Old Rochester Regional School District
Junior and Senior High School

Facilities Condition Assessment

February 2024

LeftField
THE RIGHT CHOICE IN PROJECT MANAGEMENT

Table of Contents

Executive Summary

In accordance with a request by the Old Rochester Regional School District, herein referred to as "The District", LeftField has performed an existing conditions survey and analysis of the Old Rochester Junior and Senior High School. The purpose of the analysis was to identify the condition of the existing facility including envelope and operational infrastructure to identify need exposure and allow for continued operations. A team of professional architects and engineers representing each of the major building disciplines visited the site and worked in collaboration to develop and ultimately refine this report. The assessment contained herein is intended to provide the necessary background to support the recommendations presented and to provide information to the decision makers that could impact an ensuing project(s).

The condition survey of the existing facility identified the immediate needs of the facility, analyzed, and forecasted the life expectancy of the existing building systems and identified any code issues as well as thresholds that trigger additional items. Many of the items identified are forecasted to approach the end of their useful life within the next ten years based on ASHRAE Estimated Life Expectancy tables and an evaluation of current conditions.

In addition to identifying the issues, LeftField engaged a professional cost estimator to provide estimated replacement costs associated with each recommendation. A timeline of scheduled repairs/replacements was provided, dividing the work into four different categories reflecting their priority level, each having its associated total cost.
The four time periods are as follows:

- Category 1: Immediate
- Category 2: 1-2 Years
- Category 3: 3-5 Years
- Category 4: 5-10 Years

The District may choose to address these recommendations in multiple phases of work consistent with the above-listed priority level, thus suggesting that some work would not be contracted until several years in the future. Public construction costs historically increase with time due to rising materials and labor costs. Therefore, to assist The District in preparing for future expenditures, the provided cost estimate has factored for construction cost escalation by applying a predicted percentage rate of increase to the number of years from today that specific work may be contracted. This methodology revealed that an estimated $23.7 million would be needed for immediate repairs, $3.8 million for repairs recommended within 1-2 years, $6.6 million for repairs recommended within 3-5 years, and $19.3 million for repairs recommended within 5-10 years.

An additional category (#5) was established for upgrades to the Athletic facilities. The intent is to provide recommendations and associated costs for The District to evaluate if and when they would want to execute some or all of those items. As with all the recommended updates, the associated costs will vary relative to when the work is contracted. If, hypothetically, all the recommendations in this category were contracted within 6 months, the grand total of estimated costs would be roughly $10.5 million.

Introduction

The District has commissioned LeftField to perform a comprehensive building assessment of the Old Rochester Junior and Senior High School to identify existing building deficiencies, prioritize their repairs and provide associated construction costs to address the identified issues. The last major renovation to the building occurred between 2001-2003. The roof was replaced in 2003 and the MEP systems were all replaced during this major renovation. Essentially, all the major mechanical and electrical systems are now twenty years old. It is our opinion that much of this infrastructure is in need of repair or replacement. This report will identify those items which are currently not working and/or most likely will be failure points in the near future.

A team of architects and engineers from LeftField performed a visual assessment of the facility and identified existing building issues within the following categories that will need to be addressed within the next ten years. At this time civil engineering and programmatic needs were not included in the evaluation.

-Mechanical-Equipment-Plumbing systems and equipment:
- Boilers
- Pumps
- ERVs
- AHUs
- Chillers
- Generators
- Booster pump
- Lighting
- Sprinklers
- Fire Alarm
- Other

- Envelope:
- Windows
- Doors
- Roof
- Masonry

-Interior:
- Flooring
- Ceilings
- Condition of walls/slabs
- Elevators

-Site:
- Curbs
- Pavement
- Utility infrastructure
- Retaining walls
- Fencing
- Stairs
- Railings
- Bollards

-Code and/or Accessibility

The building evaluation presented in this report is based on field observations, review of available construction documents, prior reports, and discussions with personnel from the facility. Building codes and pertinent guidelines, presently in force locally and federally, were utilized in evaluating the buildings.

Findings

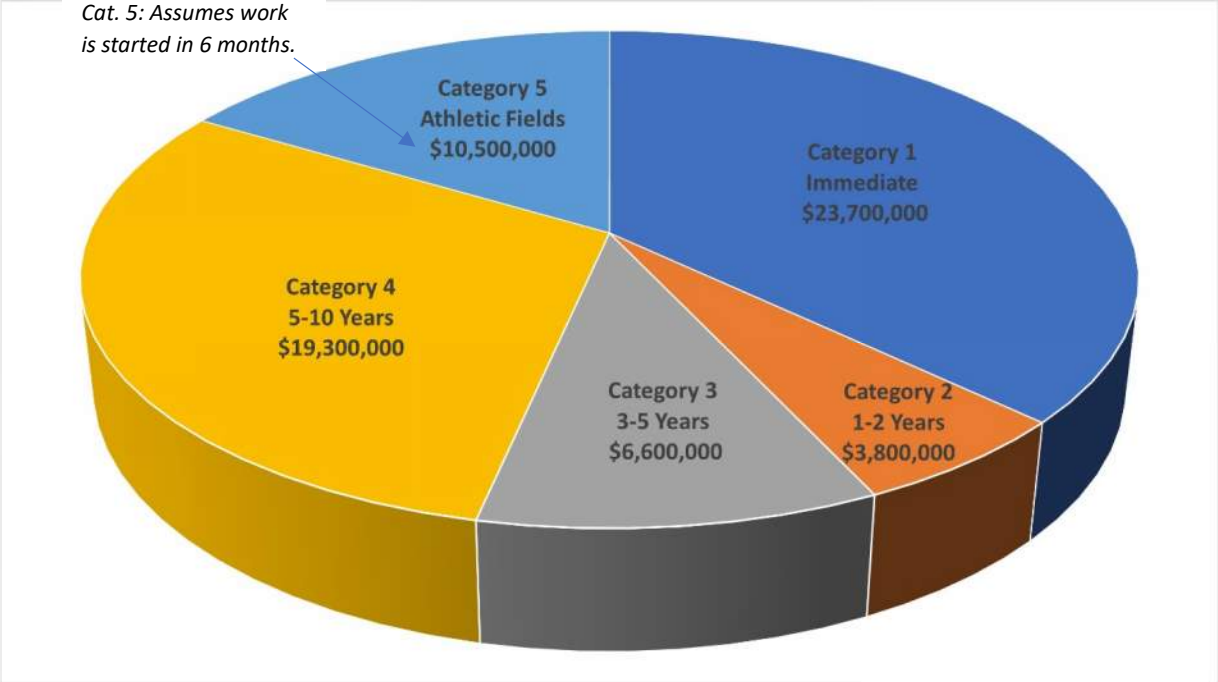
Overall, visually, the facility appears to be well maintained. The facility underwent substantial renovation in 2001-2003 that included Architectural, MEP, and Code/Accessibility upgrades. However, our evaluation did reveal that some of the facilities' systems are reaching the end of their useful life based on a professional estimation of the remaining life cycle using the equipment or system´s current state of wear and the ASHRAE tables and forecasted to need replacement within the next 10 years. Therefore, this report recommends the repair or replacement of many building system components to ensure healthy and efficient operation over the long-term life of the facility.

Please Note: Our findings are not intended to portray the Old Rochester High School Administration, the Facilities Department staff, or its personnel in an unfavorable light. In fact, we hope this report identifies the overwhelming tasks and sheer amount of continued maintenance required to address the deficiencies noted for a 389,000SF facility, which provides program for 1,250 students in an active operational mode seven days a week.

Estimate

It is important to note that the costs provided are estimates and not based on actual bids. The estimates are based on projected direct costs for replacement with percentages applied for estimated contractor mark-ups and escalation. Our team and the facilities department have discussed and agreed that, in some cases, with continued preventative maintenance, full replacement of equipment may not be required. However, we are providing estimated replacement costs in all cases for The District's reference. The estimates are based on our findings along with an estimate that was created by an independent construction cost estimator. the sum of the trade costs from the identified building issues, factoring in the general contractor's overhead, profit, fees, construction & design contingencies, phasing and escalation premiums, the total estimated cost of all recommended work in all categories is approximately $63.9 million.

