Medford Public Schools
489 Winthrop Street, Medford, Massachusetts 02155 Dr. Marice Edouard-Vincent, Superintendent of Schools

April 13, 2023

Massachusetts School Building Authority
% Statement of Interest/Core Program
40 Broad Street, Suite 500
Boston, MA 02109

Re: Statement of Interest - Medford High School - Core Program

To Whom it May Concern:

During the spring of 2022, in anticipation of submitting a Statement of Interest (SOI) for the MSBA's Core Program on behalf of Medford High School (MHS), the Medford Public Schools (MPS) retained the services of CREF, a real estate & facilities firm based in Boston, MA, with extensive experience in school construction. CREF and its partner agency Environmental Health & Engineering, Inc., based out of Newton, completed a joint environmental and facilities condition assessment of MHS. Based on the positive feedback we received in response to that SOI last year, and given the consistency and growing accumulation of the infrastructure-related challenges that we continue to face with our flagship school, we have again relied heavily on that report as well as our own analysis to provide thorough responses to the components of this 2023 SOI application.

This year's SOI was electronically submitted on April 13, 2023. The information derived from the aforementioned report is generally referenced in our SOI as the "CREF report." The CREF report is again attached hereto as an appendix to this SOI on the basis that its conclusions and assessments are consistent with the conclusions that MPS had reached in deciding to submit this latest SOI on behalf of our flagship school. Where appropriate, we have made note of the specific aspects of MHS's deteriorating infrastructure that have worsened in the course of the last year:

- While these challenges have been persistent over an extended period of time, the volume and urgency of the challenges have grown exponentially since the Medford Public Schools submitted its previous Statement of Interest and participated in the MSBA's senior study visit in October of 2022. This year three separate hallways have been forced to be shut down due to the detection of abnormal and potentially dangerous levels of asbestos attributable to broken floor panels.

- Despite the winter of 2022-2023 being relatively mild, the school's pattern of burst pipes has worsened with multiple major failures resulting in the flooding and forced closures of classrooms with costly and expedited repair projects again a near constant phenomenon. During the current school year alone, multiple vocational programs have seen major disruptions to their instructional sequencing due to significant leaks in their lab or shop

areas. Further, multiple guidance offices have been forced to temporarily relocate due to the persistence of the leaking during inclement weather.

- On multiple occasions during the first half of the 2022 - 2023 school year, school administrators and public safety officials were forced to respond to in-school emergencies for which the school's cavernous scale and deficient technologies posted obstacles both with respect to immediate response and subsequent investigatory steps. These incidents, which ranged from medical emergencies to two well-documented physical altercations between students, have laid bare the inherent safety and security deficiencies of Medford High School, as well as the detrimental effect the building has on the school's culture.

As we noted in the final notation box of the SOI, the Medford Public Schools are deeply grateful to the MSBA for the opportunity to be considered for the Core Program. If there is any additional information we can provide, please contact me at 781–393-2442.

Thank you again; we look forward to hearing from you.

Sincerely Yours,

Dr. Marice Edouard-Vincent,
Superintendent

Massachusetts School Building Authority

Next Steps to Finalize Submission of your FY 2023 Statement of Interest

Thank you for submitting an FY 2023 Statement of Interest (SOI) to the MSBA electronically. **Please note, the District's submission is not yet complete if the District selected statutory priority 1 or priority 3**. If either of these priorities were selected, the District is required to mail the required supporting documentation to the MSBA, which is described below.

ADDITIONAL DOCUMENTATION FOR SOI STATUTORY PRIORITIES #1 AND #3: If a District selects Statutory priority #1 and/or priority #3, the District is required to submit additional documentation with its SOI.

- If a District selects statutory priority #1, Replacement or renovation of a building which is structurally unsound or otherwise in a condition seriously jeopardizing the health and safety of the school children, where no alternative exists, the MSBA requires a hard copy of the engineering or other report detailing the nature and severity of the problem and a written professional opinion of how imminent the system failure is likely to manifest itself. The District also must submit photographs of the problematic building area or system to the MSBA.
- If a District selects statutory priority #3, Prevention of a loss of accreditation, the SOI will not be considered complete unless and until a summary of the accreditation report focused on the deficiency as stated in this SOI is provided.

ADDITIONAL INFORMATION: In addition to the information required above, the District may also provide any reports, pictures, or other information they feel will give the MSBA a better understanding of the issues identified at a facility.

If you have any questions about the SOI process please contact the MSBA at 617-720-4466 or SOI@massschoolbuildings.org.

Massachusetts School Building Authority

School District Medford

District Contact David G Murphy TEL: (781) 393-2100

Name of School Medford High

Submission Date 4/13/2023

SOI CERTIFICATION

To be eligible to submit a Statement of Interest (SOI), a district must certify the following:

- [x] The district hereby acknowledges and agrees that this SOI is NOT an application for funding and that submission of this SOI in no way commits the MSBA to accept an application, approve an application, provide a grant or any other type of funding, or places any other obligation on the MSBA.
- [x] The district hereby acknowledges that no district shall have any entitlement to funds from the MSBA, pursuant to M.G.L. c. 70B or the provisions of 963 CMR 2.00.
- [x] The district hereby acknowledges that the provisions of 963 CMR 2.00 shall apply to the district and all projects for which the district is seeking and/or receiving funds for any portion of a municipally-owned or regionally-owned school facility from the MSBA pursuant to M.G.L. c. 70B.
- [x] The district hereby acknowledges that this SOI is for one existing municipally-owned or regionally-owned public school facility in the district that is currently used or will be used to educate public PreK-12 students and that the facility for which the SOI is being submitted does not serve a solely early childhood or Pre-K student population.
- [x] Prior to the submission of the SOI, the district will schedule and hold a meeting at which the School Committee will vote, using the specific language contained in the "Vote" tab, to authorize the submission of this SOI. This is required for cities, towns, and regional school districts.
- [x] Prior to the submission of the SOI, the district will schedule and hold a meeting at which the City Council/Board of Aldermen or Board of Selectmen/equivalent governing body will vote, using the specific language contained in the "Vote" tab, to authorize the submission of this SOI. This is not required for regional school districts.
- [x] The district hereby acknowledges that current vote documentation is required for all SOI submissions. The district will use the MSBA's vote template and the required votes will specifically reference the school name and the priorities for which the SOI is being submitted.
- [x] The district hereby acknowledges that it must upload all required vote documentation on the “Vote” tab, in the format required by the MSBA. All votes must be certified or signed and on city, town or district letterhead.
- [x] The district hereby acknowledges that this SOI submission will not be complete until the MSBA has received all required supporting documentation for statutory priority 1 and statutory priority 3. If statutory priority 1 is selected, your SOI will not be considered complete unless and until you provide the required engineering (or other) report, a professional opinion regarding the problem, and photographs of the problematic area or system. If statutory priority 3 is selected, your SOI will not be considered complete unless and until you provide a summary of the accreditation report focused on the deficiency as stated in this SOI. The documentation noted above must be post-marked and submitted to the MSBA by the Core Program SOI filing period closure date.

LOCAL CHIEF EXECUTIVE OFFICER/DISTRICT SUPERINTENDENT/SCHOOL COMMITTEE CHAIR (E.g., Mayor, Town Manager, Board of Selectmen)

Chief Executive Officer *	**School Committee Chair**	**Superintendent of Schools**
Breanna Lungo-Koehn	Breanna Lungo-Koehn	Marice Edouard-Vincent
Mayor		
		
(signature)	(signature)	(signature)
Date	Date	Date
4/13/2023 7:12:52 PM	4/13/2023 7:13:50 PM	4/13/2023 8:47:47 PM

* Local chief executive officer: In a city or town with a manager form of government, the manager of the municipality; in other cities, the mayor; and in other towns, the board of selectmen unless, in a city or town, some other municipal office is designated to the chief executive office under the provisions of a local charter. Please note, in districts where the Superintendent is also the Local Chief Executive Officer, it is required for the same person to sign the Statement of Interest Certifications twice.

Massachusetts School Building Authority

School District Medford

District Contact David G Murphy TEL: (781) 393-2100

Name of School Medford High

Submission Date 4/13/2023

Note

MPS is grateful to MSBA for the opportunity to submit this Statement of Interest. Much of the information provided in this year's SOI is similar, except that the educational and financial implications of our flagship school's infrastructure is imposing increasing challenges to our ability to effective serve the interests of Medford students.

While these challenges have been persistent over an extended period of time, the volume and urgency of the challenges have grown exponentially since the Medford Public Schools submitted its previous Statement of Interest and participated in the MSBA's senior study visit in October of 2022.

This year three separate hallways have been forced to be shut down due to the detection of abnormal and potentially dangerous levels of asbestos attributable to broken floor panels.

Despite the winter of 2022-2023 being relatively mild, the school's pattern of burst pipes has worsened with multiple major failures resulting in the flooding and forced closures of classrooms with costly and expedited repair projects again a near constant phenomenon. During the current school year alone, multiple vocational programs have seen major disruptions to their instructional sequencing due to significant leaks in their lab or shop areas. Further, multiple guidance offices have been forced to temporarily relocate due to the persistence of the leaking during inclement weather.

On multiple occasions during the first half of the 2022 - 2023 school year, school administrators and public safety officials were forced to respond to in-school emergencies for which the school's cavernous scale and deficient technologies posted obstacles both with respect to immediate response and subsequent investigatory steps. These incidents, which ranged from medical emergencies to two well-documented physical altercations between students, have laid bare the inherent safety and security deficiencies of Medford High School, as well as the detrimental effect the building has on the school's culture.

Again, thank you again for your consideration.

The following Priorities have been included in the Statement of Interest:

1. ☐ Replacement or renovation of a building which is structurally unsound or otherwise in a condition seriously jeopardizing the health and safety of school children, where no alternative exists.
2. ☐ Elimination of existing severe overcrowding.
3. ☐ Prevention of the loss of accreditation.
4. ☐ Prevention of severe overcrowding expected to result from increased enrollments.
5. ☑ Replacement, renovation or modernization of school facility systems, such as roofs, windows, boilers, heating and ventilation systems, to increase energy conservation and decrease energy related costs in a school facility.
6. ☐ Short term enrollment growth.
7. ☑ Replacement of or addition to obsolete buildings in order to provide for a full range of programs consistent with state and approved local requirements.
8. ☐ Transition from court-ordered and approved racial balance school districts to walk-to, so-called, or other school districts.

SOI Vote Requirement

☑ I acknowledge that I have reviewed the MSBA's vote requirements for submitting an SOI, which are set forth in the Vote Tab of this SOI. I understand that the MSBA requires votes from specific parties/governing bodies, in a specific format using the language provided by the MSBA. Further, I understand that the MSBA requires certified and signed vote documentation to be submitted with the SOI. I acknowledge that my SOI will not be considered complete and, therefore, will not be reviewed by the MSBA unless the required accompanying vote documentation is submitted to the satisfaction of the MSBA. All SOI vote documentation must be uploaded on the Vote Tab.

SOI Program: Core
Potential Project Scope: Potential New School
Is this a Potential Consolidation? No

Is this SOI the District Priority SOI? Yes
School name of the District Priority SOI: 2023 Medford High

Is this part of a larger facilities plan? Yes

If "YES", please provide the following:

Facilities Plan Date: 2/24/2021
Planning Firm: Collins Center
Please provide a brief summary of the plan including its goals and how the school facility that is the subject of this SOI fits into that plan:

As noted in the Medford Public Schools previous SOI submission, new construction or a substantial building rehabilitation of MHS is a key component of the capital improvement plan and overall commitment to facilities planning that Mayor Breanna Lungo-Koehn released in February of 2021.

In partnership with the Collins Center at UMASS Boston, Mayor Lungo-Koehn unveiled an extensive review and implementation process by which all city facilities and capital assets are being examined and prioritized accordingly with respect to infrastructure improvements. Addressing the deteriorating infrastructure of MHS is also consistent with the maintenance and capital planning exercises performed by the Medford School Committee over the last several years. In these exercises, MHS represents a concentration of prospective costs and critical priorities that exceeds all other school facilities in the district.

At close to 600,000 square feet, MHS represents by far the largest and most complex facility in the city's portfolio, and with the exception of one building housing a small alternative high school program, it is the only school in MPS that was not part of an extensive school construction initiative that took place in the late 1990s and early 2000s. During that time, the City of Medford, in partnership with the Massachusetts School

Building Assistance Program, completed the construction of five state-of-the-art (at the time) school facilities housing six schools (three K-5s, one 6-8, and one K-5 and 6-8 that are housed in one building). As experienced by many other communities, Medford's largest school, MHS, was not addressed at that time. However, two decades later, MPS is eager to recapitalize its commitment to the students and residents of Medford through high-quality and reliable school infrastructure that is both conducive to and imperative for 21st century learning.

Annual discrepancies between essential maintenance and available funding have created a vicious cycle in which emergency plumbing and heating repairs alone have averaged between $60,000 and $100,000 and are being addressed on an ad hoc basis based on allocations from the municipal government's free cash. Despite the mayor and school committee's shared desire to establish a systemized process of capital planning, the operational implications necessitated by the building's deteriorating infrastructure have proven to be both too unpredictable to fully plan for and too steadily urgent to ignore.

These challenges were particularly pronounced over the course of the last year since the district's previous SOI was submitted. Multiple hallways have been forced into closure in order for emergency abatement work to be performed due unusual levels of asbestos being detected from panels being dislodged. This along with the well-documented history of burst pipes and electrical problems have only increased the urgency underlying the facilities master planning that the mayor's work with the Collins Center was intended to mitigate.

In addition to applicable federal and state code requirements (e.g., 521 CMR), the City of Medford has published a Climate Action and Adaptation Plan to which all future municipal projects are expected to adhere. The potential "domino effect" of standards that could not have been contemplated when the building was built in the late 1960s (e.g.,fire alarm and sprinkler installation in 90% of the building or hazardous material abatement) give rise to significant concerns around the cost of renovations and repairs. All of these are current factors in the city and district's deliberations over how to address the MHS situation, which are by far the most complicated and consequential of the Medford community's capital asset challenges.

Please provide the current student to teacher ratios at the school facility that is the subject of this SOI: 13 students per teacher

Please provide the originally planned student to teacher ratios at the school facility that is the subject of this SOI: 20 students per teacher

Does the District have a Master Educational Plan that includes facility goals for this building and all school buildings in District? No

Does the District have related report(s)/document(s) that detail its facilities, student configurations at each facility, and District operational budget information, both current and proposed? No

If "NO", please note that:
If, based on the SOI review process, a facility rises to the level of need and urgency and is invited into the Eligibility Period, the District will need to provide to the MSBA a detailed Educational Plan for not only that facility, but all facilities in the District in order to move forward in the MSBA's school building construction process.

Is there overcrowding at the school facility? Yes

If "YES", please describe in detail, including specific examples of the overcrowding.

Medford High School's enrollment in Ch. 74 vocational programming has increased dramatically since the merger of the two schools in 2017, rising from 22% of eligible students in school year 2017 - 2018 to over 45% of eligible students in school year 2022 - 2023. While MPS takes immense pride in exponential growth of these innovative educational offerings, it is posing a threefold challenge with respect to overcrowding:

(1) First, several programs, including but not limited to Electrical and Health Assisting, are being forced to restrict the number of available seats in their programs due to spatial limitations. Programs like these that need specialized

shop or lab space for students to have meaningful experiential learning are unable to benefit from space that is inefficiently repurposed. This has the potential to diminish the quality and the quantity of vocational offerings MHS can afford students, which has a compounding and negative impact on the overall educational culture the district aspires to establish.

(2) All career and technical educational offerings require related learning spaces to effectuate educational objectives. This includes classroom type settings for CTE instructors to convene their students and engage in thoughtful and penetrating dialogue in addition to shop and lab space. While the vocational wing of MHS was constructed originally as its own vocational school and therefore in some instances provides appropriate shop and lab square footage, the layout of the facility is wanting with respect to companion classroom space. This has resulted in programs (including but not limited to Biotechnology, Carpentry, and Culinary) lacking in this essential element in their students' learning environments.

(3) In addition to the district's inability to provide seats in existing programs commensurate with the level of interest, an analysis by the Metro North Workforce Board has urged the consideration of the development of additional Ch. 74 programs (including but not limited to Plumbing, Animal Science, Dental Assisting, and Information Support Services/Networking). Given the exploding popularity of the school's existing programs, and the interest being expressed in these and other prospective programs, there is a compelling basis to consider the development and adoption of additional programs in environments that are well situated for students to gain proficiency in these workforce-sustaining educational pathways.

Unfortunately, while there is a significant amount of underutilized square footage throughout MHS, the classroom/lab/shop space that could potentially be utilized through the expanded CTE programming and development of these types of programs does not exist. MHS has effectively reached its spatial capacity with respect to vocational programming just as the eagerness on the part of students to explore and participate in these programs has been growing. This is part of why MPS is so eager to explore changes to the infrastructure in which MHS is housed so that the structure of the building itself does not prove too rigid to allow for the appropriate and responsible expansion of educational opportunities for students.

Since the spring 2022 SOI was submitted, MPS has continued to examine how to grow and strengthen the district's award-winning career and technical educational programming. More efficient space and more modern infrastructure is a crucial determinant in that analysis.

Has the district had any recent teacher layoffs or reductions? No

If "YES", how many teaching positions were affected? 0
At which schools in the district?
Please describe the types of teacher positions that were eliminated (e.g., art, math, science, physical education, etc.).

Has the district had any recent staff layoffs or reductions? No

If "YES", how many staff positions were affected? 0
At which schools in the district?
Please describe the types of staff positions that were eliminated (e.g., guidance, administrative, maintenance, etc.).

Please provide a description of the program modifications as a consequence of these teacher and/or staff reductions, including the impact on district class sizes and curriculum.

Does not apply

Please provide a description of the local budget approval process for a potential capital project with theMSBA. Include schedule information (i.e. Town Meeting dates, city council/town council meetings dates, regional school committee meeting dates). Provide, if applicable, the District's most recent budget approval process that resulted in a budget reduction and the impact of the reduction to the school district (staff reductions, discontinued programs, consolidation of facilities).

