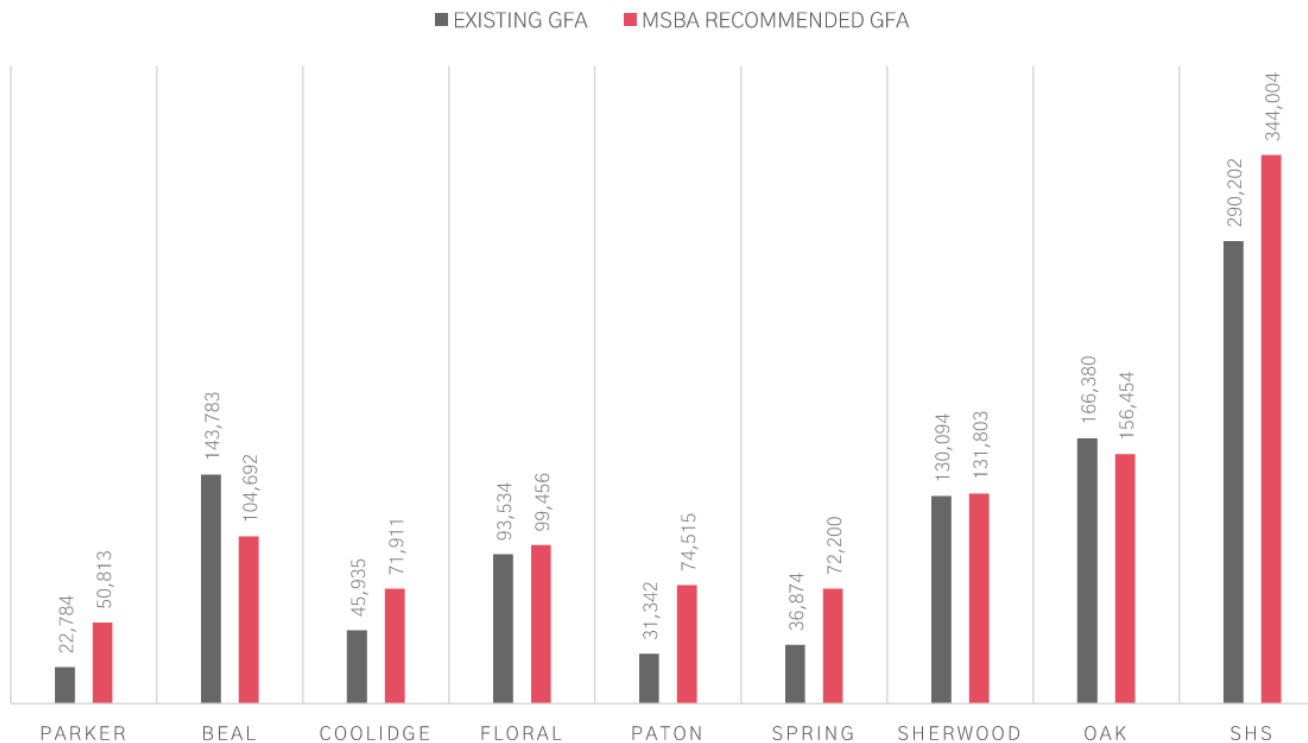
	SQ FT AREA		
	CURRENT	PROJECTED	10-YR DELTA
PRE-K			
PARKER ROAD	22,784	50,813	(28,029)
ELEMENTARY (K-4)	351,468	422,774	(71,306)
MAJOR HOWARD BEAL	143,783	104,692	39,091
CALVIN COOLIDGE	45,935	71,911	(25,976)
FLORAL STREET	93,534	99,456	(5,922)
SPRING STREET	36,874	72,200	(35,326)
WALTER J PATON	31,342	74,515	(43,173)
MIDDLE SCHOOL (5-8)	296,474	288,257	8,217
SHERWOOD	130,094	131,803	(1,709)
OAK	166,380	156,454	9,926
HIGH SCHOOL (9-12)			
SHREWSBURY HIGH	290,202	344,004	(53,802)

Educational Review | Gross Floor Area Summary Tables

The gross floor area (GFA) analysis is largely in alignment with the previous analysis, in that schools with higher design capacity have a square footage larger than the MSBA guidelines dictate (i.e. Beal), and vice versa.

However, some interesting takeaways can be noted here as well:

- As in the previous analysis, the greatest discrepancy is noted at the high school level, followed closely by the preschool level.
- The MSBA-recommended square footage for the 10-year enrollment values is roughly equal for Parker Road, Coolidge, Paton, and Spring Street schools.



Parker Road Preschool | Introduction

Parker Road Preschool is located north of Route 9 on the western edge of Shrewsbury. The preschool shares space with offices for the School Board, as well as with the local television station & utility company. (Note that these auxiliary spaces have been excluded from our space summary template. Any net or gross square footages presented, therefore, represent only the preschool areas of this building.)

The building is organized around utility company space, which must be accessed from within the school when required. This creates a potential security risk. A reception desk and administrative offices exist adjacent to the main preschool entrance. Classrooms are along the north and west of the single-story building, behind reception. Certain pairs of classrooms share a dedicated toilet, accessible from both sides. There are multi-user restrooms for both students and staff (separated) at the south end of the west corridor. The west corridor is single-loaded, which further contributes to the inefficient layout overall.

Most programmatic spaces here are unable to appropriately meet user needs. Classrooms are small and unequally distributed. Special education spaces (classrooms, speech rooms, 1:1 rooms, etc.) are sparingly provided; this is of particular concern, given that approximately 50% of the preschool population in Shrewsbury are special education students (as opposed to 15% of elementary students). Storage space is minimal; additionally, the faculty does not have a dedicated workroom to prepare curriculum or materials. While a staff kitchen is provided, there is no staff dining area. The nurse's office is undersized and remotely located from the main administrative area. While there are outdoor play areas, a gross motor room is not provided on the interior.

Enrollment is forecasted to increase to 242 students over the next ten years (from 203 students). The analysis will show that a school almost four times the size of Parker will need to be provided in order to adequately take care of this age group.



Parker Road Preschool | 10-Year Enrollment Forecast

SCHOOLYEAR	TOTAL ENROLLMENT (PRE-K)	CHANGE
2022-23	203	-
2031-32	242	39
*Design Capacity	--	--

Enrollment numbers taken from “Population and Enrollment Forecasts, 2022-23 Through 2031-32”
by McKibben Demographic Research, March 2022; see Appendix for full report.

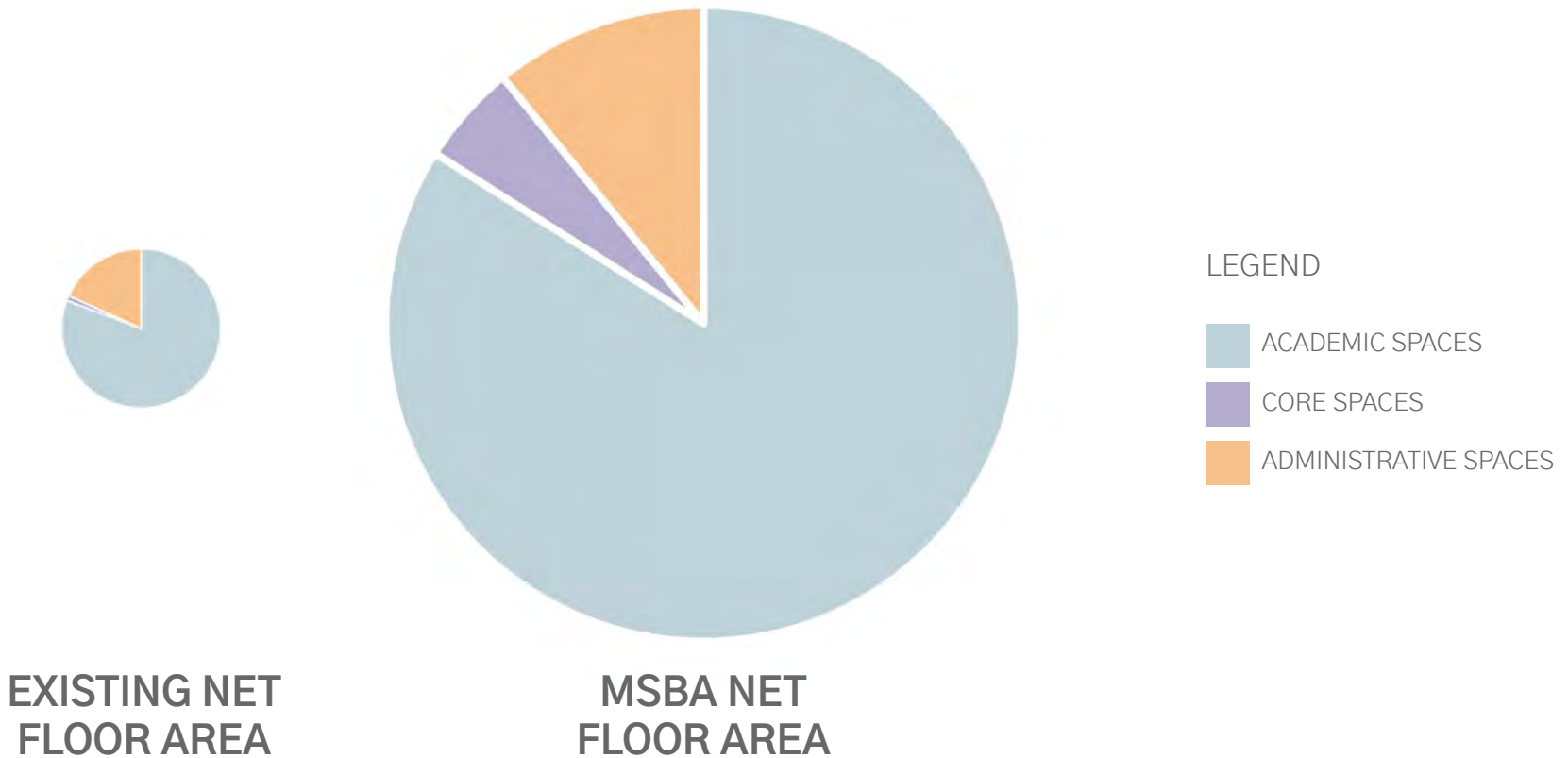
*Design Capacity refers to the mean student body population that a given school can support as it currently exists.
Mean value is calculated based on the SPS School Committee policy guidelines for class size,
as well as MSBA guidelines for classroom square footage size.
Note that portable classroom square footage is excluded from this calculation.
See Educational Review Introduction for the calculation methodology.

Parker Road Preschool | MSBA Space Summary Template

SPACE TYPE	EXISTING SQFT (NET)	MSBA GUIDELINE SQFT (NET)	DEFICIENCY (GROSS GF =1.5)
CORE ACADEMIC SPACES <small>* Excludes portable classroom square footage.</small>	6,053	32,325	(39,408)
SPECIAL EDUCATION	1,338	3,830	(3,738)
ACADEMIC TOTAL	7,391	36,155	(43,146)
ART & MUSIC	0	0	0
HEALTH & PHYSICAL EDUCATION	0	2,000	(3,000)
MEDIA CENTER	0	0	0
DINING & FOOD SERVICE	92	200	(162)
CORE TOTAL	92	2,200	(3,162)
MEDICAL	176	610	(651)
ADMINISTRATION & GUIDANCE	994	2,097	(1,655)
CUSTODIAL & MAINTENANCE	504	1,982	(2,217)
ADMINISTRATIVE TOTAL	1,674	4,689	(4,523)
TOTAL FLOOR AREA	9,157	43,044	(50,831)

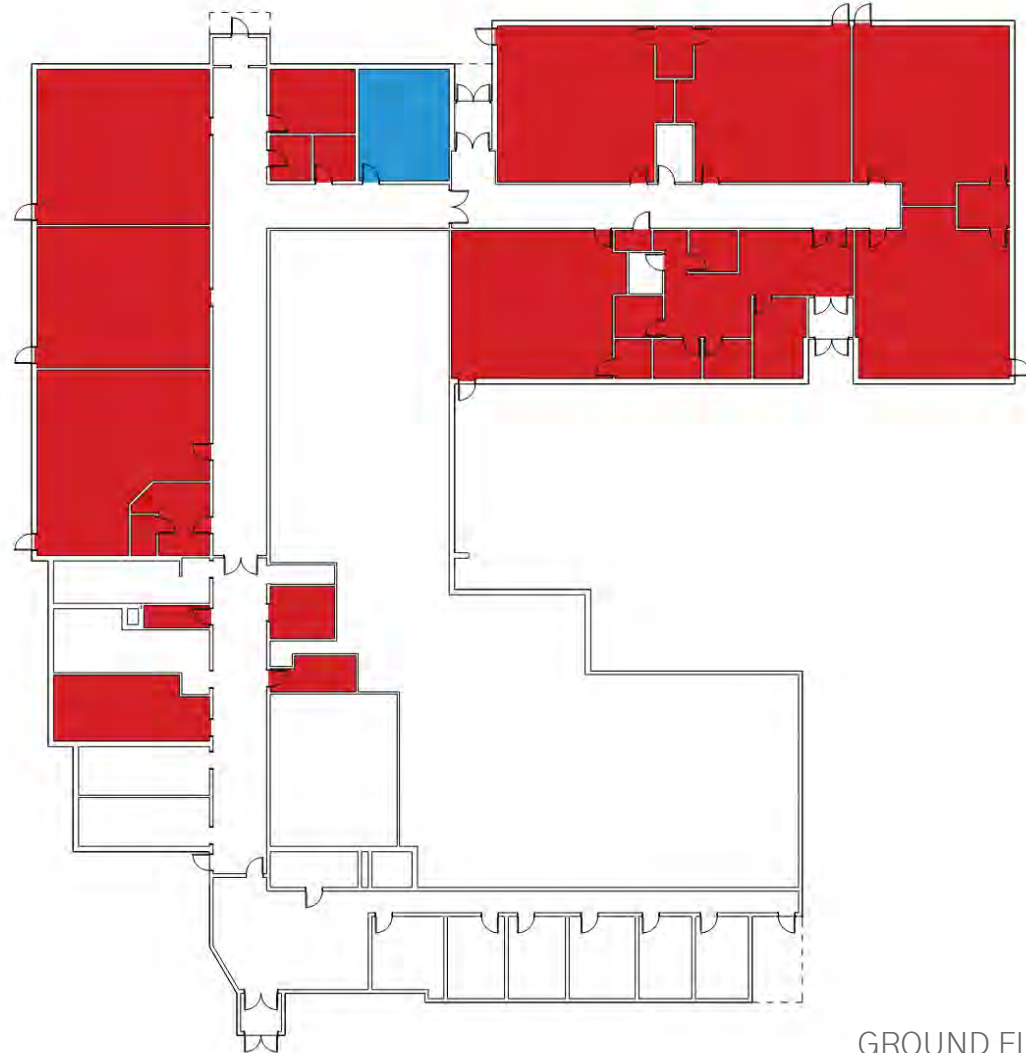
*MSBA guideline square footages calculated based on the 10-year enrollment forecast value: **242 students**

Parker Road Preschool | MSBA Space Summary Template







- The School Committee has verified that preschools do not require the same core area spaces that elementary schools do, as many of these services are provided directly in the classroom. However, in lieu of a full-size gymnasium, a smaller gross motor room should be incorporated, as well as a staff dining area. These values are reflected in the previous chart.
- There is a significant deficiency of space at all levels. These deficiencies, along with the fact that this preschool shares space with a utility company, do not support an addition/renovation option for this school. Options development should focus on new construction.
- Special education needs are greater for the preschool population in Shrewsbury; this should be taken into consideration when developing options.

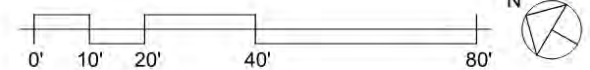
Parker Road Preschool | MSBA Comparison Plans



LEGEND

-  10% OVER MSBA GUIDELINES
-  MEETS MSBA GUIDELINES
-  10% UNDER MSBA GUIDELINES
-  MODULAR/PORTABLE

GROUND FLOOR PLAN



Parker Road Preschool | Educational Review

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Parker Road Preschool | Educational Review

	CURRENTLY PROVIDED	SQ FOOTAGE MEETS MSBA GUIDELINES	QUANTITY MEETS MSBA GUIDELINES	GENERAL NOTES
CORE ACADEMIC SPACES	●	○	○	FIVE CLASSROOMS INCLUDE A TOILET WHILE TWO DO NOT; ALL CLASSROOMS UNDERSIZED
SPECIAL EDUCATION	●	○	○	NO FULL-SIZE SPED CLASSROOMS; NO DEDICATED TOILET FACILITIES; NO FULL-SIZE RESOURCE ROOMS
ART & MUSIC	○	N/A	N/A	STAND-ALONE ART AND MUSIC ROOMS NOT REQUIRED FOR PRESCHOOL; ART/MUSIC TAKES PLACE IN THE CLASSROOM
HEALTH & PHYSICAL EDUCATION	○	N/A	N/A	FULL GYMNASIUM NOT REQUIRED FOR PRESCHOOL; GROSS MOTOR ROOM TO BE PROVIDED IN FUTURE OPTIONS DEVELOPMENT
MEDIA CENTER	○	N/A	N/A	STAND-ALONE MEDIA CENTER NOT REQUIRED FOR PRESCHOOL
DINING & FOOD SERVICE	●	○	●	STAND-ALONE CAFETERIA OR KITCHEN NOT REQUIRED FOR PRESCHOOL; STUDENTS EAT IN CLASSROOMS; STAFF LUNCH ROOM IS CURRENTLY PROVIDED (UNDERSIZED)
MEDICAL	●	○	○	NO PRIVATE EXAM ROOMS; UNDERSIZED NURSE OFFICE; UNDERSIZED TOILET ROOM IS NOT ADA-COMPLIANT
ADMINISTRATION & GUIDANCE	●	○	○	RELOCATE SCHOOL BOARD OFFICES CURRENTLY AT PARKER ROAD TO TOWN HALL; SCHOOL BOARD OFFICES SQUARE FOOTAGE NOT INCLUDED IN OPTIONS; NO SMALL MEETING ROOMS OR TEACHER WORK ROOMS PROVIDED
CUSTODIAL & MAINTENANCE	●	○	○	NO LOADING AREA OR STOREROOM PROVIDED

● YES ○ NO

Parker Road Preschool | Educational Review



Classrooms are all under the minimum square footage recommended by MSBA



Reception space is undersized but provides good visual access to main entrance



Offices are small; quantity does not meet need; no work rooms provided (copier in hallway)



Shared toilet room; inequitable distribution of toilet facilities for classrooms



Insufficient special education spaces (1:1 room with observation window to small group room shown)



Lack of storage space – storage cabinets line hallways as required

Calvin Coolidge School | Introduction

Calvin Coolidge School serves K–4 students in the southwest quadrant of Shrewsbury. Originally built in 1927, it has been renovated and/or added onto several times over the years, including the latest addition of portable classrooms in 1995. This pattern of additions and renovations has created a disorganized spatial layout.

The main entrance off of Florence Street is visually secured by the administrative office immediately adjacent. The building itself consists of a single-story central mass containing administration, kindergarten, and assembly spaces (gymnasium, cafetorium, and library), with a three-story classroom block to the northeast (or right of the main entrance) and single-story portable classrooms to the southwest (or left of the main entrance). There is an elevator serving upper floors as well. Outside of the three-story classroom block, circulation is circuitous and inefficient.

Classrooms are organized with shared support spaces between them. Classroom sizes are all under the MSBA-recommended minimum for this grade level (900 square feet); additionally, there is an unequal distribution of classroom sizes, which further exacerbates the issue. Special education spaces are dispersed throughout the building, and there are teacher workrooms and toilets on the first and third floors of the classroom block.

Kindergarten classrooms are grouped together to the southwest, separate from the rest of the classrooms. Four of the six kindergarten classrooms are portable classrooms. These are undersized and do not have dedicated toilet facilities. The other two kindergarten classrooms are more appropriately sized, and while they do include toilet rooms, those rooms do not meet current guidelines for accessibility.

While almost all MSBA-required spaces are provided in one way or another, size deficiencies exist at almost every level; this is further evidenced by the design capacity/enrollment analysis. Coolidge's enrollment is projected to increase by 45 students over the next ten years, but the design capacity does not even meet the current enrollment needs. As the building is fairly old compared to others in the Town, it will be difficult to bring this up to current standards without significant intervention.



Calvin Coolidge School | 10-Year Enrollment Forecast

SCHOOLYEAR	TOTAL ENROLLMENT (K-4)	CHANGE
2022-23	247	-
2031-32	292	45
*Design Capacity	200	(92)

Enrollment numbers taken from “Population and Enrollment Forecasts, 2022-23 Through 2031-32”
by McKibben Demographic Research, March 2022; see Appendix for full report.

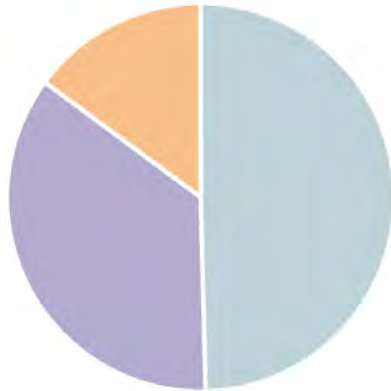
*Design Capacity refers to the mean student body population that a given school can support as it currently exists.
Mean value is calculated based on the SPS School Committee policy guidelines for class size,
as well as MSBA guidelines for classroom square footage size.
Note that portable classroom square footage is excluded from this calculation.
See Educational Review Introduction for the calculation methodology.

Calvin Coolidge School | MSBA Space Summary Template

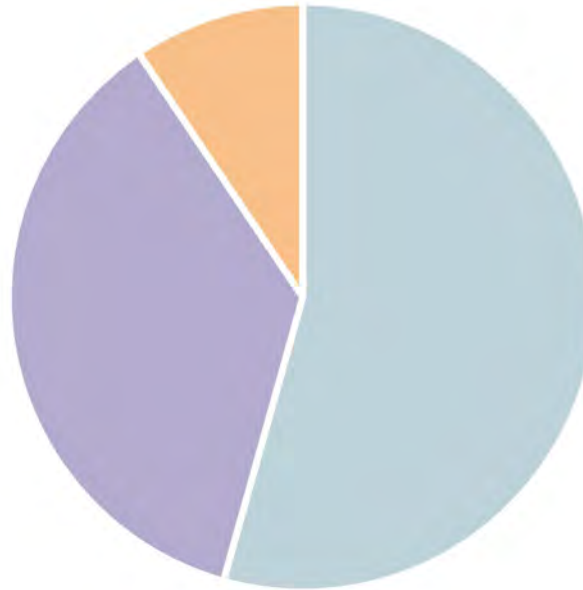
SPACE TYPE	EXISTING SQFT (NET)	MSBA GUIDELINE SQFT (NET)	DEFICIENCY (GROSS GF = 1.5)
CORE ACADEMIC SPACES <small>* Excludes portable classroom square footage.</small>	12,720	20,600	(11,820)
SPECIAL EDUCATION	2,542	5,455	(4,370)
ACADEMIC TOTAL	15,262	26,055	(16,190)
ART & MUSIC	1,619	2,500	(1,322)
HEALTH & PHYSICAL EDUCATION	4,017	7,650	(5,450)
MEDIA CENTER	1,601	2,020	(629)
DINING & FOOD SERVICE	3,692	5,190	(2,247)
CORE TOTAL	10,929	17,360	(9,647)
MEDICAL	279	610	(497)
ADMINISTRATION & GUIDANCE	3,091	2,015	1,614
CUSTODIAL & MAINTENANCE	1,214	1,900	(1,029)
ADMINISTRATIVE TOTAL	4,584	4,525	89
TOTAL FLOOR AREA	30,775	47,940	(25,748)

*MSBA guideline square footages calculated based on the 10-year enrollment forecast value: **292 students**

Calvin Coolidge School | MSBA Space Summary Template

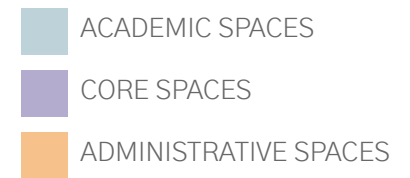


EXISTING NET FLOOR AREA



MSBA NET FLOOR AREA

LEGEND







- Classrooms (including special education) comprise the greatest deficiency, particularly with removal of portables. This is in alignment with the enrollment/design capacity analysis.
- The existing gymnasium is only about 54% of the square footage recommended by MSBA; similarly, the existing kitchen is about 61%. The cafeteria itself falls just shy of the MSBA value, but reportedly cannot support all families for performances. These spaces comprise the second-largest deficit (behind academic spaces), and will be closely reviewed during options development.
- Administration & guidance spaces are oversized, but medical and custodial spaces are deficient; in lieu of adding square footage, consider reallocating these spaces (if possible) for an improved distribution.

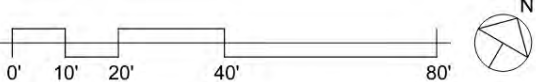
Calvin Coolidge School | MSBA Comparison Plans



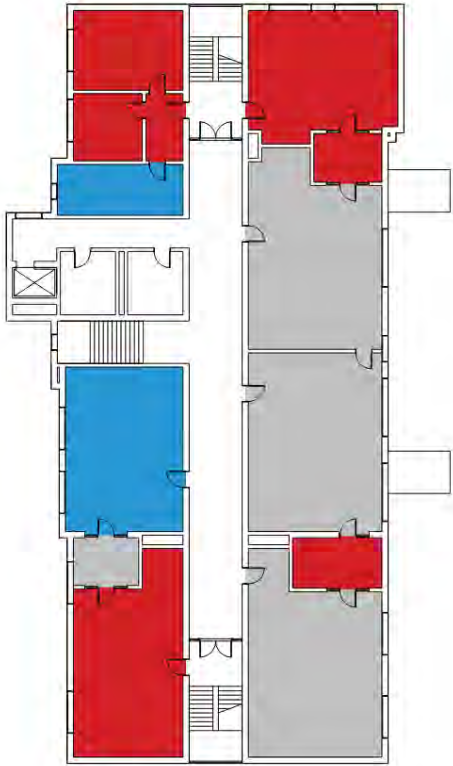
LEGEND

-  10% OVER MSBA GUIDELINES
-  MEETS MSBA GUIDELINES
-  10% UNDER MSBA GUIDELINES
-  MODULAR/PORTABLE

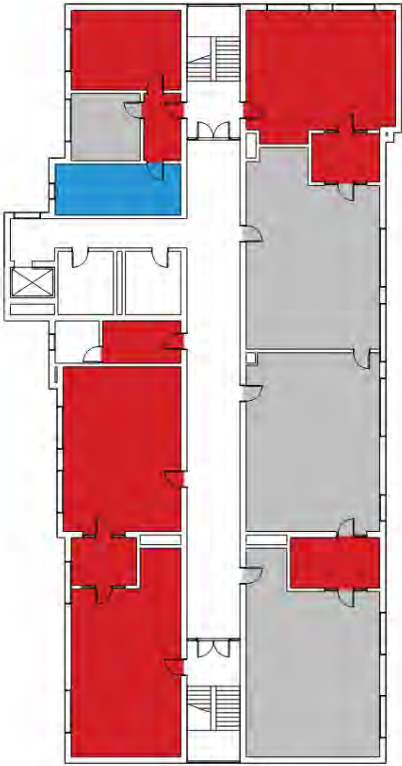
GROUND FLOOR PLAN



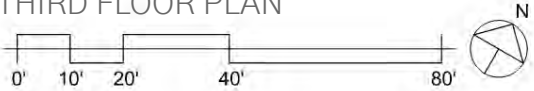
Calvin Coolidge School | MSBA Comparison Plans







SECOND FLOOR PLAN



THIRD FLOOR PLAN



LEGEND

-  10% OVER MSBA GUIDELINES
-  MEETS MSBA GUIDELINES
-  10% UNDER MSBA GUIDELINES
-  MODULAR/PORABLE

Calvin Coolidge School | Educational Review

	CURRENTLY PROVIDED	SQ FOOTAGE MEETS MSBA GUIDELINES	QUANTITY MEETS MSBA GUIDELINES	GENERAL NOTES
CORE ACADEMIC SPACES	●	○	○	CLASSROOMS UNDERSIZED AND UNEQUALLY DISTRIBUTED; TEACHER PLANNING SPACES PROVIDED AT FIRST AND THIRD FLOORS AND BETWEEN CLASSROOMS (SOME USED AS OFFICES)
SPECIAL EDUCATION	●	○	○	DISPERSED THROUGHOUT MAIN CLASSROOM BLOCK; ONE SPED CLASSROOM HAS DEDICATED TOILET; ALL SPACES UNDERSIZED, THOUGH MOST SPED PROGRAM ELEMENTS ARE PROVIDED (WITH EXCEPTION OF READING ROOMS)
ART & MUSIC	●	○	○	ART AND MUSIC CLASSROOMS ARE BOTH UNDERSIZED WITH INADEQUATE STORAGE; NO ENSEMBLE/PRACTICE ROOMS FOR MUSIC; ART SUPPLY ROOM IS SHARED WITH OTHER CLASSROOM; NOT ENOUGH PROJECT STORAGE
HEALTH & PHYSICAL EDUCATION	●	○	○	GYM IS ROUGHLY 54% OF RECOMMENDED SIZE, WITH INADEQUATE STORAGE AND NO HEALTH INSTRUCTOR OFFICE; NO WALL PADS IN GYM, EXCEPT AT ROCK CLIMBING WALL; NO SPECTATOR SEATING/BLEACHERS
MEDIA CENTER	●	○	○	MEDIA CENTER NEEDS EXPANSION AND MODERNIZATION; NO SMALL GROUP BREAKOUT SPACES OR PRIVATE/QUIET STUDY AREAS; NO MAKER SPACE
DINING & FOOD SERVICE	●	○	○	ACOUSTICS AN ISSUE IN CAFETORIUM; STAGE NON-FUNCTIONAL – CURRENTLY USED AS EXTENDED DAY STORAGE; CAFETORIUM SIZE IS INADEQUATE TO HOUSE ALL FAMILIES FOR PERFORMANCES
MEDICAL	●	○	○	COMBINED OFFICE AND EXAM ROOM, WITH NO PRIVACY BETWEEN THE TWO; BATHROOM DOES NOT MEET ACCESSIBILITY STANDARDS
ADMINISTRATION & GUIDANCE	●	●	●	MAIN OFFICE & PRINCIPAL’S OFFICE ADJACENT TO MAIN ENTRANCE; OTHER ADMINISTRATIVE AND GUIDANCE AREAS DISPERSED ON ALL FLOORS
CUSTODIAL & MAINTENANCE	●	○	○	MAIN CUSTODIAL AREA REMOTELY LOCATED FROM LOADING DOCK; LOADING DOCK ACCESSIBLE FROM KITCHEN OR GYMNASIUM ONLY

● YES ○ NO

Calvin Coolidge School | Educational Review



Undersized classroom



Undersized gymnasium with no spectator seating/bleachers and inadequate storage



Media center undersized and dated; tables for small groups provided in main space (no quiet areas)



Modular classrooms house undersized kindergarten spaces with no toilet rooms



Cafetorium inadequate for performances (too small, acoustic issues); stage non-functional



Teacher planning space & restroom on first and third floor; additional shared spaces between classrooms

Floral Street School | Introduction

Floral Street School serves K–4 students from the southeastern and central eastern portions of Shrewsbury. Located just north of Route 9 and east of South Street in a largely residential zone, this is one of the larger elementary schools in the district, with a current enrollment of 508 students.