Proportion of Costs by Category



Implementation Plan

In the following report, Leftfield has identified many areas needing upgrading or wholesale replacement. While we recognize that obtaining the necessary funding to address the deficiencies noted is a major undertaking and may only be allocated over several years of petitioning, we also want to ensure that several of the systems identified as needing upgrades/repairs/replacement will have to be bundled or grouped as a single endeavor, even though they may be called out as a separate system. Even when bundling the work into groups and phases, you will still find the challenges of staging and implementing the proposed work while the school is in session. Based upon our review of the utility bills, it appears that only the month of July is when there is minimal activity occurring at the schools however, if planned, staged, and managed correctly, this window will allow for the invasive work to occur in various building locations.

Let us expand a comment just referenced, the bundling or grouping of tasks. For example, one of the major areas identified for improvement is the Building Automation System, which we elaborate on below in more detail. However, the issue with spending any funding on this immediate need is that the building HVAC systems all need to be fully operational first. To illustrate this prioritization task one step further, the building's thermal envelope needs to be addressed before the HVAC systems can be properly functioning. This means the leaking exterior doors and any other identified envelope issues should be repaired first to ensure the HVAC systems can maintain control within the building's enclosed space.

We have attempted to "bundle" the tasks based upon their interdependence as relevance in achieving the desired system upgrade and is indicated in the numbering sequence in the below tables (e.g., 1A, 2A, 3A, etc.).

We would be happy to explain our methodology in person to help clarify our comments.

Breakdown of Tasks

To assist The District in making an informed decision of what building related issues need to be performed and the associated time period for the repairs, we have subdivided the construction costs into categories, identified in the following tables:

Category 1 – Immediate Repair or Replacement

Equipment or systems that are not presently functioning and require repair or replacement to bring to a functioning state, or equipment or systems that are highly likely to fail in the upcoming school year and require repair or replacement to mitigate a disruption to the school program.

Note: Our team and the facilities department have discussed and agreed that, in some cases, with continued preventative maintenance, full replacement may not be required. However, we are providing projected replacement costs for The District's reference. ***The costs provided are estimates and not based on actual bids. The estimates are based on projected direct trade costs with percentages applied for estimated contractor mark-ups and escalation.***

			Estimated Cost			
	Subcategory	**Reason for Work**	**Immediate (REC)**	**1-2 Years**	**3-5 Years**	**5-10 Years**
1A	Full building re-commissioning (Now and after all HVAC repairs are complete)	Commissioning is a systematic process of ensuring that a building performs in accordance with its design intent. The process entails observation, testing, and evaluation of data to identify issues and develop solutions to reach optimal system operation.	$299,741	$309,976	$333,370	$365,537
1B	Replace existing exterior entry doors and improve building perimeter safety	The intent is to mitigate outdoor air infiltration and improve safety/security. The existing facility has many exterior doors that present a potential security risk. The following is a general architectural and procedural recommendation related to the building perimeter: Doors scheduled as entry doors (e.g., main office entry, gymnasium, auditorium) should be controlled by a proximity card reader, electric lock, request to exit switch, door to be monitored by the school's video surveillance system. Only during parent and bus drop off will certain doors remain unsecure. At these times, staff would be positioned at doors for supervision. Outside of these times, under no circumstances should doors be unsecure or propped open. Either of these events	$592,096	$612,314	$658,526	$722,068

		should trigger an alarm on the access control system for staff review. All exterior doors not used for normal entry, but for emergency egress only, should be equipped with hardware on the interior side only unless specifically requested by local authorities. All doors should include doors closers. Alarms should be generated for unauthorized access. Doors with access into the school should be marked in numerical order based on the clock position method, starting with the main entry as number one. For public use after school hours, it is recommended that access be limited to only designated public zones, (e.g., auditoriums and gymnasiums) while non-public, classroom areas are securely locked. <u>Note:</u> When replacing the main entry door storefront systems, The District should consider incorporating forced-entry resistant laminated glass composite in place of regular glass. The estimate includes a premium for forced-entry resistant glass at those areas.				
2A	28 RTUs and 13 AHUs	Replacement of aging, and in some cases, non-operational equipment to ensure optimal HVAC system operation and IAQ (Internal Air Quality)	$12,716,518	$13,150,721	$14,143,229	$15,507,927
2B	Exhaust Fans (91 installed)	See above item 2A comment	$511,432	$528,896	$568,812	$623,698
2C	Classroom Unit Ventilators (approx. 99)	See above item 2A comment	$964,415	$997,347	$1,072,619	$1,176,117
2D	Dual Temperature Pumps (8) and	See above item 2A comment	$255,154	$263,867	$283,781	$311,164

	Condenser Water Pumps (3					
2E	VFD's for Building Dual Temp Pumps and Condenser Water Pumps	Variable Frequency Drives (VFDs) are used to control the motor speed of pumps in the HVAC system, adjusting flow in accordance with demand. This equipment is aging, and in some cases, non-functioning and replacement is recommended.	$89,993	$92,993	$100,011	$109,661
3	New Building Automation System, all controllers, damper and valve actuators, thermostats, temp sensors, control cabinets, etc.	Reduce energy costs by capturing full operational status of the HVAC (Heating, Ventilation, and Air Conditioning) system and ensuring all equipment is properly functioning while operating according to a schedule that aligns with and supports the building's day-to-day functions	$5,829,957	$6,029,029	$6,484,050	$7,109,704
4	Domestic hot water system	Replacement of aging piping and recirculation pumps to ensure appropriate hot water temperatures are delivered to hand wash and dish wash sinks.	$7,493	$7,749	$8,334	$9,138
5	HS Science Classrooms Install EPO master shut off, repair fume hoods, repair satellite storage cabinets	Emergency Power Off (EPO) switches allow the disabling of natural gas supply in an emergency event. With their science curriculum moving towards "green" labs, The District may consider capping the gas piping. With age, existing fume hoods and acid storage cabinets will continue to have operational issues and will need repair or replacement.	$113,152	$117,016	$125,847	$137,990
6	PH neutralization System w/monitor and tank	This system serves the science classrooms but does not appear to be operational. It should be serviced, repaired, or replaced.	$299,740	$309,976	$333,370	$365,537
7	Junior High Cafetorium roof leaks	Although the majority of the roof appears to be intact and professionally installed, there are some areas where the roof transitions from the cafetorium into the main	$11,240	$11,624	$12,501	$13,707

		dwelling where roof leaks (we noted two) have occurred. There is evidence of water infiltration along the ceiling area and puddles form on the floor after a raining event.				
8	Install new Men's and Women's Restrooms at Athletic Field Area	There are currently no *outdoor* ADA compliant restroom facilities onsite. The nearest restrooms inside the building are over 500ft from the spectator bleachers. The travel distance for spectators exceeds the requirements set in the code.	$2,023,249	$2,092,336	$2,250,248	$2,467,377
	Total:		**$23,714,181**			

Category 2 – Items Identified for Repair or Replacement Between 1-2 Years

Equipment or systems likely to fail in 1-2 years that are recommended for repair or replacement based on an estimation of life using the equipment or system's current state of wear and the ASHRAE tables.