The annual MPS budgeting process continually includes significant gaps in maintenance and repairs funding due to infrastructure demands of MHS taxing the district's operating budget well beyond any capacity that could be sustained. Emergency repairs to heating and plumbing systems average $60,000 - $100,000 per project. Capital repair projects are determined by Municipal Government based on the availability of Free Cash once that is certified, but that has led to fluctuating capacity and untenable uncertainty with respect to the district's capital planning. Ultimately the volume and scope of the maintenance and repairs necessary to keep the 50+ year old facility operating has proven increasingly unsustainable. This has continued to be true in the winter of 2022-2023 despite relatively mild temperatures.

General Description

BRIEF BUILDING HISTORY: Please provide a detailed description of when the original building was built, and the date(s) and project scopes(s) of any additions and renovations (maximum of 5000 characters).

The Medford High School and Medford Vocational Technical High School complex was constructed during the late 1960s and opened in the fall of 1970. From its opening until 2017 it housed two distinct schools, Medford High School and Medford Vocational Technical High School. In 2017 the Medford School Committee voted to merge the two schools into one comprehensive high school. But despite the forward-looking vision aimed at establishing one flagship school to serve as the epicenter of public education for the Medford community, the facility is designed for the delivery of instruction in a bygone era, namely the early 1970s. The challenges yielded by its antiquated design have been exacerbated with increasing severity by infrastructure that ranges from deteriorating to inoperable. MPS envisions Medford High School as a comprehensive high school with a broad array of academic programming and a host of vocational educational programs sanctioned under M.G.L. Ch. 74. But the 52-year-old facility housing MHS is an obstacle to optimal learning conditions.

To fulfill the educational objectives of the schools' merger, MPS is again submitting an SOI to the Massachusetts School Building Authority's (MSBA) Core Program to explore all avenues toward ensuring the infrastructure of the district's flagship school meets the instructional and operational needs of our students. The current infrastructure has frustrated efforts to merge the two schools, and increasingly, the facility itself is an impediment to executing the school's mission to afford students an engaging, meaningful and rigorous 21st century learning experience.

The facility's deteriorating infrastructure and inherent spatial challenges pose unnecessary barriers to the high-caliber educational experience that is achievable based on the school's commitment to a comprehensive secondary education for all students. As detailed elsewhere in this SOI, the poor condition of the facility casts liens on education as manifested in wildly fluctuating temperatures, variable air quality, and frequent disruptions to learning caused by malfunctioning, inoperative or inadequate infrastructure. Overall, the current MHS facility is continuing to detract from the quality of the education students are receiving and is serving as a detriment to the school's culture and climate.

In 2013 and 2014, MPS partnered with the MSBA to extensively renovate one floor of one wing of MHS. The renovated portion of the school includes 17 labs and classrooms constituting what is referred to throughout this SOI as "the science wing" or "science area." As noted throughout this SOI, the science area of MHS is the exception rather than the rule with regard to the functionality of its infrastructure and its overall conduciveness to high-caliber instruction.

As detailed elsewhere in this SOI, other renovations to the original facility have generally been limited only to a new EPDM roof in 1990 and boiler installations in 2008 and 2014.

The goal of a potential Core Program project through a partnership with MSBA would be to eliminate the near constant distractions that the facility is causing and to establish a more optimal 21st century learning environment that positions all MHS students to thrive during their secondary schooling years and in their post-secondary lives.

Since the district's previous submission, no renovations or repairs have occurred beyond the emergency repairs necessitated by abnormal levels of asbestos and multiple burst pipes that are referenced elsewhere in this year's SOI.

TOTAL BUILDING SQUARE FOOTAGE: Please provide the original building square footage PLUS the square footage of any additions.

570000

SITE DESCRIPTION: Please provide a detailed description of the current site and any known existing conditions that would impact a potential project at the site. Please note whether there are any other buildings, public or private, that share this current site with the school facility. What is the use(s) of this building(s)? (maximum of 5000 characters).

The campus of MHS does not share public or private space that would affect a potential project.

ADDRESS OF FACILITY: Please type address, including number, street name and city/town, if available, or describe the location of the site. (Maximum of 300 characters)

489 Winthrop Street
Medford, MA 02155

BUILDING ENVELOPE: Please provide a detailed description of the building envelope, types of construction materials used, and any known problems or existing conditions (maximum of 5000 characters).

Exterior and Envelope: The design of the MHS was conducted in accordance with the Commonwealth's "Structural Regulations of School Houses." It is a three-story, reinforced concrete structure with multiple low-slope roofs. The foundation construction consists of conventional concrete spread footings to support structural columns. The site walkways around the perimeter of the facility are beyond their useful life expectancy and have been determined to pose potential safety and accessibility challenges, specifically on the west elevation.

The school's envelope components are past their useful life and in need of replacement for both performance and aesthetic reasons. The existing single-pane operable, fixed windows and translucent fiberglass panels all fail to meet contemporary energy efficiency and security standards.

The roofing is antiquated and lacks proper insulation and sustainability elements in addition to opportunities for natural light. It further lacks appropriate protection against rainwater or the capacity to incorporate systems for grey-water use. This is one of several examples of how the facility lacks basic systems intended to maximize efficiency and is so antiquated that an attempt to incorporate modern technology aimed at increasing efficiencies would be untenable.

MHS is separated into quadrants (A, B, G, and H) by a ¾" wide expansion joint system. The flexible sealant used in the original construction has been presumed to contain hazardous materials, complicating any efforts toward improvement or replacement.

The building was found in the CREF report to most likely contain significant quantities of hazardous materials with an abatement or mitigation cost to exceed $10,000,000, not including replacement materials, labor or management fees. In addition, the CREF report found the building's energy utilization benchmarks to be alarmingly high with the building's 2021 EUI of 86.0 kBtu/ft2, or 77% higher than the national average of 48.5 kBtu/ft2 for K-12 schools as reported by CBECS. For MHS to meet Mass Save's energy efficiency target for Zero-Net Energy Buildings of 25 kBtu/ft2, energy intensity would have to be reduced by over 70%.

The exterior of the building superstructure consists of primarily reinforced concrete panels, brick veneer, and mechanically fastened concrete fins. The superstructure has not been significantly improved and was constructed with the original building in 1970-71.

The original exterior concrete wall assembly and fenestration has several punched openings for windows, doors, and vents. Unit ventilator supply and exhaust louvers populate all classroom locations throughout the facility, but experience frequent malfunctions, and many instances, have not been in working order for some time. The sealants around all original openings are in poor condition and failing in most locations.

All exterior assembly intersections (masonry to concrete in most cases) include similar exterior joint sealants original to the building's construction. The caulking at these typical locations are failing and are beyond their

useful life expectancy.

Door openings are enclosed by a mixture of metal door and doorframe assemblies and are sealed with exterior caulking of various types. Most of the openings in the building exterior date to original construction and there are no proximity card readers of any kind. All exterior and interior doors are locked manually by key, reflecting an obsolete system that is both economically inefficient and suboptimal from a security perspective.

At the auditorium, pool and areas surrounding the vocational programs, the exterior assembly includes semi-opaque fiberglass panels allowing minimal daylight into the building. These panels date to the school's original construction, but a study as far back as 2007 by Drummey Rosane Anderson, Inc., and others, noted the panels to be "in very poor condition, and need replacement." As noted in the CREF report, they are well beyond any useful life expectancy.

As stated in the CREF report, the information technology (IT) infrastructure has been periodically added to MHS throughout its 50+ year history, but the school's construction did not contemplate scaling technology, which is reflected in its systems' performance. The CMU block construction inhibits wireless communications and technologies. Modern specifications are unattainable absent major and cost prohibitive reconstruction. Makeshift IDF closets are not located in the optimal locations, do not have appropriate cooling/HVAC and do not have enough dedicated power to support the infrastructure. These deficiencies have and continue to cause power outages and other problems stemming from the ad-hoc nature of their installations (e.g., unshielded CAT5/6 cables running directly over equipment causing melting/breaks).

Has there been a Major Repair or Replacement of the EXTERIOR WALLS? NO
Year of Last Major Repair or Replacement:(YYYY) 1970
Description of Last Major Repair or Replacement:
N/A

Roof Section A
Is the District seeking replacement of the Roof Section? YES
Area of Section (square feet) 215000
Type of ROOF (e.g., PVC, EPDM, Shingle, Slate, Tar & Gravel, Other (please describe)
EPDM covers the largest portion of the building.
Age of Section (number of years since the Roof was installed or replaced) 32
Description of repairs, if applicable, in the last three years. Include year of repair:
The main roof system is an EPDM material single ply construction. The original roof, completed in 1970, was replaced in 1990 and is approximately 215,934 SF in area. The EDPM roof systems are not pitched to drains except for the roof above the new science wing, which was the last major roofing project and occurred when that area of the building was renovated between 2013 and 2014. That newer section over the science wing is a PVC roof construction of approximately 40,000 square feet. Atypically, there is no 16" +/- high parapet at the main roof. The mechanical penthouse is in the central, 30 SF structural bay.

The EPDM roof is in poor condition. In an infrared roof survey prepared by The Garland Company in 2016, several areas were observed to have wet insulation below the rubber membrane. Ponding conditions are readily observable, which were documented in the Garland report. Several puncture holes and associated patching are observable as well. Per that 2016 Garland report, the EPDM roof is well beyond its useful life expectancy and a full replacement was estimated in 2016 to cost upwards of $2 million (2016 dollars), but that pricing did not include the costs of abatement of any hazardous materials within the scope of work.

The district's targeted repair strategies have carried and will continue to carry only a short life expectancy of 1-3 years and is not considered by MPS to be a cost-effective approach at this juncture.

Window Section A
Is the District seeking replacement of the Windows Section? YES
Windows in Section (count) 900

Type of WINDOWS (e.g., Single Pane, Double Pane, Other (please describe))
Single pane steel casement windows and translucent fiberglass panels at the pool, auditorium, and select areas of the vocational area of the building. Classroom windows are single pane casement style.
Age of Section (number of years since the Windows were installed or replaced) 52
Description of repairs, if applicable, in the last three years. Include year of repair:
There have been no comprehensive repairs. The building was constructed with approximately 900 windows throughout the facility. There have been no comprehensive windows replacement or repair initiatives to date. MHS's fenestration consists of single pane steel casement windows that are original to the building's 1960s-1970s era construction, along with translucent fiberglass panels at the pool, auditorium, and select areas of the vocational area of the building.. Classroom windows are single pane casement style windows. Cranks are mostly in working condition but require ongoing costly and tedious maintenance. Caulking and sealants are in poor condition and in need of immediate remediation and replacement. The CREF report referenced a 2007 study they reviewed in which the translucent fiberglass panels were noted as being in "very poor condition and in need of replacement at [that] time."

MECHANICAL and ELECTRICAL SYSTEMS: Please provide a detailed description of the current mechanical and electrical systems and any known problems or existing conditions (maximum of 5000 characters).

The main MHS mechanical room is in D Building and houses infrastructure for buildings A, B and D. The walls of the main mechanical room are painted concrete and CMU. Firestopping is incomplete on the wall elevations. The slab on grade is concrete with 3-4" equipment pads. Key pieces of equipment within the room included heat exchangers for buildings A, B and D; two decommissioned air handler units, domestic hot water tanks and pumps, boilers, electric motor control panels and transformers, the main chemical waste tank, the sprinkler standpipe servicing the new science wing on the third floor, and an obsolete and frequently malfunctioning pneumatic control system. All but the new domestic water equipment was installed at the time the building was constructed, in poor condition and beyond useful life expectancy.

In addition, significant amounts of water frequently pool on the floor. The origin of the water is believed to be a combination of equipment leaks and ground water seepage, which is of particular concern. The analysis in the CREF report is that its origin is possibly related to hydraulic pressure from below the slab system. That report recommended that the under-slab drainage system be assessed to confirm whether pockets of water or artesian wells are present below the building and are a contributing factor to the standing water in the main mechanical room.

As noted below, the overall condition of the boiler room and its boilers are considered adequate, but the impact of the relatively decent functioning boilers is significantly mitigated by the near decrepit conditions of the systems in the adjoining mechanical room, the main mechanical room, and its other auxiliary mechanical room, referred to as the E Building mechanical room. The overall condition of the transformers and generators in that room are in poor condition and beyond their useful life expectancy. In addition, the 20-year old compressor that is housed in the mechanical room adjoining the boiler room does not function properly and when coupled with the fail pneumatic system and the deteriorating thermostats throughout the facility results in a complete lack of temperature controls and the questionable air quality that has raised the ire of educators, students and visitors to the building.

With respect to the incinerator room, wall assemblies are painted CMU and concrete. Interior sealant joints are painted CMU with abutting concrete walls. The flooring is finished concrete. The incinerator has been decommissioned for over 40 years, however, MPS has identified no reports to assess the level of abatement completed.

Boiler Section 1
Is the District seeking replacement of the Boiler? NO
Is there more than one boiler room in the School? YES
What percentage of the School is heated by the Boiler? 100
Type of heating fuel (e.g., Heating Oil, Natural Gas, Propane, Other)

The heating systems for MHS are composed of low-pressure steam boilers in the school's boiler room and servicing the entirety of the building.

Age of Boiler (number of years since the Boiler was installed or replaced) 14

Description of repairs, if applicable, in the last three years. Include year of repair:

The boilers have been replaced more recently than much of the school's infrastructure, with one replacement boiler being installed in 2008 and two more as part of an MSBA initiative in 2014. In the last year, the district has been forced to install a new (and costly) hot water heater in the boiler room, which was necessitated due to the irreparable breakdown of the existing hot water heater in the spring of 2021.

For heating hot water, low pressure steam from the boilers is provided to multiple hot water heat exchangers located throughout the building in areas where the AHU and classroom UV heating units reside. Heat exchangers and hot water pumping systems are considered to be in fair condition. Domestic hot water for the school is provided by two separate systems, one that is operational and one that is under repair. The first is on the first-floor mechanical room and serves 60% of the facility. The second is on the second floor mechanical room in the vicinity of the gymnasium and locker rooms that serves 40% of the facility. This latter system involves a pair of steam to hot water tanks that are original to the building and is in the process of being replaced with a dedicated system similar to the mechanical room system. The copper distribution piping for domestic cold and hot water throughout MHS is from the original construction, is in poor condition and beyond useful life. Leaks are continually occurring and represent a costly problem for the district.

Has there been a Major Repair or Replacement of the HVAC SYSTEM? YES

Year of Last Major Repair or Replacement:(YYYY) 2020

Description of Last Major Repair or Replacement:

The school's classrooms are served, or intended to be served, by UVs that provide only heating via both hot water coils or steam heating coils. Repairs were completed to the UVs during the 2020 - 2021 school year to improve the frequency of air exchanges to meet heightened air quality standards related to COVID-19. A multitude of motors were repaired, and MERV-8 filters were replaced by MERV-13 filters, resulting in a significant increase in the number of burned-out motors needing to be replaced during SY 21-22 as the motors were not intended to withstand the capacity of the MERV-13 filters. The unit ventilators are the main source of heating in each classroom and function as the primary ventilation. They were installed during the original school construction and are in poor condition and well beyond their useful life expectancy.

Even despite the recent repairs, in a host of classrooms the exhaust system is frequently found to malfunction. In addition to being an intended significant component of MHS's HVAC system, they are part of the exterior opening assembly. Both interior and exterior sealants and caulking are in poor and most cases failing condition and in need of immediate abatement, improvement and/or replacement. MPS has found it exceedingly difficult to find parts for these obsolete units, delaying repairs and frustrating impacted students and staff even further.

More information related to the challenges posed by the school's failing HVAC systems is below.

Has there been a Major Repair or Replacement of the ELECTRICAL SERVICES AND DISTRIBUTION SYSTEM? YES

Year of Last Major Repair or Replacement:(YYYY) 2022

Description of Last Major Repair or Replacement:

There are three electrical transformers located throughout the three mechanical rooms in the school. One of the transformers has begun to show evidence of failure and the district intends to replace it in the near future to avoid a catastrophic systems failure. The main electrical room is located in D Building and houses the electrical power distribution equipment to service the school. The power distribution system includes panels and feeders that were installed during original construction and are now well beyond their useful life expectancy and in poor condition. These highly antiquated electrical systems have proven increasingly unreliable particularly during extreme weather conditions. Power outages are not uncommon during either heat waves or snowstorms. Only a small section of the school's vocational wing features efficient LED lighting, the rest of the school is lit with inefficient earlier technology (T12) and this contributes to the poor energy efficiency to which elevated utilities expenses are partially attributed. The next significant (emergency) capital repair that the district will

undertake is the replacement of a contingency generator necessary to ensure the integrity of the information technology systems in the building in the event of power outages. The science area includes new 480/277V lighting systems and power panels with associated feeders in conduit.

BUILDING INTERIOR: Please provide a detailed description of the current building interior including a description of the flooring systems, finishes, ceilings, lighting, etc. (maximum of 5000 characters).

Main Lobby: The main entry, which is in its original condition up to and including a mural celebrating a then-upcoming national bicentennial celebration, has walls consisting of painted CMU, polished brick, linoleum tiles, and wood paneling. The lobby's floors include original red quarry tile throughout. The CREF report deemed the lobby to be beyond its useful life expectancy and in need of improvement and or replacement due to paint, sealants and caulking materials believed, based on their age, to contain hazardous materials.

Apparent upon entering the building from the school's main entrance is the inconsistency with the facility and modern accessibility standards. The school predates the Americans with Disabilities Act by 20 years, and insufficient modifications have been made to the building since that time. In addition to practical challenges this poses for students, families, community members, and visitors, out-of-code ramps and makeshift restrooms are not in keeping with the district's full-fledged commitment to equity and accessibility. As noted elsewhere in this SOI, poor technology and basic deficiencies like poorly maintained elevators are inconsistent with how the City of Medford and MPS value and prioritize the rights of all those who attend or visit MHS.

Classrooms: Classroom walls are painted CMU and concrete. Flooring in the classrooms is composed of linoleum tile. Ceilings have either exposed concrete deck or suspended acoustical ceiling tile.

Hallways: Wall assemblies are painted CMU and concrete, some of which has ceramic tile and wood panel finishes. Interior sealant joints are painted CMU with abutting concrete walls. Flooring in essentially all locations consists of 9" x 9" flooring tiles installed during the original building construction. A variety of acoustic suspended ceiling tile assemblies are present through the multitude of hallways in the school.