The building opens up onto a main lobby, with assembly spaces distributed around the perimeter. The administrative suite is to the right, with direct lines of sight to the main entrance via storefront windows for security. The gymnasium is also to the right of the main entrance, and the media center and cafetorium are to the left. Multi-user men’s and women’s restrooms round out the lobby spaces. This arrangement fosters a welcoming sense of community and security.

Past the cafetorium, two classroom wings protrude out to the north and the west. There is an unequal distribution of classroom square footage, but all footprints meet MSBA guidelines for size. Two multi-user and two single-user restrooms are centrally located at the node where the classroom wings meet on all three floors. Special education spaces are also dispersed on all three floors; though the spaces provided are inadequate to address the need. Indeed, the special education deficit comprises the primary need at Floral. Kindergarten spaces are dispersed between the ground and first floors. No kindergarten classroom has a dedicated toilet room.

The ground floor houses a large area dedicated to storage for the school department. This could provide future expansion space should the storage be relocated elsewhere; but as it is a windowless area adjacent to the boiler room, careful consideration would be needed as far as what type of space to include here.

Enrollment projections here are stable, with only 2 students projected to add to the enrollment over the next ten years. There is still a 20–student deficit from a design capacity standard, but this is relatively negligible when compared to other schools in the district.



Floral Street School | 10-Year Enrollment Forecast

SCHOOL YEAR	TOTAL ENROLLMENT (K-4)	CHANGE
2022-23	520	—
2031-32	510	(10)
*Design Capacity	476	(34)

Enrollment numbers taken from “Population and Enrollment Forecasts, 2022-23 Through 2031-32”
by McKibben Demographic Research, March 2022; see Appendix for full report.

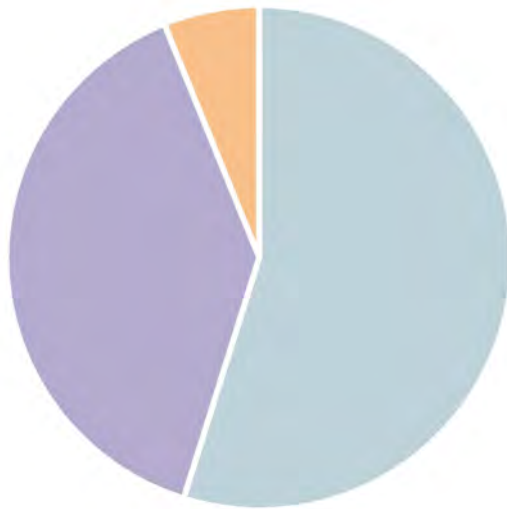
*Design Capacity refers to the mean student body population that a given school can support as it currently exists.
Mean value is calculated based on the SPS School Committee policy guidelines for class size,
as well as MSBA guidelines for classroom square footage size.
Note that portable classroom square footage is excluded from this calculation.
See Educational Review Introduction for the calculation methodology.

Floral Street School | MSBA Space Summary Template

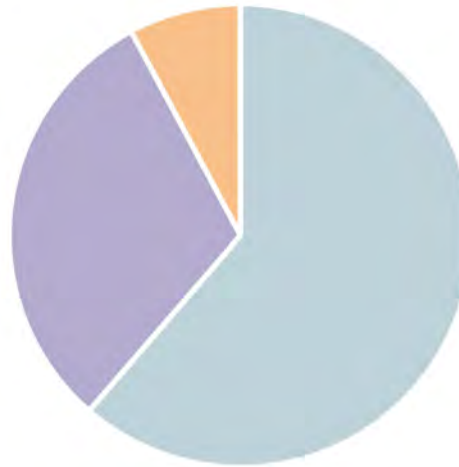
SPACE TYPE	EXISTING SQFT (NET)	MSBA GUIDELINE SQFT (NET)	DEFICIENCY (GROSS GF = 1.5)
CORE ACADEMIC SPACES <small>* Excludes portable classroom square footage.</small>	28,410	32,475	(6,098)
SPECIAL EDUCATION	4,168	8,210	(6,063)
ACADEMIC TOTAL	32,578	40,685	(12,161)
ART & MUSIC	3,229	2,575	981
HEALTH & PHYSICAL EDUCATION	7,458	7,650	(288)
MEDIA CENTER	2,945	2,965	(30)
DINING & FOOD SERVICE	8,897	7,232	2,498
CORE TOTAL	22,529	20,422	3,161
MEDICAL	394	710	(474)
ADMINISTRATION & GUIDANCE	1,850	2,375	(788)
CUSTODIAL & MAINTENANCE	1,413	2,110	(1,046)
ADMINISTRATIVE TOTAL	3,657	5,195	(2,307)
TOTAL FLOOR AREA	58,764	66,302	(11,307)

*MSBA guideline square footages calculated based on the 10-year enrollment forecast value: **510 students**

Floral Street School | MSBA Space Summary Template



EXISTING NET FLOOR AREA



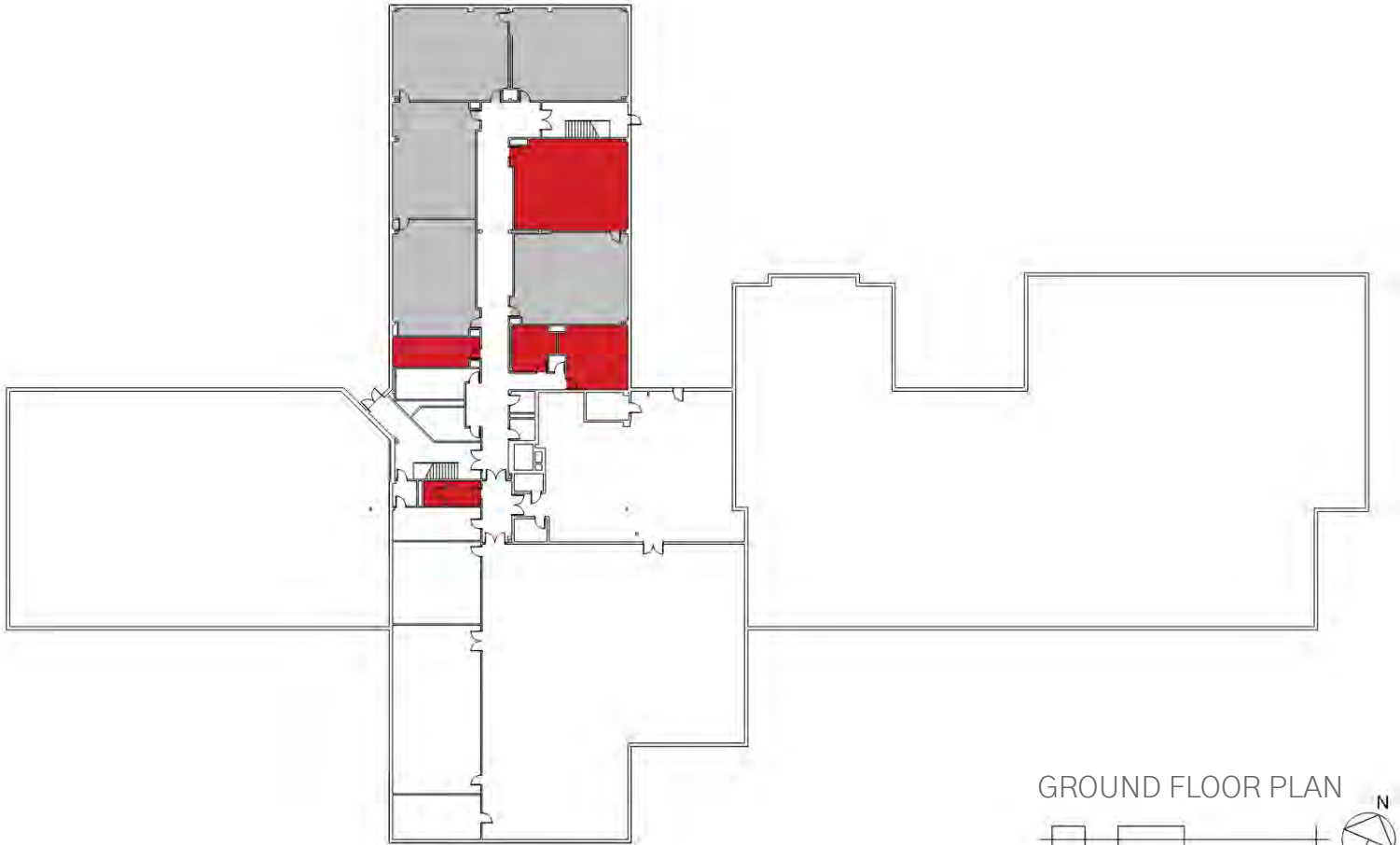
MSBA NET FLOOR AREA

LEGEND

- ACADEMIC SPACES
- CORE SPACES
- ADMINISTRATIVE SPACES

- Special education spaces comprise the largest deficit; almost all types of services are provided, but in insufficient sizes and/or quantities to meet the need. This could be alleviated by allocating more of these services to Beal, which has the capacity to adequately support these students. Building expansion is not feasible for this location due to wetlands protections.
- The total academic deficit shown is a bit misleading, as it includes non-classroom spaces like common areas and teacher planning rooms. When comparing just the standard classroom square footage to the MSBA recommendation for this enrollment, Floral actually has a 1,800 square foot excess of classroom space.
- Administration spaces are generally undersized, which contributes to the deficit.

Floral Street School | MSBA Comparison Plans

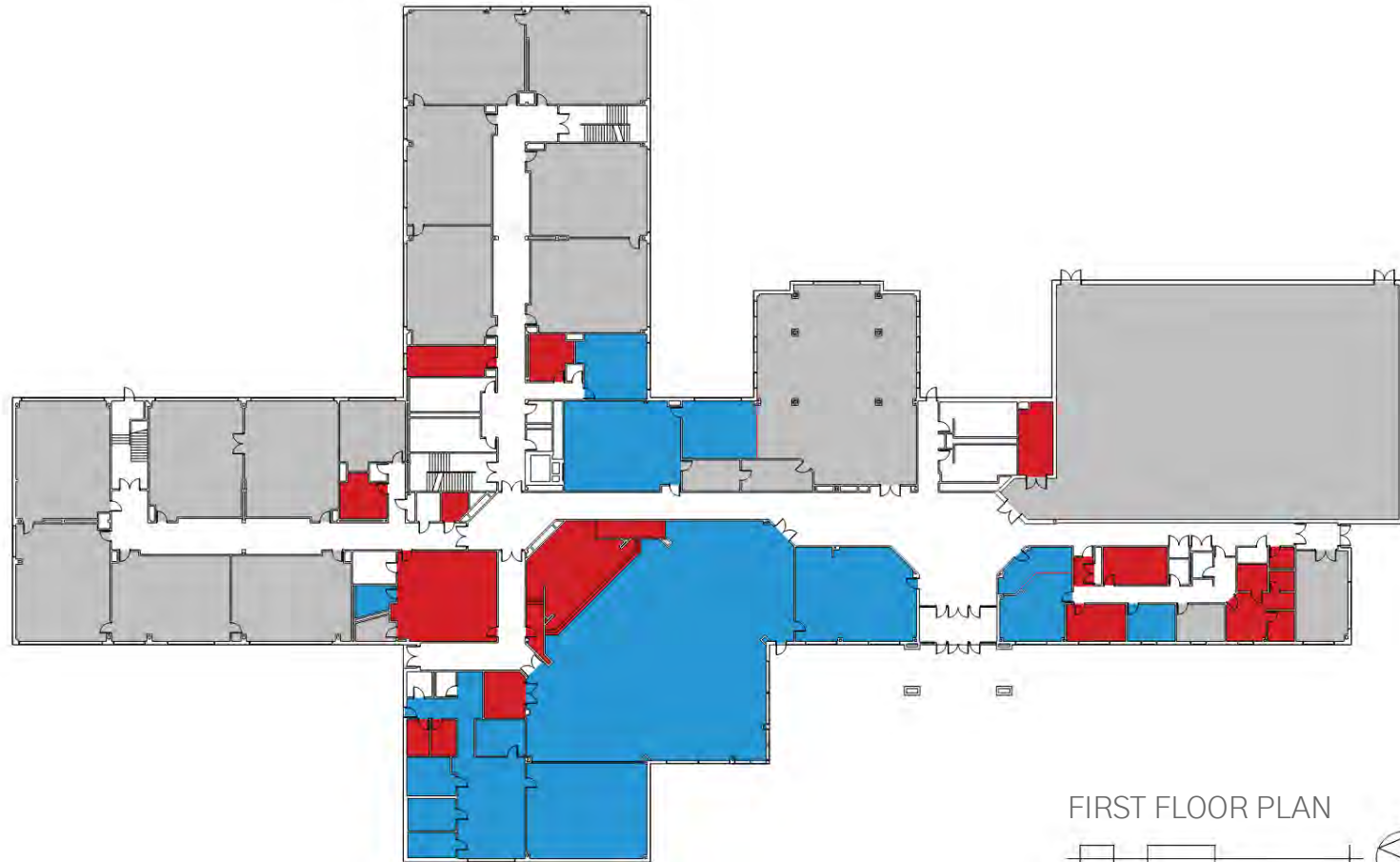


LEGEND





- 10% OVER MSBA GUIDELINES
- MEETS MSBA GUIDELINES
- 10% UNDER MSBA GUIDELINES
- ▨ MODULAR/PORTABLE

GROUND FLOOR PLAN

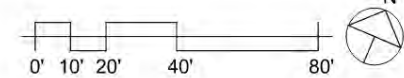
Floral Street School | MSBA Comparison Plans



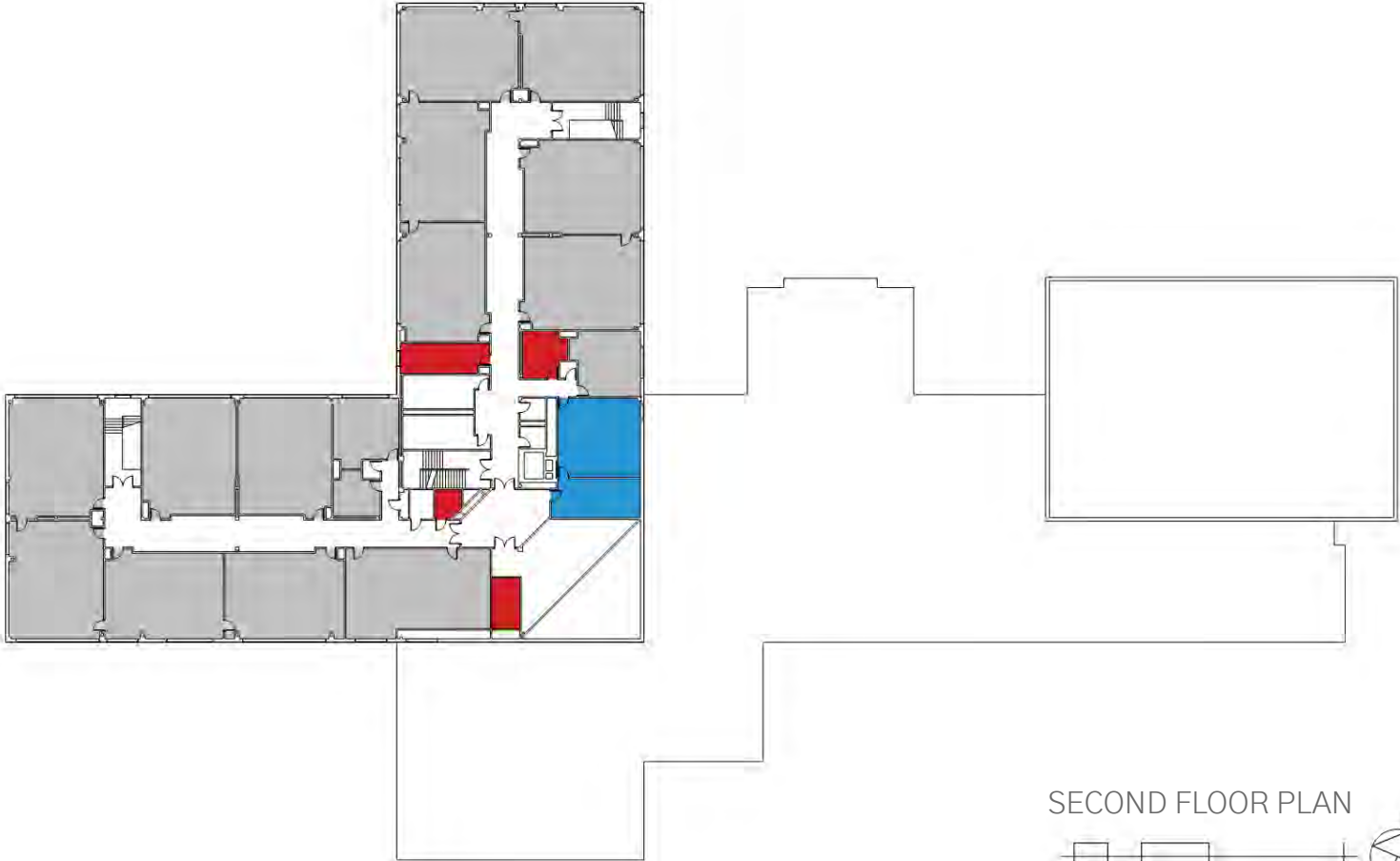
LEGEND

-  10% OVER MSBA GUIDELINES
-  MEETS MSBA GUIDELINES
-  10% UNDER MSBA GUIDELINES
-  MODULAR/PORTABLE

FIRST FLOOR PLAN



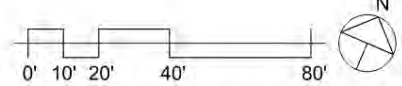
Floral Street School | MSBA Comparison Plans



LEGEND

- 10% OVER MSBA GUIDELINES
- MEETS MSBA GUIDELINES
- 10% UNDER MSBA GUIDELINES
- MODULAR/PORTABLE

SECOND FLOOR PLAN



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Floral Street School | Educational Review

	CURRENTLY PROVIDED	SQ FOOTAGE MEETS MSBA GUIDELINES	QUANTITY MEETS MSBA GUIDELINES	GENERAL NOTES
CORE ACADEMIC SPACES	●	○	○	CLASSROOMS GENERALLY MEET MSBA GUIDELINES FOR SIZE; QUANTITY DOES NOT; TEACHER PLANNING SPACES PROVIDED ON EACH FLOOR (BUT THE GROUND FLOOR ROOM HAS BEEN REALLOCATED FOR OT/PT)
SPECIAL EDUCATION	●	○	○	SPED CLASSROOMS DISPERSED ON ALL THREE FLOORS; GENERALLY UNDERSIZED THOUGH MOST SERVICES PROVIDED; NO DEDICATED TOILET FACILITIES
ART & MUSIC	●	●	●	ONE OF ART CLASSROOMS IS COMBINATION ART/MUSIC/MAKER SPACE; MUSIC ROOM IS APPROXIMATELY 23% UNDERSIZED; TWO PRACTICE ROOMS PROVIDED (THREE RECOMMENDED); ART/MUSIC ROOMS DISPERSED (ONE PER FLOOR)
HEALTH & PHYSICAL EDUCATION	●	○	●	GYMNASIUM SQUARE FOOTAGE MEETS REQUIREMENTS, BUT STORAGE IS UNDERSIZED AND HEALTH INSTRUCTOR OFFICE NOT PROVIDED
MEDIA CENTER	●	○	●	CENTRALLY LOCATED; GOOD NATURAL LIGHT; SOME SPACE HAS BEEN REALLOCATED TO SPECIAL EDUCATION VIA TEMPORARY PARTITIONS
DINING & FOOD SERVICE	●	●	●	STAGE SLIGHTLY UNDERSIZED; FACULTY LOUNGE OVERSIZED – COULD BE REALLOCATED TO OTHER AREAS IN NEED OF SPACE
MEDICAL	●	○	○	NURSE OFFICE SMALL – COULD EXPAND INTO ELL CLASSROOM TO EAST TO SATISFY MSBA RECOMMENDATIONS FOR SQUARE FOOTAGE
ADMINISTRATION & GUIDANCE	●	○	○	MAIN ADMIN BLOCK ON FIRST FLOOR; SOME OFFICES DISPERSED ON SECOND FLOOR; NOT ENOUGH OFFICES/GUIDANCE SPACES OR SMALL MEETING SPACES
CUSTODIAL & MAINTENANCE	●	○	●	NO LARGE WORKSHOP OR RECEIVING ROOM; DELIVERIES ACCEPTED FROM LOADING DOCK THROUGH KITCHEN OR ADJACENT CORRIDOR

● YES ○ NO

Floral Street School | Educational Review



Welcoming lobby with direct access to administration and assembly spaces



Classrooms are adequately sized, though disparities exist; no dedicated toilets for kindergartens



Gymnasium meets requirements, but associated storage and office spaces do not



Portion of media center has been reallocated to small group services via movable partitions



School department storage in basement provides potential opportunity for future school expansion



Cafetorium is sized appropriately and well-maintained, as are the kitchen and associated spaces

Major Howard W Beal School | Introduction

Major Howard W. Beal School is the newest school building addition to the Town of Shrewsbury. Completed in 2021, this building replaces a nearly 100-year-old school in the center of town. Beal School serves students in grades K–4, and is open year-round. Completion of the LEED-certifiable school has allowed the district to offer full-day kindergarten for all eligible residents, as well as address a number of deficiencies beyond those of the former Beal School.

Building organization meets modern standards for educational design. The administrative suite is directly adjacent to the main entrance; the main vestibule is secured so that visitors are not allowed access to the school without checking in at reception first. The main entrance opens onto a long corridor, with public and assembly spaces organized on either side; this corridor terminates in a grand stairway down to the media center. There are four classroom wings that radiate out from the centralized media center; one is dedicated to kindergarten. The classroom wings are each grouped around a shared commons, creating a neighborhood feel. All kindergarten classrooms have dedicated toilet and storage rooms. Ample special education space has been provided amongst all the various classroom wings, which creates an inclusive environment for these students and ensures equity of services provided. The building is fully accessible by ADA and MAAB standards.

Beal’s enrollment is projected to drop by 35 students over the next ten years. Given this and its recent completion, it is not a candidate for any design intervention. However, the design capacity of Beal far exceeds the 10-year enrollment projection; at optimized operations, it could serve an additional 300 students. Thus, Beal could be utilized as a swing space capable of absorbing almost an entire elementary school of students, should the school in question need intervention.



Major Howard W Beal School | 10-Year Enrollment Forecast

SCHOOLYEAR	TOTAL ENROLLMENT (K-4)	CHANGE
2022-23	609	—
2031-32	548	(61)
*Design Capacity	848	300

Enrollment numbers taken from “Population and Enrollment Forecasts, 2022-23 Through 2031-32”
by McKibben Demographic Research, March 2022; see Appendix for full report.

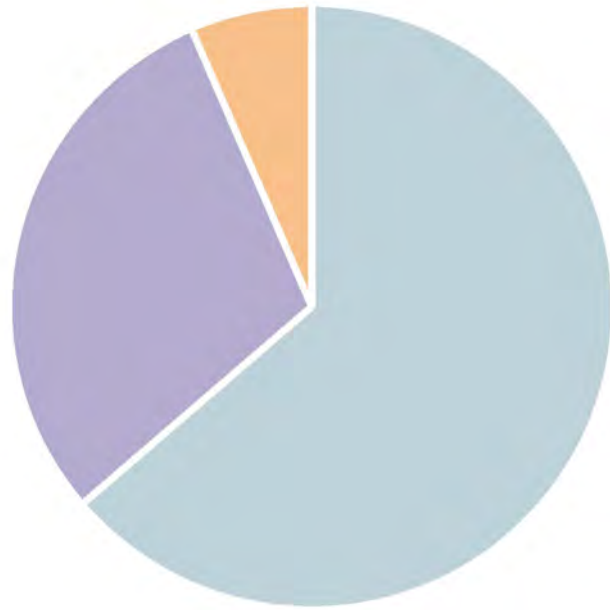
*Design Capacity refers to the mean student body population that a given school can support as it currently exists.
Mean value is calculated based on the SPS School Committee policy guidelines for class size,
as well as MSBA guidelines for classroom square footage size.
Note that portable classroom square footage is excluded from this calculation.
See Educational Review Introduction for the calculation methodology.

Major Howard W Beal School | MSBA Space Summary Template

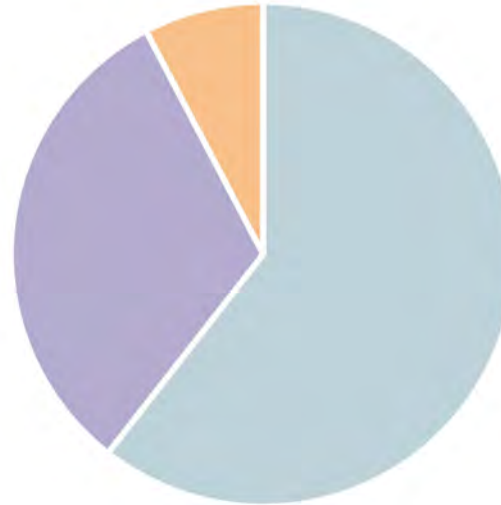
SPACE TYPE	EXISTING SQFT (NET)	MSBA GUIDELINE SQFT (NET)	DEFICIENCY (GROSS GF=1.5)
CORE ACADEMIC SPACES <small>* Excludes portable classroom square footage.</small>	47,100	34,050	19,575
SPECIAL EDUCATION	14,160	8,210	8,925
ACADEMIC TOTAL	61,260	42,260	28,500
ART & MUSIC	6,350	3,800	3,825
HEALTH & PHYSICAL EDUCATION	7,650	7,650	0
MEDIA CENTER	4,225	3,136	1,634
DINING & FOOD SERVICE	10,461	7,578	4,325
CORE TOTAL	28,686	22,164	9,783
MEDICAL	950	810	210
ADMINISTRATION & GUIDANCE	2,925	2,413	768
CUSTODIAL & MAINTENANCE	2,390	2,148	363
ADMINISTRATIVE TOTAL	6,265	5,371	1,341
TOTAL FLOOR AREA	96,211	69,795	39,624

*MSBA guideline square footages calculated based on the 10-year enrollment forecast value: **548 students**

Major Howard W Beal School | MSBA Space Summary Template



EXISTING NET FLOOR AREA



MSBA NET FLOOR AREA

LEGEND





- ACADEMIC SPACES
- CORE SPACES
- ADMINISTRATIVE SPACES

- Beal was oversized to account for some of the inequities that existed in other parts of the district, as well as to ensure full-day kindergarten would be provided for all eligible Shrewsbury students. Not all classrooms are currently in use at their full capacity, as the enrollment is far below the design capacity.
- Special education spaces account for almost twice the MSBA recommendation for square footage.
- These spatial excesses make Beal a critical component of options development, as it could feasibly act as a swing space for one of the other elementary schools (or even absorb almost an entire population permanently), should there be a need to take a school offline for renovation.