			Estimated Cost			
	Subcategory		**Immediate**	**1-2 Years (REC)**	**3-5 Years**	**5-10 Years**
1	Two (2) 600 Tons Cooling Towers	The existing towers are now 20+ years old and are reaching the end of their life expectancy. Many components need repair or replacement.	$749,351	$774,939	$833,425	$913,843
2	Two (2) PVI Domestic Hot Water Heaters	The existing units are now 20+ years old and are reaching the end of their life expectancy. New technology (e.g., instantaneous, or on-demand heaters) have proven to be advantageous.	$104,909	$108,492	$116,679	$127,938
3	Seventy-three (73) VAV Terminal Units	These units will require preventative maintenance, testing, damper repositioning, and recommissioning to ensure continued operation. Full replacement is likely not required, but a replacement cost is provided for reference	$218,810	$226,282	$243,360	$266,842

4	Kitchen Walk-in Cooler & Freezer	These units are aging, and will require maintenance (e.g., door heater repairs, gasket replacements, pipe reinsulating) Full replacement may not be required, but a replacement cost is provided for reference	$92,170	$95,318	$102,511	$112,402
5	Kitchen/Food Service Equipment	This equipment is aging, and in several cases non-functioning. The current issues include: • Lack of enough functioning commercial ovens to meet service needs due to age and wear (5 minimum required) • Kettles and Steamers not functioning properly (2 kettles and 4 steamers minimum required) • Tray washing conveyor system improperly pitched for drainage, causing continual rotting issue • Existing dishwasher unit is aged and worn • Existing exhaust hoods are aged. New, more energy efficient technologies offer smoke and heat sensors that can automatically adjust fan operation.	$988,273	$1,028,070	$1,105,673	$1,212,459
6	Fire suppression pump	This unit is aging and showing some wear and tear. The priority should be to execute some basic maintenance to extend its useful life. A full replacement cost is provided for reference.	$224,805	$232,482	$250,027	$274,153
7	Heating Boilers and EFG Controls	These units are 20+ years old and have been well maintained. The priority should be to execute some basic maintenance to extend its useful life. A full replacement cost is provided for reference.	$569,507	$588,953	$633,403	$694,521
8	Master PA System for both JHS and HS	The Junior and Senior High schools, although physically connected, do not share a common PA system. In the event of an emergency (e.g., a building intrusion), two separate announcements are	$693,765	$717,454	$771,601	$846,054

		required despite the emergency having an impact on both schools. The remedy would be a full replacement to have one (1) common system that could be programmed so that each administration office can reach their respective building areas for normal, daily announcements, but have a facility-wide communication option available for certain circumstances.				
	Total:			**$3,771,990**		

Category 3 – Items Identified for Repair or Replacement Between 3-5 Years

			Estimated Cost			
	Subcategory	**Reason for Work**	**Immediate**	**1-2 Years**	**3-5 Years (REC)**	**5-10 Years**
1	1200-ton York centrifugal chiller	This unit is 20+ years old and the priority should be to execute basic maintenance to extend its useful life (possibly an additional 10 years). A full replacement cost is provided for reference.	$3,776,733	$3,905,694	$4,200,464	$4,605,772
2	Worn, damaged flooring tiles, VCT and Tile	Normal wear and tear on heavily trafficked school flooring systems is expected. Damaged/missing tiles will continue to appear as the facility ages. The District should be prepared for repair and replacement of floor finishes.	$1,549,660	$1,602,575	$1,723,524	$1,889,829
3	Upgrade existing pavement and curbing areas	There is some evidence of cracking, spalling and settlement at exterior concrete steps and walkways due to typical wear and tear and freeze/thaw cyclic expansion. The asphalt parking areas are beginning to deteriorate. Some areas are exhibiting signs of gross failure (i.e., “alligator” cracks) and this will continue to progress as the asphalt ages.	$149,870	$154,987	$166,685	$182,768

4	Clean exterior masonry and patch/repair damage as needed	There are areas of mildew and staining around the building on each of the material types. In many cases it appears to be a result of overflow from the roof during or after precipitation events. The District should prepare to repair cracked mortar joints and reset masonry as needed due to age and wear.	$29,974	$30,997	$33,337	$36,553
5	Caulking and sealants at exterior walls joints and window perimeters	The caulking at masonry and metal panel, joints and window and louver openings is aged and exhibits cracking and movement in some areas. This will continue to develop as the caulking continues to age. Replacement will help extend the life of the envelope system.	$404,649	$418,467	$450,050	$493,475
	Total:				**$6,574,060**	

Category 4 – Items Identified for Repair or Replacement Between 5-10 Years

			Estimated Cost			
	Subcategory	**Reason for Work**	**Immediate**	**1-2 Years**	**3-5 Years**	**5-10 Years (REC)**
1	Acoustical ceiling tile system	The acoustical ceiling tile system will continue to wear with time. The facilities staff will continue to replace damaged individual tiles as part of cyclic maintenance. In the future, to prevent the general appearance of age and deterioration, The District may consider a larger scale replacement project.	$1,498,703	$1,549,878	$1,666,850	$1,827,687
2	Existing membrane roof system	This is a low slope, single-ply, roof membrane system. The existing roofing system is in generally good condition except for a few areas needing more immediate attention. With proper cleaning and removal of overgrown trees next to the building that	$12,609,061	$13,039,615	$14,023,737	$15,376,900

		could cause damage, the roof will not begin reaching the end of its useful for another 10 years.				
3	JHS elevator – Replace with ADA compliant passenger elevator	This elevator likely dates to the early 1960s and lacks ADA/MAAB compliant dimensions and signage. The audible signal is malfunctioning, and not providing the appropriate sounding, (i.e., once for up and twice for down direction). The facility *does* have a fully MAAB/ADA compliant, stretcher accommodating elevator. However, The District may consider upgrading/replacing the Junior High School Elevator and signage for increased accessibility.	$412,143	$426,216	$458,383	$502,614
4	Update science classroom casework and counters	With age and heavy use, these systems will continue to deteriorate.	$1,273,448	$1,316,932	$1,416,323	$1,552,984
	Total:					**$19,260,185**

Category 5 – Athletics

School athletic fields are an important asset to the community. When implemented, improvements can provide enhanced opportunities for use. As part of their long-term facilities plan, the district could consider making the following improvements:

			Estimated Cost			
	Subcategory	**Reason for Work**	**Immediate**	**1-2 Years**	**3-5 Years**	**5-10 Years**
1	Install new LED lighting at existing track, football, baseball, softball fields and tennis courts	There is opportunity for energy and cost savings as well as expansion of periods of field use by installing new LED lighting at both existing lighting poles and at new locations (baseball and softball fields).	$1,423,768	$1,472,384	$1,583,508	$1,736,302
2	Install new irrigation systems at existing baseball, softball, and soccer fields	Irrigation systems will help turf establishment and maintenance, thereby improving playing conditions and preventing erosion.	$1,873,379	$1,937,348	$2,083,563	$2,284,609
3	Re-leveling of existing baseball, softball, and soccer fields	Poor and unpredictable New England weather can cause great stress to field turf, resulting in erosion, sloping, and unevenness. This issue was observed during the team's walkthrough. Re-leveling would create a smoother surface for playing conditions, affecting the game's quality and player safety.	$3,746,759	$3,874,697	$4,167,127	$4,569,218
4	Bleacher Systems	There is currently no spectator seating at the baseball, softball, and soccer fields. With age, the football bleachers will become increasingly worn and need replacement. The District may consider replacing the existing football bleacher system and adding spectator seating to the softball and baseball fields.	$1,624,595	$1,680,069	$1,806,866	$1,981,213

5	High School Gymnasium Upgrades	Age, wear, and tear are preventing proper safety and function. In addition to typical cyclic maintenance such as washing and painting the gym walls, the following upgrades should be considered: • Replace safety wall padding • Replace existing divider with new motorized curtain • Replace existing bleachers with new motorized bleacher system	$294,696	$296,334	$300,077	$305,224
6	Athletic Storage	The facility can benefit from having a prefabricated storage building dedicated to athletic materials and equipment.	$1,498,703	$1,549,878	$1,666,850	$1,827,687
	Total:		**$10,461,900**	**$10,810,710**	**$11,607,991**	**$12,704,253**

ATTACHMENT A:

Assessment Narrative

Boston | Worcester | Providence
www.leftfieldpm.com

General Facility Information

Address	135 Marion Road, Mattapoisett, MA 02739
Present Use	Institutional, Education, Assembly
Grades	7-12 (Junior and Senior High School)
Year Constructed	1961
	renovated in 2001
Site	Entire Educational Complex - Approximately 94 Acres
Square Footage	389,000SF
Appraisal	$60,312,500

Assessment Narrative

Structure

Although a full structural review is not in the scope of this facility assessment, the team could observe that the building structure appears to reflect the standard construction of its era. We observed no obvious signs of subsurface settlement or cracking at the foundation level. During our review of the envelope, we observed two (2) areas exhibiting some movement of the exterior masonry. A likely cause could be environmental. Water infiltration can rust structural steel members and push outwards on the masonry cladding system. Both areas were at roof level where exposure to water is frequent. However, a structural engineer would need to review and make a qualified evaluation.