Bathrooms and Building Plumbing: Both student bathrooms and staff bathrooms are similar in their construction and date to the building's origin. Wall assemblies consist of CMU walls with ceramic tile. Flooring tile was installed during the original school construction. The CREF report advised that although 9" x 9" linoleum tile was not observed, the subfloor mastic and leveling compounds should be tested prior to any future improvements.

Plumbing feeding the bathrooms include copper and black iron, installed during the original building construction. Many of the fixtures have been replaced periodically over 50+ years; however, leaks are frequent and common, and the plumbing is in extremely poor condition and beyond its useful life expectancy.

MPS maintenance staff routinely replaces the domestic water copper piping incrementally as leaks and cracks are identified. This occurs on nearly a weekly basis. Very few isolation valves are found in either the copper or black iron piping. Given the age of the building, MPS has grown increasingly concerned that the plumbing system will fail with even greater regularity. A variety of acoustic suspended ceiling tile assemblies include wet spots and stains indicative of the expired shelf life of most of the facility's plumbing systems.

Stairwells: Stairwells located in each quadrant of MHS are painted CMU and concrete walls. Interior sealant joints are painted CMU with abutting concrete walls. Multiple flooring conditions in many locations consist of 9" x 9" flooring tiles installed during the original building construction. A variety of acoustic suspended ceiling tile assemblies are also present throughout MHS.

Cafeterias: There are three cafeterias, two of which have seating capacity of 300 students and one with a seating capacity of 150 students. Wall assemblies within the cafeterias are painted CMU and concrete walls, some of which have tile and wood panel finishes. Interior sealant joints are painted CMU with abutting concrete walls. Flooring includes 9" x 9" flooring tiles installed during the original building construction. The cafeterias include a suspended acoustical ceiling assembly.

Elevators: There are four aging elevators in MHS with three, generally, in working order, but in poor condition. The main elevator, located off the main entry lobby, is a hydraulic powered three-stop cab which was installed during the building's original construction. The cab was observed to be in working condition but has not been modernized and has had maintenance issues recently. Other elevators service the building's loading dock and athletic facilities, both of which are operational but are not modernized and are in poor working condition. A fourth elevator is located in the school's main kitchen and is intended to provide for more efficient delivery of school meals, but has been disabled for over a year due to exorbitant repair cost estimates.

PROGRAMS and OPERATIONS: Please provide a detailed description of the current grade structure and programs offered and indicate whether there are program components that cannot be offered due to facility constraints, operational constraints, etc. (maximum of 5000 characters).

MHS is a 9th through 12th grade comprehensive secondary school that is organized into three "houses," namely House M, House H, and House S. The house system permits the deployment of counseling and support staff to help shepherd students through their secondary school years. The school administration has organized itself around the infrastructure as best they can, but neither the house system nor the school's comprehensive identity as both an academic and vocational hub of learning are served well by the school's antiquated and failing physical structure.

Currently, the facility allows most existing programs to subsist, but with substantial limitations on program expansion and deeper learning that could be realized with more advanced and reliable infrastructure, especially with respect to instructional technology.

As noted elsewhere, the current MHS facility does not support related classroom space for several career and technology/vocational programs, resulting in students having to rely on makeshift classroom space amidst their shop or lab space for this critical aspect of the Ch. 74 CTE programs. In addition, spatial constraints within the CTE area of the building limit the district's ability to expand or grow existing programs and/or to develop and adopt new programs in the current facility.

Faulty electrical systems, unpredictable HVAC systems and crumbling plumbing systems constantly divert student and staff attention away from teaching and learning, making the stable, consistent and effective delivery of instruction more complicated and difficult than it should be.

Finally, the lack of high caliber classroom technology makes the full realization of educators' vision for innovative learning diminished because improvised methods of technology utilization afford educators correspondingly fewer opportunities to engage learners in ways that more modern educational environments could and would provide.

EDUCATIONAL SPACES: Please provide a detailed description of the Educational Spaces within the facility, a description of the number and sizes (in square feet) of classrooms, a description of science rooms/labs including ages and most recent updates, a description of the cafeteria, gym and/or auditorium and a description of the media center/library (maximum of 5000 characters).

MHS's infrastructure exhibits neither aesthetic nor functional qualities essential to its educational mission. Core academic spaces are inadequate to consistently implement contemporary curriculum. Student leaders described their school environment as "bleak," with one noting that "MHS is a brutal place to go to school..." Students have suggested that the building is unwelcoming and resembles a prison, which is exacerbated by rapidly deteriorating infrastructure.

Contributing to the bleak and prison-like feel are dark spaces with inadequate lighting. A considerable number of classrooms are interior spaces with no natural light. In all, MHS has 145 instructional spaces that are classrooms, CTE shops/labs and science labs. There are 116 classrooms or CTE-related rooms, 17 science lab spaces, one library and 11 CTE shops. 49 of these classrooms, or 34.2%, have no windows and no natural light. Classrooms that have windows have extremely diminished natural light due to the concrete structures framing the windows. This inadequate amount of natural light and the punishing aura emanating from the fluorescent lighting elsewhere

have prompted students to respond with skepticism to the district's stated commitment to social and emotional wellness. Upon returning to in-person learning in 2020, multiple students commented that a true investment in mental health would include less dingy learning environments.

The vast majority of the building resembles how it did in 1970. Science areas were extensively renovated in 2013-2014 with modern technology, fixtures, furniture and infrastructure. This area includes 17 classrooms/labs, which like the rest of the academic spaces, are approximately 870 square feet in size. With this notable exception, there have been no other major updates to any other section of the building. Classrooms are dotted with cart-based projectors lacking any meaningful instructional technology.

Science areas have comprehensive academic technology that enhances students' experiences, but they also illustrate a stark contrast to the substandard classrooms located throughout the remainder of the facility. Classes are frequently relocated due to heating or plumbing failures. Students do not have faith that the facility will function properly , causing a perpetual sense of distraction. Meanwhile the discomfort caused by fluctuating temperatures are not conducive to deeper learning. Disquieting scenes like students using blankets while in classrooms with failing HVAC are common.

Technology access is also a significant concern. Despite a roughly 1:1 environment, MHS is plagued by spotty and inconsistent network access and suffers from an over reliance on access points and relayers to combat a concrete structure predating the need for WiFi.

The MHS library media center is an interior space lacking adequate HVAC, natural light, technology and, generally, the capacity to support students. The library is 11,000 square feet, with makeshift offices having been constructed over the years to provide office space where there was once centralized cooling. The extremely low ceilings and original unforgiving lighting evoke the feeling of studying in a cave rather than a venue for the thoughtful exchange of ideas. The subpar conditions exacerbate the inequities experienced by high-need learners who would benefit from a more hospitable and technologically equipped media center.

MPS has taken considerable pride in its interscholastic athletics programming and has seen its physical education and health programming as interconnected to its core academic offerings. But some of the locker room facilities are inadequate and reflect the fact that the school opened prior to significant advancements in gender equity. Areas that should be utilized daily by female students have deteriorated to near deplorable conditions, and the facilities for male students are not materially better. With the facility's construction predating Title IX, the inequities between the two locker room facilities are noticeable with respect to size and overall condition. Student leaders and members of the community often describe the gender inequities as both obvious and completely unacceptable.

As noted elsewhere, the repairs to the school's hot water system are nearly complete, but the breakdown of this system rendered the showers unusable, yielding unacceptable conditions.

CAPACITY and UTILIZATION: Please provide the original design capacity and a detailed description of the current capacity and utilization of the school facility. If the school is overcrowded, please describe steps taken by the administration to address capacity issues. Please also describe in detail any spaces that have been converted from their intended use to be used as classroom space (maximum of 5000 characters).

The original design capacity in 1970 was reported to be for 3,500 students. There are currently approximately 1,300 students enrolled at MHS.

Given that there have been virtually no major renovations (with the exception of the science wing in 2014) the presumed actual capacity is not much lower than the original design capacity. However, the organization of the school as one comprehensive high school and the desire to integrate the academic and vocational programming and house model has resulted in various spatial challenges that are only exacerbated by the infrastructure related concerns articulated in this SOI.

MHS has a capacity that well exceeds its current or any projected total student population. However, as noted

elsewhere, the appropriate space for its current or prospective Ch. 74 CTE/vocational programming is severely limited, leading to current and future overcrowding for programming that is considered vital to its identity as a comprehensive high school.

MAINTENANCE and CAPITAL REPAIR: Please provide a detailed description of the district's current maintenance practices, its capital repair program, and the maintenance program in place at the facility that is the subject of this SOI. Please include specific examples of capital repair projects undertaken in the past, including any override or debt exclusion votes that were necessary (maximum of 5000 characters).

Medford has not attempted to conduct override or debt exclusion votes during the lifetime of the MHS facility. The MPS maintenance program consists of an in-house team of custodians and tradespeople who work to keep the existing and aging infrastructure clean and in working order through daily maintenance and ad hoc repairs. In addition, MPS outsources nightly cleaning duties to an external vendor that performs routine custodial work. As noted elsewhere, MPS has been participating in the City of Medford's recent capital planning process in which capital projects are identified, prioritized and then examined for purposes of allocating capital repair funding. In the last two years, capital repairs have been limited either to situations deemed emergencies related to the COVID-19 related disruptions to in-school learning or repairs to infrastructure that has either suffered from a catastrophic failure or is deemed to be on the verge of such a failure. These projects have included the installation of network servers to bolster the virtual environment in which the school (and district's) cloud-based systems operate, the hot water heater, an electrical transformer, and the series of plumbing and HVAC repairs referenced elsewhere in this SOI. Current maintenance practices focus on high need areas and emergency situations, often during school vacations or summer breaks, but this pace is insufficient to address the depth and frequency of the infrastructure challenges and compromises efforts to make Medford High School the true educational epicenter of the Medford community. The Medford School Committee has discussed in various forums the need for a comprehensive capital repair and maintenance program. However, the sheer scope of issues that require repair, remediation or reconstruction at MHS has hindered the ability of the district to enact such a plan and strategic approach.

For an additional exemplar as to the severe challenges with respect to the foreboding nature of capital repairs and maintenance with respect to MHS, consider this additional information related to the school's beleaguered HVAC systems:

MHS's HVAC systems consist of a combination of rooftop air handling units (AHU) central AHUs and unitary classroom unit ventilators (UV). The vast majority of the building is devoid of air conditioning. Central AHU and UV units support the majority of the building and are original to the time of construction. They are all in very poor condition or inoperable. They are all clearly beyond their useful life and replacement would require installation of new distribution components (conduit, ductwork, cabling, etc.).

The ten original central AHUs are designed as mixed air systems combining outdoor and recirculated indoor air. They serve interior zones (in cases in which they do function). They have all long exceeded their useful life, are generally in poor condition and a number of them are non-functional. The remaining operational units require constant maintenance and attention for proper operation.

Temperature controls both for the central AHUs and the classroom UVs are governed by a pneumatic control system original to the building. A few experienced MPS maintenance technicians have mastered the operation of the system, but it is woefully obsolete and requires significant investment in time to properly operate. Control panels servicing multiple AHS units have ceased functioning and the general condition of the system, which is original to the building, is poor and must be run continuously 24 hours a day and seven days a week. This inefficiency is reflected in the very high energy consumption of the facility, stated elsewhere in this SOI.

The rooftop air handling units (AHU) associated with third floor science classroom renovation are newer and modern at approximately 10 years old. These AHU provide 100% outdoor air and are equipped with heat recovery systems.

Air conditioning in MHS is limited to a select set of office spaces with window or portable air conditioning units,

as well as the 17-classroom/lab science area that, as referenced elsewhere, was renovated in 2013-2014. Originally, B Building, representing ? of the school's square footage, was outfitted with a centralized air conditioning system. However, when an absorption system failed catastrophically over 15 years ago, it was determined to be cost prohibitive to undertake repairs leaving the vast majority of the building devoid of any cooling capacity. Students and staff experience sweltering conditions during long portions of the year, detracting from their teaching and learning activities.

Priority 5

Question 1: Please provide a detailed description of the issues surrounding the school facility systems (e.g., roof, windows, boilers, HVAC system, and/or electrical service and distribution system) that you are indicating require repair or replacement. Please describe all deficiencies to all systems in sufficient detail to explain the problem.

MHS represents a composition of infrastructure that is in various states of disrepair or deterioration, with the vast majority of the school's operating systems having outlived their useful life expectancy. As noted elsewhere in this SOI, with the exception of the modernized science area, the remainder of the building's systems including but not limited to its roof, HVAC system, electrical systems, security systems (to the extent they exist), plumbing, and windows detract from the stability and consistency of the school's educational programs through constant malfunctions and failures.

Specifically, the approximately 215k square foot EPDM roof that was installed in 1990 contains wet insulation below the rubber membrane and frequently is subject to ponding on its surface. It is not pitched to drains and is in poor condition. The existing storm water piping and roof drains are also in poor condition.

With respect to windows, classroom windows are thermally inefficient single pane casement style windows with casement cranks that require ongoing costly maintenance. The windows' caulking and sealants are in poor condition and in need of replacement.

The boilers are considered adequate, but their value is compromised by the deteriorating, obsolete or failed infrastructure associated with their operation. The copper distribution piping for domestic cold and hot water was installed during the original construction of the building, in poor condition and beyond useful life exacerbating the challenges posed by the frequency and severity of the leaks and burst pipes discussed elsewhere in this SOI.

The building's HVAC systems are controlled by obsolete pneumatic devices requiring significant ongoing maintenance, with panels intended to control AHU 1 and AHU 2 no longer functioning.

Despite herculean efforts on the part of maintenance staff efforts during the 2020 – 2021 school year to markedly improve air quality throughout the school, dirty ductwork and clogged reheat coils are forcing the district to choose between near constant maintenance on these systems or subpar indoor air quality. UV motors are failing at unsustainable rates due to higher capacity filters intended to maintain more frequent air exchange of the COVID era.

The school's hundreds of classrooms are known to frequently overheat in mild weather patterns and be near uninhabitable during cold streaks.

MHS's power distribution systems include panels and feeders that are essentially all in poor condition and were installed during original construction, exceeding their useful life expectancy. Modern technology and reliable Internet have proven to be virtually impossible to capitalize upon in light of the facility's concrete construction. Crude and makeshift solutions around the ad hoc creation of IT equipment closets that lack appropriate cooling/HVAC and sufficient power represent the extent to which the district has stretched the building's infrastructure beyond acceptable and reasonable measures.

As noted elsewhere in this SOI, MHS has recently been estimated to expend substantially more energy than a typical American school. This was not a shocking conclusion in light of the fact that the original design capacity for the MHS facility was 3,500 students, whereas the current enrollment is approximately 1,300. Specifically, the CREF report found that the building's 2021 EUI of 86.0 kBtu/ft2, or 77% higher than the national average of 48.5 kBtu/ft2 for K-12 schools as reported by CBECS.

For MHS to meet Mass Save's energy efficiency target for Zero-Net Energy Buildings of 25 kBtu/ft2, energy intensity would have to be reduced by over 70%. In light of the disproportionate level of energy consumption, MPS lacks the capacity to effectuate a noticeable reduction in energy consumption. The layout of the building and the volume of Ch. 74 vocational programming make

the strategic use of specific components of the building problematic, and the age and deterioration of the HVAC and electrical systems make virtually all usage inefficient at one level or another.

In addition to the basic infrastructure that has deteriorated throughout the 50+ year use of the building, are a series of deficiencies that represent unacceptable challenges to the school community's safe and secure utilization of the facility. MHS lacks a fire suppression system with the lone exception for the science wing. The school's fire alarm and intercom system require constant maintenance by local vendors upon whose institutional knowledge of the antiquated systems MPS has become beholden. There is no electronic locking system and other vulnerabilities represent a significant departure from what would be considered best practice.

Priority 5

Question 2: Please describe the measures the district has already taken to mitigate the problem/issues described in Question 1 above.

As noted elsewhere in this SOI, the impact of deteriorating infrastructure has posed operational challenges as well as culture and climate challenges, all of which are continuing to have a detrimental impact on the school's capacity to deliver an optimal caliber of instruction. With respect to the operational challenges, the district is now basically in a perpetual state of mitigation. Reoccurring and one-time financial resources alike are being diverted away from teaching and learning to address emergency repairs to failing infrastructure and to minimize disruptions to classroom routines as much as possible. With regard to the most notable discrete mitigation efforts, the MPS has undertaken the following:

The most significant mitigation efforts referenced several times throughout this SOI was the renovation of the science wing in B Building in 2013 – 2014. This renovation effort restored centralized air conditioning to this one floor of one section of the building. It also provides for modern efficient lighting systems and the school's lone fire suppression system.

Through an MSBA partnership, two boilers were installed in 2014 to address heating issues in the building. As noted elsewhere the value of these boilers is diminished significantly by the plethora of associated infrastructure that are failing or in disrepair, i.e. the obsolete pneumatic controls. The original HVAC system continues to support the school to the extent infrastructure of its age and condition can do so.

The original EPDM roof was replaced in 1990, but as noted several times throughout this SOI, it is now well beyond its useful life expectancy and exhibiting evidence of water damage and patched puncture holes that are representative of the ongoing efforts toward mitigation.

Due to a catastrophic failure of one of MHS's two water heater systems in 2021, the installation of a new hot water heater system is nearly complete.

A thorough series of repairs were completed to the classroom UVs during the 2020 - 2021 school year. The purpose of these repairs was to improve the frequency of air exchanges to meet heightened air quality standards related to COVID-19. A multitude of motors were repaired, and MERV-8 filters were replaced by MERV-13 filters, the result of which has been a significant increase in the number of burned-out motors needing to be replaced during the 2021 - 2022 school year as the infrastructure was not intended to withstand the capacity of the MERV-13 filters. The unit ventilators are the main source of heating in each classroom and function as the primary ventilation. They were installed during the original school construction and are in poor condition and well beyond their useful life expectancy.

The MHS fire alarm system is generally original to the building's opening, however 20 years ago a module system unintended for a building of this size and complexity was incorporated into the system to maintain functionality. The science area maintains a more modern addressable system, but the Medford Fire Department has advised MPS on multiple occasions that the current system is inadequate and not in compliance with contemporary standards. MPS invests annually in maintenance to ensure a basic level of functionality, but the cost of a wholesale replacement of a system so intertwined with the facility's infrastructure has been considered financially prohibitive.