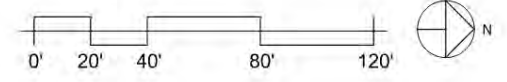
Major Howard W Beal School | MSBA Comparison Plans



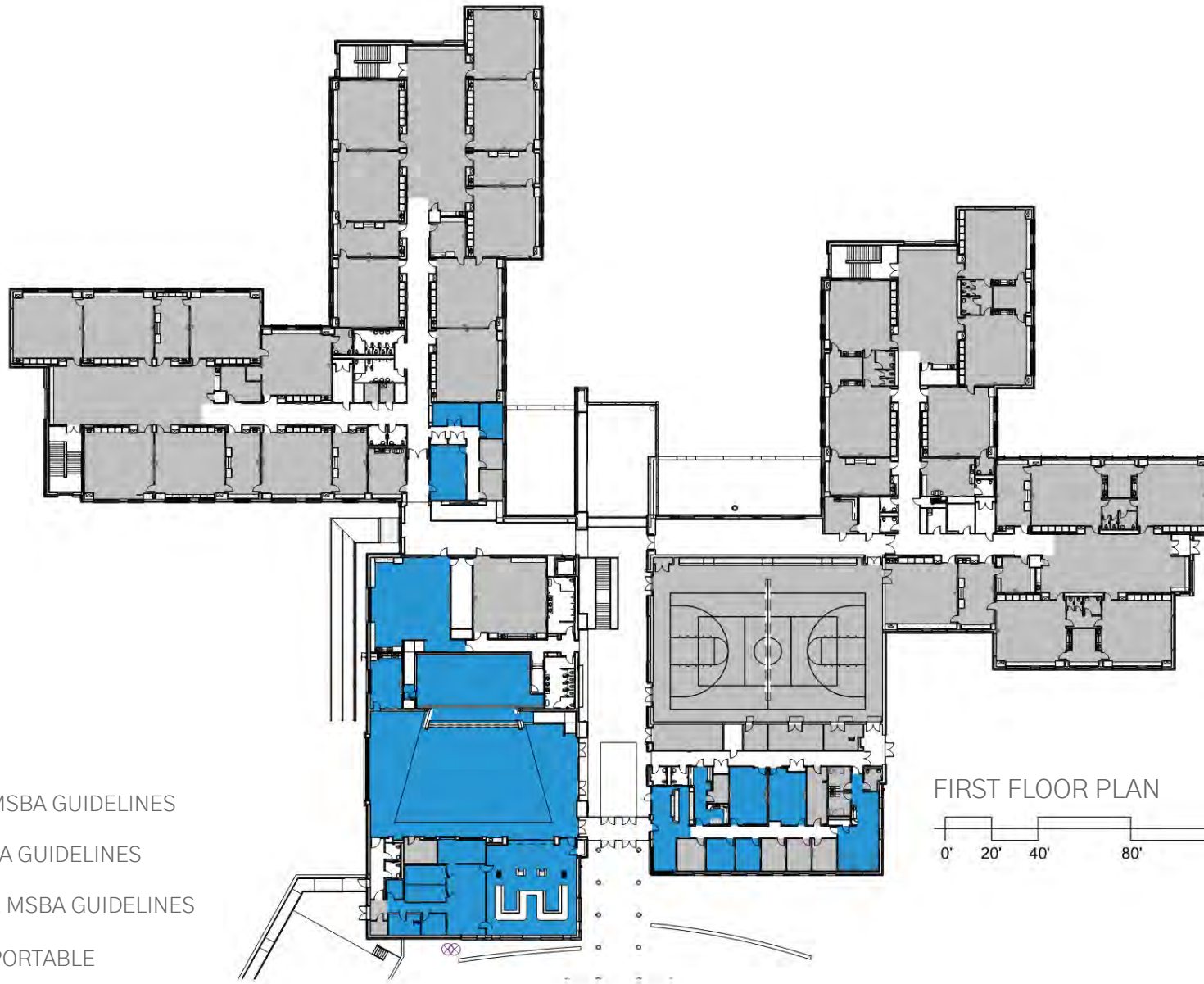
LEGEND

-  10% OVER MSBA GUIDELINES
-  MEETS MSBA GUIDELINES
-  10% UNDER MSBA GUIDELINES
-  MODULAR/PORABLE





GROUND FLOOR PLAN



Major Howard W Beal School | MSBA Comparison Plans



LEGEND

-  10% OVER MSBA GUIDELINES
-  MEETS MSBA GUIDELINES
-  10% UNDER MSBA GUIDELINES
-  MODULAR/PORTABLE

FIRST FLOOR PLAN

Major Howard W Beal School | Educational Review

	CURRENTLY PROVIDED	SQ FOOTAGE MEETS MSBA GUIDELINES	QUANTITY MEETS MSBA GUIDELINES	GENERAL NOTES
CORE ACADEMIC SPACES	●	●	●	
SPECIAL EDUCATION	●	●	●	
ART & MUSIC	●	●	○	NO PRACTICE/ENSEMBLE ROOMS PROVIDED; BUT MUSIC CLASSROOMS EXCEED QUANTITY REQUIRED BY MSBA
HEALTH & PHYSICAL EDUCATION	●	●	●	
MEDIA CENTER	●	●	●	FULL MAKER SPACE PROVIDED WITHIN MEDIA CENTER
DINING & FOOD SERVICE	●	●	●	
MEDICAL	●	●	●	
ADMINISTRATION & GUIDANCE	●	●	●	
CUSTODIAL & MAINTENANCE	●	●	●	

● YES ○ NO

Major Howard W Beal School | Educational Review



Central spine corridor connects main entrance with all assembly spaces



Cafetorium and stage sufficiently sized for all-school meetings as well as lunch periods



Classrooms arranged in neighborhoods, with common areas for breakout instruction



Efficient, well-lit circulation makes navigation easy



Kindergartens have their own wing and common areas with direct access to playground



Media center & maker space centrally located at crosspoint of classroom wings

Spring Street School | Introduction

Serving students in the northeastern quadrant of Shrewsbury, Spring Street School currently houses a population of 297 students in grades K–4. This is one of the smaller elementary schools in the district.

The first floor is a split level; the main entrance and academic wing to the north are on the upper lobby level, while assembly spaces (the gymnasium and cafe-torium) and the administrative suite are on the lower lobby level to the south. There is elevator access between these two levels; however, the addition of this elevator resulted in a rather circuitous circulation route to the lower lobby, as well as a compression of the upper lobby space. Additionally, the stage in the cafe-torium is not accessible; it can only be accessed via stairs.

The administrative suite is remotely located from the main entrance; there is no direct visual access to the vestibule, nor was any type of controlled entry system observed. This presents a potential security concern.

In the classroom wing, multi-user toilet rooms are centrally located on both floors, as are core spaces such as the library or art room. Classrooms meet MSBA requirements for quantity; however, the classroom size is far below both MSBA and SPS norms. This square footage deficiency was alleviated with the addition of six portable classrooms to the northeast; however, these do not factor into the analysis conducted for this report. All classrooms (with the exception of a few of the portable classrooms) have a sink. Circulation is very efficient overall.

Enrollment projections are fairly stable here, with an increase of only 6 students forecasted for the ten-year value. However, the school is operating at almost 200% of its design capacity, indicating the need for either building expansion or redistricting to alleviate the burden.



Spring Street School | 10-Year Enrollment Forecast

SCHOOL YEAR	TOTAL ENROLLMENT (K-4)	CHANGE
2022-23	308	—
2031-32	303	(5)
*Design Capacity	152	(151)

Enrollment numbers taken from “Population and Enrollment Forecasts, 2022-23 Through 2031-32” by McKibben Demographic Research, March 2022; see Appendix for full report.

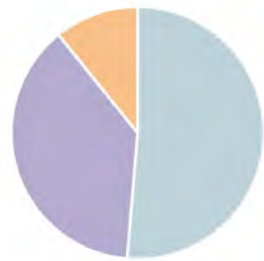
*Design Capacity refers to the mean student body population that a given school can support as it currently exists. Mean value is calculated based on the SPS School Committee policy guidelines for class size, as well as MSBA guidelines for classroom square footage size. Note that portable classroom square footage is excluded from this calculation. See Educational Review Introduction for the calculation methodology.

Spring Street School | MSBA Space Summary Template

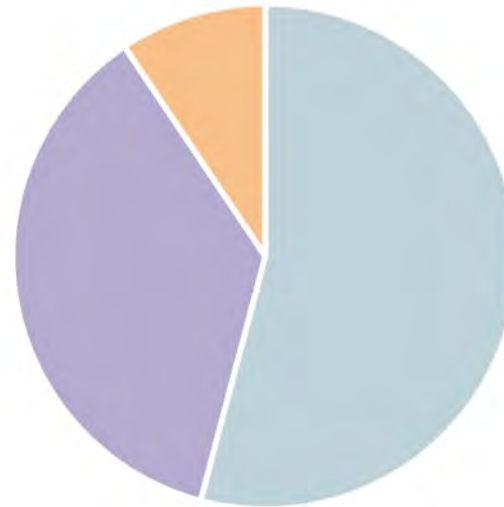
SPACE TYPE	EXISTING SQFT (NET)	MSBA GUIDELINE SQFT (NET)	DEFICIENCY (GROSS GF = 1.5)
CORE ACADEMIC SPACES <small>* Excludes portable classroom square footage.</small>	10,138	20,600	(15,423)
SPECIAL EDUCATION	1,080	5,455	(6,563)
ACADEMIC TOTAL	11,398	26,055	(21,986)
ART & MUSIC	814	2,500	(2,529)
HEALTH & PHYSICAL EDUCATION	2,579	7,650	(7,607)
MEDIA CENTER	1,123	2,034	(1,367)
DINING & FOOD SERVICE	3,893	5,376	(2,225)
CORE TOTAL	8,409	17,560	(13,727)
MEDICAL	203	610	(611)
ADMINISTRATION & GUIDANCE	1,605	2,018	(620)
CUSTODIAL & MAINTENANCE	590	1,903	(1,970)
ADMINISTRATIVE TOTAL	2,398	4,531	(3,200)
TOTAL FLOOR AREA	22,205	48,146	(38,912)

*MSBA guideline square footages calculated based on the 10-year enrollment forecast value: **303 students**

Spring Street School | MSBA Space Summary Template

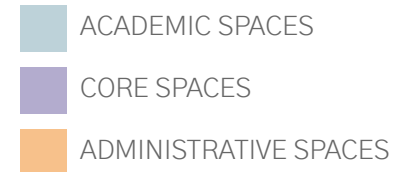


EXISTING NET FLOOR AREA



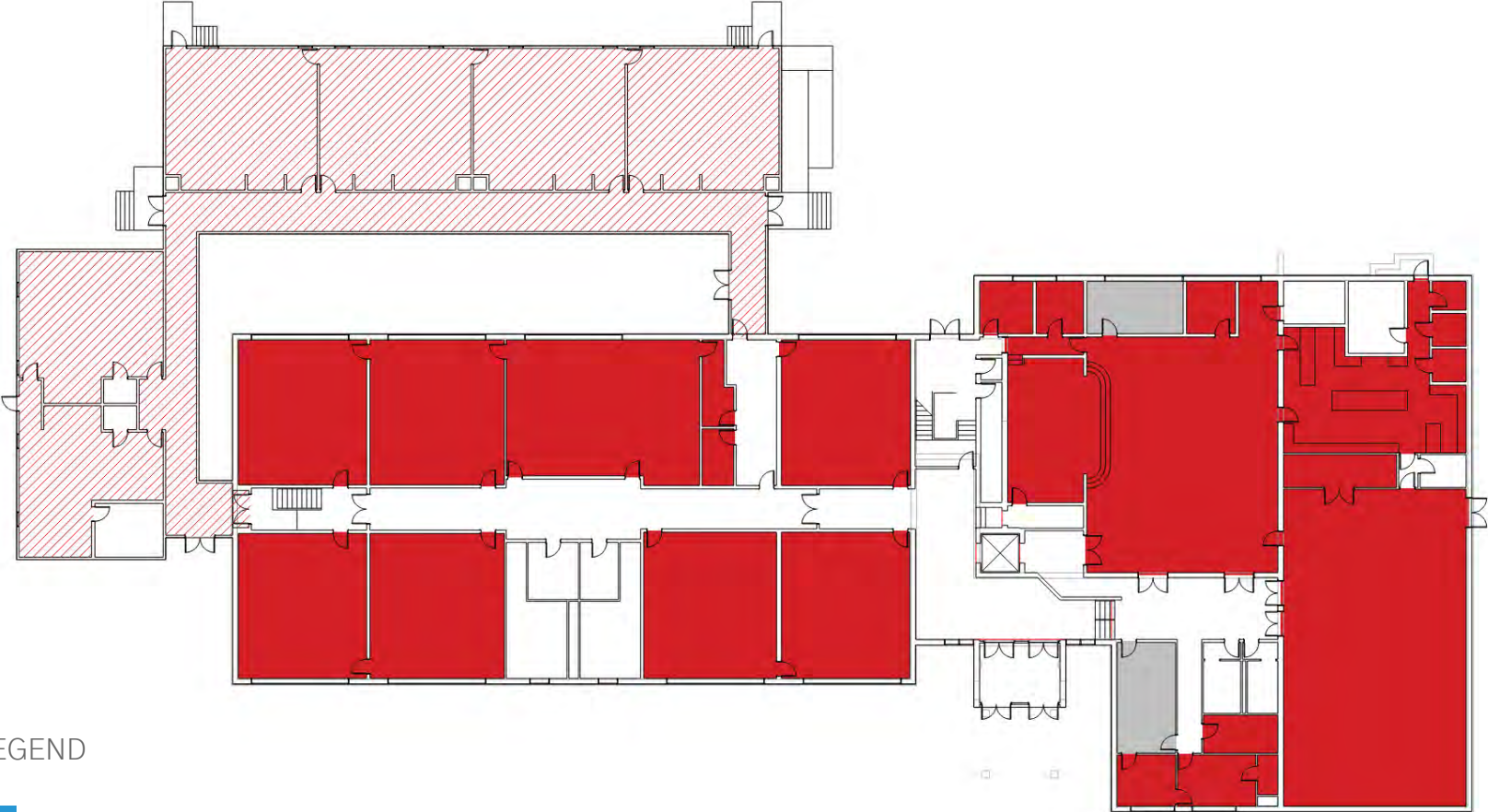
MSBA NET FLOOR AREA

LEGEND



- Generally speaking, all rooms at Spring Street School are quite small compared to MSBA recommendations. This contributes to the deficits across the board.
- The average classroom size is 794 sq ft for general classrooms and 812 for special education classrooms (the MSBA minimum recommendation for both is 900 sq ft). There are also no common spaces, no ESL/ELL classroom, no teacher planning spaces, and no STE room.
- The media center is about 55% of the MSBA recommended size; the gymnasium is about 35%, and the art room is about 81%. (While a music classroom is provided here, it is in a portable classroom, so it has not been included in this analysis.) The stage is 53% of the recommended size; additionally, it is inaccessible (no ramp).
- Custodial & maintenance spaces make up the bulk of the administrative deficit. Some closets have been re-purposed for offices where appropriate; these spaces in particular are greatly undersized.

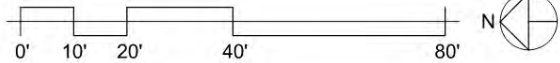
Spring Street School | MSBA Comparison Plans



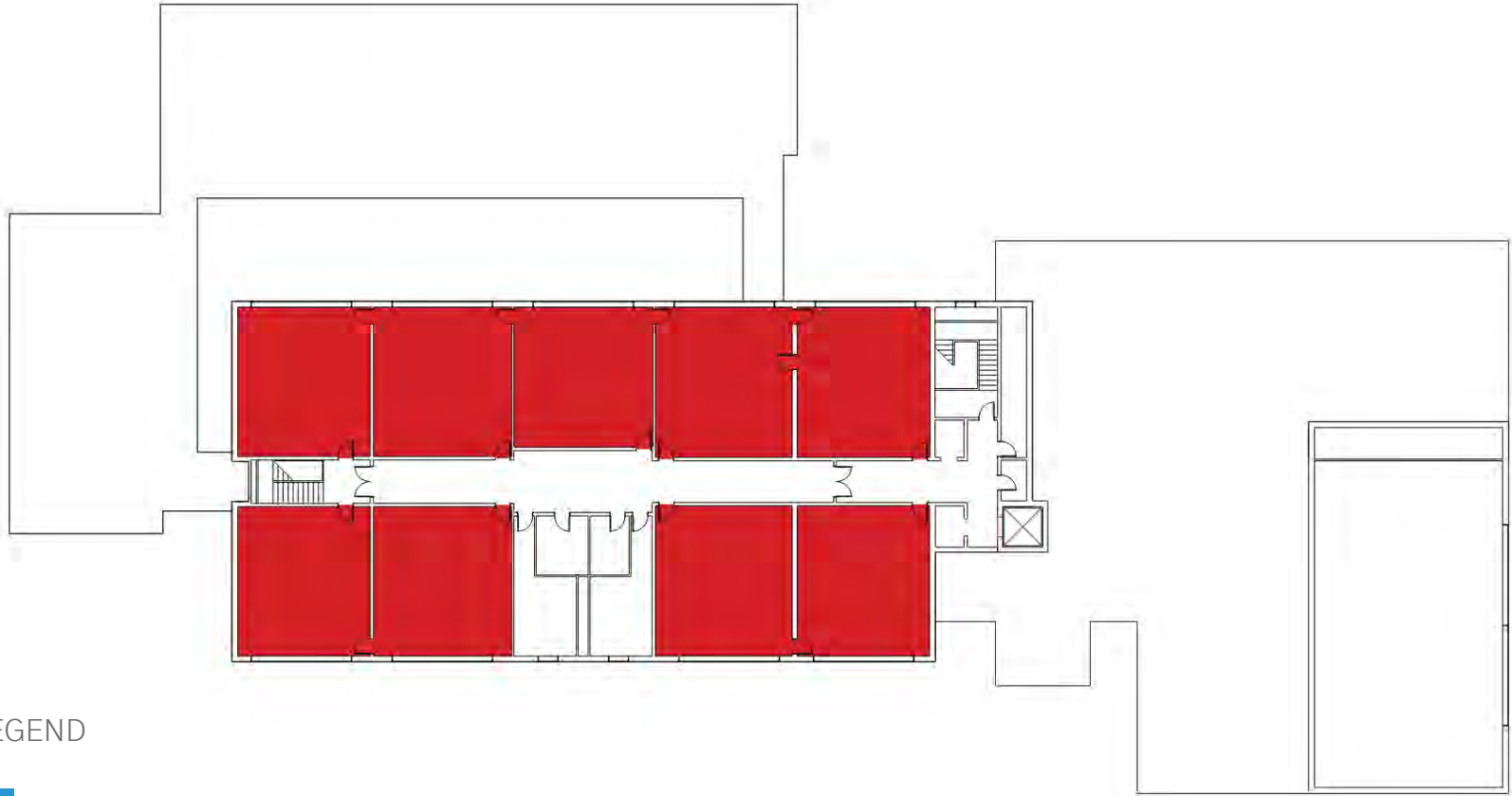
LEGEND

- 10% OVER MSBA GUIDELINES
- MEETS MSBA GUIDELINES
- 10% UNDER MSBA GUIDELINES
- MODULAR/PORTABLE

GROUND FLOOR PLAN



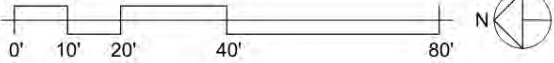
Spring Street School | MSBA Comparison Plans



LEGEND

- 10% OVER MSBA GUIDELINES
- MEETS MSBA GUIDELINES
- 10% UNDER MSBA GUIDELINES
- MODULAR/PORTABLE

SECOND FLOOR PLAN



Spring Street School | Educational Review

	CURRENTLY PROVIDED	SQ FOOTAGE MEETS MSBA GUIDELINES	QUANTITY MEETS MSBA GUIDELINES	GENERAL NOTES
CORE ACADEMIC SPACES	●	○	○	ALL CLASSROOMS UNDERSIZED; THREE MODULAR CLASSROOMS (OUT OF SIX-TEEN TOTAL)
SPECIAL EDUCATION	●	○	○	ALL SPED CLASSROOMS UNDERSIZED; ONE SPED CLASSROOM (OUT OF TWO TOTAL) & OT/PT ROOM ARE BOTH MODULAR; NO DEDICATED TOILET FACILITIES
ART & MUSIC	●	○	○	ART ROOM IS UNDERSIZED; MUSIC ROOM IS MODULAR; INADEQUATE STORAGE FOR BOTH
HEALTH & PHYSICAL EDUCATION	●	○	○	GYMNASIUM & ATHLETIC STORAGE UNDERSIZED; NO HEALTH INSTRUCTOR OFFICE PROVIDED
MEDIA CENTER	●	○	●	LIBRARY IS CURRENTLY ABOUT 55% OF THE MSBA-RECOMMENDED SIZE
DINING & FOOD SERVICE	●	○	●	CAFETERIA, STAGE, KITCHEN, AND STORAGE ALL UNDERSIZED; FACULTY LUNCH ROOM ADEQUATE; STAGE IS INACCESSIBLE
MEDICAL	●	○	○	NURSE OFFICE SHARED WITH EXAM ROOM – UNDERSIZED; TOILET UNDERSIZED AND NON-ADA-COMPLIANT
ADMINISTRATION & GUIDANCE	●	○	○	MAIN ADMIN BLOCK REMOTELY LOCATED FROM MAIN ENTRANCE ON LOWER LOBBY LEVEL – POOR VISIBILITY/SECURITY; CONFERENCE ROOM IS THE ONLY ADMINISTRATIVE SPACE ON SECOND FLOOR
CUSTODIAL & MAINTENANCE	●	○	○	NO WORKSHOP; INADEQUATE STORAGE & TRASH ROOMS; ONLY ONE JANITOR CLOSET FOR ENTIRE BUILDING

● YES ○ NO

Spring Street School | Educational Review



Undersized classrooms with good access to natural light; sinks provided



Gymnasium with exterior access and storage room; no bleachers or wall pads; undersized



Cafeteria with stage; stage is inaccessible (no ramp, only accessed via stairs)



No direct line of sight from school office to main entrance – insecure; elevator corridor to right of stair



Former classroom re-purposed as media center; undersized



Efficient circulation in classroom wing (both floors); double-loaded corridors with short travel distances

Walter J. Paton School | Introduction

Centrally located on Route 140 just south of Main Street, Walter J. Paton School serves K-4 students in the heart of the town. The school is organized with the administrative suite directly adjacent to the main entrance on the south side of the building, with good visibility to greet visitors. The two-story classroom wing is to the north of the entrance, and the cafe-gym-atorium and accessory support spaces are to the west, along with a lower basement level. The classroom wing and entrance are fully accessible via elevator; the basement level is not. Toilet rooms are not centralized; rather, girls and boys toilet rooms bookend the classroom wing on both floors. There are no dedicated toilet rooms for the kindergarten classrooms.

Enrollment is forecasted to increase by only 6 students over the next 10 years, but the design capacity of the school as it currently exists is greatly insufficient to support that population. This is further highlighted by the square footage deficiencies seen in the MSBA Space Summary Template on the following pages.

The biggest concern would be that of the cafe-gym-atorium, or “Triple Threat” space. Separating these uses into a cafetorium and gymnasium (with adequate storage space for both) would be the preferred solution for an elementary school. Classrooms are sized appropriately and have good access to natural light; but there are not enough to support the student body population. (This will be exacerbated by the removal of three modular classrooms at the north side of the building.) The generous classroom sizes have been useful in flexibly reallocating space for media center, art, music, reading, and special education uses. An administrative expansion added much needed office space, though it still falls short of the mark overall.



Walter J. Paton School | 10-Year Enrollment Forecast

SCHOOLYEAR	TOTAL ENROLLMENT (K-4)	CHANGE
2022-23	291	-
2031-32	318	27
*Design Capacity	206	(112)

Enrollment numbers taken from “Population and Enrollment Forecasts, 2022-23 Through 2031-32”
by McKibben Demographic Research, March 2022; see Appendix for full report.

*Design Capacity refers to the mean student body population that a given school can support as it currently exists.
Mean value is calculated based on the SPS School Committee policy guidelines for class size,
as well as MSBA guidelines for classroom square footage size.
Note that portable classroom square footage is excluded from this calculation.
See Educational Review Introduction for the calculation methodology.

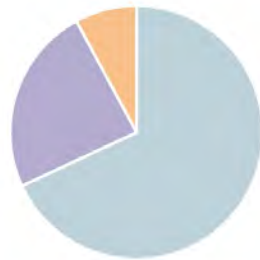
Walter J. Paton School | MSBA Space Summary Template

SPACE TYPE	EXISTING SQFT (NET)	MSBA GUIDELINE SQFT* (NET)	DEFICIENCY (GROSS GF=1.5)
CORE ACADEMIC SPACES <small>* Excludes portable classroom square footage.</small>	12,591	21,525	(13,401)
SPECIAL EDUCATION	2,223	5,830	(5,411)
ACADEMIC TOTAL	14,814	27,355	(18,812)
ART & MUSIC	878	2,500	(2,433)
HEALTH & PHYSICAL EDUCATION	0	7,650	(11,475)
MEDIA CENTER	935	2,101	(1,749)
DINING & FOOD SERVICE	3,411	5,509	(3,147)
CORE TOTAL	5,224	17,760	(18,804)
MEDICAL	282	610	(492)
ADMINISTRATION & GUIDANCE	1,356	2,033	(1,016)
CUSTODIAL & MAINTENANCE	84	1,918	(2,751)
ADMINISTRATIVE TOTAL	1,722	4,561	(4,259)
TOTAL FLOOR AREA	21,760	49,676	(41,874)

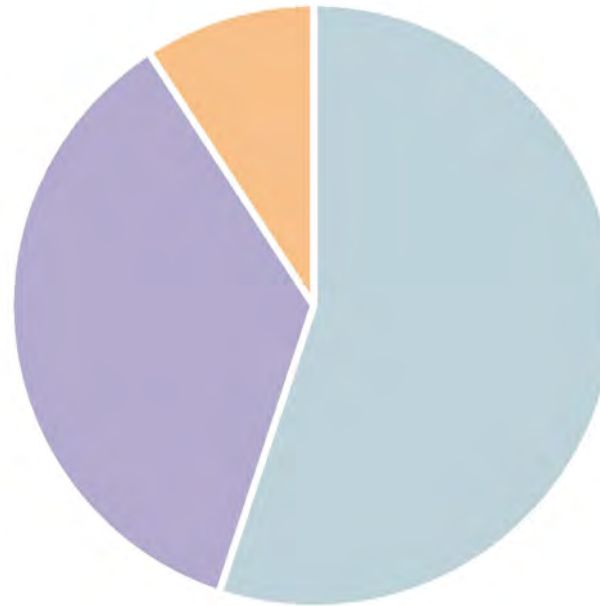
*MSBA guideline square footages calculated based on the 10-year enrollment forecast value:

318 students

Walter J. Paton School | MSBA Space Summary Template



EXISTING NET FLOOR AREA



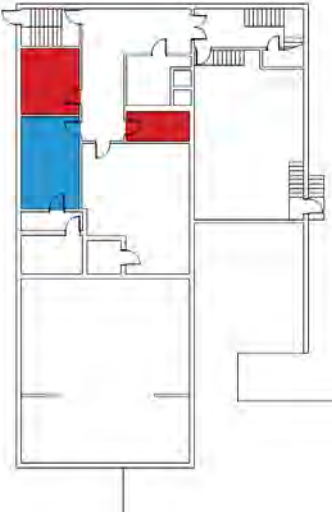
MSBA NET FLOOR AREA

LEGEND

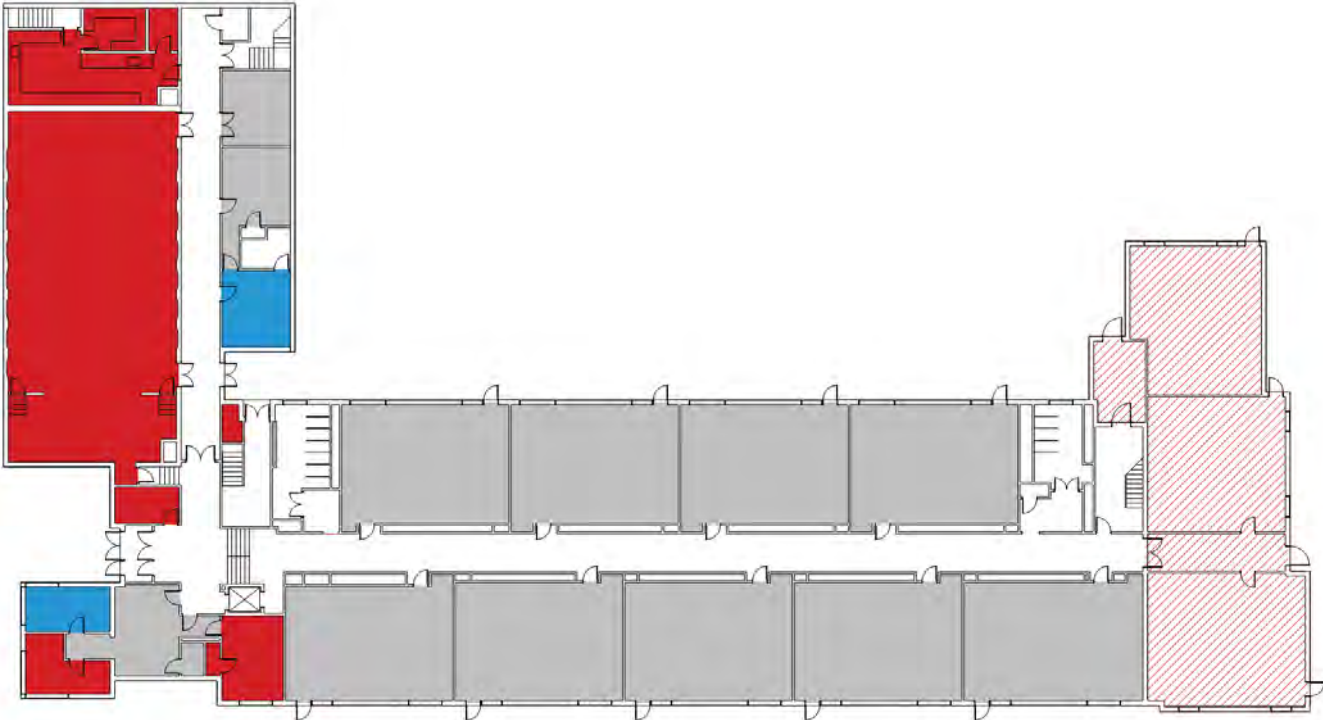
- ACADEMIC SPACES
- CORE SPACES
- ADMINISTRATIVE SPACES

- The “Triple Threat” cafe-gym-atorium space accounts for the greatest square footage deficiency, followed by classrooms.
- While the classroom deficiency is exacerbated by the removal of about 2,550 square feet of portable classroom space, classrooms would still be only 64% of the square footage needed to meet the enrollment need with the portables included.
- A case can be made for a full academic wing addition, as well as a new gymnasium.