Recommendation

The facility, as it currently stands, is grandfathered from requiring any updates required to conform to the latest version of the International Existing Building Code (IEBC). However, as renovations and improvements are performed on the facility, the IEBC requires code upgrades on a sliding scale. The criteria are based on the extent of the work performed within the following three levels:

Level 1 – Minor repairs and roof replacements

Level 2 – Intermediate repairs, equipment and fixture kitchen replacement and some space alterations

Level 3 – Major repairs, with work being performed beyond 50% of the aggregate building area

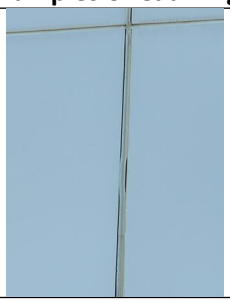
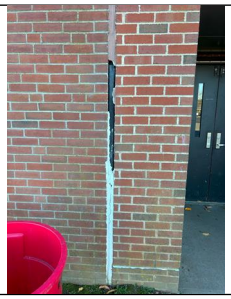
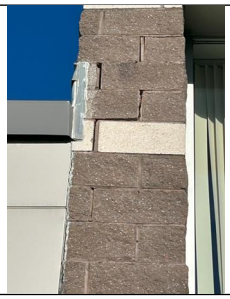
Exterior Façade

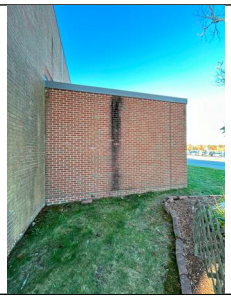
The exterior façade of the facility consists of a combination of brick, precast masonry, and metal panels. All materials are generally in sound condition. The caulking at masonry and metal panel, joints and window and louver openings is aged and exhibits cracking and movement in some areas. This will continue to develop as the caulking continues to age. The one area where movement of masonry units

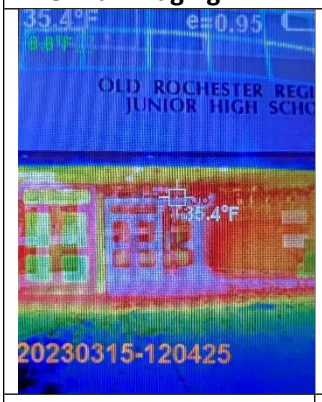
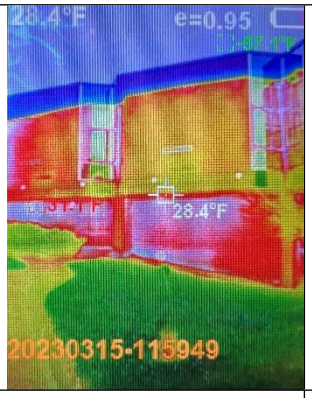
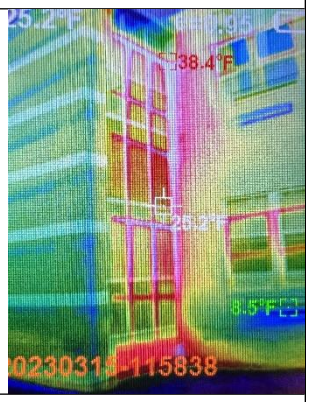
and mortar cracking was observed (Exhibit D below) is likely the result of a location specific issue (e.g., flashing failure at roof level change) rather than a systemic issue.

There are areas of mildew and staining around the building on each of the material types. In many cases it appears to be a result of overflow from the roof during or after precipitation events. In at least one such location, moss can be seen underneath the overflow which is indicative of the frequency of water overflow at that area. There are also possible indications of moisture infiltration on the interior surface of the exterior walls. Further investigation, including a dew point analysis would need to be performed to identify if this moisture is entering from the exterior or from moisture latent air condensing on the exterior walls.

The review team performed thermal imaging of the exterior envelope to help identify any deficiencies such as water infiltration, air leakage, and lack of insulation. The imaging identifies thermal anomalies where either water infiltration or unanticipated air leakage is occurring on the envelope system. The thermal imaging showed only minimal heat loss across the envelope.

Examples of Caulking, Joint Deterioration			
			
Example A Caulking at metal panel joint is separating and creating openings to the inner wall assembly	**Example B** Caulking at masonry opening perimeter is cracking and creating openings to the inner wall assembly	**Example C** Caulking at expansion joint has failed and is creating openings to the inner wall assembly	**Example D** Movement of masonry units suggests water infiltration at that location

Examples of Mildew, Staining			
			
Example A	**Example B**	**Example C**	**Example D**

Thermal Imaging			
			
Example A	**Example B**	**Example C**	**Example D**

Recommendation

Remove and replace caulking at all exterior joints, windows, and louvered openings. This will help preserve and extend the life of the exterior envelope by preventing water infiltration. Clean the mildew stains from the masonry with cyclic washing. Consider addressing the ponding issue near the roof edges to prevent overflow from running down and staining the facades.

Roof

The entire roof of both the junior and senior high school is a low slope, single-ply, roof membrane system. The roofing system is in good condition with no evidence of membrane damage and minimal signs of patching and repair work at both the flat areas as well as all flashing transition points. A large quantity of lichen was observed to be covering the roof membrane. During a site visit following a day of heavy rain, water collection was observed near the edges of the roof causing overflow onto the exterior walls. This appears to be causing the staining observed during the exterior façade inspection. Near the High School Auditorium, trees have overgrown onto the roof surface and causing abrasion and potential damage to the roof membrane.

Additionally, the Junior High Cafetorium Roof shows some evidence of leaking. Although the majority of the roof appears to be intact and professionally installed, there are a couple of areas where the roof transitions from the cafetorium into the main dwelling where roof leaks (we noted two) have occurred. There is evidence of water infiltration along the ceiling area and puddles form on the floor after a raining event. Repairs should be made as soon as possible.

Examples of Roof Conditions			
			
Example A Typical edge condition where a ridge in the roof surface prevents water from flowing towards internal drains.	**Example B** Continuous water overflow from roof edge onto the masonry below	**Example C** Tree branches have grown over the top of the roof and causing abrasion on the membrane.	**Example D** Presence of lichen across the roof membrane

Recommendation

The PVC roof membrane appears to be in fair condition. At just over 20 years of age, The District could expect up to another 10-20 years of life from this roof with proper maintenance including the following measures:

- *Fully cleaning the lichen observed across the PVC membrane*
- *Trimming back any overgrown trees that are now touching the PVC roof surface*
- *Consider addressing the ponding issue near the edges of the roof by reinstalling the tapered insulation to properly pitch to drain.*
- *Immediately repair the above described leaking issues at the Junior High School Cafetorium*

Windows

The 2001 renovation project included the installation of double pane, insulated glazing throughout. *Thermal imaging showed only minimal heat loss across the envelope. The large majority of these window units are in good condition with the exception of a few leaking seals as evidenced by the presence of moisture between the panes of glass.

**Note that the building was under negative pressure during the thermal scan which could impact the imaging results.*

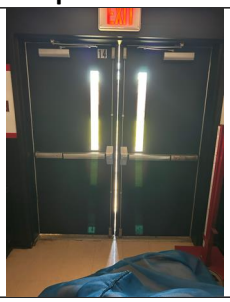
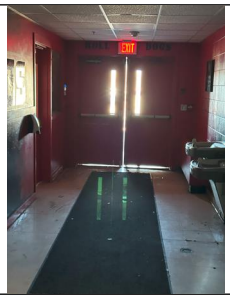
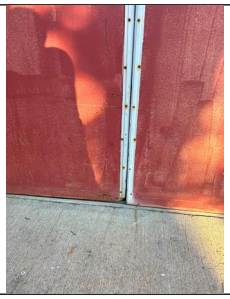
Recommendation

With all windows throughout the facility already being insulated double pane, there is no need for a wholesale upgrade. Leaking seals can be replaced on an individual, as needed basis as part of cyclic building maintenance.