Priority 5

Question 3: Please provide a detailed explanation of the impact of the problem/issues described in Question 1 above on your district's educational program. Please include specific examples of how the problem prevents the district from delivering the educational program it is required to deliver and how students and/or teachers are directly affected by the problem identified.

As referenced throughout this SOI, the impact of the building's deficiencies manifest themselves in a multitude of ways, ranging from the broad inability to truly integrate the school's academic and vocational identities, to the persistent distractions caused by having to relocate classrooms due to leaky or burst pipes. The school's culture and climate are destabilized by temperatures that fluctuate uncontrollably and technology that cannot be relied upon. Lighting systems are woefully inefficient, resulting in a diversion of resources that could otherwise be invested in teaching and learning, while providing an atmosphere that is considered bleak, foreboding, and incongruent with the type of affirming educational atmosphere the district is seeking to foster for students.

Again, as noted elsewhere in this SOI, students in a host of Ch. 74 vocational programs lack adequate and appropriate space to engage in their chosen disciplines. Other students are forced to choose programs that they are less passionate about (or to enroll elsewhere) because the school lacks the appropriate spatial capacity to develop and adopt a full range of vocational options for students. And students in all academic and vocational disciplines have become accustomed to draping themselves in sweatshirts and blankets or need to relocate on a moment's notice due to failing infrastructure. These constant disruptions are inconsistent with the standards MPS seeks to represent as an educational institution.

Priority 5

Question 4: Please describe how addressing the school facility systems you identified in Question 1 above will extend the useful life of the facility that is the subject of this SOI and how it will improve your district's educational program.

As noted elsewhere in this SOI, the useful life expectancies of the majority of the systems on which the school's operations rely have already expired. MPS is committed to addressing these deficiencies due to the district's recognition that they are interconnected and interdependent on one another, and the quality of the secondary education students are receiving is contingent upon infrastructure that, at a minimum, is not constantly distracting. Ideally, the school's infrastructure would serve to empower educators and leave students well-situated to capitalize on the vision of a comprehensive educational program that seamlessly integrates the school's academic and vocational programming opportunities.

Please also provide the following:

Have the systems identified above been examined by an engineer or other trained building professional?:
YES

If "YES", please provide the name of the individual and his/her professional affiliation (maximum of 250 characters):

Engineers retained by MPS:

Shaun Finn, Vice President, CREF

Patrick Murphy, Vice President, Project Lead, CREF

Christopher Wood, Director of IT, CREF

Matt Fragala, Managing Principal Consultant, EH&E

Brian Baker, Engineering Support, EH&E

The date of the inspection: 4/14/2022

A summary of the findings (maximum of 5000 characters):

In anticipation of submitting last year's Statement of Interest (SOI), the Medford Public Schools (MPS) retained the services of CREF, a real estate & facilities based in Boston, MA, with extensive experience in school construction. CREF and its partner agency Environmental Health & Engineering, Inc., based out of Newton, completed a joint environmental and facilities condition assessment of Medford High School. MPS's responses to the inquiries within the Statement of Interest are based in part on the information obtained through these reports, which are collectively referenced in the SOI as the "CREF report." The CREF report will be submitted to the MSBA as an appendix to this (SOI) on the basis that its conclusion and assessments are consistent with the conclusions that MPS has reached in deciding to submit this SOI on behalf of our flagship school, Medford High School (MHS).

In addition, in 2016, MPS retained The Garland Company, Inc. (Garland) to complete an infrared roof survey of MHS. As discussed in the district's previous SOI submissions, that report found that the school's main roof system, EPDM, was plagued by numerous wet insulation spots, ponding conditions, anomalies, punctures and weakened repair patches. That report was reviewed in preparation of the CREF report and several of its conclusions are referenced as appropriate throughout this SOI. The urgency of the challenges Garland identified has been exacerbated by the fact that targeted repair solutions have carried a short life expectancy of only 1-3 years and have proven financially ineffective and imprudent.

The CREF report's executive summary stated in relevant part:

The Building likely contains significant quantities of hazardous building materials including asbestos, lead paint, and polychlorinated biphenyls (PCBs). The cost to fully remediate or mitigate the presence of hazardous building materials is estimated to exceed $10,000,000. This does not include associated costs for replacement materials, or the related labor and management fees included in future projects.

The Building exterior and interior sub-element review included in this report cross references building materials in poor condition and in need of replacement with potentially hazardous conditions related to sealants, adhesives, and paint applications.

The HVAC units serving the remaining areas of the Building (including the central air handling units and classroom unit ventilators) are original to the time of construction and appear in very poor condition. Several of the systems inspected were not operational due to mechanical or control issues and are clearly beyond their useful life. Replacement of these units will also require the installation of new distribution components (conduit, ductwork, cabling, etc.) which will likely uncover additional hazardous materials, resulting in a compounding effect on the scope, schedule and budget considerations noted above.

Energy utilization benchmarking indicates the building is more energy intense than average school buildings. The Building's 2021 EUI of 86.0 kBtu/ft2 is 77% higher than the national average of 48.5 kBtu/ft2 for K-12 schools reported by CBECS. For the Building to meet Mass Save's energy efficiency target for Zero-Net Energy Buildings of 25 kBtu/ft2, energy intensity would have to be reduced by over 70%.

Finally, it should be noted that all future projects will need to take into account the City of Medford Climate Action and Adaptation Plan (draft plan published in October 2021), and any applicable Federal, State, and Municipal code requirements that have been put in place in the 50+ years since the facility was initially constructed. This will likely cause a "domino effect" where code required upgrades (eg. fire alarm and sprinkler installation in approximately 90% of the Building) and the resulting hazardous material abatement needs will multiply the cost of the primary renovations to a substantial degree to the point where significant improvements to the existing building must be considered against the cost and long-term value of a full-building replacement.

Priority 7

Question 1: Please provide a detailed description of the programs not currently available due to facility constraints, the state or local requirement for such programs, and the facility limitations precluding the programs from being offered.

As noted elsewhere in this SOI, due to facility constraints, the following programs have reached capacity and cannot accept new students despite there being student interest in these programs: Electricity, Health Assisting, Construction & Craft Laborers, Cosmetology.

These programs currently have a waitlist of students who want to participate in them. In addition, MPS has engaged a variety of external stakeholders including the Metro North Workforce Board to ascertain what programs would best serve the students of Medford the years ahead. At a minimum, MPS would seek to expand MHS's Ch. 74 programs to include Plumbing, Animal Science, Dental Assisting, and Information Support Services and Networking. But further expansions to communications related programming as well as theater and arts classes like set design and construction, sound and lighting design, and sculpture are ones that school administrators have met with student, family and community representatives about developing. These opportunities are currently stalled because the existing MHS facility lacks the spatial capacity in the areas of the building that would be suitable for this type of program expansion.

Priority 7

Question 2: Please describe the measures the district has taken or is planning to take in the immediate future to mitigate the problem(s) described above.

Similar to the efforts that are and have been underway to prevent the building's failing infrastructure from diminishing educational opportunities for students, MPS is also in a perpetual state of mitigation with respect to ensuring the spatial and logistical challenges posed by the current facility do not have disproportionately negative impact on the instructional opportunities available to students. Throughout MHS, classrooms and meeting spaces are being repurposed as learning spaces to support specific programs. Many of these spaces that are being used for purposes other than the ones that were intended or even contemplated at the time of construction and generally are not conducive to CTE programming. As noted elsewhere in this SOI, MHS's CTE programs are rapidly growing and there is evidence of genuine and passionate engagement on the part of students. For this reason, MHS has not slowed its recruitment of students or its encouragement of students committing to the various pathways available, but there is virtually no space remaining in the appropriate areas of the building to repurpose.

MHS has also attempted to take mitigation steps that are unrelated to physical infrastructure in order to combat problems caused by infrastructure. Two years ago, MHS reorganized into a House model to provide students with more individualized counseling and guidance support. This has positioned school staff to develop strong relationships with both students and families for purposes of guiding students toward post-secondary opportunities. This is helpful to the extent the MHS is able to offer programming consistent with student interests but is problematic when MHS cannot offer sufficient seats in the programs in which students are expressing interest. In addition to not maximizing the opportunities for student engagement, this type of disconnect could also serve to exacerbate the school to student (and family) bonds and relationships that have already been battered by the pandemic-related disruptions over the last two years.

In the time since the district last submitted an SOI, MHS has dealt with a series of culture and climate issues exacerbated by the building's poor infrastructure. In the fall of 2022, multiple physical altercations between students was rendered more difficult because of the school's poor layout. While the architecture alone did not cause and would not entirely alleviate these challenges, MPS feels strong that systemic security systems will enhance the district's ability to provide the type of culture and climate MHS students deserve and expect.

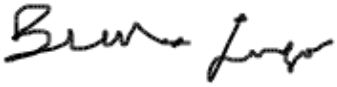
Priority 7

Question 3: Please provide a detailed explanation of the impact of the problem described in this priority on your district's educational program. Please include specific examples of how the problem prevents the district from delivering the educational program it is required to deliver and how students and/or teachers are directly affected by the problem identified.

The problems described throughout this SOI have a significant impact on the Medford Public Schools and the district's flagship school, MHS. The school's ability to deliver academic programming has been severely compromised by inadequate, deteriorating or failing infrastructure and the disruptions to student learning that those deficiencies have caused. Students have expressed on numerous occasions that they feel unready and disengaged in a building that does little to nothing from an infrastructure perspective to induce strong student and school community relationships. Students have grown accustomed to frequently moving classrooms in attempts to find learning spaces without leaky ceilings, burst pipes, or inhospitable temperatures. In early 2023, major thoroughfare hallways were forced to be shutdown due to asbestos levels, forcing students to reroute through the cavernous building to reach their classes, with them rarely doing so on time. Students and families have also expressed outrage at the inability of the school environment to provide reliable and accessible technology. While the significant COVID-related influx of external funding has mitigated this challenge, the technological standards under which the school is operating are subpar at best. All of these contribute to a significant disruption to student learning and unstable educational environment that is incongruent with continuous progress and the type of school community MHS seeks to cultivate on behalf of its students.

CERTIFICATIONS

The undersigned hereby certifies that, to the best of his/her knowledge, information and belief, the statements and information contained in this statement of Interest and attached hereto are true and accurate and that this Statement of Interest has been prepared under the direction of the district school committee and the undersigned is duly authorized to submit this Statement of Interest to the Massachusetts School Building Authority. The undersigned also hereby acknowledges and agrees to provide the Massachusetts School Building Authority, upon request by the Authority, any additional information relating to this Statement of Interest that may be required by the Authority.

Chief Executive Officer *	**School Committee Chair**	**Superintendent of Schools**
Breanna Lungo-Koehn	Breanna Lungo-Koehn	Marice Edouard-Vincent
Mayor		
		
(signature)	(signature)	(signature)
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* Local chief executive officer: In a city or town with a manager form of government, the manager of the municipality; in other cities, the mayor; and in other towns, the board of selectmen unless, in a city or town, some other municipal office is designated to the chief executive office under the provisions of a local charter. Please note, in districts where the Superintendent is also the Local Chief Executive Officer, it is required for the same person to sign the Statement of Interest Certifications twice.

Report of Findings: Focused Facility Condition Review

Medford High School

April 14th, 2022

Table of Contents

Appendices

1. Executive Summary

In March of 2022, CREF conducted a focused facility condition review of Medford High School (the "Building") located at 489 Winthrop Street, in Medford, MA. The campus houses students in grades 9-12 for both Medford's high school and vocational school programs. The three-floor facility consists of four connected wings (A, B, C, D) with a combined gross floor area between 530,000 - 600,000 square feet. The Building was reportedly constructed in 1971 and there are approximately 302 classrooms in the facility.

The purpose of this review is to aid the staff in documenting the existing physical conditions of the Building which should be considered during future planning for any major improvements or core replacement initiatives.

Review efforts included a summary level assessment of the facility's interior and exterior physical building condition, a non-destructive review of reported and/or visible hazardous materials, HVAC systems performance, and information systems and infrastructure functionality. Interviews with key management and operations staff were conducted in-person to solicit their observations and experience with the assemblies and systems noted above, and to participate in building tours.

These efforts resulted in this focused assessment of pre-selected facility sub-elements, observed conditions, and health & safety conditional findings to help inform decision making for the capital investment strategy for maintaining, upgrading or replacement of the building.

As main pillars of the project, pertinent documents were reviewed related to design, operations and maintenance of the HVAC systems and hazardous materials management with the following major findings:

- The Building likely contains significant quantities of hazardous building materials including asbestos, lead paint, and polychlorinated biphenyls (PCBs). The cost to fully remediate or mitigate the presence of hazardous building materials is estimated to exceed $10,000,000. This does not include associated costs for replacement materials, or the related labor and management fees included in future projects. [1]

- The Building exterior and interior sub-element review included in this report cross references building materials in poor condition and in need of replacement with potentially hazardous conditions related to sealants, adhesives, and paint applications.

- The HVAC units serving the remaining areas of the Building (including the central air handling units and classroom unit ventilators) are original to the time of construction and appear in very poor condition. Several of the systems inspected were not operational due to mechanical or control issues and are clearly beyond their useful life. Replacement of these units will also require the installation of new distribution components (conduit, ductwork, cabling, etc.) which will likely uncover additional hazardous materials, resulting

[1] Environmental Health & Engineering, *Environmental and HVAC System Review, Medford High School, Medford, Massachusetts (EH&E 25440)*

in a compounding effect on the scope, schedule and budget considerations noted above.[2]

- Energy utilization benchmarking indicates the building is more energy intense than average school buildings. The Building's 2021 EUI of 86.0 kBtu/ft2 is 77% higher than the national average of 48.5 kBtu/ft2 for K-12 schools reported by CBECS. For the Building to meet Mass Save's energy efficiency target for Zero-Net Energy Buildings of 25 kBtu/ft2, energy intensity would have to be reduced by over 70%.

Finally, it should be noted that all future projects will need to account for the City of Medford Climate Action and Adaptation Plan (draft plan published in October 2021), and any applicable Federal, State, and Municipal code requirements (e.g., 521 CMR) that have been put in place in the 50+ years since the facility was initially constructed. This will likely cause a "domino effect" where code required upgrades (e.g., fire alarm and sprinkler installation in approximately 90% of the Building) and the resulting hazardous material abatement needs will multiply the cost of the primary renovations to a substantial degree to the point where significant improvements to the existing building must be considered against the cost and long-term value of a full-building replacement. It is also noted that as cited in Massachusetts Code 521 CMR 3.3.2: "If the work performed, including the exempted work, amounts to 30% or more of the *full and fair cash value* (see **521 CMR 5.38**) of the *building* the entire *building is required to comply with 521 CMR."*

[2] Environmental Health & Engineering, *Environmental and HVAC System Review, Medford High School, Medford, Massachusetts (EH&E 25440) 2022*

2. Project Background

Medford Public Schools - Buildings & Grounds Department is responsible for the maintenance, management, and planning of the Building. CREF was selected to conduct a focused facility condition review to identify deficiencies in select building systems and prioritize the findings to aid in making key investment decisions about sustaining services within the high school.

This review is intended to identify significant facility components which will need to be addressed either through repair or replacement should any major renovation or substantive upgrades be planned. Many of the facilities building components were observed to be in poor condition and Medford believes it is significantly behind on deferred maintenance and repairs to support the buildings. This report defines those components, identifies the significant deficiencies, and provides recommendations for strategic planning purposes.

2.1 Contract Basis

CREF submitted a response for professional services inclusive of a focused facility condition review dated March 7, 2022. Medford informed CREF of its decision to award CREF the project the following week.

2.2 Goals & Objectives of the Project

The goal of this project is to provide Medford with an understanding of the current condition of facilities included within project scope of work, and to identify and quantify in-scope facility conditions in terms of significant non-cyclical repairs and replacements of building systems, components, and assemblies. The information obtained during this project is to be used to support the development of Statement of Interest (SOI) to be submitted to the Massachusetts School Building Authority (MSBA).

The primary objectives of the project were to::

1. Review, to the extent they were available, existing drawings of the Building prior to the on-site review.
2. Review information provided on past, current and/or planned projects and significant maintenance activities.
3. Interview the facilities team, including the head of buildings and grounds, and /or building engineers knowledgeable regarding the construction and maintenance history of the school to document deficiencies previously identified by the staff.
4. Create a narrative summary describing the major construction features and building systems that comprise the facility.
5. Take photographs to document existing field conditions.
6. Perform a non-destructive visual inspection of the facility to identify in scope component level deficiencies and life-cycle conditions.

2.3 Scope of Work

CREF furnished the personnel, equipment, materials, and other necessary resources to conduct the focused review of the facility. The scope includes field observations and assessment of facility sub elements included below:

1. **Building Exterior and Envelope**
2. **Interiors**
3. **Plumbing**
4. **HVAC**
5. **Fire Protection**
6. **Electrical**
7. **Information Systems**
8. **Security System**

The work was divided into three major tasks:

1. Planning & Information Gathering
2. Field Inspection
3. Information Analysis and Recommendations

3. Scope Activities

CREF conducted a kick-off meeting with representatives of the High School to confirm the project scope, objectives, and approach. The purpose of the meeting was to confirm that both the CREF team and The Building team clearly understood the scope, objectives, and risks of the work to be undertaken before beginning the project. The meeting was held in the Superintendent's Conference Room at Medford High School at 10:00am on March 17th, 2022. The meeting was attended by the individuals listed below representing the Building and CREF.

Medford High School Representatives

David Murphy, Asst. Superintendent for Finance and Operations
John McLaughlin, Director of Buildings and Grounds; Primary Field Contact
John Bissell, Manager of Buildings and Grounds

CREF Representatives

Shaun Finn, LEED AP, CSL; Vice President, Executive Oversight, CREF
Patrick Murphy, EIT; Vice President, Project Lead, CREF
Christopher Wood, CISSP; Director of IT, CREF
Matt Fragala, MS, CIH, CSP; Managing Principal Consultant, EH&E
Brian Baker, PE; Engineering Support, EH&E

3.1 Project Kick-Off Meeting

During the kickoff meeting, the following items were completed and/or discussed:

- Introductions
- Goals & Objectives
- Building Contacts
- Safety & Security
- Scheduling & Site Access
- Escorts
- On-site Interviews
- Clarification of Building Information
- Existing Background Data
- Known Site Restrictions

3.2 Background Data Review

Prior to the beginning the field data collection, CREF reviewed background information provided for the Building. The information provided was in "hard copy" format, located in the plan room adjacent to the Building and Grounds Office. Partial sets of the original as-builts and the new science wing project were located and reviewed. CREF used the information obtained to supplement its understanding of the as-built construction features observed on site.