Walter J. Paton School | MSBA Comparison Plans



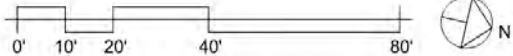
BASEMENT PLAN



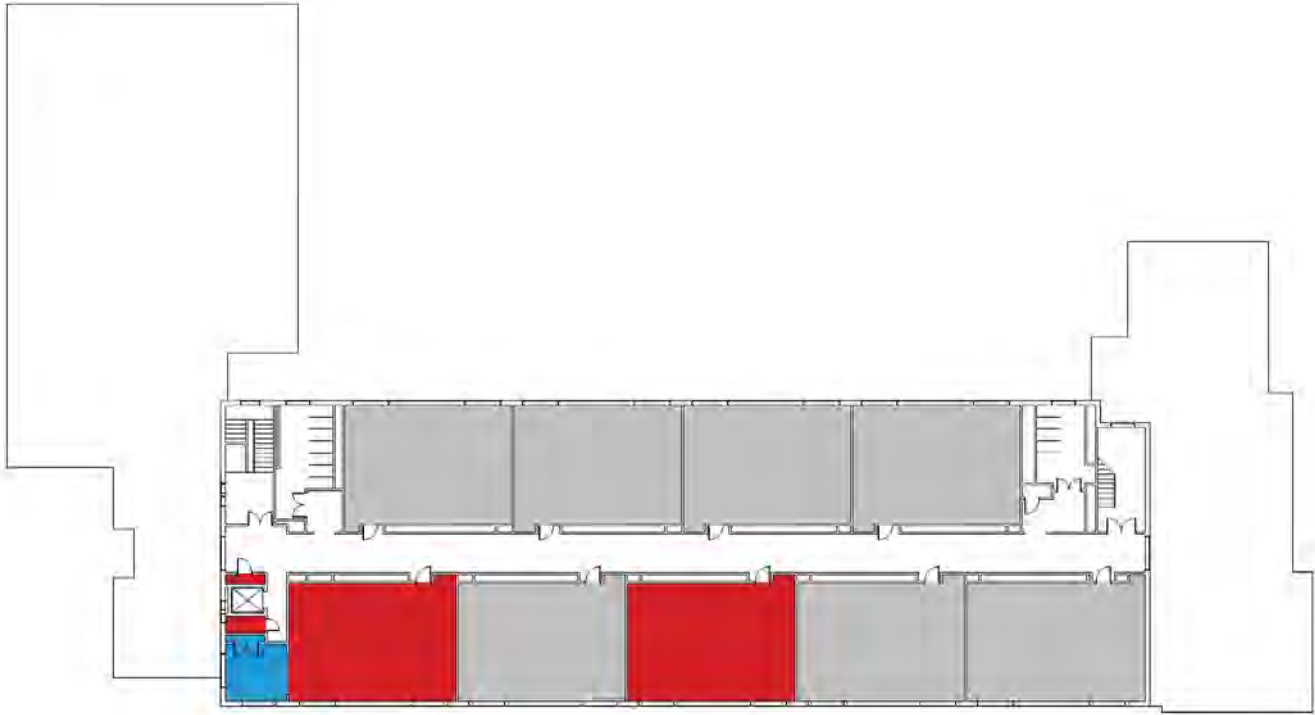
FIRST FLOOR PLAN

LEGEND





- 10% OVER MSBA GUIDELINES
- MEETS MSBA GUIDELINES
- 10% UNDER MSBA GUIDELINES
- MODULAR/PORTABLE



Walter J. Paton School | MSBA Comparison Plans



LEGEND

-  10% OVER MSBA GUIDELINES
-  MEETS MSBA GUIDELINES
-  10% UNDER MSBA GUIDELINES
-  MODULAR/PORTABLE

SECOND FLOOR PLAN



Walter J. Paton School | Educational Review

	CURRENTLY PROVIDED	SQ FOOTAGE MEETS MSBA GUIDELINES	QUANTITY MEETS MSBA GUIDELINES	GENERAL NOTES
CORE ACADEMIC SPACES	●	●	○	NO AREAS FOR SMALL GROUP INSTRUCTION OR MEETING; TEACHER PLANNING SPACES IN BASEMENT (NON-ACCESSIBLE – NO ELEVATOR ACCESS); LACK OF ADEQUATELY EQUIPPED ELL CLASSROOMS/RESOURCE ROOMS
SPECIAL EDUCATION	●	○	○	EXISTING SPACES SHARED BY MULTIPLE EDUCATORS; NO DEDICATED TOILET ROOM FOR STUDENTS REQUIRING ASSISTANCE WITH DIGNITY
ART & MUSIC	●	○	○	ART/MUSIC/READING CURRENTLY COMBINED IN ONE CLASSROOM WITH USES SEPARATED BY MOVABLE PARTIAL-HEIGHT PARTITIONS; SPACE IS UNDERSIZED FOR ITS CURRENT USE (BUT ADEQUATE FOR CLASSROOM USE)
HEALTH & PHYSICAL EDUCATION	○	○	○	GYM IS UNDERSIZED “TRIPLE THREAT” SPACE (SHARED WITH CAFETERIA AND AUDITORIUM USES); INADEQUATE ATHLETIC STORAGE
MEDIA CENTER	●	○	●	CLASSROOM CONVERTED TO MEDIA CENTER; SPACE IS UNDERSIZED FOR ITS CURRENT USE (BUT ADEQUATE FOR CLASSROOM USE)
DINING & FOOD SERVICE	●	○	●	KITCHEN STORAGE & LAYOUT ARE VERY LIMITED; EXISTING SPACE IS MAXED OUT; CAFETERIA IS SHARED SPACE WITH GYMNASIUM AND AUDITORIUM
MEDICAL	●	○	●	RESTROOM IS NON-ADA-COMPLIANT; MEDICAL WAITING AREA FALLS WITHIN ADMINISTRATIVE SUITE (LIMITS PRIVACY)
ADMINISTRATION & GUIDANCE	●	○	○	NO CONFERENCE ROOMS OR SMALL MEETING ROOMS PROVIDED; NO COPIER SPACE OR RECORDS ROOM; UNDERSIZED TEACHER WORK ROOM AREA LOCATED IN INACCESSIBLE BASEMENT; ONE COUNSELING ROOM PROVIDED (UNDERSIZED)
CUSTODIAL & MAINTENANCE	●	○	○	GREATLY UNDERSIZED

● YES ○ NO

Walter J. Paton School | Educational Review



Adequately sized classrooms with good access to natural light



“Triple Threat” space: cafe-gym-atorium



Classroom re-purposed to house art/music/reading



Classroom re-purposed to house various special education programs, including OT/PT



Maxed-out kitchen with limited storage options



Undersized teacher work room located in basement (no elevator access)

Sherwood Middle School | Introduction

Sherwood Middle School serves grades 5 and 6 in the northwest quadrant of Shrewsbury. It shares a site and outdoor athletic facilities with Oak Middle School (which serves grades 7 and 8). This grade configuration is a bit unusual but has served the district well.

As the newest school constructed in the district, Sherwood has a more contemporary feel and spatial organization than the other facilities. The administration suite is directly adjacent to the main entrance, and visitors are required to check in at the front desk before they can gain access to the building. This is the preferred arrangement for an entry sequence at a school.

From the main lobby, the gymnasium (with stage and bleachers) is to the right, while the classroom wings are to the left. Classrooms are organized in neighborhoods, clustered around common areas for small group breakout sessions or informal instruction. The cafeteria is on the ground floor level, and the media center and art rooms are on the second floor with their own upper lobby area. Restrooms and teacher planning spaces are centrally located between each classroom wing. Special education spaces are dispersed on all three floors.

Sherwood is greatly overburdened by enrollment right now, operating 115 students over its design capacity. However, relief is forecasted over the next decade, as enrollment numbers are predicted to return to more comfortable levels. Given that, and the fact that the school is so new, Sherwood is a lower priority for intervention.



Sherwood Middle School | 10-Year Enrollment Forecast

SCHOOLYEAR	TOTAL ENROLLMENT (5-6)	CHANGE
2022-23	948	-
2031-32	820	(128)
*Design Capacity	837	17

Enrollment numbers taken from “Population and Enrollment Forecasts, 2022-23 Through 2031-32”
by McKibben Demographic Research, March 2022; see Appendix for full report.

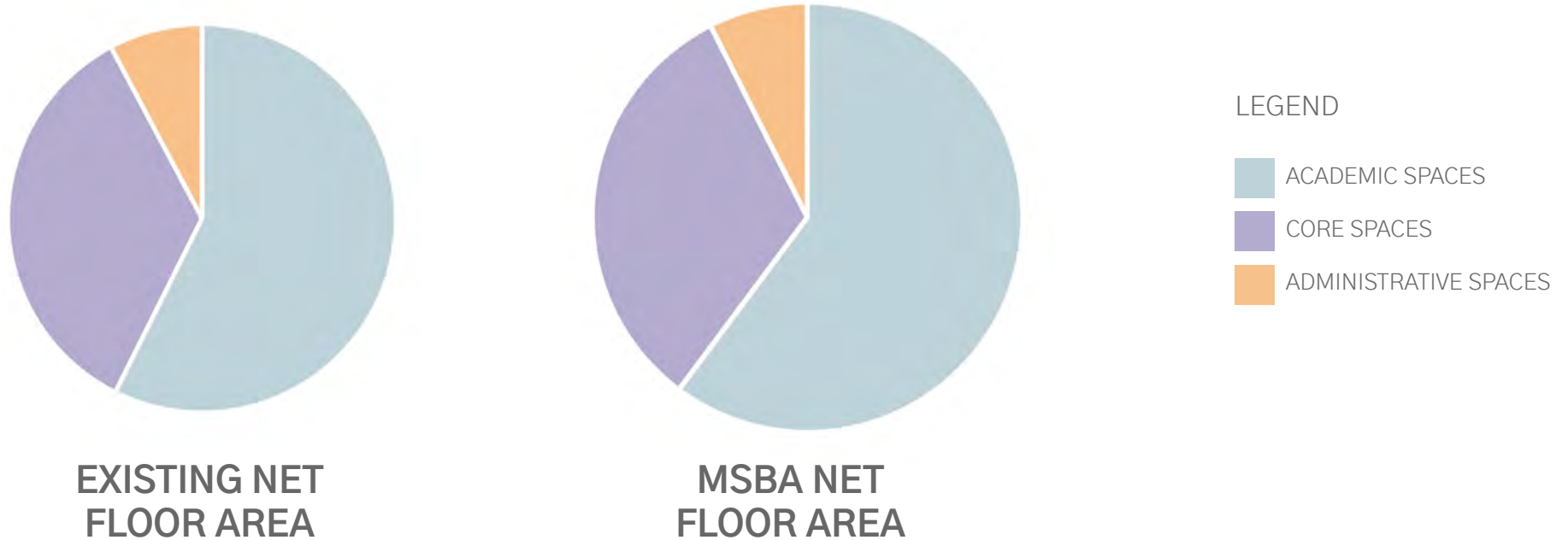
*Design Capacity refers to the mean student body population that a given school can support as it currently exists.
Mean value is calculated based on the SPS School Committee policy guidelines for class size,
as well as MSBA guidelines for classroom square footage size.
Note that portable classroom square footage is excluded from this calculation.
See Educational Review Introduction for the calculation methodology.

Sherwood Middle School | MSBA Space Summary Template

SPACE TYPE	EXISTING SQFT (NET)	MSBA GUIDELINE SQFT (NET)	DEFICIENCY (GROSS GF = 1.5)
CORE ACADEMIC SPACES <small>* Excludes portable classroom square footage.</small>	44,410	42,150	3,390
SPECIAL EDUCATION	7,211	11,590	(6,569)
ACADEMIC TOTAL	51,621	53,740	(3,179)
ART & MUSIC	5,072	4,800	408
VOCATIONS & TECHNOLOGY	0	0	0
HEALTH & PHYSICAL EDUCATION	12,017	9,750	3,401
MEDIA CENTER	3,246	5,095	(2,774)
DINING & FOOD SERVICE	11,013	10,648	548
CORE TOTAL	31,348	30,293	1,583
MEDICAL	992	910	123
ADMINISTRATION & GUIDANCE	5,223	3,770	2,180
CUSTODIAL & MAINTENANCE	795	2,295	(2,250)
ADMINISTRATIVE TOTAL	7,010	6,975	53
TOTAL FLOOR AREA	89,979	91,008	(1,544)

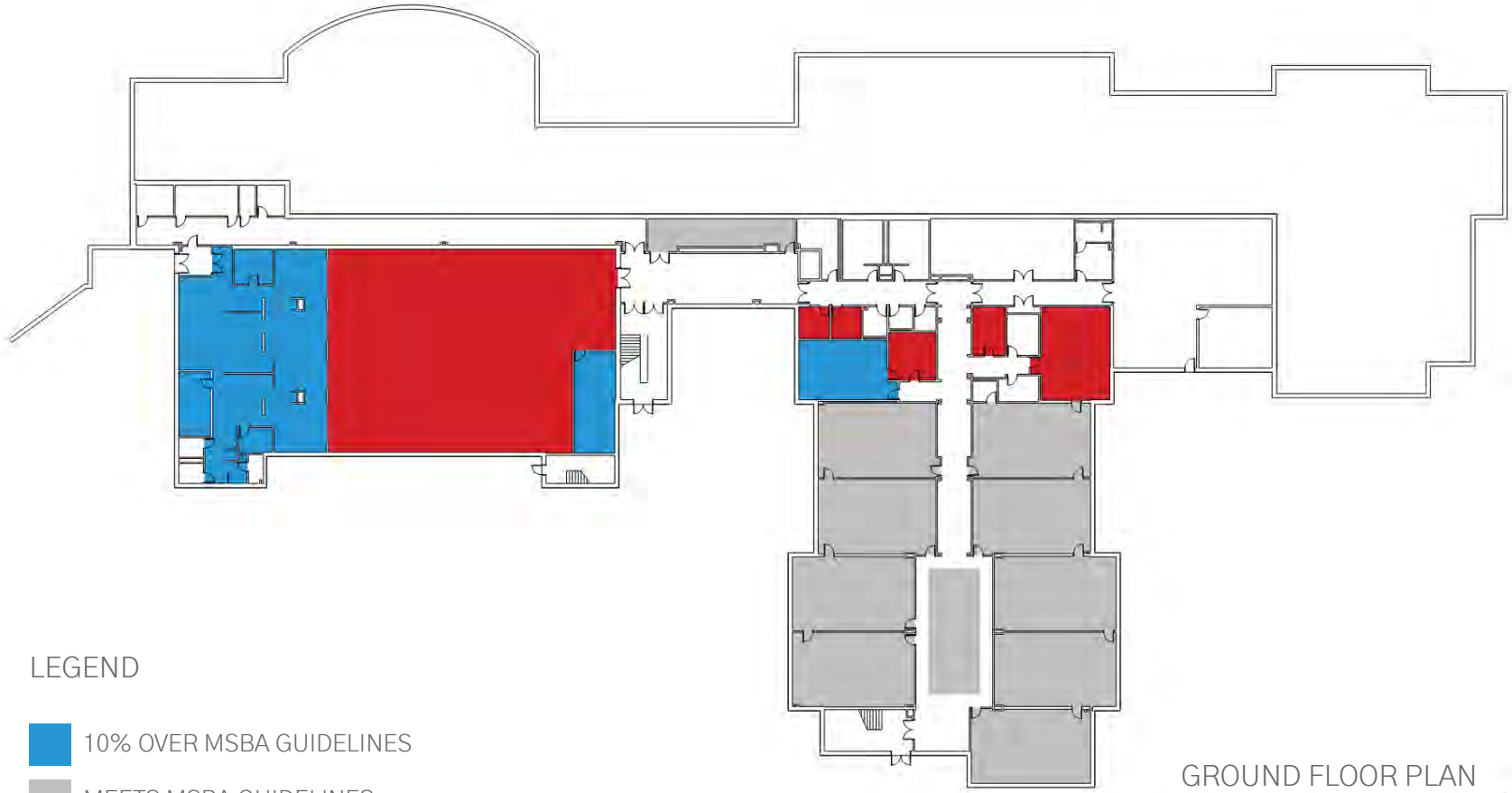
*MSBA guideline square footages calculated based on the 10-year enrollment forecast value: **820 students**

Sherwood Middle School | MSBA Space Summary Template







- The core academic deficiency is purely the result of a lack of special education spaces. In fact, Sherwood has a 13-classroom surplus, when compared to the MSBA space summary template value. The lack of special education spaces can be attributed to the current excess in enrollment (952 students versus a design capacity of 837); as enrollment is forecasted to drop by 132 students over the next ten years, classrooms can be reallocated to make up the difference.
- The media center is undersized but has opportunity for expansion, if desired (there are two classrooms directly adjacent that the media center could expand into).
- There are no technical classrooms currently provided at Sherwood.
- Custodial spaces are lacking; but assuming these facilities can be shared with Oak Middle School, which is directly adjacent and has extensive custodial space, this may be a non-issue.

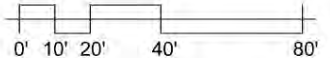
Sherwood Middle School | MSBA Comparison Plans



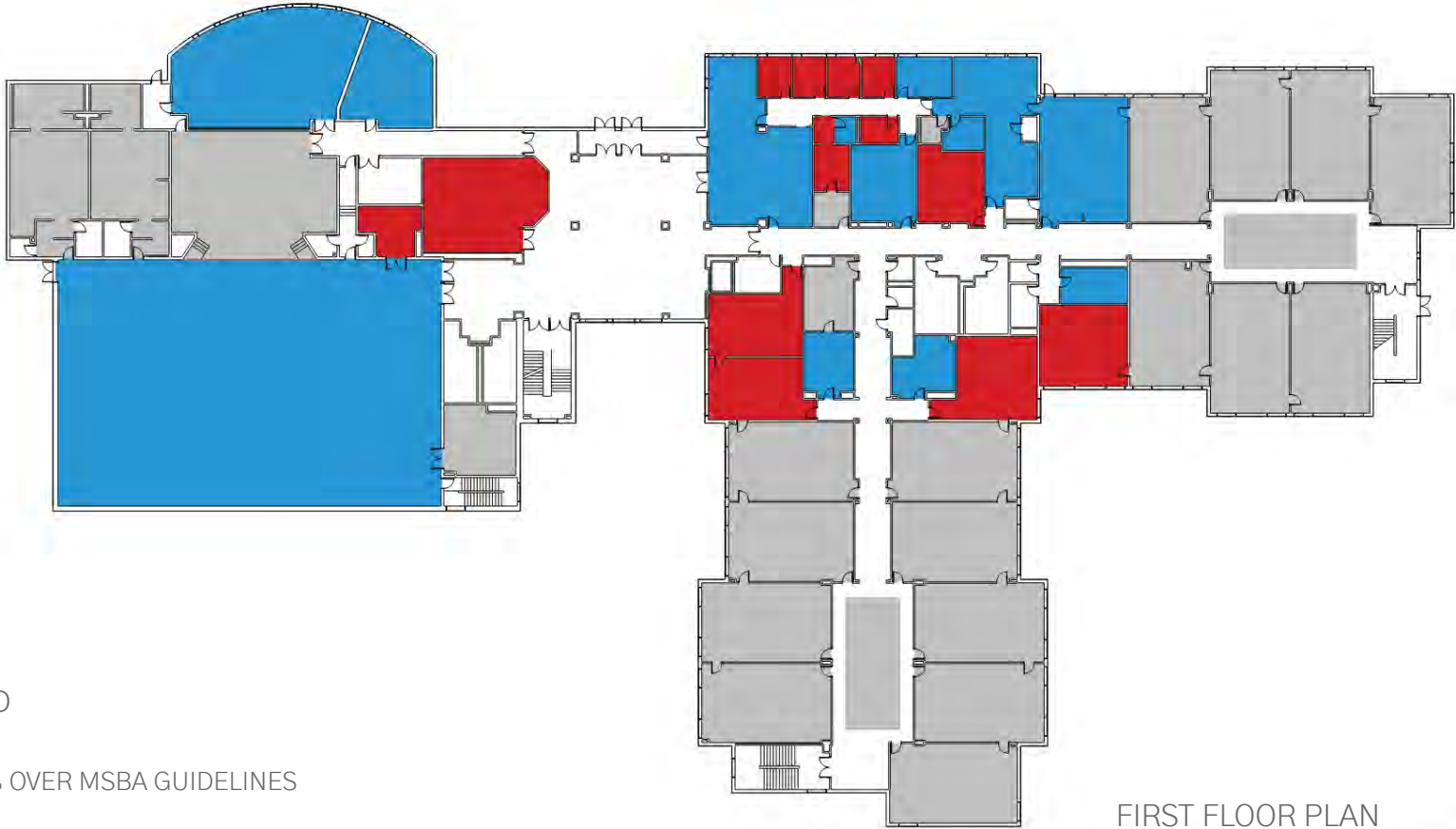
LEGEND

-  10% OVER MSBA GUIDELINES
-  MEETS MSBA GUIDELINES
-  10% UNDER MSBA GUIDELINES
-  MODULAR/PORTABLE

GROUND FLOOR PLAN



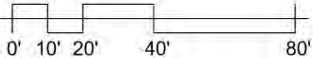
Sherwood Middle School | MSBA Comparison Plans



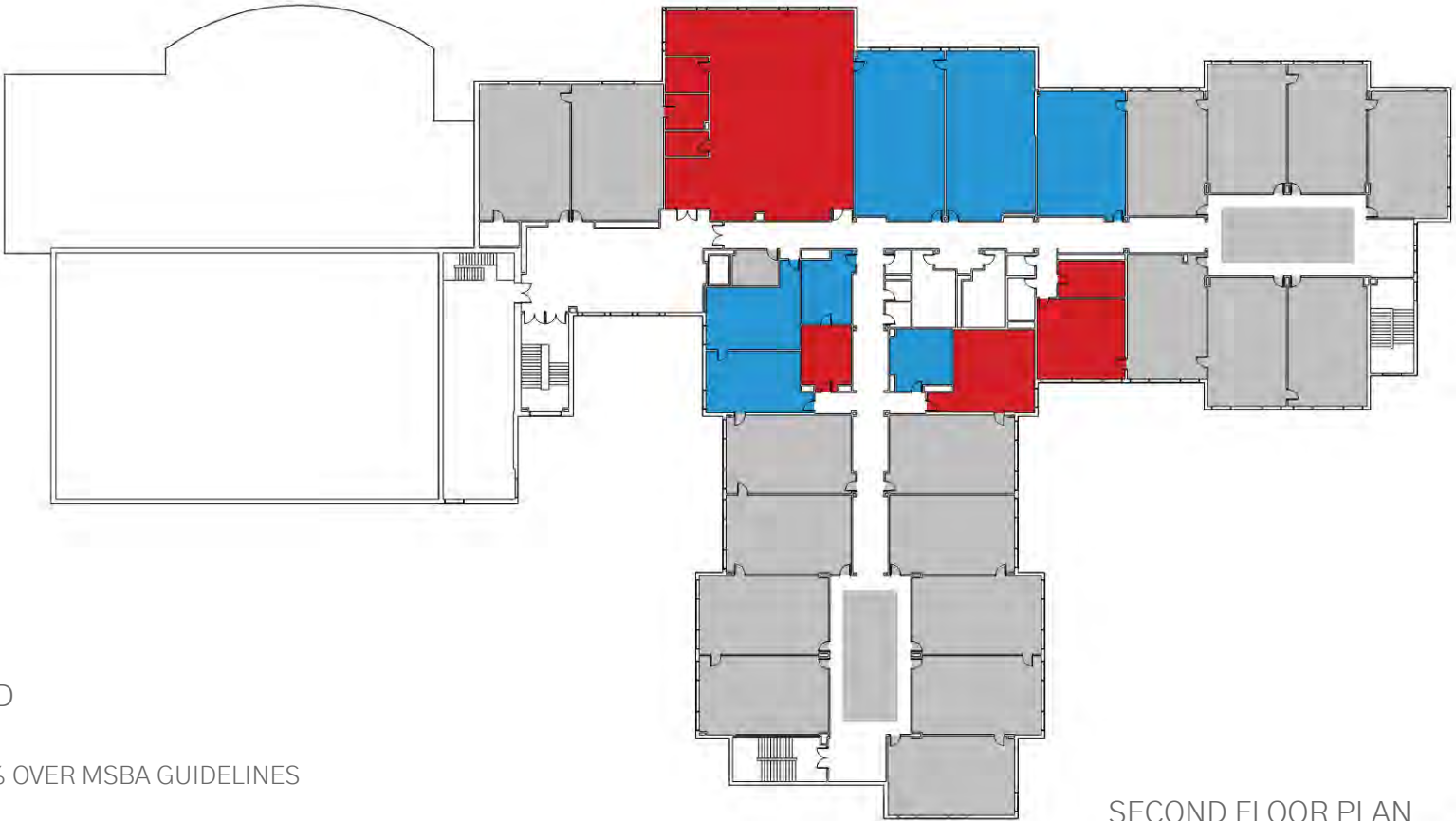
LEGEND

- 10% OVER MSBA GUIDELINES
- MEETS MSBA GUIDELINES
- 10% UNDER MSBA GUIDELINES
- ▨ MODULAR/PORABLE

FIRST FLOOR PLAN



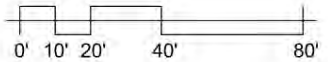
Sherwood Middle School | MSBA Comparison Plans



LEGEND

- 10% OVER MSBA GUIDELINES
- MEETS MSBA GUIDELINES
- 10% UNDER MSBA GUIDELINES
- MODULAR/PORTABLE

SECOND FLOOR PLAN



Sherwood Middle School | Educational Review

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Sherwood Middle School | Educational Review

	CURRENTLY PROVIDED	SQ FOOTAGE MEETS MSBA GUIDELINES	QUANTITY MEETS MSBA GUIDELINES	GENERAL NOTES
CORE ACADEMIC SPACES	●	●	○	CLASSROOM QUANTITY EXCEEDS RECOMMENDATIONS, BUT NO ESL/ELL CLASSROOMS OR STE CLASSROOMS PROVIDED
SPECIAL EDUCATION	●	○	○	SPED CLASSROOM QUANTITY EXCEEDS RECOMMENDATIONS, BUT NO RESOURCE ROOMS PROVIDED; SPACES ARE UNDERSIZED
ART & MUSIC	●	○	○	STAGE SUBDIVIDED BY TEMPORARY PARTITIONS TO CREATE CHORAL/DRAMA CLASSROOM; ORCHESTRA ROOM UNDERSIZED; ART ROOMS ADEQUATELY SIZED
VOCATIONS & TECHNOLOGY	○	○	○	NOT CURRENTLY PROVIDED FOR THESE GRADE LEVELS
HEALTH & PHYSICAL EDUCATION	●	●	●	GYMNASIUM IS OVERSIZED; INCLUDES BLEACHERS, WALL PADS, AND CLIMBING WALL; STAGE IS LOCATED HERE
MEDIA CENTER	●	○	●	MEDIA CENTER UNDERSIZED; POSSIBLE TO EXPAND INTO ADJACENT CLASSROOMS IF DESIRED; SMALL MAKER SPACE CART PROVIDED
DINING & FOOD SERVICE	●	○	●	CAFETERIA IS 86% OF RECOMMENDED MSBA SIZE; KITCHEN IS OVERSIZED
MEDICAL	●	●	○	NO PRIVATE EXAM/RESTING ROOMS; OVERSIZED NURSE'S OFFICE/WAITING ROOM
ADMINISTRATION & GUIDANCE	●	●	●	OFFICES GENERALLY UNDERSIZED; SEMINAR ROOMS PROVIDE ADDITIONAL MEETING SPACE
CUSTODIAL & MAINTENANCE	●	○	○	NO STOREROOM, RECEIVING ROOM, OR RECYCLING/TRASH ROOM; WORKSHOP AND OFFICE ARE UNDERSIZED; MAY BE ABLE TO UTILIZE OAK'S FACILITIES

● YES ○ NO

Sherwood Middle School | Educational Review



Typical classroom with modern technology, natural light, and flexible furnishings



Gymnasium with stage; movable partitions on stage close to create a drama/choral classroom



Administrative suite directly adjacent to main entrance with controlled visitor access; optimal layout for security



Common areas outside classrooms provide flexible space for breakout sessions or informal instruction



Cafeteria slightly undersized but with good natural light



Media center undersized; small maker space cart provided

Oak Middle School | Introduction

Oak Middle School acts as a counterpart to Sherwood Middle School, serving students in grades 7 and 8 in the northwest quadrant of Shrewsbury. Outdoor athletic facilities are shared with the neighboring Sherwood.

Four linear building wings intersect perpendicularly to create an enclosed courtyard in the center of the building. The building is organized with the primary assembly spaces grouped to the north of the courtyard, and classroom wings and administration spaces to the south. The southwest entrance acts as the main entrance to the building, with the administrative suite directly adjacent to the vestibule. Public entrances at the gymnasium (northeast side) and auditorium (northwest side) create community connection while maintaining separation from the more private student spaces. Custodial spaces to the northeast are adjacent to Sherwood, which facilitates the opportunity to share resources between the schools. Circulation is mostly efficient, but wayfinding can be difficult.

Classrooms are undersized, though the quantity meets or exceeds MSBA requirements for all classroom types (general, science, and special education). This leads to a square footage overage for general classrooms, but a deficit for science and special education classrooms. Additionally, Oak has no common spaces, teacher planning spaces, or special education resource rooms. Certain technical classrooms are provided here, but not enough to meet the need.

Surpluses exist for art & music spaces as well as physical education spaces. Gym facilities are oversized across the board, particularly at the locker rooms. The auditorium is the primary driver for the art & music overage; MSBA does not require auditoriums at the middle school level. In fact, there is only one art classroom provided at Oak when MSBA recommends two. This deficit is masked by the overall surplus. The media center is undersized, but opportunities for expansion exist. Administration spaces along with dining facilities appear to be sufficient.

While currently operating 165 students over the design capacity, Oak's enrollment is projected to decrease over the next ten years. There will still be a 41-student deficit to overcome, however.



Oak Middle School | 10-Year Enrollment Forecast

SCHOOLYEAR	TOTAL ENROLLMENT (7-8)	CHANGE
2022-23	944	—
2031-32	855	(89)
*Design Capacity	814	(41)

Enrollment numbers taken from “Population and Enrollment Forecasts, 2022-23 Through 2031-32”
by McKibben Demographic Research, March 2022; see Appendix for full report.