Exterior Doors

The exterior hollow metal doors are exhibiting deterioration as evidenced by significant daylight coming through gaps around the panel edges, and noticeable rusting, particularly near the thresholds. Currently, this issue presents outdoor infiltration into the building, creating HVAC operation inefficiencies and thermal comfort issues. The issue is exacerbated by negative air pressure inside the building as noted in the review of the HVAC system below. The negative pressure continuously draws outdoor air into the building through openings in the exterior envelope such as the gaps at the exterior doors.

Further deterioration of the doors at the panel edges, jambs, and thresholds will ultimately result in the inability to properly open and close. This will create significant safety and security issues if doors cannot be properly opened for emergency egress and if intruders can access the interior through a door that does not fully close due to warpage.

Examples of Exterior Hollow Metal Door Deterioration			
			
Example A Exterior Hollow Metal Doors exhibiting substantial daylight between and underneath panels	**Example B** Exterior Hollow Metal Doors exhibiting substantial daylight between and underneath panels	**Example C** Exterior Hollow Metal Door exhibiting substantial daylight between panel and threshold	**Example D** Evidence of erosion at the bottom of exterior hollow metal doors

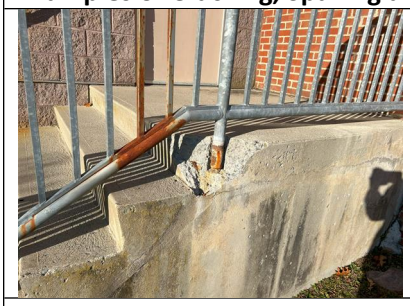
Recommendation

Replace all exterior hollow metal doors and frames and seal with weatherstripping at bottoms and jambs. This will help improve the building's energy efficiency and prevent future safety and security issues. There should also be some consideration of installing or creating air locks, double sets of doors, foyer entrances with cabinet heaters to help mitigate the energy losses when opening a highly used exterior door used for frequent access.

Refer to the below HVAC section for recommendations on addressing the negative air pressure issue.

Parking, Curbing, Exterior Walkways and Steps

There is some evidence of cracking, spalling and settlement at exterior concrete steps and walkways due to typical wear and tear and freeze/thaw cyclic expansion. The asphalt parking areas are beginning to deteriorate. Some areas are exhibiting signs of gross failure (i.e., “alligator” cracks) and this will continue to progress as the asphalt ages.

Examples of Cracking, Spalling and Settlement		
		
Example A Cracked/spalling concrete at exterior stairs outside of ORCTV	**Example B** Alligator cracking and potholes at drive aisle	**Example C** Concrete settlement causing a height differential and potential tripping hazard

Recommendation

The District should plan on mill and overlay upgrades to paved parking areas and repairs to asphalt curbing in certain areas. In addition, repairs and maintenance to exterior concrete steps and walkways will be necessary to maintain safe building access.

Athletic Fields

Our review found the existing conditions of the exterior athletic facilities to be well maintained. However, despite the best efforts of the grounds crew, the increasingly poor and unpredictable New England weather (e.g., Periods of either a lack of, or extreme rainfall) can cause great stress to turf, sometimes making for poor playing conditions. Over time, a lack of established turf may contribute to sloping and unevenness of the playing fields, a condition that was observed at some of the fields at this facility. Only the football and multipurpose fields currently have an irrigation system. The existing bleachers are in fair condition and feature ADA compliant access ramps. The existing baseball and softball fields do not have covered dugouts or spectator seating.

There are currently no outdoor ADA compliant restroom facilities. The building entrance closest to majority of the athletic fields at the north section of the property is over 300ft to the closest point of the fields. Thus, the travel distance for teachers, staff, students, and spectators from the athletic fields to the indoor restrooms exceeds the requirements set forth in CMR 248.

Recommendation

School athletic fields are an important asset to the community. When implemented, improvements can provide enhanced opportunities for use. As part of their long-term facilities plan, the district could consider making the following improvements:

- *New support buildings for restrooms and general storage accommodations.*
- *New energy efficient sports field lighting to expand the periods of field use.*
- *Install irrigations systems at the baseball, softball, and soccer fields to help maintain established turf*
- *Install accessible press box above football field bleachers*
- *Install covered dugouts and spectator seating for baseball and softball fields*
- *Re-level the grading at existing fields to address sloping and ensure proper drainage*

Building Interior

The finishes within the existing facility are generally in good condition and properly maintained.

Flooring:

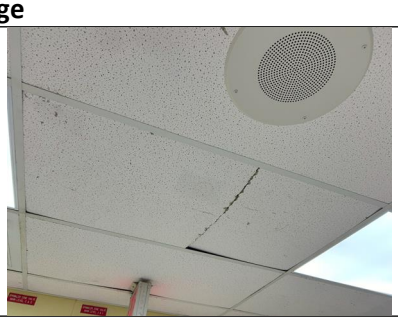
Much of the existing flooring is either VCT, carpeting or ceramic tile. The existing flooring is generally in good condition. There are some areas of worn, damaged or missing VCT and tile in heavy use areas like corridors, near door thresholds, and in the locker rooms.

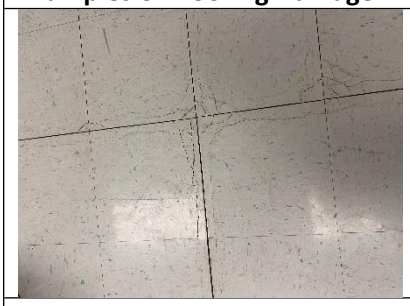
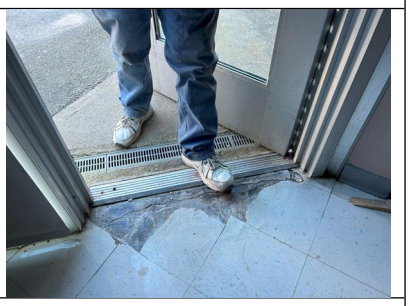
Walls:

The walls consist of either painted CMU or gypsum wall board. The wall surfaces are generally in good condition and require only cyclic washing and painting.

Ceilings:

The ceiling finishes vary from gypsum board in offices and certain rooms to 2'x4' acoustical ceiling tile (ACT) and grid system. The 2'x4' ACT grid system is generally in good condition, but there is some water staining and sagging on ceiling tiles throughout the building. Maintenance reports that much of the moisture staining is due to expansion and contraction of above ceiling piping during seasonal changes. Ongoing cyclic building maintenance will continue to include the replacement of damaged individual ceiling tiles.

Typical Examples of Ceiling Damage		
		
Example A	**Example B**	**Example C**

Examples of Flooring Damage		
		
Example A Cracking/lifting VCT in the Junior HS Art Classroom	**Example B** Missing tiles in the Boy's Locker Room	**Example C** Missing VCT from water damage at entrance to Junior HS cafetorium

Recommendation

The District should consider preparing for the replacement of large areas of flooring finishes as age, wear, and tear continue. Although not an immediate need, within 5+ years, some areas will require larger scale updating beyond regular patch/repair work. Similarly, the acoustical ceiling tile and grid system will only continue to wear as time goes on. Without a major renovation or new building project in the foreseeable future, The District may consider large scale replacement of ceiling systems to prevent the appearance of age and deterioration throughout the building.

Science Classrooms

HS Science Rooms 300, 301,302,303,304,305,308,309 – Combination of: fume hood issues (non-operational when tested), lack of master Emergency Power Off (EPO) solenoid switch to disable the natural gas supply piping feeding into the classrooms in the event of an emergency. There are currently manually operated ball valves under a protective cover with poor labeling in the classrooms but seem inadequate should a need arise to quickly cease gas flow discharge. There are also numerous classroom student access gas jets without protective covers. Several of the satellite storage cabinets lacked the required ventilation. We also observed that the science room casework and counters are generally aged and worn.