3.3 On-Site Facility Condition Review

CREF mobilized on site and began data collection on Monday, March 21, 2022. Patrick Murphy, Christopher Wood, Matt Fragala, and Brian Baker performed field data collection.

Patrick Murphy, Shaun Finn, Christopher Wood, Matt Fragala, and Brian Baker performed data review. The on-site inspection was completed on Thursday, March 23, 2022, with a follow up visit on Thursday, March 31st, 2022. John McLaughlin, John Bissel, and Allen Arena provided the building tours during the inspection phase.

This report was reviewed by the following CREF Staff:
Steve Van Ness, AIA; Vice President, Planning and Design
Chris Waltz, AIA; Director, Planning and Design
Ted Gentry, PE; Senior Project Manager

3.4 Escorts and Interviews of School Staff

During the on-site work, the CREF team was escorted by Mr. John Bissell, Manager of Buildings and Grounds. Bissel provided access to all spaces requested, and fielded questions from CREF during the kick-off meeting and during the site walkthroughs. Feedback provided by the Building staff included information describing facility maintenance history, and whether any significant issues, such as leaks were present at the facility. John on also provided information regarding the estimated age of building components at select locations.

3.5 Documentation of Facility Inventory Components

During the walkthroughs, CREF recorded select building elements and sub elements, and components that were significant parts of the as-built construction of the facility.

3.6 Data Analysis

Following completion of the field data collection, data review, CREF conducted an analysis of the data and prepared this report of findings.

4. Focused Condition Review Findings

Existing Structure

Medford High School is a three-story, reinforced concrete structure with multiple low-slope roofs. The foundation construction consists of conventional concrete spread footings to support structural columns. All concrete noted on the existing plans have a minimum 28-day strength of 3,000 PSI. The reinforced concrete columns and concrete wall sections have a 28 strength of 4,000 PSI. Reinforced steel has a 40,000 PSI yield stress, except for select areas supporting the roof structure, which are 60,000 PSI.

Each roof consists of a 6” thick, one-way reinforced concrete slab spanning 15 feet in the east-west direction to 18” wide by 36” deep reinforced concrete beams. The beams span 30 to 45 feet in the north-south direction and are supported by reinforced concrete columns. Beams typically cantilever (15’-6”, with camber) over interior columns, resulting in a 14-foot wide, east-west section of floor with no beams (6” slab only) to facilitate vertical chase ways for infrastructure distribution. These chase way zones are in the second structural bay of the exterior wall, in the north and south portions of the roof (two total). **It is important to note that this chase way zone design significantly impacts future infrastructure distribution and pathway flexibility.**

The floors of the building – the second-floor deck and third floor deck, are reinforced placed concrete. Like the roof construction, the decks consist of 6" think, one-way reinforced concrete slabs spanning 15 feet in the east-west direction. The story heigh is 12'-10"; typically leaving 9'-10" clear height below the 36" deep roof beams.

The design of the school was conducted in accordance with the Commonwealth of Massachusetts, "Structural Regulations of School Houses."

The construction classification for this facility is reinforced concrete floor and roof structure that has a fire resistance rating of at least 2 hours, equivalent to a Type 1 construction. **The existing building does not include a fire suppression system except for the third-floor science wing, renovated in 2013 and completed in 2014.**

The site walkways around the perimeter of the facility are beyond their useful life expectancy, and pose safety and accessibility challenges, specifically on the west elevation noted in the picture to the right.

4.1 Building Exterior and Envelope

The Facility is separated into quadrants (A, B, G, and H) by a ¾" wide expansion joint system. No internal joints were observed in the field or on the plans. **Cross sections of these expansion joints were not visible during the inspection period; however, it is important to note that any flexible sealant used in the original construction should be considered to potentially contain hazardous materials and great care should be taken during any improvement or replacement efforts.**

The roof systems are not pitched to drains except for the roof above the new science wing. Typically, there is a 16" +/- high parapet at the main roof. The mechanical penthouse was located in the central, 30 SF structural bay.

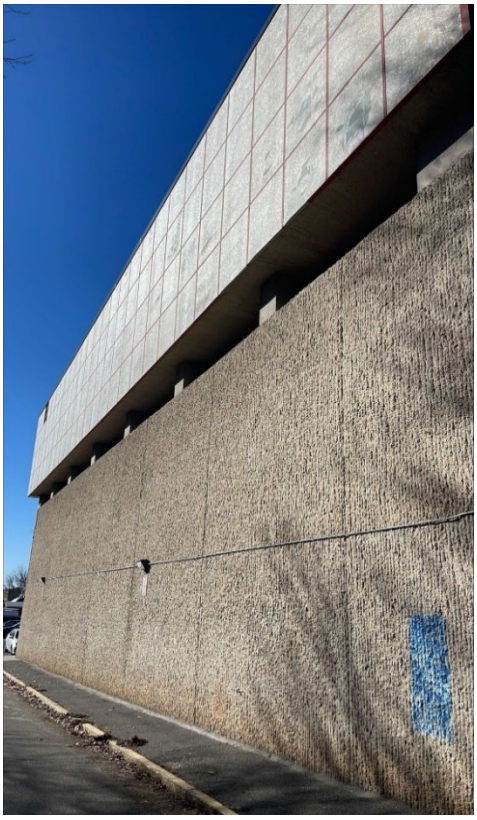
The main roof system is an EPDM material single ply construction. The original roof, completed in 1971, was replaced in 1990 and is approximately 215,934 SF in area. The roof above the new science wing was installed in 2014 and is a PVC roof construction of approximately 40,00 square feet. The EPDM roof was observed to be in poor condition. In an infrared roof survey prepared by The Garland Company in 2016, several areas were observed to have wet insulation below the rubber membrane. There were also ponding conditions observed during our field inspection, many of which were also confirmed within the 2016 Garland Report. Several puncture holes were also observed and had been patched. Per the 2016 Garland Report, the EPDM roof is beyond its useful life expectancy and a full replacement should be budgeted in the range of $1.75M – $2.00M (2016 dollars) [3]. It should be noted that this pricing estimate does not include abatement of any hazardous materials within the scope of work.

The exterior of the building superstructure consists of primarily reinforced concrete panels, brick veneer, and mechanically fastened concrete fins. The superstructure has not been significantly improved and was constructed with the original building in 1971.

The original exterior concrete wall assembly and fenestration was observed to have several punched openings for windows, doors, and vents. Unit ventilator supply and exhaust louvers were observed at all classroom locations throughout the facility. **The sealants around all original openings were observed to be in poor condition and failing in most locations.**

[3] The Garland Company, Inc., *Medford High School – Infrared Roof Survey,* 2016

All exterior assembly intersections (masonry to concrete in most cases) include similar exterior joint sealants original to the building's construction. The caulking at these typical locations is beyond its useful life expectancy. Conditions associated with future replacement **of the joints will be outlined further in the EH&E report (Appendix A).**



At the auditorium, pool and select areas of the Vocational School, the exterior assembly includes semi-opaque fiberglass panels which allow daylight into the interior of the building. These panels were installed during the original building construction and a 2007 study completed by Drummey Rosane Anderson, Inc., with assistance from Simpson Gumpertz & Heger, identified the panels to be "in very poor condition, and need replacement at this time" [4]. They are well beyond useful life expectancy.

Door openings are enclosed by a mixture of metal door and doorframe assemblies and are sealed with exterior caulking of several types. Most of the openings in the building exterior were constructed when the building was originally built in 1971.

[4] Drummey Rosane Anderson, Inc*., Pool Facilities Report*, 2007

The building fenestration consists of single pane steel casement windows which are original to the building. Classroom windows are single pane casement style windows. Cranks appeared to be in working condition but require ongoing maintenance**. Mentioned earlier in this report, caulking and sealants were observed to be in poor condition and in need of immediate remediation and replacement**.

4.2 Building Interior

Main Lobby

The main entry lobby walls consist of painted CMU, polished brick, linoleum tiles, and wood paneling. Floors in the main lobby consist of original red quarry tile throughout. The lobby was observed to be in the original condition, beyond its useful life expectancy and in need of improvement and or replacement. Please refer to the EH&E Report (Appendix A) for more information on paint, sealants and caulking materials present in this location as it should be presumed that hazardous materials are present.

Auditorium

The main auditorium, located adjacent to the main lobby consists of wall elevations of polished brick and painted concrete. The walls were observed to be in well maintained condition. The main auditorium floor consists of a broadloom carpet assembly which was installed as an improvement to the original flooring. The carpet appears to have been installed within the last 10-20 years. The walls consist of painted concrete and CMU with fabric wrapped acoustical panels. The timing of the installation appears to be within the last 10-20 years. The ceiling assembly consists of a finished GWB suspended ceiling which sits below a composite steel and wood framed catwalk assembly.

Lecture Halls

The lecture halls typically were observed to be constructed with the original building in 1970 except for the new science wing lecture hall. The wall construction typically consists of elevations of painted CMU and painted concrete walls with fabric wrapped acoustical panels in select locations. The floors were observed to be linoleum tile. Ceiling assemblies consist of acoustical suspended ceiling tile mechanically hung from the concrete deck. Please refer to the EH&E Report (Appendix A) for more information on paint, sealants and caulking materials present in this location as it should be assumed that hazardous materials are present.

Classrooms and Unit Ventilation

Classroom walls are painted CMU and concrete. Flooring in the classrooms was observed to be linoleum tile. Ceilings were observed to be either exposed concrete deck or suspended acoustical ceiling tile.

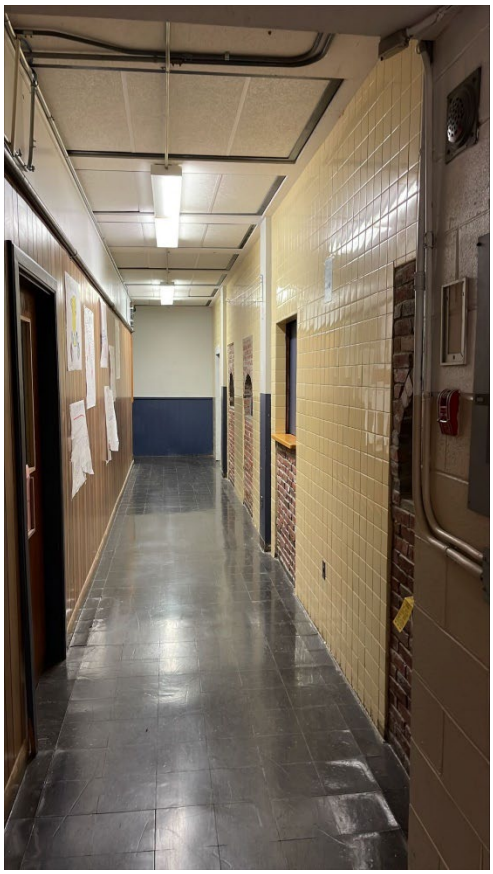
Univents (Unit Ventilators) were observed in each classroom and function as the primary ventilation. The ventilators were installed during the original school construction and were observed to be in poor condition, and well beyond useful life expectancy. In most of the classrooms the exhaust did not appear to function. **The ventilators are of particular concern, as they are not only a significant factor of the buildings' HVAC performance, but also are part of the exterior opening assembly. Both interior and exterior sealants and caulking were in poor and most cases failing condition and in need of immediate abatement, improvement and/or replacement. It should be noted that the staff has found it exceedingly difficult to find parts for these obsolete units.**

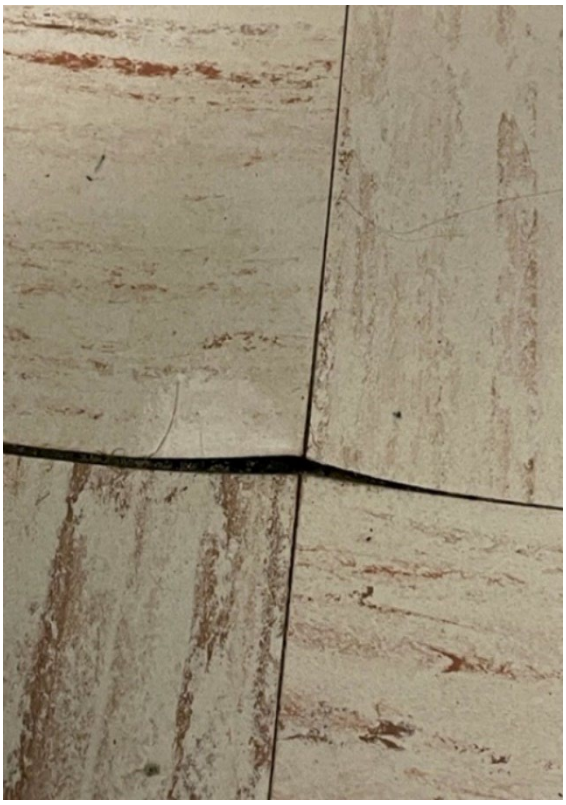
Please refer to the EH&E Report (Appendix A) for more information on paint, sealants and caulking materials present in this location as it should be assumed that hazardous materials are present.

Prep, Chemical Storage & Work Rooms were observed to be constructed with the original building and presented in the same fashion as the classrooms and offices (painted CMU or concrete walls, linoleum flooring and acoustical suspended ceiling tile.

Corridors

Several corridors within the high school were inspected as part of the survey. Wall assemblies were observed to be painted CMU and concrete, some of which had ceramic tile and wood panel finishes. Interior sealant joints were observed where painted CMU and concrete walls abut. **Flooring observed in all locations consisted of 9" x 9" flooring tiles installed during the original building construction**. A variety of acoustic suspended ceiling tile assemblies were observed. Please refer to the EH&E Report (Appendix A) for more information on paint, sealants and caulking materials present in this location as it should be assumed that hazardous materials are present.

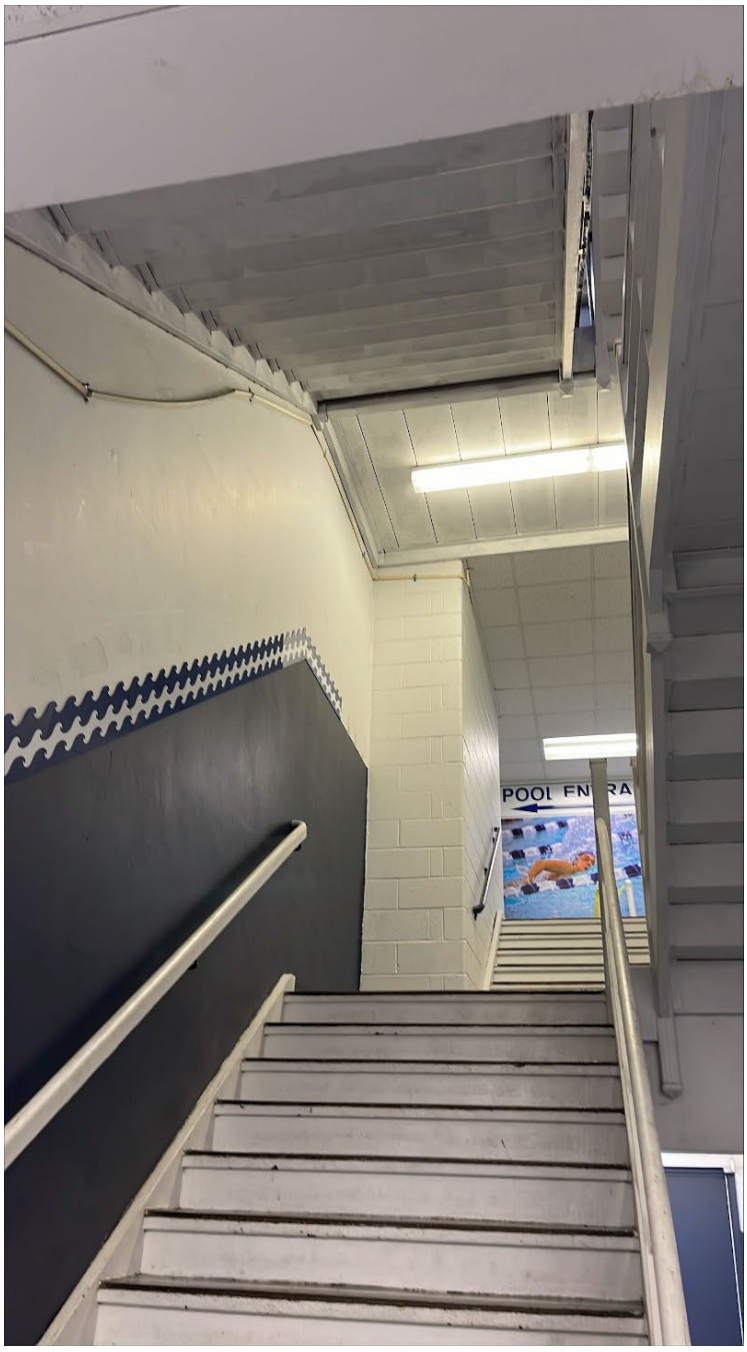




Bathrooms and Building Plumbing

Both student bathrooms and staff bathrooms were observed to be similar in their construction. Wall assemblies consisted of CMU walls with ceramic tile. Flooring tile was installed during the original school construction. **Although 9" x 9" linoleum tile was not observed, the subfloor mastic and leveling compounds should be tested prior to any future improvements.** Plumbing feeding the bathrooms was observed to be copper and black iron, installed during the original building construction in 1970. Many of the fixtures appear to have been replaced over the years, however, leaks were observed, and the plumbing was in poor condition and beyond its useful life expectancy. The maintenance staff has been routinely replacing the domestic water copper piping incrementally as leaks and cracks are identified. Very few isolation valves were observed in either the copper or black iron piping. At approximately fifty years old, the plumbing system of the Building will increasingly continue to fail. A variety of acoustic suspended ceiling tile assemblies were observed. Please refer to the EH&E Report (Appendix A) for more information on paint, sealants and caulking materials present in this location as it should be assumed that hazardous materials are present.