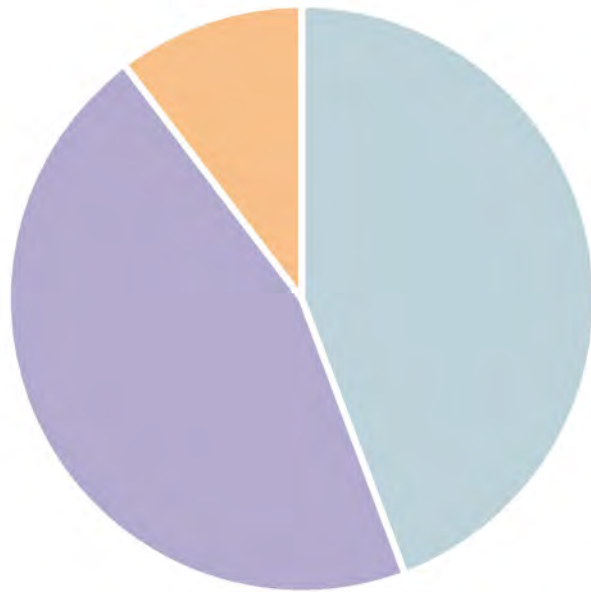
*Design Capacity refers to the mean student body population that a given school can support as it currently exists.
Mean value is calculated based on the SPS School Committee policy guidelines for class size,
as well as MSBA guidelines for classroom square footage size.
Note that portable classroom square footage is excluded from this calculation.
See Educational Review Introduction for the calculation methodology.

Oak Middle School | MSBA Space Summary Template

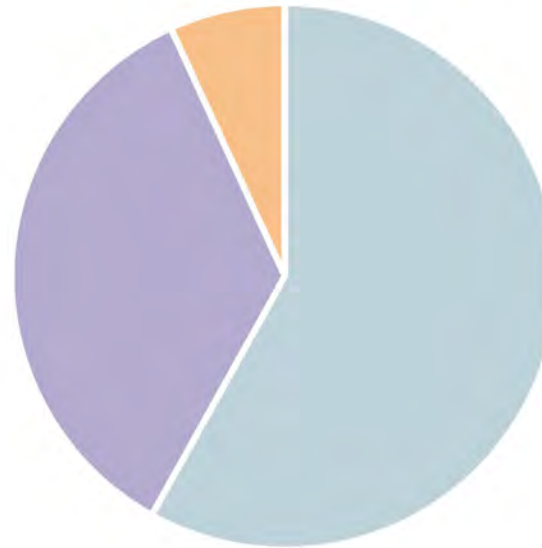
SPACE TYPE	EXISTING SQ FT (NET)	MSBA GUIDELINE SQ FT (NET)	DELTA (GROSS GF=1.5)
CORE ACADEMIC SPACES <small>* Excludes portable classroom square footage.</small>	43,201	48,620	(8,129)
SPECIAL EDUCATION	4,904	11,965	(10,592)
ACADEMIC TOTAL	48,105	60,585	(18,720)
ART & MUSIC	16,111	6,400	14,567
VOCATIONS & TECHNOLOGY	3,191	5,760	(3,854)
HEALTH & PHYSICAL EDUCATION	19,170	9,750	14,130
MEDIA CENTER	4,074	5,296	(1,833)
DINING & FOOD SERVICE	9,013	9,366	(530)
CORE TOTAL	51,559	36,572	22,481
MEDICAL	755	1,010	(383)
ADMINISTRATION & GUIDANCE	7,799	3,805	5,991
CUSTODIAL & MAINTENANCE	2,673	2,330	515
ADMINISTRATIVE TOTAL	11,227	7,145	6,123
TOTAL FLOOR AREA	110,891	104,302	9,884

*MSBA guideline square footages calculated based on the 10-year enrollment forecast value: **855 students**

Oak Middle School | MSBA Space Summary Template



EXISTING NET FLOOR AREA



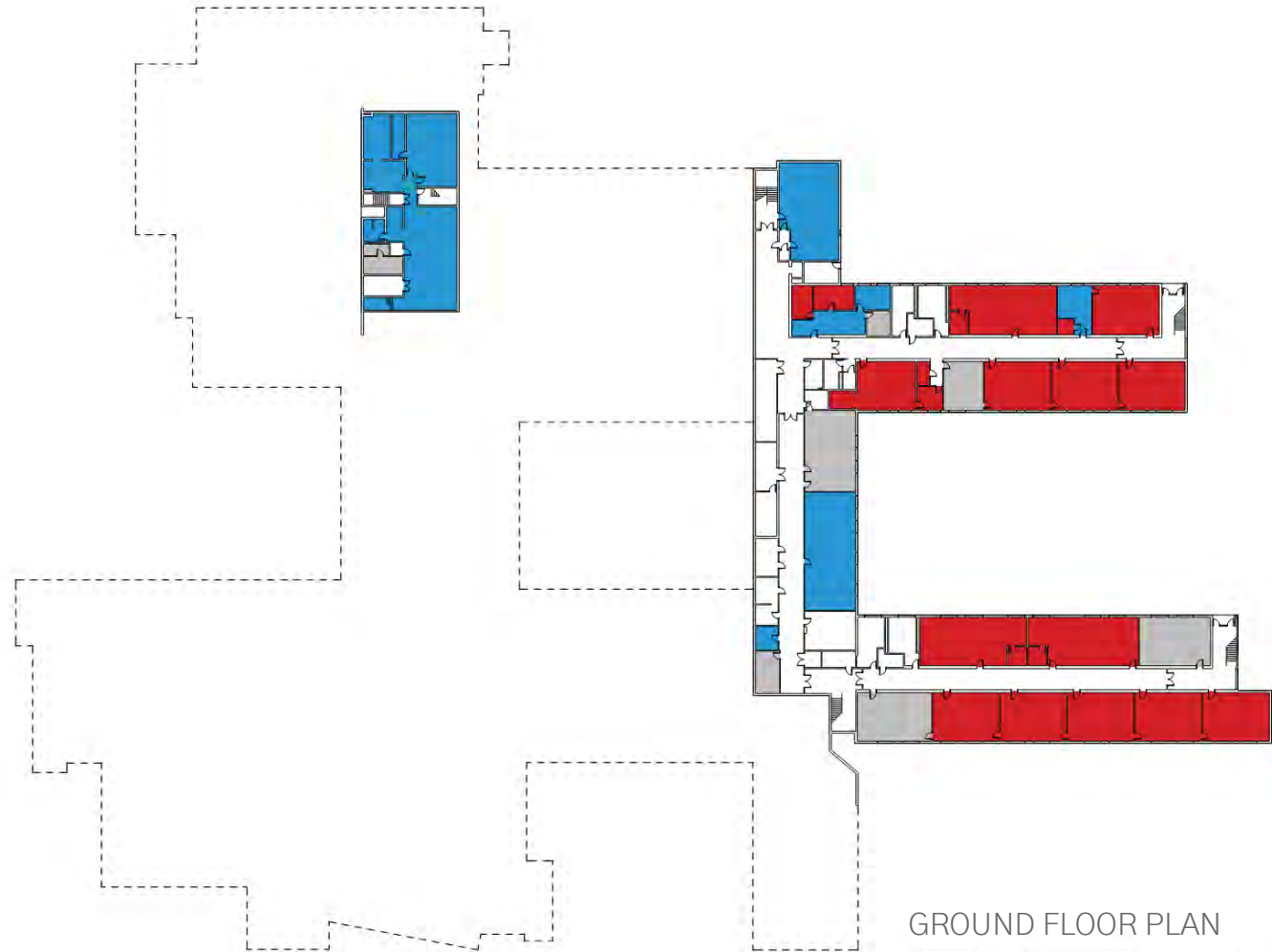
MSBA NET FLOOR AREA

LEGEND

- ACADEMIC SPACES
- CORE SPACES
- ADMINISTRATIVE SPACES

- The core academic deficiency is primarily due to the lack of commons and teacher planning spaces, as well as undersized science classrooms. The quantity of both general and science classrooms is actually greater than the MSBA recommendation; in the case of general classrooms, this leads to a square footage surplus of about 3,800 sq ft. Undersized classrooms and a lack of resource rooms are the primary drivers for the special education deficit.
- Oak's auditorium is not an MSBA requirement for the middle school level; this, along with oversized athletic facilities, accounts for the core spaces surplus. However, the individual deficiencies shown in the chart cannot be ignored because of the overall surplus, as the uses of these spaces are not interchangeable. These deficiencies should be addressed discretely.
- No work is needed for the administrative areas; the medical deficiency is negligible.

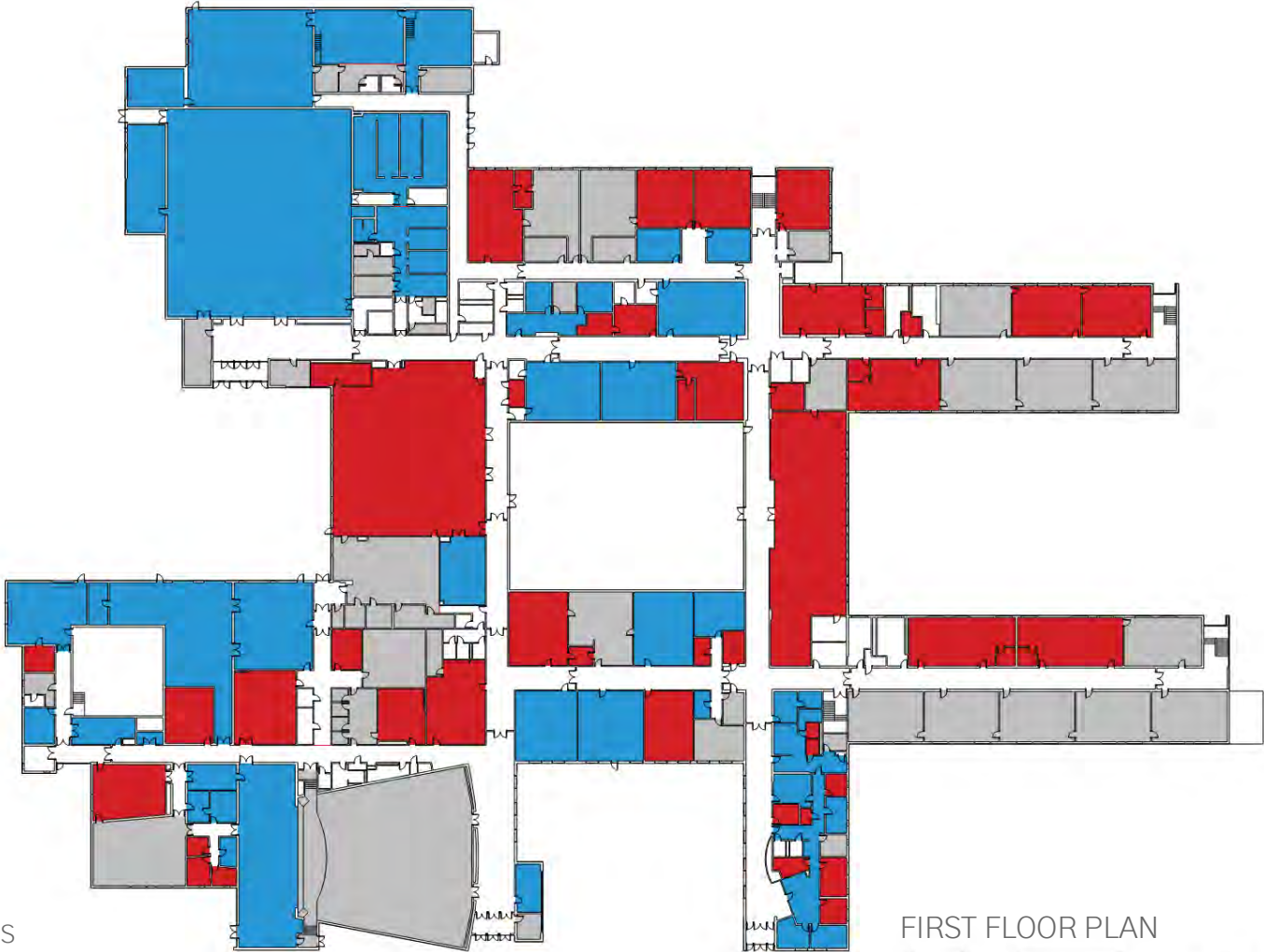
Oak Middle School | MSBA Comparison Plans







LEGEND

- 10% OVER MSBA GUIDELINES
- MEETS MSBA GUIDELINES
- 10% UNDER MSBA GUIDELINES
- MODULAR/PORTABLE

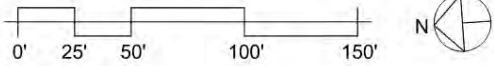
Oak Middle School | MSBA Comparison Plans



LEGEND

-  10% OVER MSBA GUIDELINES
-  MEETS MSBA GUIDELINES
-  10% UNDER MSBA GUIDELINES
-  MODULAR/PORTABLE

FIRST FLOOR PLAN



Oak Middle School | Educational Review

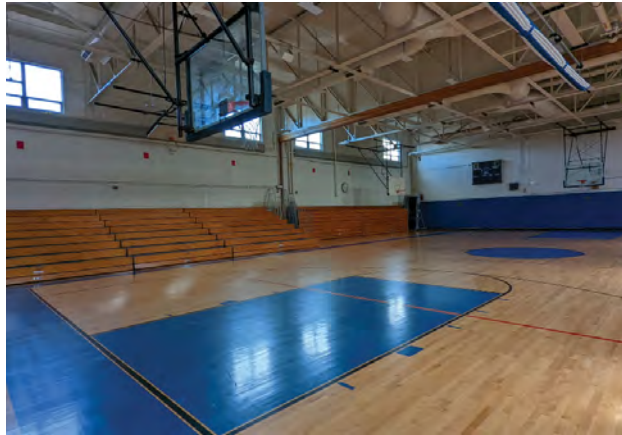
	CURRENTLY PROVIDED	SQ FOOTAGE MEETS MSBA GUIDELINES	QUANTITY MEETS MSBA GUIDELINES	GENERAL NOTES
CORE ACADEMIC SPACES	●	○	○	CLASSROOMS UNDERSIZED BUT IN GREATER QUANTITY – CREATING AN EXCESS OF CLASSROOM SPACE; NO COMMONS OR TEACHER PLANNING PROVIDED
SPECIAL EDUCATION	●	○	○	CLASSROOMS UNDERSIZED BUT IN THE CORRECT QUANTITY; LACK OF RE-SOURCE ROOMS COMPRISES THE LARGEST DEFICIT IN THIS CATEGORY
ART & MUSIC	●	●	●	AUDITORIUM CREATES EXCESS OF SPACE; ONLY ONE ART ROOM AND STORAGE/KILN ROOM PROVIDED (TWO RECOMMENDED BY MSBA FOR BOTH)
VOCATIONS & TECHNOLOGY	●	○	○	ONE ENGINEERING DESIGN CLASSROOM AND ONE COMPUTER LAB PROVIDED (WITH STORAGE); NOT ENOUGH TO MEET THE NEED
HEALTH & PHYSICAL EDUCATION	●	●	●	GYMNASIUM IS OVERSIZED; TWO HEALTH CLASSROOMS PROVIDED; BOYS LOCKER ROOM NOT ACCESSIBLE (NO ELEVATOR ACCESS)
MEDIA CENTER	●	○	●	MEDIA CENTER IS CURRENTLY ABOUT 77% OF MSBA-RECOMMENDED SIZE
DINING & FOOD SERVICE	●	○	●	DINING & FOOD SERVICES AREAS ARE MINIMALLY UNDERSIZED, WITH THE EXCEPTION OF THE STAFF LUNCH ROOM (TWO ROOMS PROVIDED)
MEDICAL	●	○	○	ONLY ONE EXAMINATION/RESTING ROOM PROVIDED – SIX TOTAL ARE RECOMMENDED FOR THIS ENROLLMENT
ADMINISTRATION & GUIDANCE	●	●	●	SPATIAL SURPLUS OF ALMOST 4,000 SQ FT; ALL SPACES PROVIDED EXCEPT FOR TEACHER MAIL & TIME ROOM
CUSTODIAL & MAINTENANCE	●	●	●	SLIGHT SPATIAL SURPLUS OF ALMOST 350 SQ FT; NO RECYCLING/TRASH ROOM OR RECEIVING ROOM; STOREROOM IS UNDERSIZED

● YES ○ NO

Oak Middle School | Educational Review



Standard classroom; undersized, but with ample natural light and flexible furnishings



Oversized gymnasium contributes to an overall surplus of physical education spaces



Engineering design classroom; one of two technical classrooms provided



Administration suite directly adjacent to main entrance, with high visibility to greet visitors



Auditorium primarily responsible for art & music coverage



Media center is undersized but opportunities for expansion exist, if desired/required

Shrewsbury High School | Introduction

Serving students in grades 9–12, Shrewsbury High School is currently operating well over capacity. The four–story building exists in the northwest quadrant of the town, somewhat remotely located off of Quinsigamond Avenue north of Interstate 290 on Sewall Hill. The site houses athletic facilities to the south and parking to the west and northeast.

The building is organized with assembly spaces to the west of the main entrance, and classroom wings and administration spaces to the east. One central “Main Street” corridor connects all areas on an east–west axis.

The main entrance opens onto a two–story lobby, with the cafeteria and auditorium directly to the west (and gymnasium beyond those); the main administration suite lies to the east. This suite has direct line of sight to the entrance but is physically separated from the vestibule. This prohibits controlled entry for visitors.

Beyond the administration suite, a pair of three–story classroom wings extend out perpendicularly from the Main Street corridor to the south. This configuration creates congested circulation patterns between class periods, with bottlenecks occurring at the ends of the academic wings. (This is exacerbated primarily by over–enrollment, but also by the placement of the multi–user restrooms at the ends of these halls.) General classrooms are on the small end of the MSBA–recommended range for classroom square footage; science labs are undersized, as is the media center. On the opposite hand, the gymnasium is greatly oversized. There is also a lack of adequately–sized technical classrooms.

Over–enrollment has burdened the cafeteria in that the seating area is not sufficient to meet the need. There are a couple of opportunities for expansion, if adding another lunch period is not desired.

Shrewsbury High School presents the most pressing need in the district, as far as enrollment is concerned. Currently 585 students over capacity, this deficit is projected to reduce to 499 students in ten years’ time. While this does indicate an improvement, it will hardly be enough. Clearly, large–scale intervention is needed as soon as possible in order to best serve this community.



Shrewsbury High School | 10-Year Enrollment Forecast

SCHOOLYEAR	TOTAL ENROLLMENT (9-12)	CHANGE
2022-23	1,821	-
2031-32	1,749	(72)
*Design Capacity	1,250	(499)

Enrollment numbers taken from “Population and Enrollment Forecasts, 2022-23 Through 2031-32”
by McKibben Demographic Research, March 2022; see Appendix for full report.

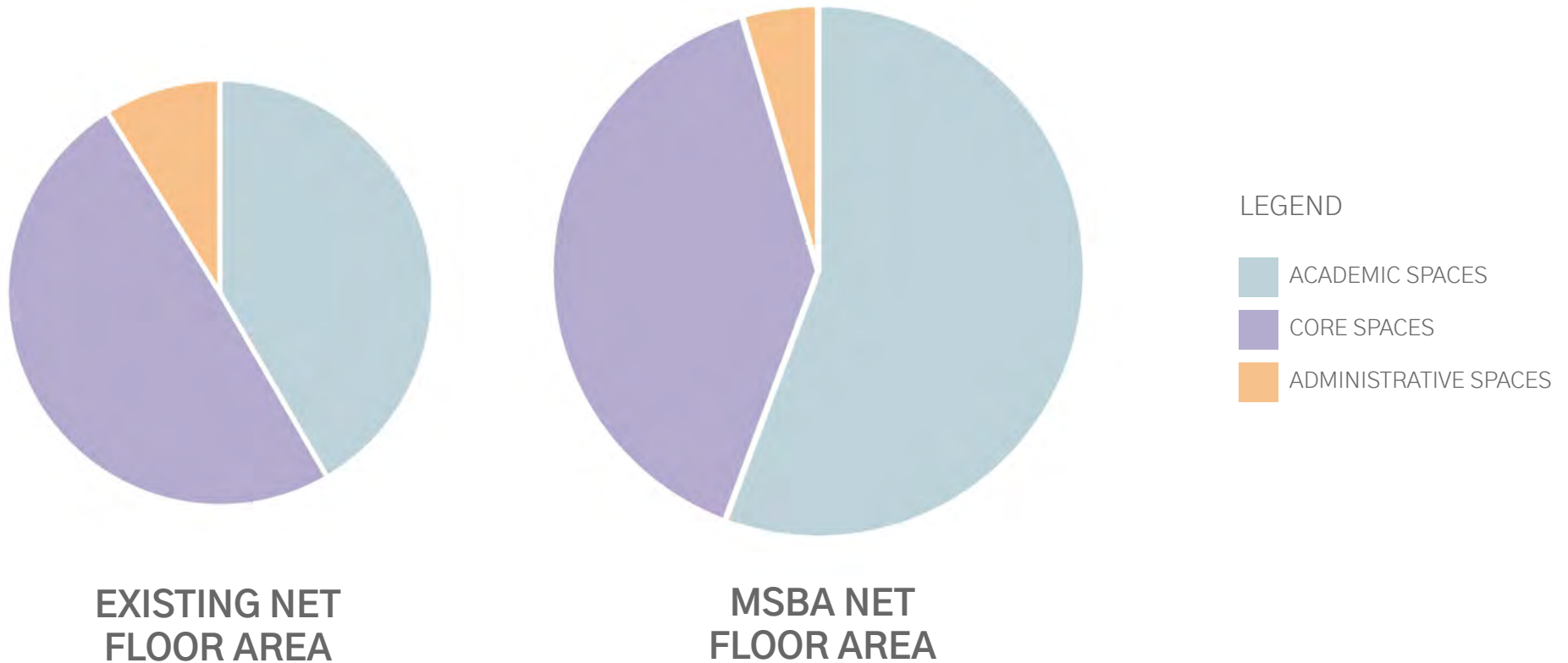
*Design Capacity refers to the mean student body population that a given school can support as it currently exists.
Mean value is calculated based on the SPS School Committee policy guidelines for class size,
as well as MSBA guidelines for classroom square footage size.
Note that portable classroom square footage is excluded from this calculation.
See Educational Review Introduction for the calculation methodology.

Shrewsbury High School | MSBA Space Summary Template

SPACE TYPE	EXISTING SQFT (NET)	MSBA GUIDELINE SQFT (NET)	DEFICIENCY (GROSS GF=1.5)
CORE ACADEMIC SPACES <small>* Excludes portable classroom square footage.</small>	73,969	101,535	(41,349)
SPECIAL EDUCATION	9,669	26,160	(24,737)
OTHER (PRE-K SUITE)	1,743	0	2,615
ACADEMIC TOTAL	85,381	127,695	(63,471)
ART & MUSIC	10,395	8,350	3,068
VOCATIONS & TECHNOLOGY	7,722	21,600	(20,817)
HEALTH & PHYSICAL EDUCATION	47,454	26,194	31,890
MEDIA CENTER	9,201	10,831	(2,445)
AUDITORIUM & DRAMA	11,111	10,400	1,067
DINING & FOOD SERVICE	15,628	13,668	2,940
CORE TOTAL	101,511	91,043	15,702
MEDICAL	1,270	1,510	(360)
ADMINISTRATION & GUIDANCE	11,965	6,150	8,723
CUSTODIAL & MAINTENANCE	5,021	2,937	3,126
ADMINISTRATIVE TOTAL	18,256	10,597	11,489
TOTAL FLOOR AREA	205,148	229,335	(36,281)

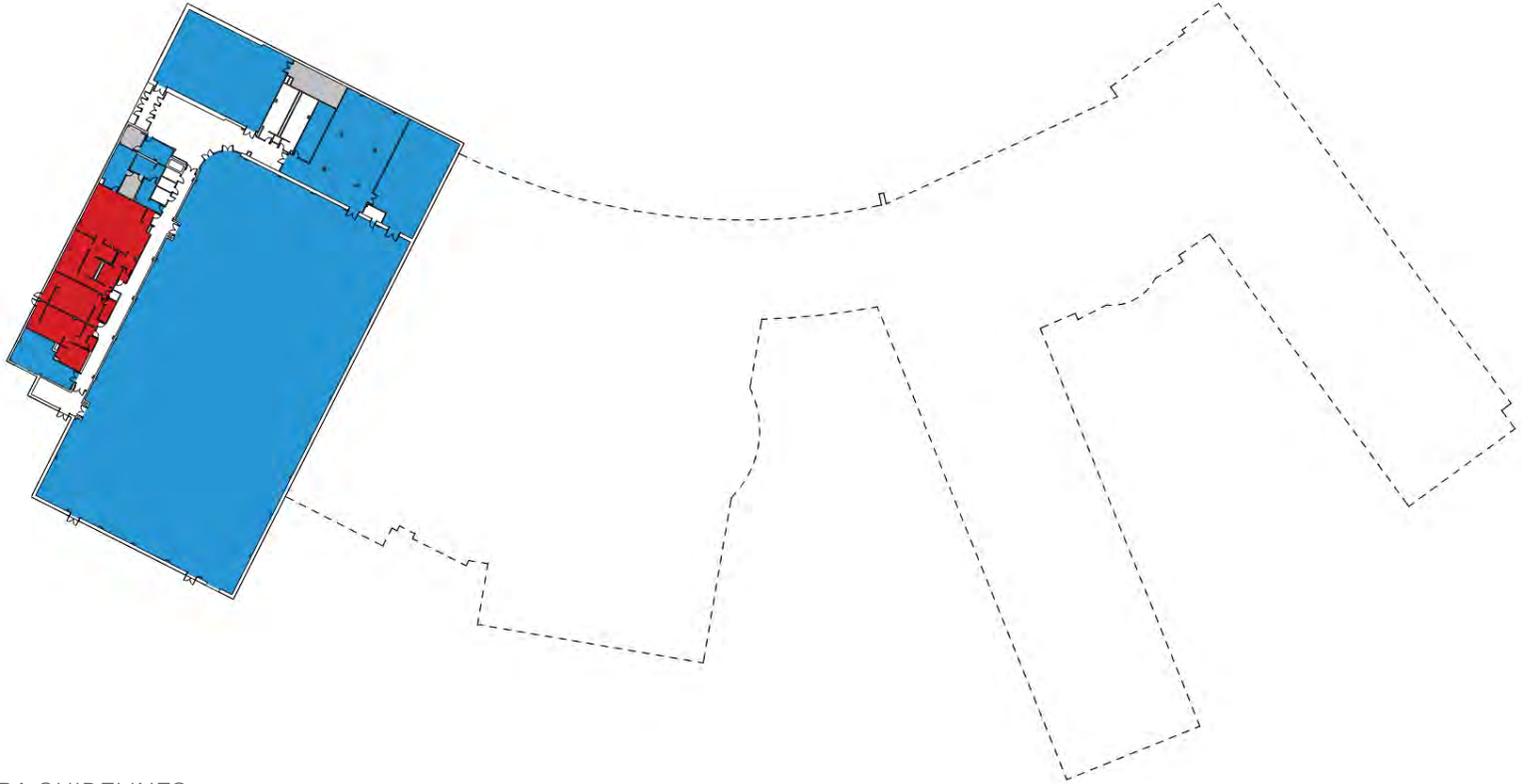
*MSBA guideline square footages calculated based on the 10-year enrollment forecast value: **1,749 students**

Shrewsbury High School | MSBA Space Summary Template



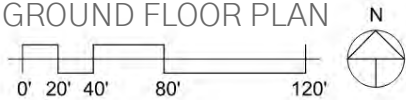
- Though the overall deficit is less than the academic, the academic and technology deficits should be the driver for any future space planning. The overages in core and administrative spaces do not truly give relief, since the uses are not interchangeable with academic spaces.
- The gymnasium and associated spaces are greatly oversized; but the realities of reducing or reallocating this in any meaningful way for classroom use is not feasible.
- Administration spaces are oversized; consideration could be given to reallocating some of this space for academic use, if appropriate.