Science Classrooms		
		
Example A Fume hood – non-operational when tested	**Example B** Rusting acid storage cabinet will no longer close securely	**Example C** Science room casework in deteriorated condition

Recommendation

- *All fume hoods should be replaced with new.*
- *The lab gas delivery system should either have emergency shut off buttons installed, or if the school does not plan to use the gas going forward, the gas piping should be capped.*
- *The lab casework and countertops should eventually be replaced.*

Plumbing

Below are the issues observed related to the building's plumbing systems:

1. Domestic Hot Water (DHW) – this system is in serious need of repairs. Typically, there are three DHW supply temperatures, 140F dishwasher, 120F food area sinks, 110F hand wash sinks. We identified several locations where the DHW was at the wrong temperature or there was insufficient DHW. Upon inspection in the mechanical room, we noted that the piping system was in need of repairs. There was a recirculating pump missing. There was another pump valved off. Some lines had no thermometers and it appeared that some recent piping changes had been made. This DHW system impacts the cafeteria and kitchen prep areas. This is a code concern.
2. Kitchen floor drains – We were informed that some of the floor drains in the kitchen area are slow to drain despite having local plumbing contractors try to remedy the problem. The floors are cleaned daily, and this backed-up water is a concern. Some re-piping may be needed to address this issue.
3. PH Neutralization System – The installed system serves the science classroom spaces however, it does not appear to be operational or has been operational for quite some time. This unit should be serviced and repaired/replaced as the program requires.
4. PVI water heaters have served industry well, but new technology has shown that instantaneous or on-demand type water heaters with some storage capacity may be a better way to go. The two PVI gas fired water heaters were manufactured in September 2001 and are over 23 years old. There is a total of 1200 gallons of hot water storage capacity available. This amount of storage is no longer required. Given the issues with the DHW delivery piping and circulating

system identified in Category 1, Bullet #6, it may make sense to look at the entire system to ensure the correct decision is made going forward.

HVAC

A detailed inspection was done of all the mechanical equipment. Much of the major equipment is in urgent need of repairs and upgrades. Below are the issues observed during the inspection:

1. Building Automation System (BAS) upgrade – not to be confused with an Energy Management System (EMS), which we would consider as a required enhancement. An EMS enhancement would allow the Facilities Dept. to track "real-time" energy consumption and would allow better management of the energy expenses. This would include various submetering points and data trending/collection. With today's energy costs, we feel this is very important to consider implementing, especially given that much of the building has programmatic needs outside of the typical school day. For example: How much energy is being used or what's the actual cost to operate the gymnasium area of the building or the auditorium area after hours? As for the existing BAS, in our opinion, it's non-functioning as currently configured. The staff do a good job at trying to manage the system they have to work with but it's a "work-around" approach and not user friendly or accurate. The whole concept of using a BAS network is so that facilities personnel can rely on the graphic representation of the installed equipment and to capture the operational status of each piece of equipment as problems arise. When installed correctly, it is a very valuable tool for facilities staff to utilize to better understand what systems are currently working, are functioning correctly, providing accurate information to the end user, monitoring or trending environmental conditions, allowing for scheduling modifications and alerting the building operators of failed or non-working equipment. In our opinion, the current system is outdated, doesn't meet the intended objective, does not control the designated equipment nor provides accurate information. The graphic interface is problematic because it does not accurately reflect the installed system equipment so that good decision making can occur remotely. We found that the field condition did not reflect the graphic display. There is very little value in trying to operate a system that fails to provide accurate information. We recommend a complete upgrade of the software, controlling parameters and user interface (graphics). We also recommend someone who understands the operational nature of building alarms and failure priorities to assist in the wholesale upgrade of this system. Too many installations rely on technicians who only know their product line and not how the entire building system equipment is supposed to operate.
2. Rooftop HVAC Equipment – by our count there are twenty-eight (28) RTU's units installed on the roof area. These units provide the tempered fresh air to the many common areas of both the high school and junior high school. It's imperative that every one of these units be fully operational while the schools are occupied. We inspected everyone one of these units for operation. We identified nineteen (19) of these RTU's in the OFF mode with either the physical electric disconnect switch off at the unit or was commanded in the OFF mode by the BAS interface. That's sixty-eight (68) percent of the major ventilation equipment was not running while the school was fully occupied. This brings us back to bullet point #1, the BAS. Without a fully functioning BAS component, it is very difficult for the facilities group to know what's not working. We counted four (4) DX (direct expansion) AC units on the roof. The issue with these DX units is that they use R-22 refrigerant gas, which can longer be supported. These units need replacement as soon as possible. Given the age of this roof top equipment, it is our

recommendation that replacement is in order. Could The District get another three to five years out of the existing equipment? In our opinion, the answer is yes, but only if major maintenance work is initiated on every unit. This means that blower motors, dampers, controls, actuators, sensors, coils, and enclosures are addressed. If the repair and restoration of these units are desired, then a complete recommissioning and rebalancing of the system is also required. We also identified six out of the thirteen Air Handling Units (AHU's) through the BAS interface as not working. Just outside of the boiler mechanical room there is an AHU # 10 in Room 0417 that has no dielectric fittings on the coil piping, which has resulted in a rotted out coil section needing replacement soon. AHU # 13, which serves the boiler mechanical room also has a bad coil. These units should be operational when school is in session. Again, each unit must be serviced.

3. The school buildings are in a negative pressure boundary. What does this mean? It means that uncontrolled exterior outside air is being sucked into the high school and junior high because the building can be compared to being under a vacuum condition. Every window or leaky door allows ambient air into the building. If it's cold out, if it's humid out, if it's dusty out, it's all coming inside the building and should not be. The reason for this is the many classroom unit ventilators and roof top units are not working properly and the many, approximately ninety-one (91) exhaust fans are removing air from the building's interior space. However, by our count, over fifty percent of the exhaust fans were not operational. See next comment.
4. Exhaust Fans – according to the construction drawings there are approximately ninety-one (91) exhaust fans installed. These fans serve various areas of the building. We did not inspect all 91 fans, but we did inspect all of the units located on the main roof. The majority of the fans on the roof were not operational. Our previous comment regarding the RTU's would apply here as well. The District could easily get another three to five more years out of all of these exhaust fans if a comprehensive PM (Preventative Maintenance) was done on each unit.
5. Classroom Unit Ventilators (UV's) - The challenges we observed with the classrooms is that some of them had operable windows while some did not. Some classrooms had one or two operable windows, some had fewer, some more. The issue with the UV's is that it is imperative that every one of these units function as intended. Many were not operating as designed, which are interfaced with the local controls and BAS network. We inspected a sufficient number of classrooms to get a fairly good sampling of the overall condition. All of the UV's need attention. From damper operation to actuator movement to sensor calibration to overall coil condition. In order for the classrooms to meet IAQ requirements and space comfort set points, these UV's must be fully functional. Several rooms were cold on the day we visited (OA was at 32F) and several classrooms were too warm. Once again, a properly functioning BAS would alert the facilities staff of out-of-range conditions and they would not have to wait for an overheating or "too cold" complaint be submitted. It should be noted that CO2 detectors were installed in the classrooms, and some were in alarm due to the high concentration levels detected, which is indicative of the lack of required fresh air.
6. VFD Replacement for the Dual Temp and Condenser Water Pumps – Located in the "Electrical Generator Room" are the VFD's for the pumps listed. There are no VFD's for the condenser water pumps and we suggest considering the installation of them. Looking at the existing ABB VFD's, we are very surprised to see the improper installation of Danfoss retrofit attempts in restoring drive operations on some of the failed units. We are surprised they passed a regulatory inspection sign-off or if a permit was pulled for this amateur repair. Several of the drive access doors do not properly close exposing live conductors. In our opinion, this is a

safety concern and needs to be addressed right away. We recommend replacing all of the drives given the current condition. Some of the drives are not working. The conduit and cabling can remain and are in good condition.