Stairwells



Stairwells located in each quadrant of The Building were observed to be painted CMU and concrete walls. Interior sealant joints were observed where painted CMU and concrete walls abut. Multiple flooring conditions were observed, and in many locations consisted of 9” x 9” flooring tiles which were installed during the original building construction. A variety of acoustic suspended ceiling tile assemblies were also observed. **Please refer to the EH&E Report (Appendix A) for more information on paint, sealants and caulking materials present in this location as it should be assumed that hazardous materials are present.**

Administrative Space

Administrative wall assemblies were observed to be painted CMU and concrete walls, some of which had ceramic tile and wood panel finishes. Interior sealant joints were observed where painted CMU and concrete walls abut. Flooring was observed to be a combination of red quarry tile and 9” x 9” flooring tiles which were installed during the original building construction. A variety of acoustic suspended ceiling tile assemblies were observed. Please refer to the EH&E Report (Appendix A) for more information on paint, sealants and caulking materials present in this location as it should be assumed hazardous materials are present.

Cafeteria

Wall assemblies within the cafeteria were observed to be painted CMU and concrete walls, some of which had ceramic tile and wood panel finishes. Interior sealant joints were observed where painted CMU and concrete walls abut. Flooring observed in all locations were 9” x 9” flooring tiles which were installed during the original building construction. The cafeteria includes a suspended acoustical ceiling assembly.

Please refer to the EH&E Report (Appendix A) for more information on paint, sealants and caulking materials present in this location as it should be assumed that hazardous materials are present.

Incinerator Room

Wall assemblies were observed to be painted CMU and concrete. Interior sealant joints were observed where painted CMU and concrete walls abut. Flooring was observed to be finished concrete. **The incinerator was not working appeared to have been decommissioned over 20 years ago, however, no reports were identified or reviewed to assess the level of abatement completed**.

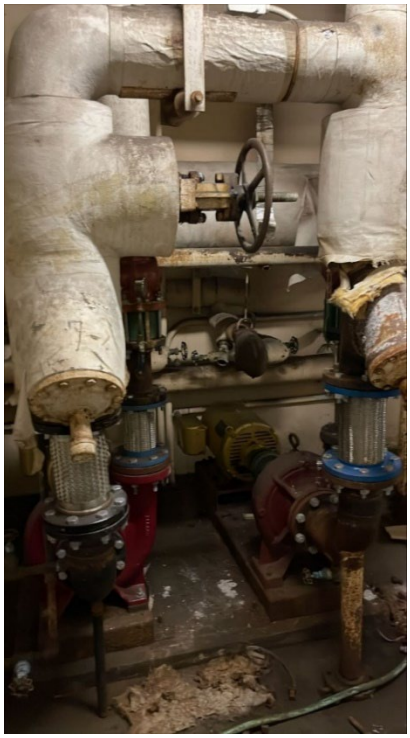
Please refer to the EH&E Report (Appendix A) for more information on paint, sealants and caulking materials present in this location as it should be assumed that hazardous materials are present.

Elevators

Three elevators were observed and included in this report. All have been maintained and were in working order, but in generally poor condition. The main elevator, located off the main entry lobby, is a hydraulic powered 3-stop cab which was installed during the Building's original construction. The service elevator, located next to the cafeteria, was also installed during the original construction. The cab was observed to be in working condition but has not been modernized and has had maintenance issues recently. The third elevator was also observed to be operational, but in poor working condition.

Mechanical Rooms

The main mechanical room located in Building D houses infrastructure for buildings A, B and D. The walls were observed to be painted concrete and CMU. Firestopping was observed to be incomplete on some of the wall elevations. The slab on grade is concrete with 3-4" equipment pads. On each day during the field inspection period significant amounts of water had pooled on the floor. It was reported that the origin of the water was a combination of equipment leaks and ground water seepage. **This standing water is of particular concern. Its origin is possibly related to hydraulic pressure from below the slab system. The under-slab drainage system should be assessed to confirm whether pockets of water or artesian wells are present below the building and are a contributing factor to the standing water in the main mechanical room**. Key pieces of equipment within the room included heat exchangers for buildings A, B and D; two decommissioned air handler units, domestic hot water tanks and pumps, boilers, electric motor control panels and transformers, the main chemical waste tank, the sprinkler standpipe servicing the new science wing on the third floor, and an obsolete pneumatic control system. All but the new domestic water equipment was observed to be installed at the time the Building was constructed, in poor condition and beyond useful life expectancy.



The school's boiler room provides hot water through facility. Three replacement boilers (2008, 2016) and a hot water system under construction during the site tour are housed within the space. The walls were observed to be painted concrete and CMU. The slab on grade is concrete with 3-4" equipment pads. The condition of the room and the existing equipment was poor the equipment is beyond its useful life expectancy.

4.3 Mechanical, Electrical, Plumbing & Fire Protection Systems

Mechanical (Refer to Appendix A - EH&E Report)

The building zones adjacent to the exterior of the Building were observed to be heated and ventilated by unit ventilators. Originally, the unit ventilators had cooling via a two-pipe change over system that received chilled or hot water from the central plant. The central chiller no longer operates. Please refer to the EH&E Report attached for further condition performance assessment.

The interior, or core area of each quadrant originally had cooling but no longer functions, due to lack of the central chiller being operational. The chiller, which was a steam absorption type, has failed in recent years and has not been repaired or replaced.

Reported deficiencies include dirty ductwork and clogged reheat coils which are contributing to poor indoor air quality. The classroom spaces also overheat in the warmer weather due to lack of air conditioning.

Air Handlers

AHU 1 and AHU 2 were observed within the main mechanical room and were not operational at the time of our inspection. Both units were observed to be in poor condition and beyond useful life expectancy. Please refer to the EH&E Report attached for further condition performance assessment.

Heat Exchangers

The heat exchangers for buildings A, B and D were observed within the main mechanical room and were operational and functioning as designed, however, they were installed during the original construction of the building and are beyond useful life expectancy. The heat exchanger located in the C building mechanical room servicing that quadrant was observed in be in the same condition and beyond useful life expectancy. Please refer to the EH&E Report attached for further condition performance assessment.

Pneumatic Controls

The building's HVAC systems were observed to be controlled pneumatically. This system is considered obsolete and requires significant maintenance to be operational. The DDC panel installed to control AHU 1 and AHU 2 is no longer functioning. Please refer to the EH&E Report attached for further condition performance assessment.

Boilers

Three low-pressure steam boilers provide heating to the school. The boilers observed were replacements from the original construction; one in 2008, and two that were installed in 2014. All appeared to be good condition. The obsolete pneumatic controls system, DDC controls, and no building automation system (BAS) are hampering performance of the boilers. Please refer to the EH&E Report attached for further condition performance assessment.

Electrical

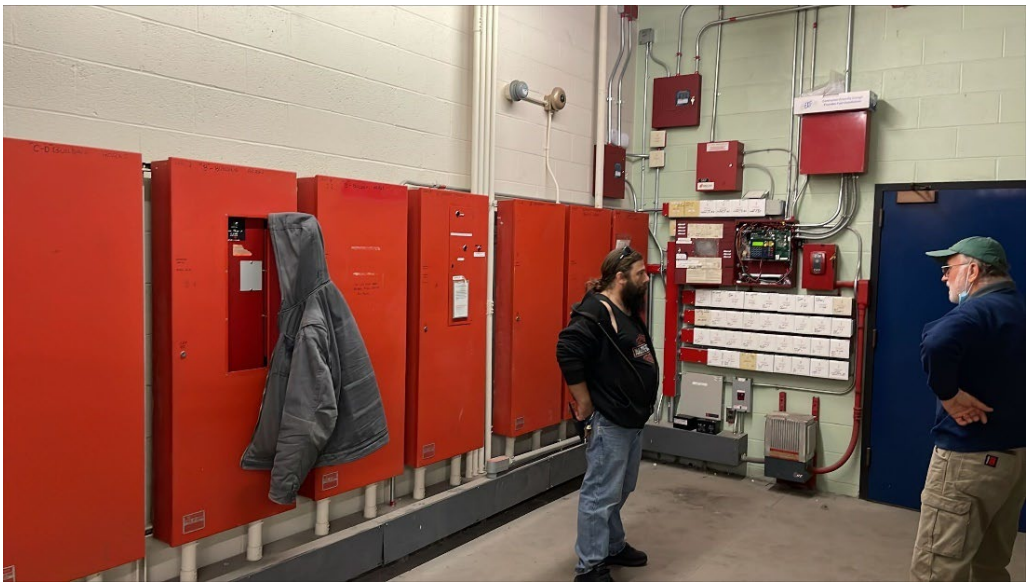
The main electrical room located in building D houses the electrical equipment servicing the building. The power distribution system including panels and feeders were observed to be installed during original construction of the building, beyond useful life expectancy and in poor condition.

The new science wing included installation of a new 480/277V lighting system, power and 208/120-volt receptacle, and power panels including associated feeders in conduit. Please refer to the EH&E Report attached for further condition performance assessment.

Fire Alarm

The building fire alarm system on the first and second floor was observed to have been installed during the original construction, in poor condition and beyond its useful life expectancy.

The third-floor fire alarm system was brough up to code in 2013 as part of the new science wing project. A complete, addressable fire alarm system was observed on this floor and in good working order.



Plumbing

The majority of the existing plumbing fixtures in the oldest sections of the Building (except in the new Science Wing) were observed to be in poor condition and beyond useful life expectancy.

The plumbing infrastructure for buildings A, B, and D are located within the main mechanical room. A new domestic hot water heater system was recently installed and in good working condition. The remaining infrastructure housed within the room was installed during the original construction of the building.

Domestic Water Service

The copper distribution piping for domestic cold and hot water throughout the Building was installed during the original construction of the building, in poor condition and beyond useful life expectancy as previously noted. During field observation it was noted by the staff that leaks are an ongoing problem throughout the Building.

Sanitary and Vents

New acid waste and vent piping was observed in the new science wing, in good working condition

Roof Storm Drainage

The existing storm water piping and roof drains were observed to be original to the Building, in poor condition and beyond useful life expectancy.

Please refer to the EH&E Report attached for further condition performance assessment.

Fire Protection

Except for the new science wing, the Building has no active fire suppression system. An automatic sprinkler system was installed to service the new science wing. Standpipes and sprinklers were observed to be supplied from a dedicated 8" water service, entering the building in the main mechanical room.

4.4 Information Systems

On Thursday, March 31st, 2022, a tour of The Building's Information Systems architecture was completed. CREF's Director of IT and Security, Christopher Wood, was escorted around the building by the Building's Network Administrator Allan Arena. Areas examined were the MDF closet in the Network Administrator offices and the IDF closets across the wings of The Building.

As an artifact of the Building's age, IT Infrastructure was added to the Building as technology changed and improved. The Building was not built with scaling technology in mind, and this is reflected in the performance of the systems. The Building's CMU block construction inhibits wireless communications and technologies and cannot be brought to modern specification without major construction.

The Building's IDF closets have been added to the structure ad-hoc and are not located in the optimal locations, do not have appropriate cooling/HVAC, and do not have enough dedicated power to support the infrastructure as it stands and cannot be upgraded. These deficiencies are liable to result in future outages and issues directly as a result of the ad-hoc nature of the installations (e.g., unshielded CAT5/6 cables running directly over equipment causing melting/breaks). The Building and will result in major infrastructure problems down the line.

As noted in other sections, the Building's construction is aging and beyond its useful life expectancy. This is also reflected in many of the IDF rooms where leaks are present. This jeopardizes both the infrastructure and the health of the employees, due to the noted hazardous material condition referenced in Appendix A.

4.5 Security System

The existing public address system was not evaluated or observed during the onsite inspection period. Proximity card readers were not observed to be installed. Exterior Doors (locked during school hours) were observed to be locked manually by key. This system is obsolete, and it is recommended that it is replaced.

4.6 Environmental

Please refer to the EH&E report in Appendix A.

4.7 ADA

Although an ADA assessment was not part of this scope of work, it is noted that the majority of the building construction is original to its 1971 design. Is does not comply with today's guidelines, and will be subject to all applicable codes, including but not limited to Massachusetts Code 521 CRM: Architectural Access Board Section 521 CMR 3.3.1 and/or Section 521 CMR 3.3.2.

5. Recommendations, Qualifications and Exclusions

Building Envelope

The majority of the building envelope components are past their useful life and in need of replacement for both performance and aesthetic reasons. The existing single-pane operable and fixed windows should be replaced by high-performance window systems that incorporate thermally broken, multi-pane glazing with low-e coatings and incorporate solar shading on the appropriate building exposures. At a minimum, the roofing should be replaced with a highly-reflective, light-colored roofing membrane with increased levels of roofing insulation, while some other sustainable options include providing a vegetated roof over part or all of the facility (depending on structural limitations), incorporation of skylights to bring more natural light to interior areas without windows, and installation of a rainwater capture system to provide water for interior grey-water use.

Interior Finishes

Interior finishes are largely outdated and many likely contain hazardous materials in the products themselves or the adhesives and sealants associated with them. Replacement will result in both visual and environmental improvements. The use of low-VOC paints and flooring will improve the indoor air quality while installation of durable, low-maintenance resilient flooring materials will also reduce maintenance time and expense. High-traffic areas can be updated with impact-resistant wall materials to further reduce maintenance needs and high acoustic value ceiling materials can be installed to improve noise control. There is a large number of finish options for all these surfaces and the final product selections will need to be evaluated based on a combination of first cost, life-cycle cost, durability, maintenance needs, "green" characteristics, and overall aesthetic impact.

Sustainability

Although a sustainability assessment was not conducted as part of this project scope, some energy conservation initiatives associated with future improvements and renovations will be significantly constrained by age and design of the school. It is clear that the building's infrastructure may require major upgrades, or full replacements in order to integrate sustainable systems. Additionally, architectural system upgrades to reduce energy consumption will also be significantly constrained.

Mechanical, Electrical, Plumbing, and Fire Protection

Please refer to Appendix A.

5c. Qualifications and Exclusions

CREF's assessment activities were intended as a preliminary review to identify problems and deficiencies; it was not intended to be a detailed analysis of the facility or its components. Although trained professionals exhibited a "standard of care," with this type of preliminary review it is possible that conditions may exist which will affect the performance of the facility, but which may not have been discovered during this review.

The scope of work specifically excluded obtaining and testing materials and CREF did not perform engineering calculations to determine the adequacy of the existing design.

This review was a non-destructive survey only and specifically excluded any investigative techniques such as moisture surveys, water intrusion testing, adhesion or cohesion testing, load testing, etc.. Testing to determine the presence of asbestos, radon, lead based paint, or other potentially hazardous materials was specifically excluded from our scope of work. Our work also excluded the dismantling or removal of casings, housings, insulation, and other enclosures to visually assess a building roof section. Our scope specifically excluded the dismantling or removal of building elements to visually assess building substrates, structural connections, or fasteners.
It was not CREF's intent to find every defect or make detailed remedial designs, but to identify obvious, visually apparent defects and to generally quantify the extent of the observed defect.

Additional Exclusions

- Comprehensive Fire Code Assessment
- Comprehensive ADA Compliance Assessment
- Comprehensive Safety and Security Assessment
- Environment, Social and Governance (ESG) Program Review

Appendix A: Environmental and HVAC System Review, Medford High School, Medford, Massachusetts (EH&E 25440)

Please see attached.

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March 31, 2022

Mr. Patrick Murphy
Vice President, Business Development & Strategy
Corporate Real Estate & Facilities, LLC (CREF)
200 High Street
Boston, MA 02110

RE: Environmental and HVAC System Review, Medford High School, Medford, Massachusetts (EH&E 25440)

Dear Mr. Murphy:

Environmental Health & Engineering, Inc. (EH&E) provides this report to Corporate Real Estate & Facilities, LLC (CREF) for the screening level environmental and heating, ventilating, and air conditioning (HVAC) system condition review conducted to support the evaluation of Medford High School (the Building) located at 489 Winthrop Street, Medford, Massachusetts. At the request of CREF, the EH&E project team has completed the characterization study to determine if building materials contain hazardous materials or are potentially contaminated with hazardous materials, the condition of primary components associated with the HVAC systems serving the Building, and energy utilization benchmarking. This information is intended for use by CREF and Medford to aid in the decision-making processes for the needs of the existing structure.

EXECUTIVE SUMMARY

- The Building likely contains significant quantities of hazardous building materials including asbestos, lead paint, and polychlorinated biphenyls (PCBs). The cost to fully remediate or mitigate the presence of hazardous building materials is estimated to exceed $10,000,000.
- The HVAC systems serving the third floor science classroom areas (installed circa 2012 as part of the third floor science classroom renovation project) appeared in good working condition as would be expected given they are relatively new.
- The HVAC systems serving the remaining areas of the Building (including the central air handling units and classroom unit ventilators) are original to the time of construction and appeared in very poor condition. A number of the systems inspected were not operating due to mechanical or control issues. These systems require a significant level of effort by facilities personnel to maintain operability and are in need of replacement, including overall fan systems and associated controls.

- Energy utilization benchmarking indicates the Building is more energy intense than average school buildings. The Building's 2021 EUI of 86.0 kilo (thousand) British thermal unit per square feet (kBtu/ft^2) is 77% higher than the national average of 48.5 kBtu/ft^2 for K-12 schools reported by Commercial Buildings Energy Consumption Survey (CBECS). For the Building to meet Mass Save's energy efficiency target for Zero-Net Energy Buildings of 25 kBtu/ft^2, energy intensity would have to be reduced by more than half.

HAZARDOUS MATERIALS

Hazardous materials review for this project consisted of a review of existing environmental reports, an initial site walkthrough, and preliminary visual assessment for presence of hazardous materials. The walkthrough and visual assessment for hazardous materials at the Building was conducted by EH&E during March 2022. In addition, EH&E utilized information gathered through conversations with personnel knowledgeable about the conditions within the Building.

During the course of EH&E's preliminary survey, four conditions were identified that will require ongoing management under an operations and maintenance (O&M) plan, pre-demolition abatement, or remediation. These conditions include:

- Known presence of installed asbestos-containing materials (ACMs) in many areas of the Building.
- Known presence of lead in paint on installed components throughout the Building.
- Known and suspect presence of several miscellaneous hazardous materials throughout the Building.
- Likely presence (did not confirm with testing) that installed building materials containing polychlorinated biphenyls (PCBs) exist in both accessible and concealed applications.