Shrewsbury High School | MSBA Comparison Plans

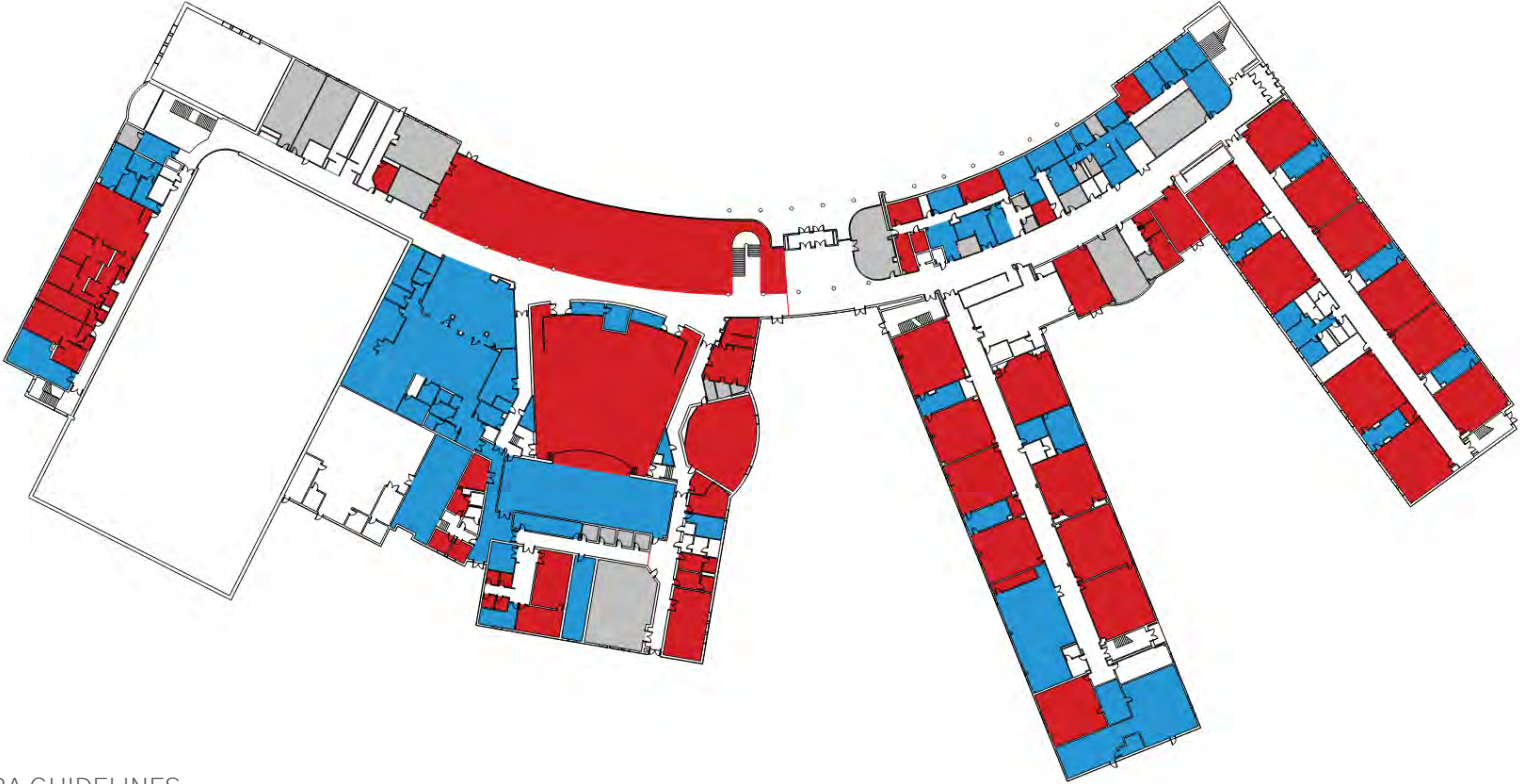


LEGEND

- 10% OVER MSBA GUIDELINES
- MEETS MSBA GUIDELINES
- 10% UNDER MSBA GUIDELINES
- ▨ MODULAR/PORABLE



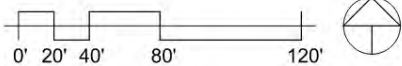
Shrewsbury High School | MSBA Comparison Plans



LEGEND

- 10% OVER MSBA GUIDELINES
- MEETS MSBA GUIDELINES
- 10% UNDER MSBA GUIDELINES
- ▨ MODULAR/PORABLE





FIRST FLOOR PLAN




Shrewsbury High School | MSBA Comparison Plans



LEGEND





-  10% OVER MSBA GUIDELINES
-  MEETS MSBA GUIDELINES
-  10% UNDER MSBA GUIDELINES
-  MODULAR/PORTABLE

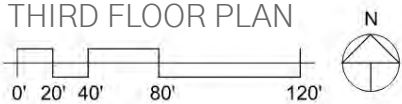
SECOND FLOOR PLAN 

Shrewsbury High School | MSBA Comparison Plans



LEGEND

-  10% OVER MSBA GUIDELINES
-  MEETS MSBA GUIDELINES
-  10% UNDER MSBA GUIDELINES
-  MODULAR/PORTABLE



Shrewsbury High School | Educational Review

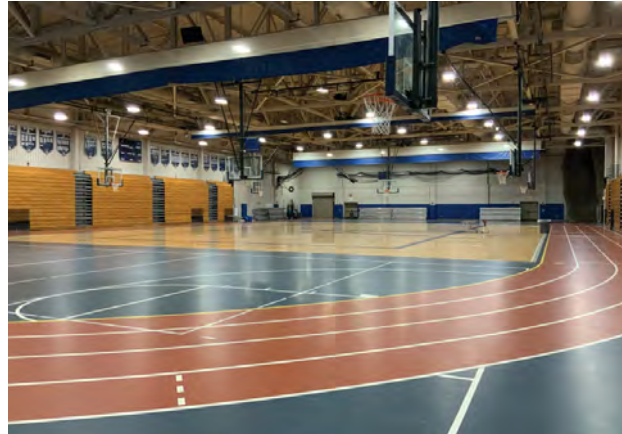
	CURRENTLY PROVIDED	SQ FOOTAGE MEETS MSBA GUIDELINES	QUANTITY MEETS MSBA GUIDELINES	GENERAL NOTES
CORE ACADEMIC SPACES	●	○	○	MANY CLASSROOMS UNDERSIZED (ESPECIALLY SCIENCE LABS); CLASSROOMS THAT DO COMPLY WITH GUIDELINES ARE ON THE LOW END OF THE ACCEPTABLE SQUARE FOOTAGE RANGE; QUANTITY IS FAR FROM MEETING NEED; ADEQUATELY SIZED TEACHER WORKROOMS EXIST ON EVERY FLOOR/EVERY WING; NO “COMMONS”
SPECIAL EDUCATION	●	○	○	MANY CLASSROOMS UNDERSIZED; CLASSROOMS THAT DO COMPLY WITH GUIDELINES ARE ON THE LOW END OF THE ACCEPTABLE SQUARE FOOTAGE RANGE; QUANTITY IS FAR FROM MEETING NEED; RESOURCE ROOMS ARE GREATEST DEFICIENCY BY FAR
ART & MUSIC	●	●	●	ORCHESTRA ROOM UNDERSIZED
VOCATIONS & TECHNOLOGY	●	○	○	SOME UNDERSIZED TECHNICAL CLASSROOMS REMAIN; LARGEST SPACE HAS BEEN REALLOCATED FOR THE SPECIAL EDUCATION 18-22Y.O. PROGRAM
HEALTH & PHYSICAL EDUCATION	●	●	●	GYM, STORAGE ROOMS, AND ATHLETIC OFFICES ARE OVERSIZED; LOCKER ROOMS/TEAM ROOMS ARE UNDERSIZED
MEDIA CENTER	●	○	●	AREAS OF MEDIA CENTER HAVE BEEN CONVERTED TO CLASSROOM OR ADMINISTRATIVE USES, WHICH LOWERS SQUARE FOOTAGE BELOW ACCEPTABLE RANGE
AUDITORIUM & DRAMA	●	●	●	AUDITORIUM ITSELF IS UNDERSIZED (STAGE EXCLUDED), BUT AUXILIARY SPACES COMBINE TO PUT CATEGORY OVER MSBA REQUIREMENTS
DINING & FOOD SERVICE	●	○	●	SEATING AREA NEEDS EXPANSION; KITCHEN AND ASSOCIATED SPACES ARE OVERSIZED
MEDICAL	●	○	●	DEFICIENCY IS MINIMAL; LOW PRIORITY TO REVISE
ADMINISTRATION & GUIDANCE	●	●	●	WHILE OVERALL SQUARE FOOTAGE EXCEEDS THE GUIDELINES, MANY OFFICES ARE UNDERSIZED; THERE ARE NOT ENOUGH SMALL MEETING ROOMS EITHER
CUSTODIAL & MAINTENANCE	●	●	●	OVERSIZED; LOW PRIORITY TO REVISE (COULD POTENTIALLY RECAPTURE SOME SPACE FOR ACADEMIC USE, IF APPROPRIATE)

● YES ○ NO

Shrewsbury High School | Educational Review



Main entrance opens onto lobby with direct access to “Main Street” corridor; administrative suite is adjacent to vestibule with clear line of sight



Gymnasium is greatly oversized (indoor track contributes); locker rooms are undersized



Cafeteria seating area is insufficient/over-crowded; kitchen and servery are adequate



Science labs are undersized and lack quantity needed to serve population



Auditorium is about 89% of the recommended size; the stage is about 82% oversized, however



“Main Street” corridor connects all wings to each other on first and second floors

OPTIONS

- Executive Summary

- Path to Net Zero

- Individual Site Plans

 - Addition/Renovation Site Plans

 - Pre-K Site Plans

 - Pre-K + Elementary Site Plans

 - 600-Student Elementary Site Plans

 - 300-Student Elementary Site Plans

Options | Executive Summary

The following options represent a wide-ranging scope of work, from light remodeling through heavy renovation and new construction. Each of the options meet the requirements of the Town of Shrewsbury School Committee Educational Plan, Department of Education guidelines for school construction, and all applicable statutes, ordinances, and building codes.

The options component of this study addresses the projected 10-year decrease in overall enrollment as well as the current space limitations at the existing schools. It is supported by the subsequent sections on phasing of construction and budget development. A significant factor in decision-making relative to providing for school needs will be the benefit of new construction to provide relief at the existing buildings where renovations and additions might occur. The obvious advantage is that renovations and additions will take less time and cost less if the buildings are vacant. Fortunately, the new Beal School has the capacity to act as a swing space at the elementary level, which will allow for sites to be easily vacated during construction. In many cases, this transfer of students will be recommended to be permanent, in order to best serve the district.

Each of the proposed options eliminates the modular or portable classrooms where they occur, as mandated by the Department of Education. For a school project to qualify for state reimbursement, a plan must be in place to eliminate all modular or portable classrooms at that grade level. This has greatly affected the Spring and Paton addition/renovation options, in that those buildings effectively double in size. Coolidge is also affected, albeit to a lesser extent.

The process by which the final overall schemes were determined started by prioritizing the School Committee's needs, based on the results of the facilities assessment and educational review for each location. From there, site plans were developed to illustrate all of the potential building project options the district could undertake, on an individual basis. Given the potential implications of some of these options coupled with the fact there are several ways to achieve the outcome, no district-wide strategies have been put forth.

The School Committee priorities have been identified as follows:



Options | Executive Summary

Address Overcrowding at the High School

The high school presented the most pressing need for the district, as the current population has fully stressed the existing building. A full academic wing addition has been proposed that will connect the two existing wings; this will help alleviate circulation bottlenecks as well as minimize site disruption.

Replace Coolidge Elementary School & Expand District-Wide Pre-K

Coolidge Elementary School is one of the oldest in the district, and is the preferred candidate for replacement. Apart from the inherent issues with the building itself, the site is large enough to support construction adjacent to the existing school without demolition; this will provide the least amount of disruption to the district as far as student relocation is concerned. This site could support new construction for 300 or 600 students, with varying ripple effects throughout the district depending on which footprint is selected.

Preschool is currently offered on a limited basis via a lottery system for Shrewsbury residents, as there are not enough seats for all eligible students in the district. The school committee has identified a desire to incorporate universal pre-kindergarten (pre-K) for all eligible students over the next ten years. The preference is to deliver preschool via one centralized location rather than dispersed amongst the neighborhood schools, as there are inherent benefits in centralizing services at this grade level. (Also note that the terms “preschool” and “pre-kindergarten/pre-K” are used interchangeably in this study.)

Parity Among the K-4 Schools

Aligned with the district’s core value of equity, the next goal is to provide parity among the remaining K-4 schools, to ensure that all schools provide the same level of service for all students. Addition/renovation solutions are best suited for the newer schools, while new construction is reserved for older schools or schools where additions of 50% or more would be required to meet the 10-year enrollment needs.

Address Aging Building Stock & Provide 21st Century Learning Spaces

This priority primarily applies to the middle schools, though it is not limited to those locations. Continued maintenance of existing facilities ensures their longevity. Additionally, renovations or additions have been proposed to ensure that 21st century learning spaces aligned with MSBA standards are provided.



Options | Executive Summary

Net Zero Upgrades

The goal for this study was to make equipment and building system improvements to reduce or eliminate the reliance on fossil fuels, with the goal of approaching net zero energy. From there, the remaining energy deficit would be offset by the provision of on-site renewable energy sources, such as photo-voltaic panel arrays and/or geothermal wells. All cost estimates include pricing for the former; pricing for the latter, specifically the photo-voltaic array costs, is listed separately.

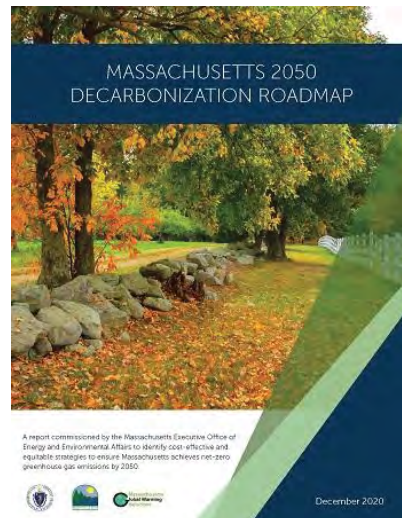
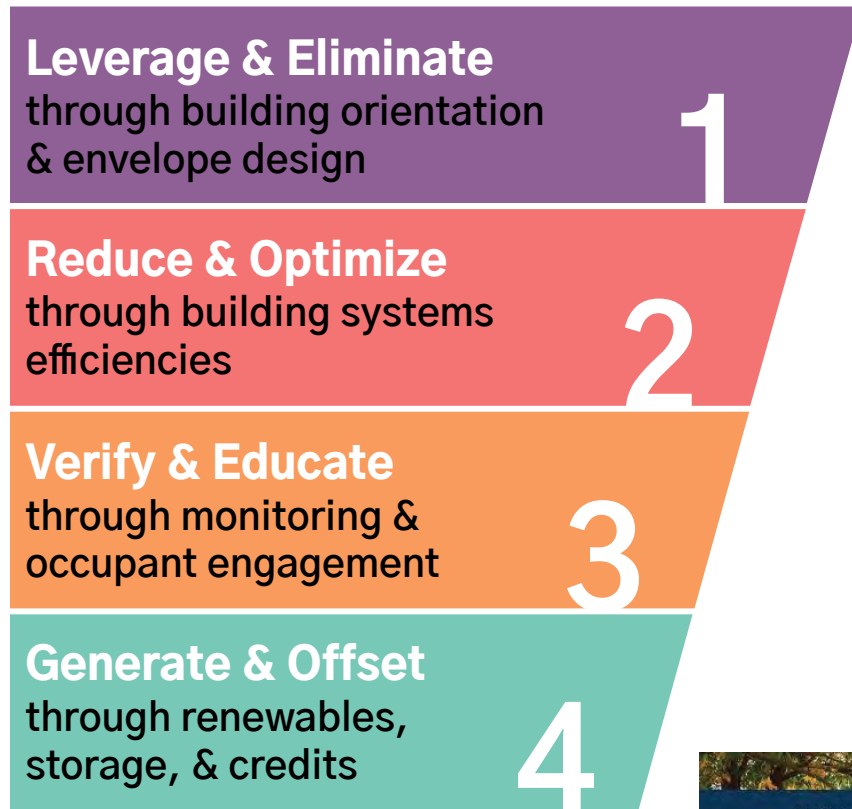
Centralized Administration

The Central Administration is currently split between Town Hall, 15 Parker Road, and spaces throughout the district. In order to provide comprehensive services and free up space in the existing facilities throughout the district consolidation of these spaces is needed. Based on previous reports approximately 6,000 net square feet is need to support consolidation of all these spaces. The previous report also articulated it is the desire of the district to remain at the Town Hall to allow for continued collaboration with all the other town departments. See Appendix for study.

All costs presented within this report are provided for comparison of options only, and have been prepared by A.M. Fogerty. The factors used for construction and other costs are based on 2024 unit pricing. Each of the projects is compared against the same relative cost for new construction, heavy renovation (tier I), and light remodeling (tier II). All budgets include costs for adding air conditioning (where none exists), as well as net zero improvement to building systems. (Renewable energy costs, i.e. photovoltaic arrays, are not included and will be listed separately.) Once an option is selected for further development, cost estimates can be prepared based on actual building design and schedules for implementation. The budgets recommended within this report should not be considered cost estimates since the report cannot predict the decisions the Town will make relative to scheduling, phasing, sequencing, and other construction-related matters.



Options | Path to Net Zero



As stated in the Options section overview, the goal for this study was to make equipment and building system improvements to reduce or eliminate the reliance on fossil fuels, with the goal of approaching net zero energy. From there, the remaining energy deficit would be offset by the provision of on-site renewable energy sources, such as photovoltaic panel arrays and/or geothermal wells. This is in line with the Town of Shrewsbury’s goals for

All cost estimates include pricing for the equipment and building system improvements only. Pricing for the renewable energy sources, specifically the photovoltaic array costs, is listed separately on the facing page. Estimated prices are given for a fully-electrified building (i.e. no natural gas service), as well as for a hybrid building (i.e. natural gas service provided for domestic hot water and kitchen equipment only; all else electric). Total electrification is not currently feasible, as the available technology has not met the demand just yet. The recommendation would be to plan for a hybrid building model, while providing conversion capability for the infrastructure to be all-electric in the future. See “Net Zero Recommendations” in Appendix.

With regards to the photovoltaic arrays, it should be noted that the size of the system will be limited by the available roof area of the building. Ground-mounted systems or parking canopy installations can be utilized as needed; however, both of these options will incur additional infrastructure costs. Additionally, electric services will need to be upgraded for all options except Beal, Sherwood, Oak, and the high school (hybrid option only).

Options | Path to Net Zero – Photovoltaic (PV) Costs

NC = New Construction
A/R = Addition/Renovation

	SQUARE FOOTAGE & CONSTRUCTION TYPE		HYBRID		ALL-ELECTRIC	
			kW NEEDED	TOTAL COST	kW NEEDED	TOTAL COST
PRE-K						
PARKER ROAD	50,813	NC	300	\$1,125,000	570	\$2,137,500
ELEMENTARY (K-4)						
MAJOR HOWARD BEAL	143,783	ETR	850	\$3,187,500	1,650	\$6,187,500
CALVIN COOLIDGE	70,000	NC or A/R	400	\$1,500,000	800	\$3,000,000
FLORAL STREET	115,000	A/R	650	\$2,437,500	1,300	\$4,875,000
SPRING STREET	70,000	NC or A/R	400	\$1,500,000	800	\$3,000,000
WALTER J PATON	70,000	NC or A/R	400	\$1,500,000	800	\$3,000,000
MIDDLE SCHOOL (5-8)						
SHERWOOD	130,094	A/R	750	\$2,812,500	1,500	\$5,625,000
OAK	190,787	A/R	1,100	\$4,125,000	2,150	\$8,062,500
HIGH SCHOOL (9-12)						
SHREWSBURY HIGH	377,871	A/R	2,200	\$8,250,000	4,300	\$16,125,000
TOTALS			7,050	\$26,437,500	13,870	\$52,012,500

Options | Individual Site Plans Introduction

Individual site plans were created at each location, based on the School Committee priorities of work as well as site constraints. These solutions and recommended budgets will be used by the town to make informed decisions as to which projects should be recommended for further study. As mentioned previously, some other these solutions have greater district wide implications than others and will weigh heavily in the solutions ultimately pursued.

Addition/Renovation

Addition/renovation solutions were looked at for all schools as a baseline for comparison to new construction options. Extensive additions are needed at some of the schools, and the cost estimates between addition/renovation and new construction options for these locations are comparable. New construction is recommended for those instances.

Pre-K Options

Both new construction and addition/renovation options are presented for a standalone pre-K facility. Final recommendations will depend on the overall district solution implemented.

New Construction – 300 Elementary Students + Pre-K

New construction options are limited to the elementary school level, as the middle schools and high school are more suited to an addition/renovation solution. This option would combine the pre-K population with an elementary population to create a centralized school. This would also allow one elementary location to be vacated for municipal or other use.

New Construction – 600 Elementary Students

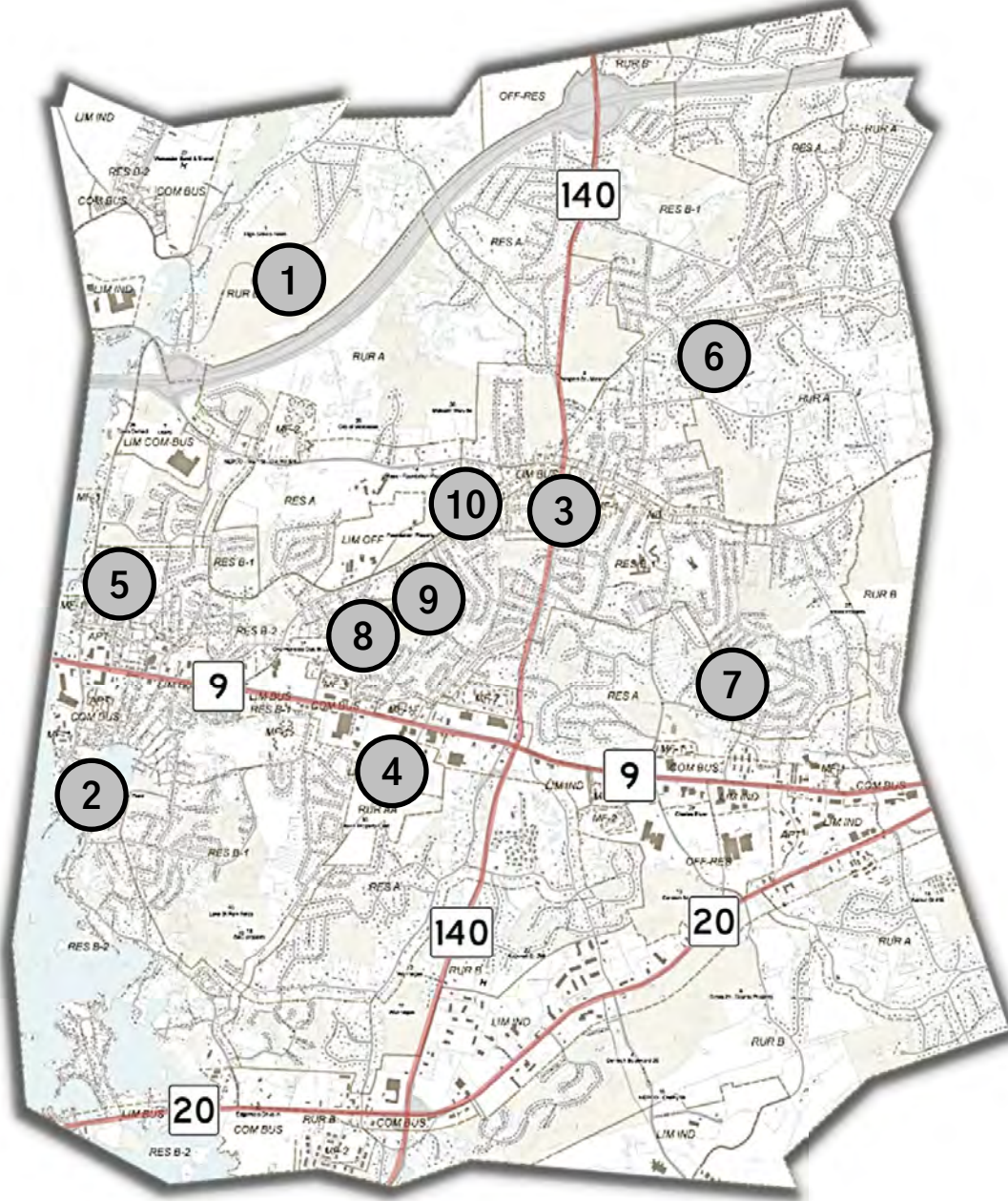
Similar to the previous option, this would be a larger elementary school that supports/replaces two existing elementary schools. It would also result in one elementary location being vacated for municipal or other use.

New Construction – 300 Elementary Students

This option allows replacement in kind for one or more elementary schools.



Options | Overall Locus Plan



- ① SHREWSBURY HIGH SCHOOL
- ② CALVIN COOLIDGE SCHOOL
- ③ WALTER J. PATON SCHOOL
- ④ MAJOR HOWARD BEAL SCHOOL
- ⑤ PARKER ROAD PRECHOOL
- ⑥ SPRING STREET SCHOOL
- ⑦ FLORAL STREET SCHOOL
- ⑧ SHERWOOD MIDDLE SCHOOL
- ⑨ OAK MIDDLE SCHOOL
- ⑩ SPS ADMINISTRATION

Options | Individual Site Plans Summary Table – Potential Options

- FEASIBLE
- ◐ MARGINAL

PRE-K

PARKER ROAD

ELEMENTARY (K-4)

MAJOR HOWARD BEAL

CALVIN COOLIDGE

FLORAL STREET

SPRING STREET

WALTER J PATON

MIDDLE SCHOOL (5-8)

SHERWOOD

OAK

HIGH SCHOOL (9-12)

SHREWSBURY HIGH

REMOVE MODULARS
& REDISTRIBUTE

ADDITION/RENOVATION
AT 10-YR. ENROLLMENT

ADDITION/RENOVATION
FOR PRE-K FACILITY

(+/-) 242 PRE-K
STUDENTS

(+/-) 375 PRE-K
STUDENTS

(+/-) 300 ELEM.
STUDENTS

(+/-) 600 ELEM.
STUDENTS

(+/-) 300 ELEM. +
300 PRE-K STUD.

NEW SCHOOL
ON
ALT. SITE

(+/-) 300
STUDENTS

(+/-) 600
STUDENTS

NEW SCHOOL
ON
EXISTING SITE

Options | Individual Site Plans Summary Table – Square Footage

	EXISTING (TOTAL SF)	ADDITION ONLY (TOTAL SF)	ADDITION/ RENOVATION (TOTAL SF)	NEW CONSTRUCTION (TOTAL SF)
PRE-K				
PARKER ROAD	22,784	0	0	50,813
ELEMENTARY (K-4)				
MAJOR HOWARD BEAL	143,783	0	0	0
CALVIN COOLIDGE	45,935	25,836	71,771	71,911
FLORAL STREET	93,534	12,407	105,941	0
SPRING STREET	36,874	38,912	75,786	72,220
WALTER J PATON	31,342	41,874	73,216	74,515
MIDDLE SCHOOL (5-8)				
SHERWOOD	130,094	8,085	138,179	0
OAK	166,380	24,407	190,787	0
HIGH SCHOOL (9-12)				
SHREWSBURY HIGH	290,202	87,669	377,871	0

Options | Addition/Renovation

ADDITION/RENOVATION: ALL SITES AT PROJECTED ENROLLMENT

*PSP = Projected School Population

	PSP*	BUDGET
PRE-K		
PARKER ROAD	--	--
ELEMENTARY (K-4)		
MAJOR HOWARD BEAL	--	--
CALVIN COOLIDGE	292	\$35,000,000
FLORAL STREET	510	\$28,000,000
SPRING STREET	303	\$40,000,000
WALTER J PATON	318	\$43,000,000
MIDDLE SCHOOL (5-8)		
SHERWOOD	--	--
OAK	855	\$84,000,000
HIGH SCHOOL (9-12)		
SHREWSBURY HIGH	1,749	\$117,000,000

All sites, save for Parker Road, Beal, and Sherwood, have been evaluated for an addition/renovation solution at the 10-year projected enrollment numbers. Existing schools are assumed to be renovated in full; the level of renovation is based on need, given the facilities assessments from the first section of the report. Any portable classrooms are assumed to be demolished and replaced with new, permanent construction.

It is clear that this solution works better for some elementary school sites than for others; the extent of renovation needed at some of these locations, combined with the age of the existing building, seem to make a good case for total demolition and construction of a completely new school. However, addition/renovation would be the preferred solution for the high school, as the relatively new school is in good condition. An addition could be warranted at Oak to provide appropriately-sized science classrooms; but this would be a lower priority item in the larger scheme.