7. Dual Temperature Pumps (8) and Condenser Water Pumps (3) - We considered placing these pumps in the 1-2 year category of need, however, there is no reason they cannot be replaced sooner because a couple of them are not operational now and the overall condition of the pumps and their connected isolation valves, balancing valves, expansion joint and flexible couplings are in need of replacement. Some of the electrical motors have been replaced upon failure but we believe there was at least one that was not operational. There is a total of eleven pumps.
8. Refrigeration Leak Detection Alarm – Mechanical Room – York Chiller – Safety Concern – A refrigeration leak detection system with horn / strobe alarm should be installed in this space with the required ventilation interconnections and notifications.
9. Junior High Cafetorium – Floor sweating causing slippery conditions. Even though this area is not air conditioned (mechanically cooled), the nature of the concrete slab-on-grade construction (low ground temperature) and the vinyl tile finished surface, poor exterior doors (2), outdoor roof top supply air ventilation to the space achieves dew point on many occasions at the floor surface when the ambient humidity is above 60% in the summer months resulting in large amounts of condensation being formed on the floor tile, which creates a hazardous slippery condition. Adding mechanical cooling to this space will ring out the OA moisture and lower the relative humidity of the supply air and reduce the formation of condensation. We would also recommend installing new exterior doors with some type of air lock to reduce the amount of uncontrolled air infiltration upon entering or exiting this space. We also noted the one of the exterior door thresholds is heaving quite badly because of the negative grade and the rain run-off towards the door from adjacent exterior walkway. This heaving is caused during the winter freeze. We would regrade the immediate area to correct this deficiency.
10. Two (2) 600 Ton Cooling Towers – Installed units are BAC but design specifications listed a comparably sized Marley unit. The current tower is approximately twenty years old and has reached its useful life expectancy. Much of the tower components need repairs / replacement and show signs of imminent failure. We would recommend considering budgeting for a new tower. Even with proper maintenance, these cooling towers seldom last more than twenty-five years without incurring serious repairs. On the other hand, the York centrifugal chiller appears to have been properly maintained and serviced and these units can last thirty years plus.
11. VAV Terminal Units – The drawings identify that there are seventy-three (73). We only inspected a small sample of these units. They are typical VAV boxes which require periodic inspection and maintenance for proper operation. These units need to be checked by using the BAS and inspecting damper operation as well as recommissioning the percentage of air flow volume being distributed to the space based upon the design requirements. We recommend a complete reinspection, rebalancing and PM completed on each box. These units can function and operate as required for several more years without issue.
12. Cleaver Brooks Hot Water Boilers (2) – Theses packaged firetube boilers are fueled with natural gas and appear to be maintained properly but we could not find any recent combustion efficiency tuning field reports. The boilers are twenty-three years old and have another twenty years of life “if” the water chemistry is performed as per manufacturer’s requirements. We did not see any water chemistry reports. The boilers were in operation. Upon inspection of the burner gas ring while in operation, it appeared that there were two (2)

questionable gas burner spuds (glowing yellow) on boiler # 2 at the seven o'clock position. This should be looked at. We also noted that the burner assemblies used the basic "jack shaft & modulating motor" combustion control system for burner operation. This approach is antiquated and newer exhaust gas analyzers should be considered being installed as an efficiency upgrade. There is a good chance the local utility company will incentivize the school to install this combustion upgrade. This new technology measures the flue gas byproduct constituents and "trims" the fuel/air ratio to precise increments ensuring optimum combustion efficiency so the heat transfer is occurring without excess air losses. The existing system uses metal linkages and pivot points which slacken up over time and are not accurate. This combustion upgrade will be an energy saver. We also noticed that on boiler #1 the Mitsubishi drive controlling the pump speed appears to have work being done and the electrical enclosure was opened up. This should be corrected.

13. York Chiller – This 1200 ton rated centrifugal chiller is approximately twenty-three years old and appears to have been factory maintained since installation. We were informed that routine service is conducted and that authorized service technicians perform the seasonal start-up and shutdown of the system. We were also informed that eddy current testing is conducted on the condenser water tubes, which is good. Typically, these chillers have a top-end overhaul performed every ten years (depending on model & manufacturer's recommendation) to inspect and change out seals and bearings. We were not informed if this work has been performed. We recommend reaching out to the manufacturer and determining what additional PM is required to ensure another ten (10) years of service life.

Recommendation

The following is the list of equipment that was reviewed and needs to be either repaired or replaced according to the above narrative and the categorization of priorities provided under the ***Breakdown of Tasks*** *section of this report. All recommendations assume proper ongoing maintenance programs including cosmetic improvements such as painting and preserving exterior items such as tower piping and gas piping.*

Equipment Needing Replacement	**Timeframe**
Domestic hot water recirculation pumps and mixing valves	ASAP
Refrigeration leak detection system	ASAP
Ph monitoring system for acid waste tank	ASAP
Honeywell BMS system, all controllers, damper and valve actuators, thermostats, temp sensors, control cabinets, etc.	ASAP
Liebert DX	ASAP
Three DX condensing units (R-22 refrigerant), 10, 20, and 40-ton units	ASAP
One 6-ton Liebert split DX system (R-22)	ASAP
89 belt drive exhaust fans	ASAP
Twenty-eight (28) McQuay RTUs, 6 are heat only, RTU-12, 20 tons DX cooling, RTU-19, 40 tons DX cooling and one is a make-up air for kitchen	ASAP
8 Dual temp pumps, 4 primary and 4 secondaries	ASAP
Thirteen (13) McQuay AHU's, AHU-1 is heat only, AHU-4 is DX cooling 10 tons	ASAP
Walk in Cooler and Freezer (Kitchen)	1-2 years

Two gas fired PVI water heaters	1-2 years
Fire suppression pump	1-2 years
Two 600-ton cooling towers	1-2 years
Seventy-three (73) VAV terminal boxes	1-2 years
Fire alarm panels upgrade	3-5 years
Three condenser water pumps	3-5 years
One 1200-ton centrifugal chiller	3-5 years
Two (gas fired cleaver brooks boilers (16,329 MBH each)	5-10 years

In addition, it is recommended that The District complete a building-wide HVAC recommissioning to ensure the proper functioning of all systems.

Electrical

Emergency Power – Generac 500 kW unit - It was not clear during our meeting with the school's administration as to the operational status or designation of this unit? Are the schools designated as a regional "shelter" for the local population in the event of a weather-related event? There was not a definitive answer offered. The reason this may warrant further scrutiny is that the existing emergency diesel generator is rated at 500-kW output. While a 500-kW rated electrical generator may seem adequate, the question that needs to be answered: Is there an agreed upon expectation that the school will offer full services (cooking, emergency shelter, etc.) if the local utility provider is unable to supply electrical power? What exactly will be powered by the generator within the schools should the local utility go down? The sizing output should be looked at to determine if it satisfies current and future expectations. During our inspection it was noted that the weather-tight enclosure for the diesel generator has failed in several locations. The cabinet access doors show signs of rot and allow for weather intrusion into the cabinet interior. There is a significant amount of rusted and wasted enclosure at the air intake location of the cabinet. We recommend that the manufacturer visit the site and offer an opinion as to the cost to replace and repair the existing enclosure. It is our opinion that if the current generator size is adequate for the school's need, then repair/replacement of the compromised weather enclosure should be completed instead of replacing the entire generator assembly. We are certain that the existing diesel engine and electric generator can and will last another ten to fifteen more years if routine maintenance and periodic load testing is performed. Also, the generator has a stand-alone belly diesel fuel tank, which will provide the needed fuel for a "period of time" (depending on load). Is there a firm contracted to re-supply the fuel in a timely manner when needed? Many of the questions raised regarding the emergency power capabilities and expectations may impact the existing electrical emergency power distribution wiring systems. The existing emergency electrical distribution bus, circuit breakers, panelboards and automatic transfer switches appeared to be in good shape and will last for the foreseeable future. We were informed that the system is tested weekly.

Our inspection of the electrical infrastructure identified no deficiencies that were apparent beyond the above-described emergency power system.