The following sections provide a summary of the key findings and recommendations from the assessment. Please note that this report is subject to the limitations in Appendix A.

Purpose

This analysis was prepared as a screening level guideline for evaluating hazardous materials associated with the Building and to facilitate initial project planning, sequencing, and abatement cost estimation. This document is not a specification or work plan for hazardous material removal, management, or disposal. A comprehensive specification for the removal, management, and disposal of identified hazardous materials will need to be drafted at a later date, at which time, bidding contractors will be required to verify all information regarding the presence, location, and quantity of hazardous materials or conditions including those listed in this preliminary analysis.

Overview of Hazardous Materials

During March 2022 EH&E conducted a screening level hazardous materials survey for building-related hazardous materials within the Building. An overview of the findings and conditions are provided as follows.

Asbestos-containing Materials (ACMs)

A summary of presumed ACMs and conditions are presented in the 2020 Asbestos Hazard Emergency Response Act (AHERA) report.[1] Significant quantities of friable and non-friable suspect materials that are confirmed and presumed ACMs have been identified as part of the AHERA report. Additional sampling and analysis of these materials is required to determine if they contain asbestos prior to disturbance. This will be accomplished through the completion of a National Emissions Standards for Hazardous Air Pollutants (NESHAPs) compliant asbestos inspection prior to any building renovation or demolition. The confirmed and presumed ACMs are located extensively throughout the interior of the Building. These materials are primarily associated with the 9" x 9" vinyl floor tiles and mastic, sink coatings, stage curtain, caulking in brick, window sills, breeching insulation, vibration cloth, caulking on interior windows, laboratory counter tops, and beige floor tiles and mastic. Currently these materials are managed under an operations and maintenance (O&M) plan.

It should be noted that locations in the Building where ACM is present, other potential hazardous materials can exist. Prior to conducting any work involving the removal of ACMs, other potentially hazardous materials must be appropriately addressed or controlled.

The U.S. Environmental Protection Agency (EPA) NESHAPs regulation, Title 40 Code of Federal Regulations (CFR) Section 61.145 requires, prior to building demolition or renovation, the removal and disposal of friable asbestos-containing building materials or those materials that will become friable as a result of demolition or renovation work. The Commonwealth of Massachusetts classifies materials as asbestos-containing materials (ACMs) when they contain greater than or equal to 1.0% asbestos. Trace concentrations (less than 1.0%) of asbestos require transport as ACM waste to an out of state facility. EH&E recommends that anyone handling building materials with trace concentrations of asbestos be properly notified of the material's asbestos status.

The existing inspections under the AHERA regulations require that friable materials be assessed for asbestos content and condition. They do not address concealed building materials that would be subject to disturbance during demolition. EH&E recommends that a comprehensive

[11] Universal Environmental Consultants, *AHERA 2020 Three-Year Re-Inspection Report, High School, 489 Winthrop Street.*

NESHAPs inspection be performed prior to any renovation or demolition to characterize all building materials.

Cost estimates provided in the AHERA report and adjusted for inflation indicate that remediation of accessible ACMs in the Building with associated monitoring will cost approximately $1,050,000.

Lead-based Paint

Lead-containing paints and coatings were identified in the Building as part of a limited investigation prior to the Science Laboratory Renovation project in 2012/13. Prior sampling identified several paints with concentrations greater than 0.1 milligrams per square centimeter (mg/cm^2) of lead. The identified materials include maroon, brown, and tan paint on CMU block, red paint on a pegboard, and light brown paint in the stairwell. This survey was limited in scope to the Science Laboratory renovation area; however, it is likely that these paints are present in other areas of the Building. The 2012/13 inspection was conducted to support demolition and waste managment efforts, and was not designed to support child occupancy of the building. Massachusetts Department of Early Education and Child Care requires that if a program serves any child younger than five years old, the licensee must provide evidence of a lead paint inspection from the local board of health, or the Massachusetts Department of Public Health, or a private lead paint inspection service and compliance with the Department of Public Health regulations at Title 105 Code of Massachusetts Regulations (CMR) Section 460.000, *Lead Poisoning Prevention and Control*.

The evaluation conducted by EH&E in March 2022 does not constitute a compliance inspection as defined under Childhood Lead Poisoning Prevention Program (CLPPP) regulations and it is not currently known if lead-containing paint is present in all areas of the Building. Review of the CLPPP database indicates that a location at the Building underwent an initial lead paint inspection on January 1, 1998. The inspector was Diane Ciano (License #3146). No additional listings were present in the database for 489 Winthrop Street, Medford, MA. It is not clear that the inspection ("Unit 1013" in the database) was conducted in the daycare area; however, given the use of the building, it is a likely location for inspection. The report states "At the time of inspection there were lead hazard found on the property. The inspection showed areas that did not meet Massachusetts rules for lead safety. Lead paint was found in poor condition (chipping or peeling), or on areas of windows that could make dust, or in areas where young children could reach it."

In order to achieve compliance with lead regulation for areas of the Building occupied by young children under 5 years of age, if not already obtained, Medford should take action to obtain a current Letter of Full Deleading Compliance. Therefore, the cost estimate provided in this report

includes an allowance for lead inspection services. This work must be completed by a Massachusetts licensed lead inspector.

One option for de-leading compliance is to make these surfaces intact with simple encapsulation at an approximate cost of $5 – $8 per square foot (SF). If, to support renovation, full removal and disposal, the cost would be approximately $12 – $15 per SF. An additional cost of $1,800 – $2,500 is estimated for contractor mobilization. Cost estimates are summarized in Table 1:

Table 1 Summary of Estimated Costs for Lead Paint Remediation, Medford High School, Medford, Massachusetts

Remediation Activity Cost Item	Estimated Cost*
Inspection and Reporting	$14,000 – $20,000
Contractor Mobilization (Lump Sum)	$1,800 – $2,500
Surface Stabilization/Encapsulation ($5 -$8/SF)	$25,000 – $40,000
Full Removal ($12- $15/SF)	$60,000 – $75,000
Total Cost - Surface Stabilization/Encapsulation	$40,800 – $62,500
Total Cost - Full Removal	$75,800 – $97,500
Total	$40,800 – $97,500

SF square feet

* All costs are approximate and must be verified by bidding contractor(s). Estimated cost assumes remediation of 5,000 square feet of space in the Building.

Any contractor that will disturb, remove, or dispose of materials coated with paint, containing lead in any amount, is subject to the OSHA *Lead Construction Standard*, 29 CFR 1926.62. OSHA requires employers to provide a complete worker protection and exposure program for any renovation or demolition activities where lead is present in paint at any concentration. A hazard assessment must be completed to determine site-specific requirements for compliance. Programs must address respiratory protection and include personal air sampling for the various tasks being performed.

Lead-containing wastes must be removed and disposed in accordance with all applicable regulations. The concentrations of lead in painted waste materials are not considered highly elevated but will require proper characterization testing prior to disposal. This is typically performed using the Toxicity Characteristic Leaching Procedure to ensure proper disposal.

Miscellaneous Hazardous Materials

Various types of miscellaneous hazardous materials (potential PCB ballasts, mercury-containing light bulbs, refrigerants, transformers, etc.) were observed throughout the Building. These materials are required to be removed and containerized for proper management prior to disposal.

EH&E observed several suspect miscellaneous hazardous materials in the Building including:

- Fluorescent light tubes (both installed and in storage) that may contain mercury.
- Fluorescent light ballasts that may contain PCBs.
- Exterior lighting that may contain mercury or other heavy metals.
- Refrigerant in white goods, coolers, and heating, ventilating, and air-conditioning equipment.
- Lead-acid batteries associated with emergency exit signs.
- Lubricants for servicing compressors and mechanical equipment.

EH&E recommends proper handling and disposal of all miscellaneous hazardous materials prior to any renovation or demolition activities. Estimated cost for removal and disposal of miscellaneous hazardous materials is approximately $125,000.

PCB-containing Building Materials

Multiple exterior caulk applications were observed in transition and expansion joints and are assumed to be present in materials concealed under newer window systems. These sealants should be assumed to contain or cover previous materials installed during the PCB era. If present, the remediation and mitigation of PCBs will likely be the largest hazardous materials expense associated with renovations of the existing Building.

Polychlorinated biphenyls (PCBs) had numerous commercial applications before they were banned in the U.S. in 1978. Those uses included the addition of PCBs to building construction materials, such as adhesives, paint, and caulk. Numerous methods for abatement and mitigation are available. In September 2009, the EPA provided initial guidance to property managers, particularly administrators of schools, on approaches to managing potential exposures to PCBs in building materials. The guidance from EPA complements the requirements in Title 40 Part 761 of the Code of Federal Regulations for characterization and disposal of waste materials that contain PCBs. PCBs were reported to have been sold in the U.S. from 1958 through 1971 for use as plasticizers or as a component of numerous industrial products. The construction of the Building occurred during this time period.

The PCB regulations do not specify a schedule for determination of PCB-containing materials as waste or a timeline for remediation of PCB waste. This aspect of the regulations provides the opportunity for property owners to identify the remediation strategy that is most appropriate for a building with PCB containing materials. The costs of removing exterior PCB caulk and contaminated porous materials, primarily concrete, using hand and mechanical tools normalized to building size, can typically range between $9 to $18 per square foot of indoor building space. The variation in costs reflects many factors including the amount and accessibility of PCB-contaminated building materials and must be verified by bidding contractor(s). Estimated cost of PCB remediation of the Building range from $4,680,000 to $9,360,000.

Preliminary Cost Information Summary

Within the Building, different types of hazardous materials or conditions exist within the same area or location and, as a result, the means and methods to appropriately address such materials may overlap or conflict. Careful planning by the project team and execution by the contractor(s) selected to conduct work is critical in ensuring that the removal, containerization, and disposal of hazardous materials are conducted in a manner that does not impact the safety of people or create release of contaminants to the environment.

Preliminary cost estimates are included by remediation activity in Table 2.

Table 2 Summary of Estimated Costs for Hazardous Building Materials Remediation, Medford High School, Medford, Massachusetts

Remediation Activity Cost Item	Estimated Cost*
Accessible Asbestos Containing Building Materials (ACBM)	$900,000
ACBM Project Design, Monitoring and Air Sampling	$145,000
Polychlorinated Biphenyl (PCB)-containing Building Materials	$8,000,000
PCB-containing Soil	$750,000
Lead-based Paint Limited Areas for Child (less than 5) Occupancy	$97,500
Universal Waste and Refrigerants	$125,000
Total	$10,000,000

* All costs are approximate and must be verified by bidding contractor(s).

MECHANICAL AND PLUMBING SYSTEMS

Heating, Ventilating, and Air-conditioning Systems

HVAC service for Medford High School is provided through a combination of rooftop air handling units (AHUs), central AHUs, and unitary classroom unit ventilators (UVs).

The rooftop AHUs are approximately 10 years old and were installed as part of the 2012 renovation of the third floor science classrooms. These AHUs provide 100% outdoor air and are equipped with heat recovery systems. There are three rooftop AHUs in total, and all provide heating and cooling to the spaces served. The rooftop AHUs and associated systems appeared in good condition, and all appeared to be operational.

The central AHUs are original to the building (circa 1967-69) and were designed as mixed air systems delivering a combination of outdoor air and air recirculated from the occupied spaces. There are approximately 10 central AHUs in total, which provide service to interior zones within the facility including interior offices and classrooms, the auditorium and band areas, locker rooms, the kitchen, and the administrative offices. With the exception of the AHU serving the administrative offices, all central AHUs are designed to provide heating only through either a hot

water or steam heating coil. The AHU serving the administrative offices also provides cooling through a direct expansion cooling coil and an air-cooled condenser located on the roof.

The central AHUs appeared in poor condition and have exceeded their useful life. A number of the central AHUs were not operating at the time of inspection due to mechanical issues or control related problems. According to facilities staff, these units require constant maintenance to maintain operability and constant attention to ensure they are controlling properly. As currently operated, these AHUs are unable to consistently meet the year round thermal and ventilation needs of the spaces served and are in need of complete replacement, including fan systems and controls.

Spaces situated along the perimeter of the Building are ventilated and thermally conditioned with individual classroom unit ventilators. These units are floor mounted and located on the exterior wall of the space. The UVs are original to the building and provide a mixture of outdoor air and air recirculated from the space served. Outdoor air is provided to the UVs through a side wall outdoor air intake that is integral to the UV. The UVs provide heating only using a hot water heating coil. The UVs surveyed as part of the assessment are in poor condition and in need of replacement. Some UVs inspected were not operating and, therefore, are not providing appropriate ventilation to the spaces served.

Automatic temperature controls for the originally installed HVAC equipment, (including central AHUs and classroom UVs) is through a pneumatic control system. This control system is original to the building and is in generally poor condition. Further, this system does not allow for facility personnel to readily assess system control points or to be notified upon system or component failure. In addition, the pneumatic control system does not allow for facilities personnel to set system operational schedules and as such, systems are operated continuously 24/7. The control system for the rooftop AHUs and the associated systems included as part of the 2012 science classroom renovation project is through direct digital control. This control system is in good condition and allows for the maintenance of set points and operational scheduling.

There are multiple exhaust fans serving the facility, which provide general exhaust for classrooms and dedicated exhaust for specific areas including the gymnasium and locker rooms, vocational technical shops, toilet rooms, etc. Exhaust fans observed by EH&E as part of the March 2022 assessment showed that they appeared in relatively good condition.

Boiler and Heating Hot Water Systems

The heating system for the building comprises three low pressure steam boilers located in the boiler room on the northeast corner of the facility. The three boilers are relatively new and were a replacement of existing boilers. Two of the boilers were installed circa 2014 and the third boiler was installed circa 2007. All boilers appeared in good condition.

For heating hot water, low pressure steam from the boilers is provided to multiple steam to hot water heat exchangers located throughout the facility where the steam is used to generate hot water for AHU and classroom UV heating (note that a small number of the original AHUs are provided direct steam for heating). Hot water generated through the steam to hot water heat exchanges is distributed to the AHU and UV heating coils through hot water circulation pumps. Heat exchanger and hot water pumping systems appeared in fair condition and operational.

Domestic Hot Water Systems

The domestic hot water for the school is provided by two separate systems, one located within the first floor south mechanical room (serves about 60% of facility), and the second located in the second floor northwest mechanical room in the vicinity of the gymnasium and locker rooms (serves about 40% of facility).

The domestic hot water system located in the first floor mechanical room comprises a set of dedicated hot water boilers that provide hot water to a set of storage tanks. These systems appeared in good working order. The domestic hot water system located in the northwest quadrant of the facility comprises two steam to hot water storage tanks that are original to the building. These systems are provided plant steam to heat and maintain the temperature of water within the tanks. These tank systems are in the process of being replaced with a dedicated domestic hot water heating system similar to that in the south mechanical room.

OVERVIEW OF ENERGY UTILIZATION BENCHMARKING

Benchmarking energy use involves comparing a building's energy utilization to similar buildings in the region. The energy use of a building is dependent of the size, use of the space and operations. The Building has 532,000 ft^2 of floor area used for classrooms, administrative offices, a gymnasium, and a 25-yard indoor heated swimming pool. For school buildings, factors including the age of the building and energy intensive equipment may increase the Energy Use Intensity (EUI). EUI is the energy use of a building per square foot of space and is often used to compare energy use across buildings in the same way that miles per gallon is used to compare fuel economy across vehicles. The energy use and weather normalized EUI for the Building from 2014 to 2021 is shown in Figure 1. The EUI ranged from 55.6 to 86.0 kBtu/ft^2 over the past 8 years with an average of 67.3 kBtu/ft^2. The Building's 2021 EUI of 86.0 kBtu/ft^2 is 77% higher than the national average of 48.5 kBtu/ft^2 for K-12 schools according to the Commercial Buildings Energy Consumption Survey (CBECS).[2] In 2020, Boston K-12 Schools reported EUIs

[2] Energy Star. 2021. *Technical Reference: U.S. Energy Use Intensity by Property Type*. Accessed on March 28, 2022, from: https://portfoliomanager.energystar.gov/pdf/reference/US%20National%20Median%20Table.pdf

from 4.5 to 139.7 kBtu/ft^2, with an average of 52.7 kBtu/ft^2 (N = 137).[3] In 2020, the Building was less efficient than 82% of Boston K-12 schools. In the past 3 years, the Building's EUI has increased from 55.6 kBtu/ft^2 in 2018 to 86.0 kBtu/ft^2 in 2021, possibly due to increased ventilation demands in response to the COVID-19 pandemic. The trends in Building EUI indicate that energy use is increasing, and the Building is less energy efficient than the national and regional averages.