Options | Addition/Renovation – Calvin Coolidge School

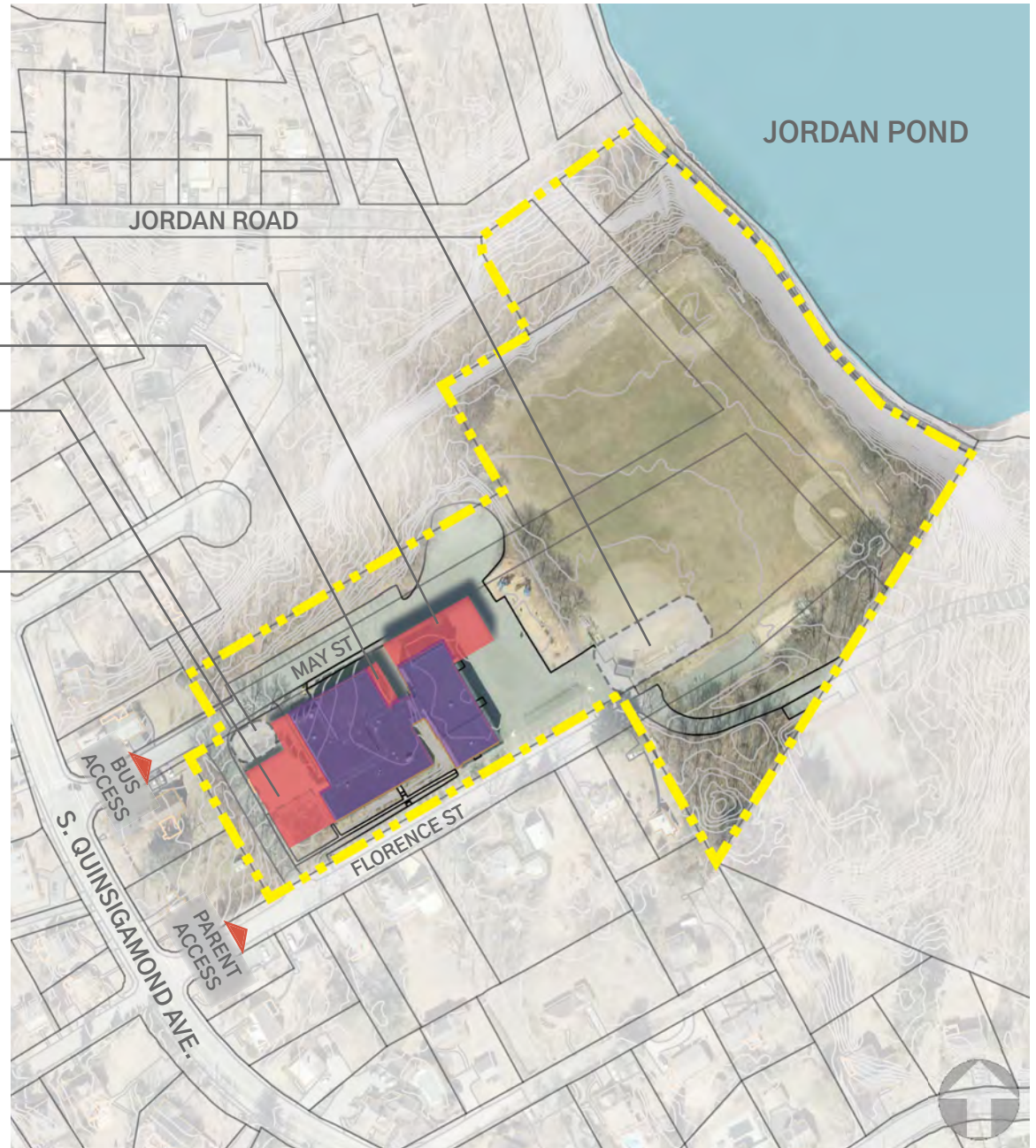
Expanded parking lot (remove baseball field)




New three-story academic wing

Expanded gymnasium

New kindergarten play yard (relocated from Florence St side of building)

Demolish portable classrooms; construct new one-story kindergarten wing with expanded kitchen & receiving area



-  Existing building to be renovated
-  New building addition
-  Existing building to be demolished
-  Wetlands
-  200' wetlands buffer zone
-  Property line
-  Vehicular access points



Locus Map

Options | Addition/Renovation – Floral Street School

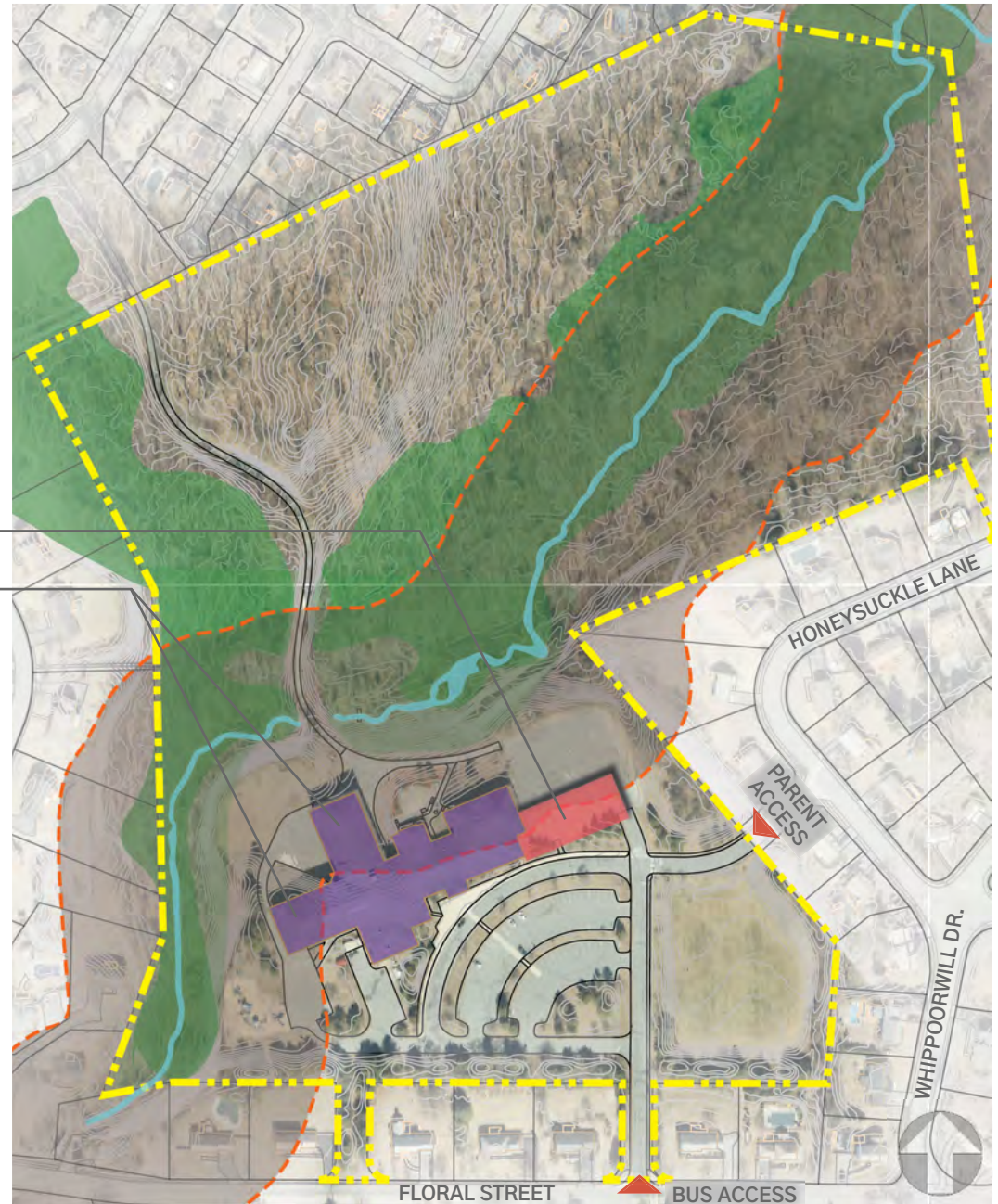
New kindergarten wing addition (6 classrooms)

Reallocate existing kindergarten classrooms to alleviate programmatic deficiencies; reallocate excess classrooms for common areas in each academic wing

-  Existing building to be renovated
-  New building addition
-  Existing building to be demolished
-  Wetlands
-  200' wetlands buffer zone
-  Property line
-  Bus Access










Locus Map



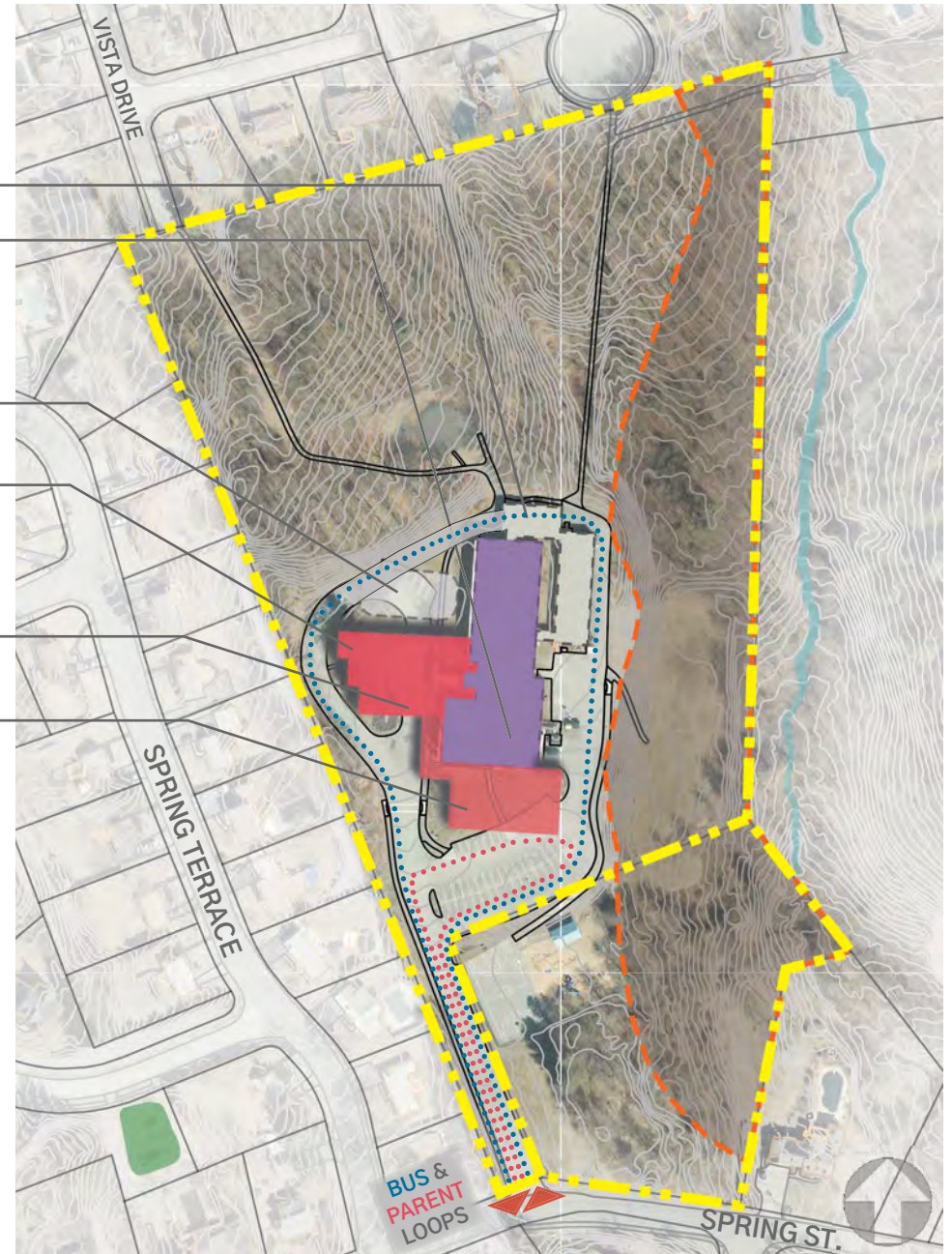
Options | Addition/Renovation – Spring Street School

- Demolish portable classrooms
- Repurpose existing gymnasium for media center, OT/PT classrooms, and/or music/art; extend new corridor to connect to new gymnasium and academic wing; expand cafeteria/kitchen
- New kindergarten rooms in new wing; add new play area adjacent
- New two-story academic wing; abandon bus turnaround in lieu of new ring road traversing entire building
- Reconfigure entry sequence for direct line of sight from relocated/expanded administrative suite
- New gymnasium

-  Existing building to be renovated
-  New building addition
-  Existing building to be demolished
-  Wetlands
-  200' wetlands buffer zone
-  Property line
-  Vehicular access points







Locus Map



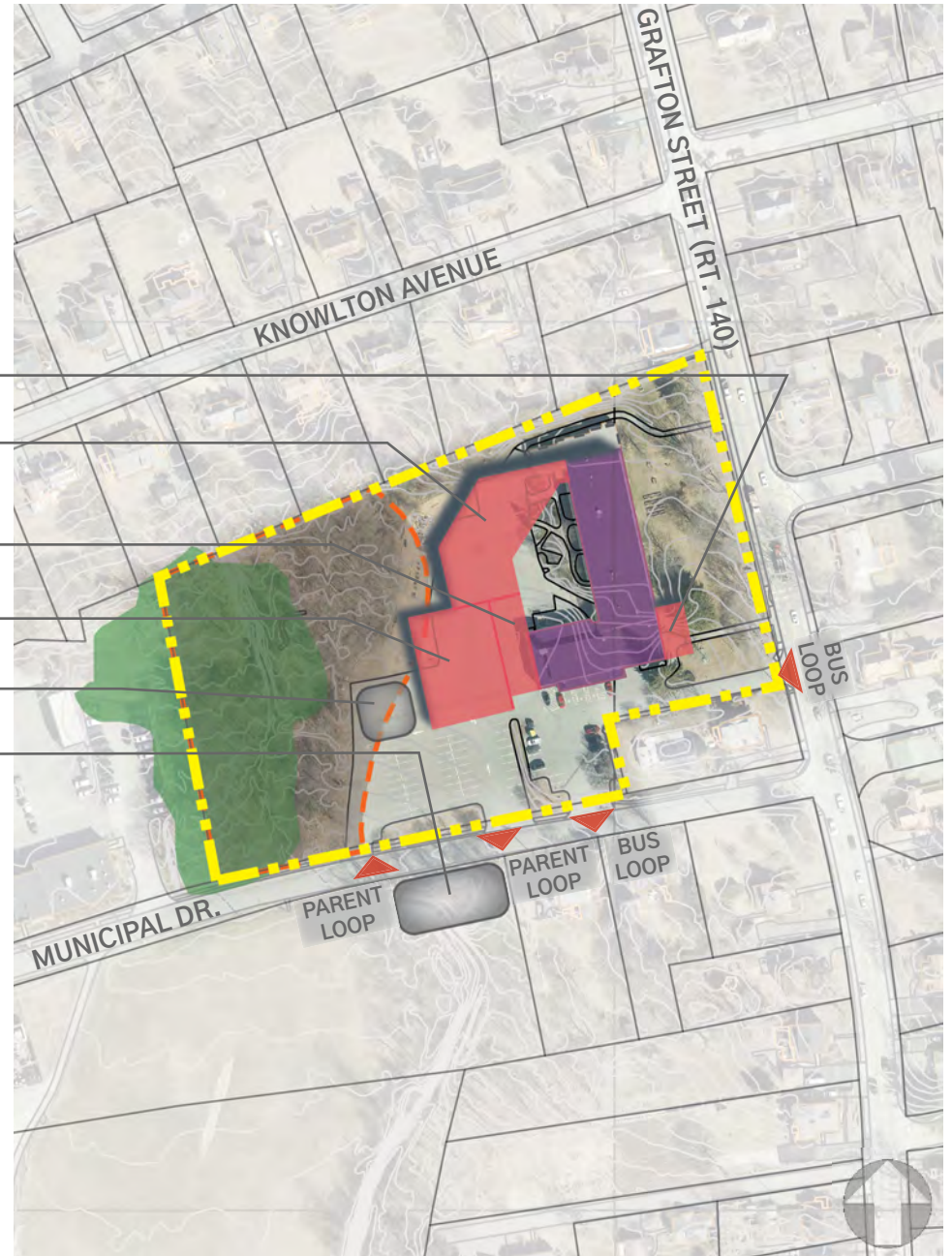
Options | Addition/Renovation – Walter J. Paton School

- New administrative suite addition
- Demolish portable classrooms and add new two-story academic wing with media center onto existing building
- Expanded kitchen & custodial spaces
- New gymnasium with storage & office
- Expanded parking option
- Expanded parking option (across Municipal Drive)

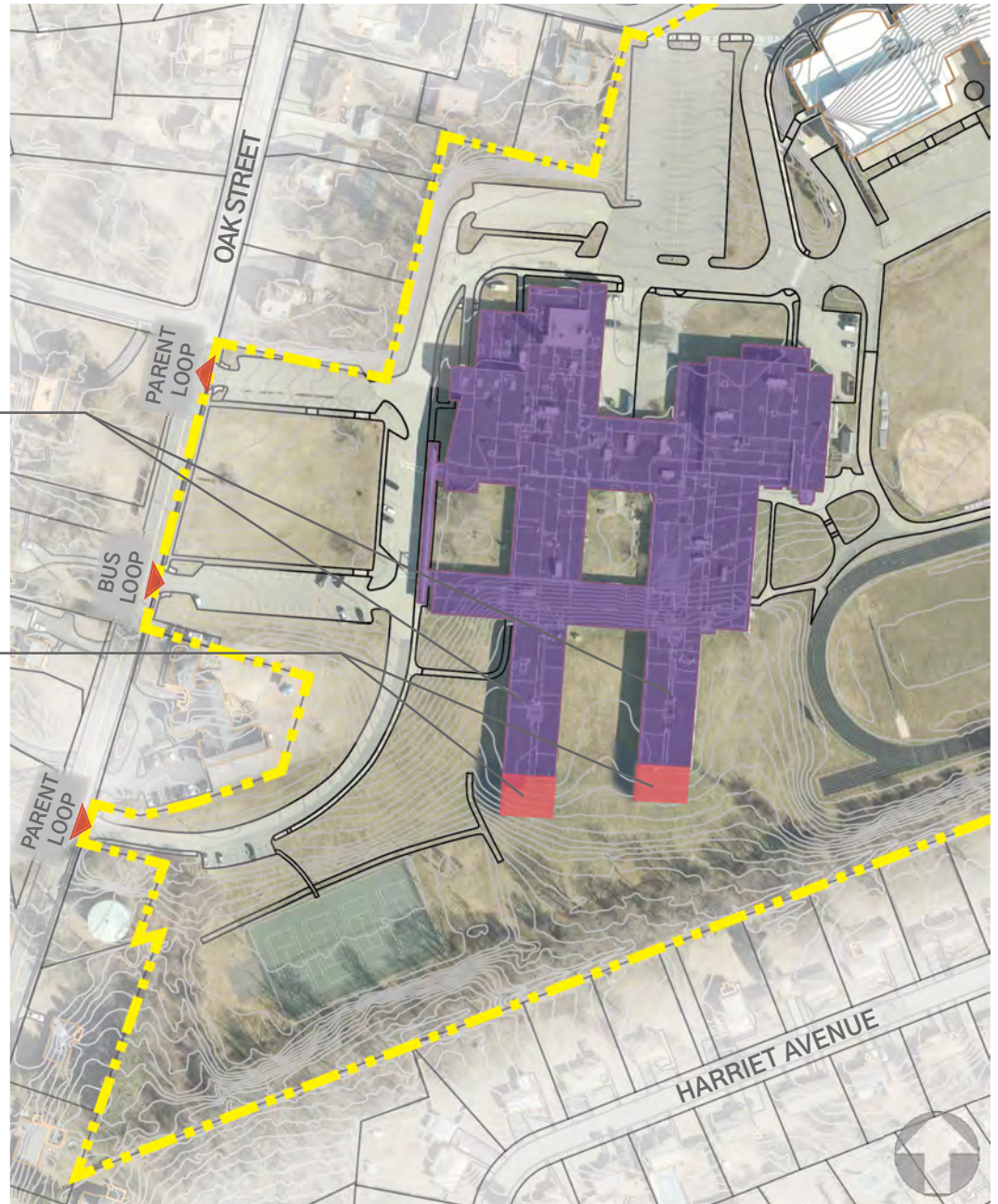
-  Existing building to be renovated
-  New building addition
-  Existing building to be demolished
-  Wetlands
-  200' wetlands buffer zone
-  Property line
-  Vehicular access points



Locus Map








Options | Addition/Renovation – Oak Middle School



Reconfigure classrooms to meet MSBA size guidelines

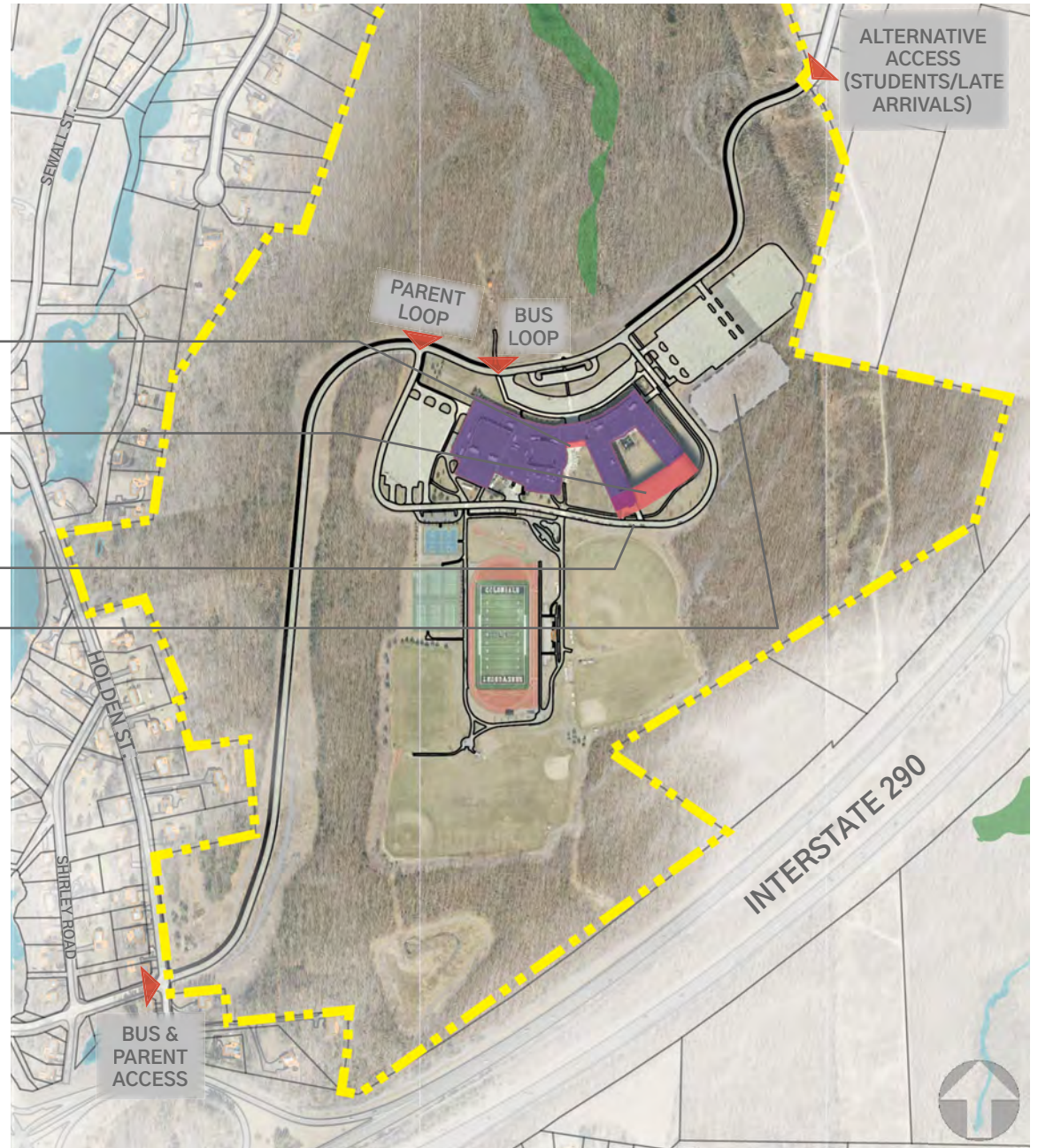
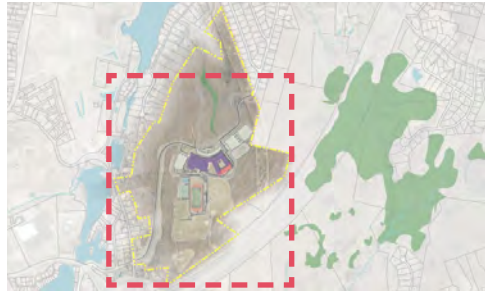
New two-story academic additions for science classrooms

-  Existing building to be renovated
-  New building addition
-  Existing building to be demolished
-  Wetlands
-  200' wetlands buffer zone
-  Property line
-  Vehicular access points



Locus Map

Options | Addition/Renovation – Shrewsbury High School





Expanded cafeteria seating

New three-story academic wing addition; connect two existing wings

Reroute ring road as required

Expanded parking lot

-  Existing building to be renovated
-  New building addition
-  Existing building to be demolished
-  Wetlands
-  200' wetlands buffer zone
-  Property line
-  Vehicular access points



Locus Map

Options | Addition/Renovation

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PRE-K OPTIONS: PARKER ROAD PRESCHOOL VS WALTER J. PATON SCHOOL

*PSP = Projected School Population

	PSP*	BUDGET
PRE-K		
PARKER ROAD	242	\$32,000,000
PARKER ROAD	375	\$39,000,000
ELEMENTARY (K-4)		
MAJOR HOWARD BEAL	--	--
CALVIN COOLIDGE	--	--
FLORAL STREET	--	--
SPRING STREET	--	--
WALTER J PATON (New Construction)	242	\$32,000,000
WALTER J PATON (New Construction)	375	\$39,000,000
WALTER J PATON (Addition/Renovation)	242	\$24,000,000
MIDDLE SCHOOL (5-8)		
OAK	--	--
SHERWOOD	--	--
HIGH SCHOOL (9-12)		
SHREWSBURY HIGH	--	--

One of the main school committee goals is to provide preschool for the 10-year enrollment projection, and to include early education offices within the same building. Upon review, the primary options for location include the Parker Road site (new construction adjacent to the existing building), and the Paton site (both addition/renovation and new construction options).

The Parker Road site is deceptively large, which would allow the new building to be built adjacent to the existing without demolition. The existing building would remain operational, and the space vacated by the existing preschool could be turned over for municipal use.

The “triple threat” space currently existing at Paton, while undesirable for an elementary school, would be uniquely suited for a preschool gross motor use. However, renovation of Paton for preschool classrooms would be extensive. New construction may be preferred as a result.

Options | Pre-K Options – New Construction at Parker Road Preschool

Potential future expansion for a 375–student population

New play field

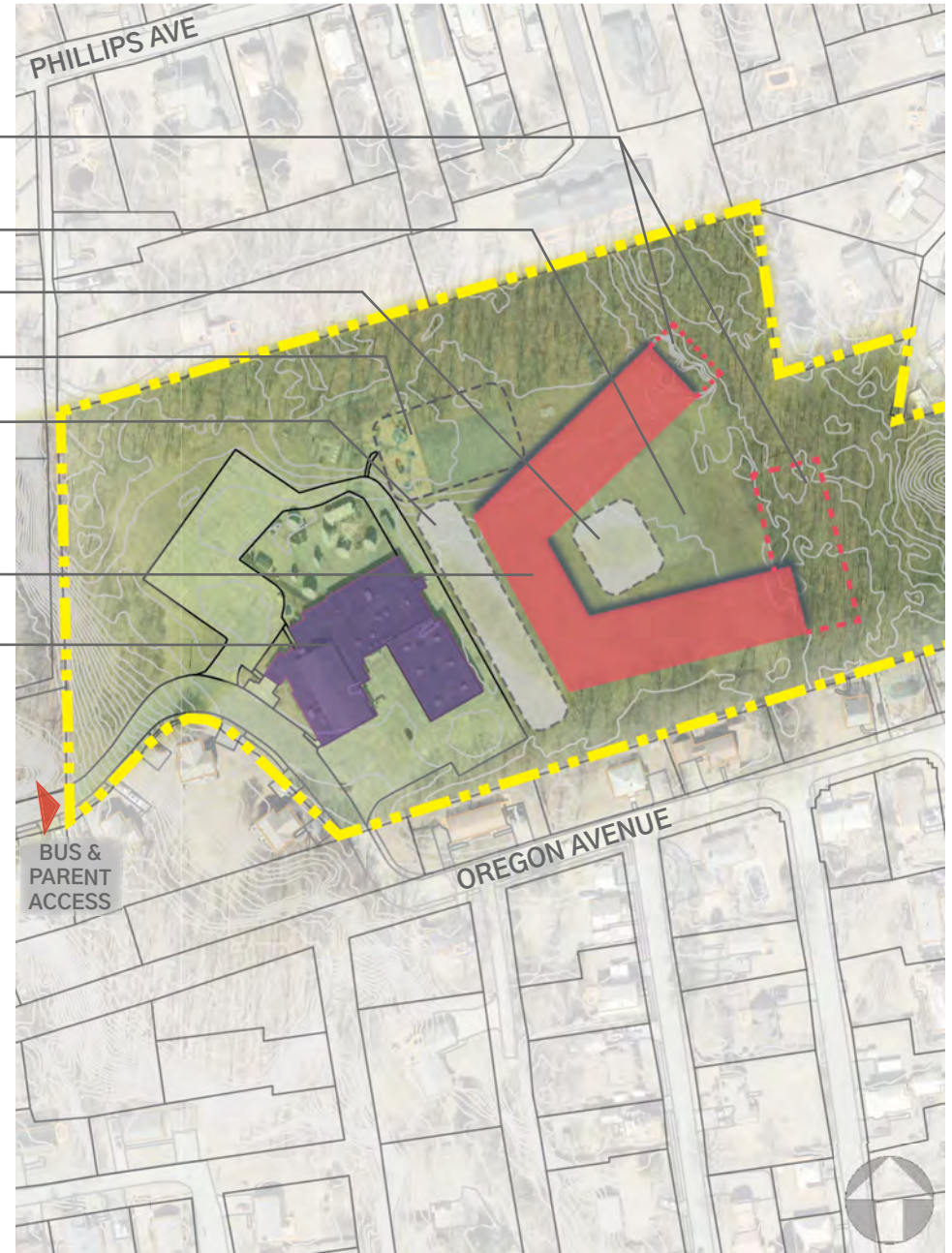
New paved play area

Existing play area to remain







Expanded parking lot & bus loop

New one–story preschool for 242 students

Existing building to remain; reallocate for municipal use





Locus Map

-  Existing building to be renovated
-  New building addition
-  Existing building to be demolished
-  Wetlands
-  200' wetlands buffer zone
-  Property line
-  Vehicular access points

Options | Pre-K Options – Addition/Renovation at Walter J. Paton School

- Expanded administrative suite
- Demolish portable classrooms and replace with new two-story academic wing
- New paved play yard
- Renovate existing academic wing for preschool classrooms with shared restrooms
- Renovate existing cafegymnasium for a new gross motor room
- New single-story classroom wing
- Expanded parking
- Expanded parking option (across Municipal Drive)



-  Existing building to be renovated
-  New building addition
-  Existing building to be demolished
-  Wetlands
-  200' wetlands buffer zone
-  Property line
-  Vehicular access points



Locus Map

Options | Pre-K Options – New Construction at Walter J. Paton School

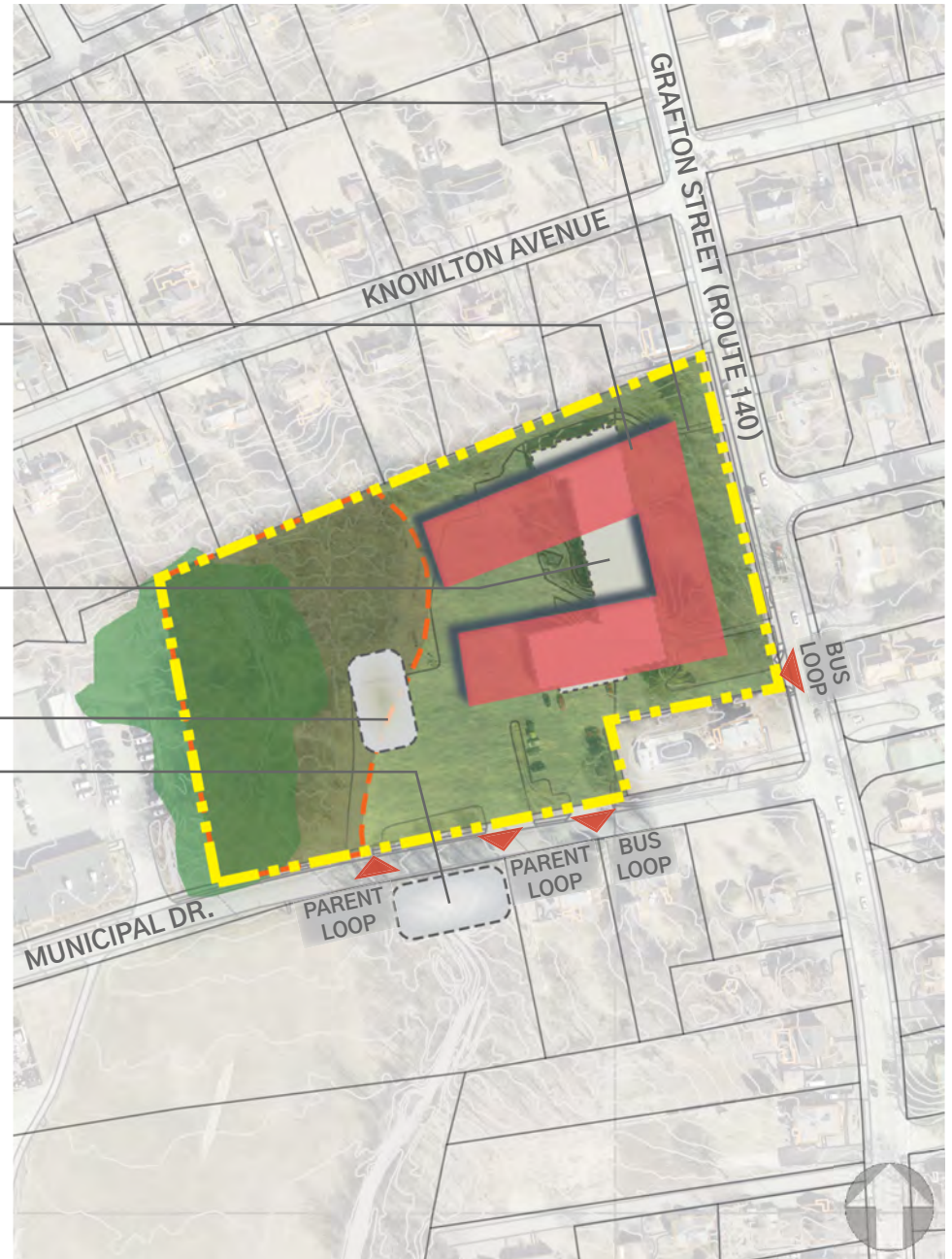
Maintain 50'-0" front yard setback

New single-story preschool building

Demolish school in its entirety;
elementary student population to
permanently transfer to Beal

Expanded parking

Expanded parking option (across Municipal Road)



- New building
- Existing building to be demolished
- Wetlands
- 200' wetlands buffer zone
- Property line
- Vehicular access points



Locus Map

Options | Hybrid Pre-K+Elementary Options

HYBRID PRE-K+ELEMENTARY SCHOOL OPTION: REPLACE CALVIN COOLIDGE SCHOOL & ADD PRE-K WING

*PSP = Projected School Population

	PSP*	BUDGET
PRE-K		
PARKER ROAD	--	--
ELEMENTARY (K-4)		
MAJOR HOWARD BEAL	--	--
CALVIN COOLIDGE	542	\$75,000,000
FLORAL STREET	--	--
SPRING STREET	--	--
WALTER J PATON	--	--
MIDDLE SCHOOL (5-8)		
SHERWOOD	--	--
OAK	--	--
HIGH SCHOOL (9-12)		
SHREWSBURY HIGH	--	--

A unique option for providing district-wide pre-K would be to combine it with an elementary school as a separate wing. This has the benefit of streamlining operations, sharing common core spaces (such as administration, kitchen, etc.), and providing potential interactions and learning experiences between younger children and older ones. Additionally, there is the chance for MSBA reimbursement of the preschool if it is combined with the elementary school (MSBA does not reimburse for preschools alone).