Equipment

1. Kitchen Walk-in Coolers (2) @ 37-degree F and Freezer Units (2) @ 5 degrees F – These units were operational but we identified several items needing attention. The door heaters did not

seem to be working. The door gaskets were in need of replacement. The refrigeration lines needed to be reinsulated. It appeared that some of the box diffuser fans were not moving air, which typically indicates a plugged coil. A comprehensive PM is required.

2. Kitchen Range Exhaust Hood - There were no cooking operations going on during our audit so we could not determine the operational functionality of the exhaust hoods. We tried to determine the type how the level exhaust air was controlled. We suspect it was a constant speed exhaust fan on manual control when cooking operations required air removal. New technologies are available which can monitor the level of opacity created by the smoke generated and therefore speed up the fan operation. There are also controls used that incorporate infrared sensors which detect the heat off the cooktop and increase exhaust airflow upon changes in measured temperature signatures. We recommend a more comprehensive study be considered to determine the level of cooking activity which will occur in the kitchen area in the near future. If the student population decreases and cooking is outsourced, then no additional improvements may be needed.

Fire Protection

The building is fully equipped with an automatic, multi-zone fire suppression system to provide full sprinkler coverage throughout the facility.

Fire Pump - We observed that PM is required on this pump assembly. Some of the valve packing gland stuffing boxes were leaking, piping insulation was missing, piping flange bolts were not the correct length, lots of corrosion on the entire pump and piping assembly. This all could be mitigated with some basic PM.

Fire Alarm

The fire alarm panel is a Gamewell addressable panel. This fire alarm system is original to the building which makes it in excess of 20 years old. The panel is functioning, but repeated troubles are a common occurrence. The serviceability of this system based on its age is troublesome because major parts are not always available. If a major renovation were to occur, our recommendation would be for a full system replacement. This would include the following scope:

- Allow for addressable devices incl. Addressable photoelectric
- smoke detectors, Addressable monitor modules,
- Addressable duct smoke detectors with remote indicator,
- Addressable relay modules, Fire alarm remote annunciator,
- Remote power supply units for visual device power. Etc.

Building Security

The existing facility has many exterior doors that present a potential security risk. The following is a general architectural and procedural recommendation related to the building perimeter:

Doors scheduled as entry doors (e.g., main office entry, gymnasium, auditorium) should be controlled by a proximity card reader, electric lock, request to exit switch, door to be monitored by the school's video surveillance system.

Only during parent and bus drop off should certain doors remain unsecure. At these times, staff would be positioned at doors for supervision. Outside of these times, under no circumstances should doors be unsecure or propped open. Either of these events should trigger an alarm on the access control system for staff review.

All exterior doors not used for normal entry, but for emergency egress only, should be equipped with hardware on the interior side only unless specifically requested by local authorities. All doors should include doors closers. Alarms should be generated for unauthorized access.

Doors with access into the school should be marked in numerical order based on the clock position method, starting with the main entry as number one.

For public use after school hours, it is recommended that access be limited to only designated public zones, (e.g., auditoriums and gymnasiums) while non-public, classroom areas are securely locked.

Note: When replacing the main entry door storefront systems, The District should consider incorporating forced-entry resistant laminated glass composite in place of regular glass.

Accessibility

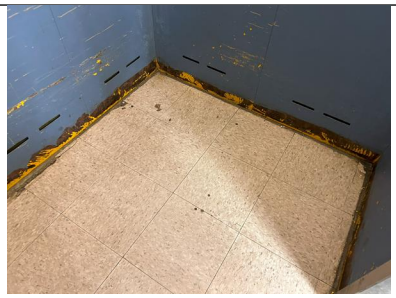
The facility's full renovation in 2001 featured upgrades to comply with the Massachusetts Architectural Access Board (MAAB) and the Americans with Disabilities Act (ADA), first implemented in 1990. This inspection did not observe any major accessibility issues or hazardous conditions. However, as ADA periodically undergoes revisions, it should be noted that full handicap accessibility per the latest version of ADA is required once any new renovation/repair project costs reach the 30% threshold of the value of the building. With the current building assessment being $60 million, full compliance with the latest version of ADA would be required when any new renovation/repair project costs exceed $20 million. Multi-phased construction projects are calculated over a three-year period.

Elevators

The facility has three (3) total passenger elevators, two (2) are located in the high school and one (1) is in the junior high school. The main passenger elevator services all four (4) levels of the facility, meets MAAB and ADA requirements, and its interior cab dimensions can accommodate a stretcher. The second passenger elevator in the high school complies with the minimum MAAB requirements for an existing elevator. The elevator in the junior high school may be original to the building (predating the 2001 renovation). It lacks ADA/MAAB compliant dimensions and signage. The audible signal is malfunctioning, and not providing the appropriate sounding, (i.e., once for up and twice for down direction). The elevator cab was observed to be very cold from exposure to outdoor air. Thus, indicating there is no functioning heating system, and there is potentially significant air leakage in the shaft and headhouse. This can further exacerbate the negative pressure issue previously described in the HVAC section of this report.

Recommendation

If a major renovation were to occur, The District may consider upgrading/replacing the Junior High School Elevator, signage, and well as repair any damage/openings in elevator shaft and headhouse to prevent outdoor air infiltration.

Elevators		
		
Example A JHS elevator does not meet all current ADA/MAAB requirements	**Example B** JHS elevator cab's interior is aged and beyond its useful life.	**Example C** The main passenger elevator cab finishes are near the end of their serviceable life

Hazardous Materials

The school has been fully abated and there are no hazardous materials issues to address.

Code Compliance

The 2001 building renovation of the Junior and Senior High Schools was constructed in compliance with the building codes in effect at the time. Since the primary purpose of the building has not been modified, the facility is grandfathered to the previous codes. However, as renovations are implemented those modifications need to comply with the current codes and standards.

Additionally in accordance with the Massachusetts supplements to the International Existing Building Code (IEBC) renovations and improvements to existing buildings are classified in one of three different levels, each level has different requirements for bringing up the facility to current standards, specifically relating to structural upgrades, energy improvements and fire protection system.

Current applicable codes:

Code Type	Applicable Code (Model Code Basis)
Building	*780 CMR: Massachusetts State Building Code, 9th Edition[A] Amended 2015 International Building Code (IBC) Amended 2015 International Existing Building Code (IEBC)
Fire Prevention	527 CMR: Massachusetts Fire Prevention Regulations M.G.L. Chapter 148 Section 26G – Sprinkler Protection
Accessibility	521 CMR: Massachusetts Architectural Access Board Regulations 2010 ADA Standards

Electrical	527 CMR 12.00: Massachusetts Electrical Code Amended 2020 National Electrical Code
Elevators	524 CMR: Massachusetts Elevator Code Amended ASME A17.1-2013/CSA B44-13
Mechanical	2015 International Mechanical Code (IMC)
Plumbing	248 CMR: Massachusetts Plumbing Code
Energy Conservation	2018 International Energy Conservation Code (IECC)

*Note the state is in the process of adopting the 10th Edition of 780 CMR which will adopt the 2021 International Codes with amendments. A specific effective date has yet to be determined, but it is expected to take effect in 2024. For this existing building there aren't any code changes that would significantly impact this building.

Recommendation

Based on the existing conditions, the facility as it currently stands is grandfathered from requiring building code improvements. However, as renovations and improvements are performed on the facility, the International Existing Building Code (IEBC) requires code upgrade on a sliding scale.

Glossary of Acronyms and Terms

ADA	Americans with Disabilities Act
ACMs	Asbestos Containing Materials
MAAB	Massachusetts Architectural Access Board
IEBC	International Existing Building Code
OPM	Owner's Project Manager
MSBA	Massachusetts School Building Authority
EPDM	Ethylene Propylene Diene Monomer
PVC	Polyvinyl-Chloride
VCT	Vinyl Composition Tile
CMU	Concrete Masonry Unit
DX	Direct Expanse
VAV	Variable Air Volume
H&V	Heating and Ventilation
PCB	Polychlorinated Biphenyls