Coolidge provides the best site for this solution, as it is large enough to support this size building. If town-owned land is added to the site, it could even be built while keeping the existing school open. There is an added benefit of connecting to Jordan Road at the north side of the property, which may alleviate some traffic congestion at Florence and May Streets. The Jordan Road entrance could be designated solely as the pre-K entrance (or vice versa), if separate entrances for the pre-K and the elementary school are desired.

Options | Hybrid Pre-K+Elementary Options – New School at Coolidge Site

Hatched areas indicate town-owned land to add (change from playground to school use)

New play field

New paved play area

New paved play area for pre-K/K students

New two-story academic wing (pre-K & K on first floor; 1-4 on second floor)

New one-story gymnasium/cafeteria/administrative wing

Demolish school in its entirety; student population to temporarily transfer to Beal during construction; create new expanded parking lot & reconfigured bus turnaround



Locus Map

- New building
- Existing building to be demolished
- Wetlands
- 200' wetlands buffer zone
- Property line
- Vehicular access points

Options | New Construction (600)

NEW CONSTRUCTION (600): NEW 600-STUDENT ELEMENTARY SCHOOL ON AN EXISTING SITE

*PSP = Projected School Population

	PSP*	BUDGET
PRE-K		
PARKER ROAD	600	\$64,000,000
ELEMENTARY (K-4)		
MAJOR HOWARD BEAL	--	--
CALVIN COOLIDGE	600	\$64,000,000
FLORAL STREET	--	--
SPRING STREET	600	\$71,000,000
WALTER J PATON	--	--
MIDDLE SCHOOL (5-8)		
SHERWOOD	--	--
OAK	--	--
HIGH SCHOOL (9-12)		
SHREWSBURY HIGH	--	--

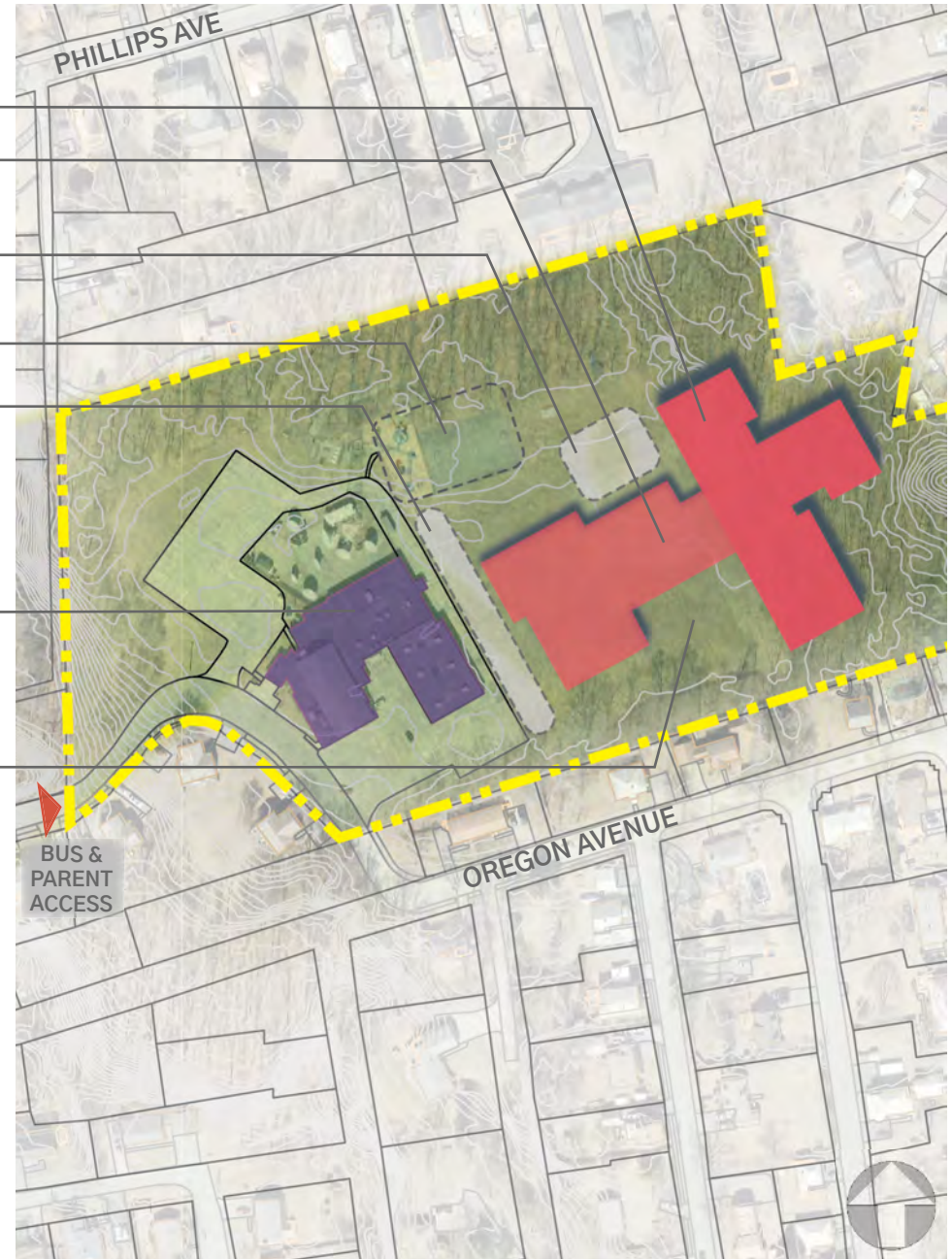
This set of options looks at sites that could house a 600-student elementary school (roughly 115,000 sf). This option has merit primarily because developable land is at a premium in Shrewsbury. Several existing sites could support a school of this size, though it would be tight in some cases.

Building a school this large would allow one of the existing elementary schools to be repurposed or replaced with an appropriately-sized preschool. Alternatively, the vacated site could be returned to the Town for municipal or other use.








Spring Street and Parker Road are possibilities for this scheme, but the resulting site design is fairly tight and involves significant land rework in certain instances. Coolidge provides the best opportunity for this scenario (assuming adjacent Town-owned land can be added to the existing parcel).

Options | New Construction (600) – Parker Road Preschool Site

- New two-story academic wing
- New one-story gymnasium/cafeteria/administrative wing
- New paved play area
- Existing play area to remain
- Expanded parking lot & bus loop
- Existing building to remain; reallocate for municipal use
- New play field



Locus Map

-  Existing building to be renovated
-  New building
-  Existing building to be demolished
-  Wetlands
-  200' wetlands buffer zone
-  Property line
-  Vehicular access points

Options | New Construction (600) – Calvin Coolidge School Site

Hatched areas indicate town-owned land to add (change from playground to school use)

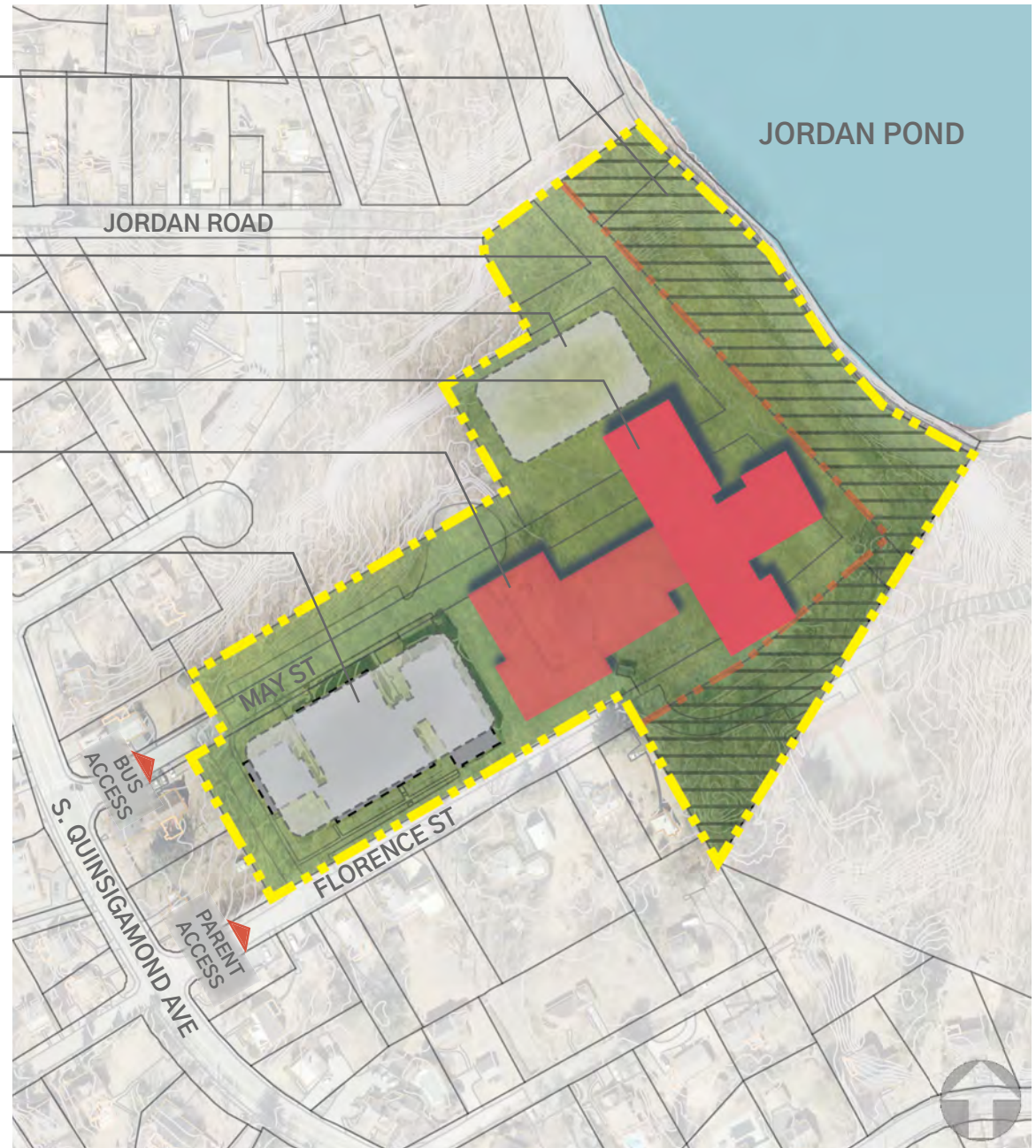
New play field

New paved play area

New two-story academic wing

New one-story gymnasium/cafeteria/
administrative wing

Demolish school in its entirety; student population to temporarily transfer to Beal during construction; add new expanded parking lot & reconfigured bus turnaround



- New building
- Existing building to be demolished
- Wetlands
- 200' wetlands buffer zone
- Property line
- Vehicular access points



Locus Map

Options | New Construction (600) – Spring Street School Site

- Demolish school in its entirety; student population to temporarily transfer to Beal during construction
- New three-story academic wing addition
- Kindergarten play area
- New one-story gymnasium/cafeteria/administrative wing
- Revise rotary for bus loop
- Relocate play area adjacent to building
- Expand parking lot; parent loop to occur in new lower parking lot



Locus Map

- New building
- Existing building to be demolished
- Wetlands
- 200' wetlands buffer zone
- Property line
- Vehicular access points

Options | New Construction (300)

NEW CONSTRUCTION (300): NEW 300-STUDENT ELEMENTARY SCHOOL ON AN EXISTING SITE

*PSP = Projected School Population

	PSP*	BUDGET
PRE-K		
PARKER ROAD	300	\$45,000,000
ELEMENTARY (K-4)		
MAJOR HOWARD BEAL	--	--
CALVIN COOLIDGE	300	\$45,000,000
FLORAL STREET	--	--
SPRING STREET	300	\$45,000,000
WALTER J PATON	300	\$45,000,000
MIDDLE SCHOOL (5-8)		
SHERWOOD	--	--
OAK	--	--
HIGH SCHOOL (9-12)		
SHREWSBURY HIGH	--	--

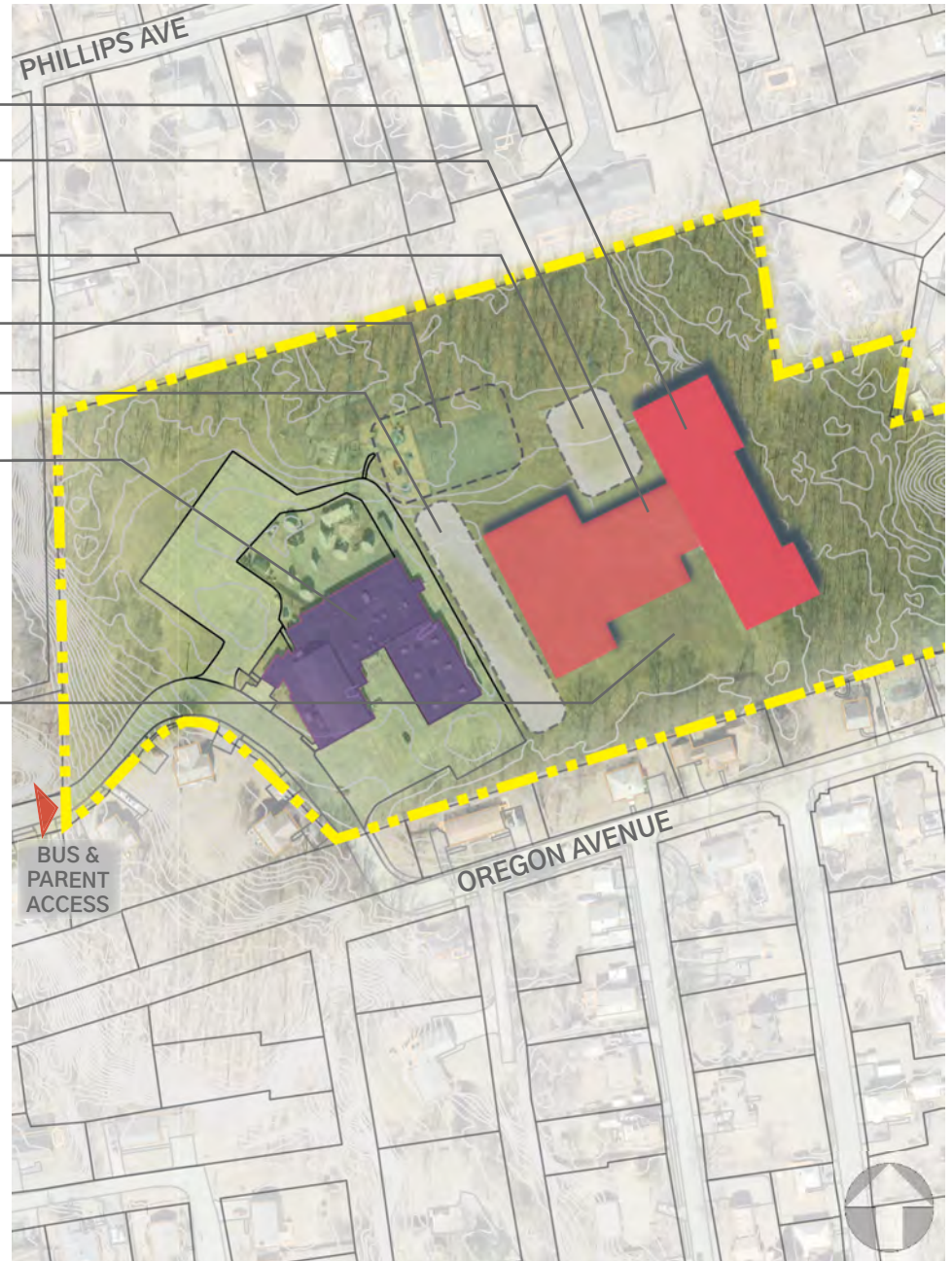
This set of options only looks at the elementary schools, as well as Parker Road (since the site is large enough to house a new elementary school of this size). The middle schools and high school are not viable candidates for new construction of any kind, as has been demonstrated.





Through the design capacity and enrollment analysis, a trend emerged for several of the elementary schools in particular (Coolidge, Spring, and Paton). All of these end up with similar 10-year enrollments of roughly 300 students. Given that fact, the fact that all three of these schools currently employ portable classrooms that have exceeded their useful life, and the fact that Beal is underenrolled by roughly the same amount of students, we looked at the possibility of replacing any of these three buildings with a new 300-student school on their given site. This gives a variety of options for the district-wide solution; priorities for development will need to be determined by the School Committee in order to narrow down the choices.

Options | New Construction (300) – Parker Road Preschool Site

- New two-story academic wing
- New one-story gymnasium/cafeteria/administrative wing
- New paved play area
- Existing play area to remain
- Expanded parking lot & bus loop
- Existing building to remain; reallocate for municipal use

New play field



-  Existing building to be renovated
-  New building
-  Existing building to be demolished
-  Wetlands
-  200' wetlands buffer zone
-  Property line
-  Vehicular access points



Locus Map

Options | New Construction (300) – Calvin Coolidge School Site

Hatched areas indicate town-owned land to add (change from playground to school use)







New play field

New paved play area

New two-story academic wing

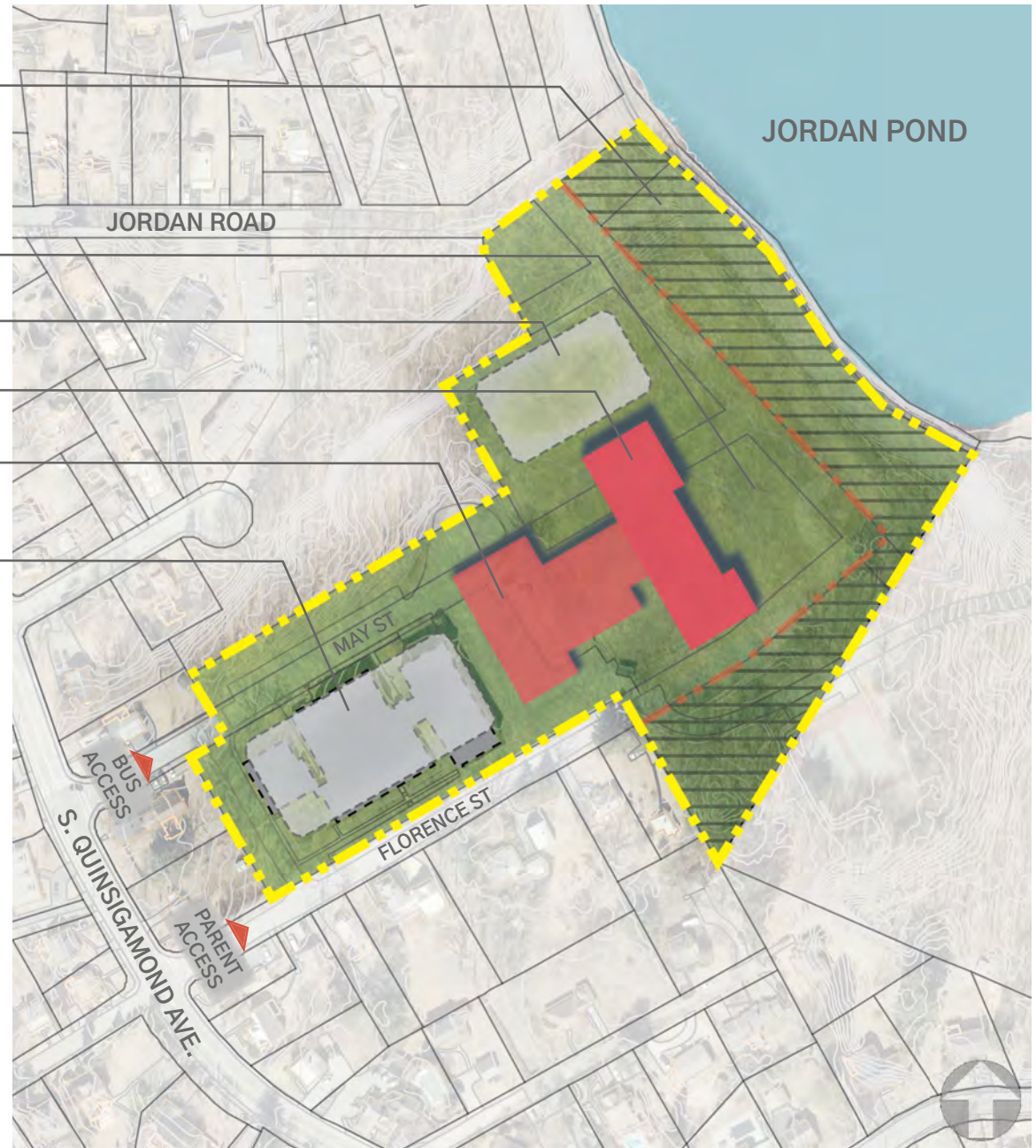
New one-story gymnasium/cafeteria/administrative wing

Demolish school in its entirety; student population to temporarily transfer to Beal during construction; create new expanded parking lot & reconfigured bus turnaround

-  New building
-  Existing building to be demolished
-  Wetlands
-  200' wetlands buffer zone
-  Property line
-  Vehicular access points



Locus Map



Options | New Construction (300) – Spring Street School Site

Demolish school in its entirety; student population to temporarily transfer to Beal during construction

New two-story academic wing with media center







Kindergarten play area

New one-story gymnasium/cafeteria/administrative wing

Revise rotary for bus loop

Relocate play area adjacent to school

Expand parking lot; parent loop to occur in new lower parking lot

-  New building
-  Existing building to be demolished
-  Wetlands
-  200' wetlands buffer zone
-  Property line
-  Vehicular access points



Locus Map



Options | New Construction (300) – Walter J. Paton School Site

Maintain 50'-0" front yard setback

New two-story academic wing

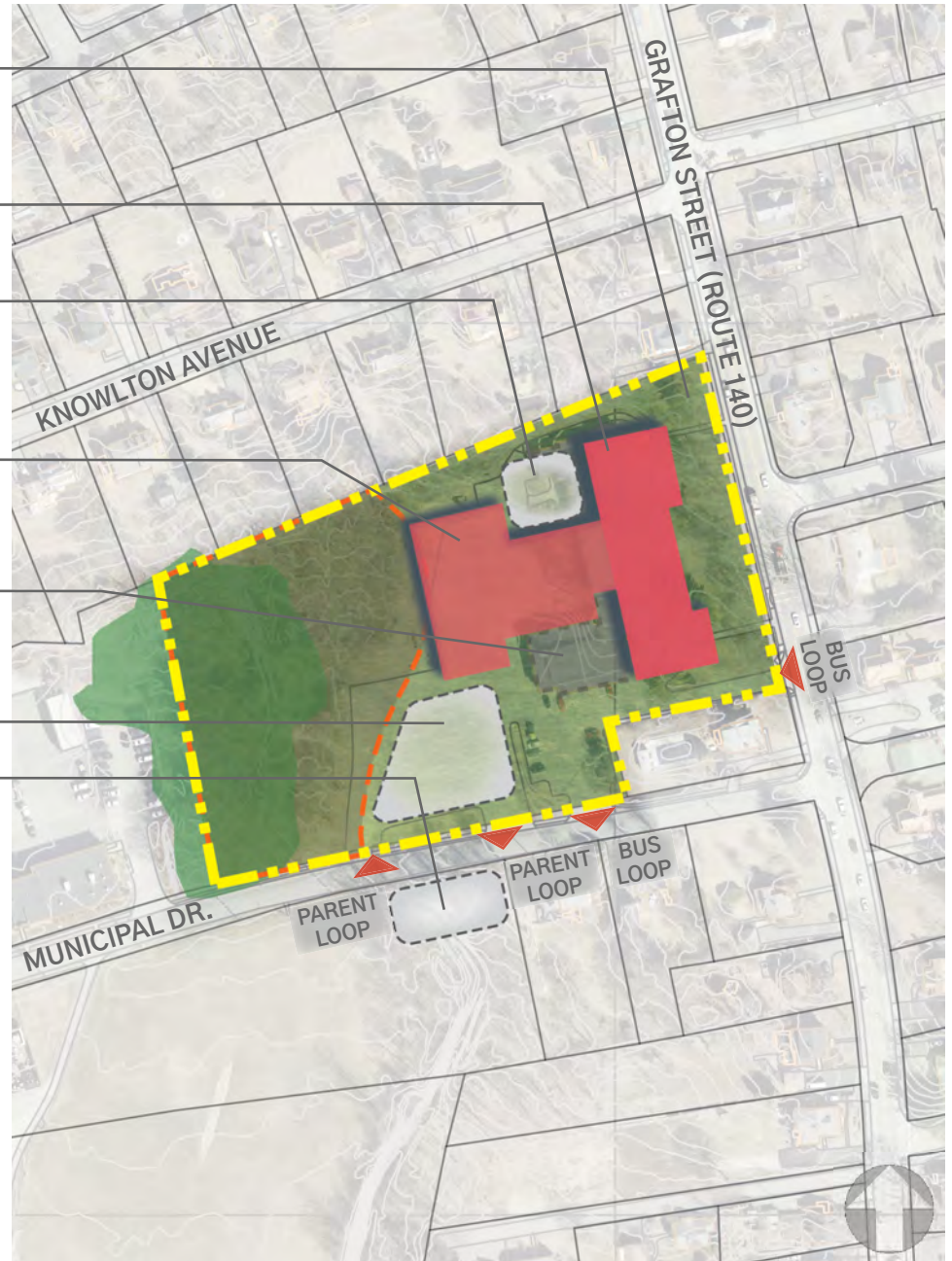
New paved play yard

New one-story gymnasium/cafeteria/administrative wing (review wetland no-build restrictions)

Demolish school in its entirety; student population to temporarily transfer to Beal during construction

Expanded parking; maintain existing parent loop

Expanded parking option (across Municipal Drive)



- New building
- Existing building to be demolished
- Wetlands
- 200' wetlands buffer zone
- Property line
- Vehicular access points



Locus Map

Options | New Construction (300)

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Options | New Construction vs Addition/Renovation

	NEW CONSTRUCTION (300 STUDENTS)	ADDITION/ RENOVATION	NOTES
ELEMENTARY (K-4)			
MAJOR HOWARD BEAL	--	--	
CALVIN COOLIDGE	\$45,000,000	\$35,000,000	Add/reno not desirable this location
FLORAL STREET	\$28,000,000	\$28,000,000	Kindergarten addition for parity
SPRING STREET	\$45,000,000	\$40,000,000	No significant savings for add/reno
WALTER J PATON	\$45,000,000	\$43,000,000	No significant savings for add/reno
TOTALS	\$163,000,000	\$146,000,000	

- Costs were calculated for an addition/renovation of each school individually
- There is a lack of significant savings between addition/renovation and new construction at the elementary level
- New construction will yield the better end product for the cost

APPENDIX [Not Included]

- Space Summary Templates
- Enrollment Projections
- Soils Mapping
- Consultant Engineer Reports
 - Facilities Assessment
 - Net Zero Recommendations
- Municipal Campus Study 2020 [Town Hall]
- Facilities Condition Assessments 2016
- Accessibility Reports