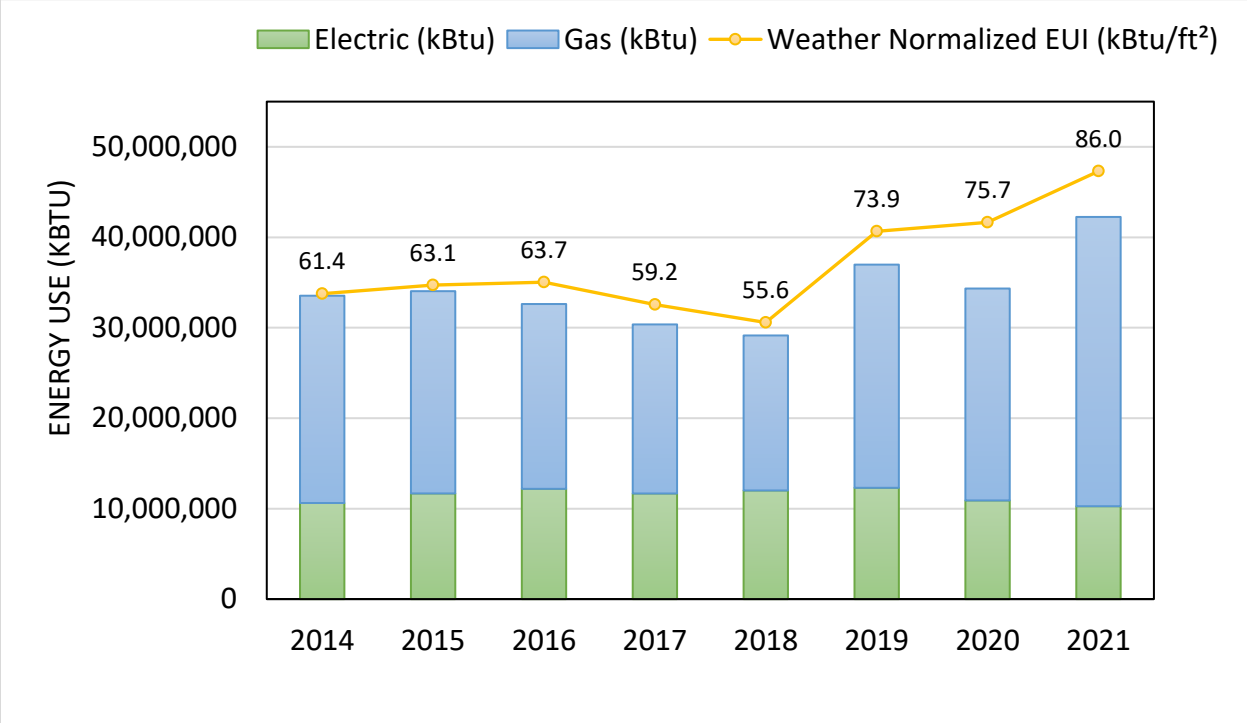

Figure 1 Energy Use and Weather Normalized Energy Use Intensity (EUI) for Medford High School from 2014 to 2021[4]

According to the U.S. Department of Energy, space heating and cooling and lighting account for approximately 70% of energy use in schools.[5] In 2021, the Building used 35.8 billion Btus of energy, 77.5% of which was from natural gas. Natural gas is primarily used in cooler months for heating, while electricity has many end-uses including lighting and space cooling in some parts of the Building. A 2009 study of 30 schools in Massachusetts assessed EUIs for fuel and electricity for standard and green buildings. The study reported an average fuel (gas and oil) use intensity of 42 kBtu/ft^2 (range 28 to 81 kBtu/ft^2) for standard schools compared to

[3] City of Boston. 2021. *2021 Reported Energy And Water Metrics*. https://data.boston.gov/dataset/b09a8b71-274b-4365-9ce6-49b8b44602ef/resource/a7b155de-10ee-48fc-bd89-fc8e31134913/download/2021-reported-energy-and-water-metrics.xlsx

[4] Gas bills for June 2020 and June 2021 were missing. Electric bills from May 2021 and June 2021 were missing. The gas usage for October 2019 was flagged as anomalous for being 16 times the average usage for the month of October.

[5] Energy Star. 2006. *Energy Star Building Manual: Chapter 10. Facility Type: K-12 Schools*. p. 3. Accessed on March 28, 2022 from: https://www.energystar.gov/sites/default/files/buildings/tools/EPA_BUM_CH10_Schools.pdf

34 kBtu/ft^2 (range 22 to 45 kBtu/ft^2) for green schools.[6] The gas intensity in 2021 for the Building was 60 kBtu/ft^2, which is 42% higher than the median for standard schools in Massachusetts. The electric EUI for the Building was lower than the median, likely due to the fact that most of the schools surveyed were built after 2000 and had air-conditioning in the entire building.

Energy efficiency in Massachusetts schools has improved over time due to state initiatives and energy saving projects. In March 2021, Massachusetts passed legislation to commit to net-zero emissions in 2050.[7] Several Massachusetts schools, have designed net-zero buildings, where the school produces as much energy as it consumes.[8] New construction or major renovation Zero-Net energy projects must have a target EUI of 25 kBtu/ft^2 or less.[9] For the Building to meet the energy efficiency target of 25 kBtu/ft^2, energy intensity would have to be reduced by more than half.

If you have any comments or questions, please contact either of us at 1-800-TALK EHE (1-800-825-5343).

Sincerely,

Matt A. Fragala, M.S., C.I.H., CSP
Managing Principal Consultant/Project Manager

Brian J. Baker, P.E.
Principal Engineer

Appendix A Limitations
Appendix B References

[6] MRET and MSBA. 2009. *Massachusetts Green Schools: Post-Occupancy Study of Energy Efficiency*. p. 34. Accessed on March 28, 2022 from: https://chps.net/sites/default/files/MA_POStudy_FINAL_110509.pdf

[7] https://www.mass.gov/news/governor-baker-signs-climate-legislation-to-reduce-greenhouse-gas-emissions-protect-environmental-justice-communities#:~:text=The%20legislation%20signed%20by%20Governor,of%20no%20less%20than%2050%25

[8] https://www.massschoolbuildings.org/programs/story_of_a_building/Dec_2021

[9] Mass Save. *Commercial New Construction or Major Renovation Path 1: Zero-Net Energy / Deep Energy Savings.* Accessed on March 29, 2020 from: https://www.massschoolbuildings.org/sites/default/files/edit-contentfiles/Programs/Story_Of_A_Building/May_2021/New_Construction_Overview_Path1.pdf

APPENDIX A
LIMITATIONS

1. Environmental Health & Engineering, Inc.'s (EH&E) assessment described in the attached report number 25440, *Environmental and HVAC System Review, Medford High School, Medford, Massachusetts* (hereafter "the Report"), was performed in accordance with generally accepted practices employed by other consultants undertaking similar studies at the same time and in the same geographical area; and EH&E observed that degree of care and skill generally exercised by such other consultants under similar circumstances and conditions. The observations described in the Report were made under the conditions stated therein. The conclusions presented in the Report were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services.

2. Observations were made of the site as indicated within the Report. Where access to portions of the site was unavailable or limited, EH&E renders no opinion as to the condition of that portion of the site.

3. The observations and recommendations contained in the Report are based on limited environmental sampling and visual observation and were arrived at in accordance with generally accepted standards of industrial hygiene practice. The sampling and observations conducted at the site were limited in scope and, therefore, cannot be considered representative of areas not sampled or observed.

4. When an outside laboratory conducted sample analyses, EH&E relied upon the data provided and did not conduct an independent evaluation of the reliability of these data.

5. The purpose of the Report was to assess the characteristics of the subject site as stated within the Report. No specific attempt was made to verify compliance by any party with all federal, state, or local laws and regulations.

APPENDIX B
REFERENCES

EPA 40 CFR 61.145. National Emissions Standards for Hazardous Air Pollutants. *Code of Federal Regulations*, Title 40, Part 61, Section 145, Standard for Demolition and Renovation. Washington, DC: U.S. Environmental Protection Agency.

EPA 40 CFR 763. Asbestos. *Code of Federal Regulations*. Title 40, Part 763, Subpart E, Asbestos-Containing Materials in Schools. Washington, DC: U.S. Environmental Protection Agency.

EPA 40 CFR 763.85. Asbestos. *Code of Federal Regulation*s, Title 40, Part 763, Section 85, Inspections and Reinspections. Washington, DC: U.S. Environmental Protection Agency.

MADEP 310 CMR 7.15. Air Pollution Control. *Code of Massachusetts Regulations.* Title 310, Part 7, Section 15, Asbestos. Boston, MA: Commonwealth of Massachusetts, Department of Environmental Protection.

MADLS 453 CMR 6.14, The Removal, Containment or Encapsulation of Asbestos. *Code of Massachusetts Regulations*, Title 453, Part 6, Section 14, Work Practices and Other Requirements for Asbestos Response Actions, Boston, MA: Commonwealth of Massachusetts, Department of Labor Standards.

OSHA 29 CFR 1910. Occupational Safety and Health Standards. *Code of Federal Regulations.* Title 29, Part 1910. Washington, DC: U. S. Occupational Safety and Health Administration.

OSHA 29 CFR 1926. Safety and Health Regulations for Construction. *Code of Federal Regulations*, Part 29, Title 1926. Washington, DC: U.S. Occupational Safety and Health Administration.

OSHA 29 CFR 1926.62. Safety and Health Regulations for Construction. *Code of Federal Regulations*, Part 29, Title 1926, Section 62, Lead. Washington, DC: U.S. Occupational Safety and Health Administration

OSHA 29 CFR 1926.1101. Safety and Health Regulations for Construction. *Code of Federal Regulations*, Part 29, Title 1926, Section 1101, Asbestos. Washington, DC: U.S. Occupational Safety and Health Administration.

Medford Public Schools

489 Winthrop Street, Medford, Massachusetts 02155

From the Medford School Committee April 3, 2023

Resolved: Having convened in an open meeting on April 3, 2023, prior to the SOI submission closing date of April 14, 2023, the School Committee of the City of Medford, in accordance with its charter, by-laws, and ordinances, has voted to authorize Superintendent Marice Edouard-Vincent to submit to the Massachusetts School Building Authority the Statement of Interest Form dated April 2023 for Medford High School located at 489 Winthrop Street which describes and explains the following deficiencies and the priority categories for which an application may be submitted to the Massachusetts School Building Authority in the future.

The Medford School Committee hereby further specifically acknowledges that by submitting this Statement of Interest Form, the Massachusetts School Building Authority in no way guarantees the acceptance or the approval of an application, the awarding of a grant or any other funding commitment from the Massachusetts School Building Authority, or commits the City of Medford to filing an application for funding with the Massachusetts School Building Authority.

2023 Medford High School MSBA Core Program Statement of Interest Summary:

Replacement, renovation or modernization of school facility systems, such as roofs, windows, boilers, heating and ventilation systems, to increase energy conservation and decrease energy related costs in a school facility.

Having been originally constructed in 1970 and with substantial portions of the building's infrastructure dating from that time, Medford High School's (MHS) operating systems, including but not limited to its pneumatic-controlled HVAC systems, roofs, windows, plumbing, and electrical systems have long outlived their useful life expectancy and/or are in very poor working condition. In addition to major energy deficiency challenges posed by these antiquated systems, which were identified recently in a facilities condition assessment and accompanying follow up analysis, the MHS facility features suboptimal ADA accessibility, fire safety, security and technology infrastructure that would potentially be addressed through an MSBA partnership.

MPS seeks to submit this Statement of Interest to explore possible remedies to environmental challenges plaguing MHS attributable to highly antiquated systems like single pane windows and plumbing and heating systems that have too frequently proved inadequate to withstand the fluctuations in weather patterns that are inevitable in the greater Medford area. In addition to escalating and wasteful utilities expenses, extreme temperatures and leaky or burst pipes have yielded significant disruptions to learning environments for students and educators.

While these challenges have been persistent over an extended period of time, the volume and urgency of the challenges have grown exponentially since the Medford Public Schools submitted its previous State of Interest and participated in the MSBA's senior student visit process over the course of the last year. Three separate hallways have been forced to be shut down due to the detection of abnormal and potentially dangerous levels of asbestos attributable to broken floor panels. Despite the winter of 2022-2023 being relatively mild, the school's pattern of burst pipes has worsened with multiple major failures resulting in the flooding and forced closures of classrooms with costly and expedited repair projects a near constant phenomenon. Finally, multiple critical incidents requiring rapid responses from public safety officials, ranging from medical emergencies to two well-documented physical altercations between students, have laid bare the inherent safety and security deficiencies of Medford High School during the current and, as yet unfinished, school year.

As noted just one year ago when students returned to in-person learning in school year 2020 - 2021 after the pandemic-related shutdowns, MPS made a concerted effort to repair HVAC systems in order to meet heightened air quality standards that were believed to help mitigate the spread of COVID-19. These efforts along with an emphasis on fresh air to increase the frequency of air exchanges in confined spaces put additional pressure on HVAC systems that by virtue of their age alone were overly taxed. In the aforementioned report and studies, MHS was estimated to expend 77% more energy than an average American school facility. While MPS will continue to identify ways to identify energy efficiency strategies in the short term, the continued reliance on a 600,000 square foot facility that now houses a fraction of the student population it once did will continue to pose major challenges from an energy conservation perspective.

Finally, while frequent air quality testing and environmental analysis has continued to demonstrate that MHS is currently a safe environment for students and staff, the materials used to build the school over 50 years ago yield considerable challenges with respect to costs and the removal of hazardous materials in the event of significant repair work, which given the school's poor functioning electrical and plumbing infrastructure represents an ongoing considerable financial risk.

Replacement of or addition to obsolete buildings in order to provide for a full range of programs consistent with state and approved local requirements.

In 2017, after decades of functioning as two distinct schools housed in one building, the Medford School Committee voted to merge Medford High School and Medford Technical Vocational High School into one comprehensive high school featuring a broad array of academic and approved ch. 74 vocational programming. Since that time, MHS has seen an increasing number of students choose to commit to studying in one of Medford's 15 approved ch. 74 vocational programs, rising from 22% of the eligible students in school year 2017 - 2018 to 45% today. This increasing investment and interest on the part of Medford students and families in vocational programming

has made the full integration and cohesion of the entire school community an urgent priority for the Medford Public Schools.

In addition to the climate and logistical challenges posed by the environment deficiencies referenced above, the antiquated infrastructure of MHS has also posed instructional and enrollment challenges in light of the increasing competitiveness of the school's vocational programs. Several of the ch. 74 programs lack adequate related classroom space, which significantly diminishes educators' ability to convene groups of students to engage in focused discussions on the disciplines they are learning. In addition, several programs, including but not limited to Health Assisting and Electrical, have found their enrollments necessarily capped due to a scarcity of space in their labs and shops.

In addition to the district's inability to provide seats in existing programs commensurate with the level of interest, an analysis by the Metro North Workforce Board has urged the consideration of the development of additional ch. 74 programs including but not necessarily limited to Plumbing, Animal Science, Dental Assisting, and Information Support Services/Networking. Given the exploding popularity of the school's existing programs, and the interest being expressed in these and other prospective programs, there is a compelling basis to consider the development and adoption of programs that will position students to gain mastery of these workforce-sustaining educational pathways.

In addition to the need to meet the demands of the Medford community by offering a full complement of vocational programming, MPS is eager to consider ways to more fully integrate what were once two schools into a comprehensive school community so students can leverage a diverse array of academic and vocational programming in an environment that is well-suited to meet their instructional needs. To that end the aforementioned environmental deficiencies that lead to wildly fluctuating temperatures and classes that are routinely relocated to other sections of the building due to burst pipes, damaged heating coils, or failing technology systems has become an all-too-common distraction to the educational environment that MHS students require. During the current school year alone, multiple vocational programs have seen major disruptions to their instructional sequencing due to significant leaks in their lab or shop areas. Further, multiple guidance offices have been forced to temporarily relocate due to the persistence of the leaking during inclement weather. In addition to these types of distractions, the building's culture is negatively affected by an antiquated architectural structure in which over one third of the learning environments offer either no or virtually no natural light.

Students have frequently described their flagship school as bleak with a persistent sense of foreboding that is exacerbated by multiple undersized cafeterias that cause supervisory challenges to staff and logistical challenges for students seeking fresh and hot meals. Venues that should serve as hospitable gathering places for the school community like the auditorium and lecture halls are instead associated with constantly malfunctioning HVAC systems that diminish both opportunities for learning and the overall school culture.

Finally, while the district has invested in staffing and security cameras to help ensure the school's physical safety, the lack of optimal security infrastructure constitutes a subtle but persistent distraction to students. This too is not a problem in the abstract. On multiple occasions during the first half of the 2022 - 2023 school year, school administrators and public safety officials were forced to respond to in-school emergencies for which the school's cavernous scale and deficient technologies posted obstacles both with respect to immediate response and subsequent investigatory steps.

These deficiencies are indicative of how the school's aging and deteriorating infrastructure has affected both the development of educational programs and the capacity for students and staff to thrive from a teaching and learning perspective within those programs.

Signed by the Chair of the Medford School Committee, Mayor Breanna Lungo-Koehn

City of Medford

OFFICE OF THE CITY CLERK

City Hall - Room 103
85 George P. Hassett Drive
Medford, Massachusetts 02155

Telephone
(781) 393-2425
FAX: (781) 391-1895

Adam L. Hurtubise
City Clerk
ahurtubise@medford-ma.gov

April 12, 2023

Mr. James A. MacDonald
Chief Executive Officer
Massachusetts School Building Authority
40 Broad Street
Boston, MA 02109

Dear Mr. MacDonald:

On April 11, 2023, the Medford City Council voted to approve Paper **23-090**, the MSBA Statement of Interest on behalf of Medford High School. The vote to approve the paper was seven in favor and zero opposed.

I have included with this letter a certified copy of the Council Paper, including a certified record of the vote total.

I have also included the Seal of the City of Medford on this letter.

Thank you for your attention to this matter. Please feel free to contact me if you have any questions.

Sincerely yours,

Adam L. Hurtubise
City Clerk

Medford City Council

11-23 4-11-23 **2023**

Paper # 23- 090

Subject: Support filing MBA Applic

for Medford Public	YES	NO	ABSENT
S. Lewis VICE PRESIDENT BEARS	✓		
COUNCILLOR CARAVIELLO	✓		
COUNCILLOR COLLINS	✓		
COUNCILLOR KNIGHT	✓		
COUNCILLOR SCARPELLI	✓		
COUNCILLOR TSENG	✓		
PRESIDENT MORELL	✓		
TOTAL	7	0	

IN CITY COUNCIL, APRIL 11, 2023

23-090

April 5, 2023

Via Electronic Delivery
To the Honorable President and
Members of the Medford City Council
Medford City Hall
Medford, MA 02155

Re: MSBA Statement of Interest

Dear President Morell and Members of the City Council:

I respectfully request and recommend that your Honorable Body approves the Massachusetts School Building Authority (MSBA) Statement of Interest on behalf of Medford High School that has been prepared by the Medford Public Schools for consideration for the MSBA's Core Program. This submission is in follow up to the March 27th letter you received from the Superintendent of Schools.

Superintendent Marice Edouard-Vincent will be available at your meeting should there be any questions or additional information that members would like to obtain.

Thank you for your consideration.

MSBA REQUIRED FORM OF VOTE TO SUBMIT STATEMENT OF INTEREST

Resolved: Having convened in an open meeting on April 11, 2023, prior to the SOI submission closing date, the City Council of the City of Medford, in accordance with its charter, by-laws, and ordinances, has voted to authorize Superintendent Marice Edouard-Vincent to submit to the Massachusetts School Building Authority the Statement of Interest Form dated April 2023 for Medford High School located at 489 Winthrop Street which describes and explains the following deficiencies and the priority categories for which an application may be submitted to the Massachusetts School Building Authority in the future.

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These deficiencies are indicative of how the school's aging and deteriorating infrastructure has affected both the development of educational programs and the capacity for students and staff to thrive from a teaching and learning perspective within those programs.

Very truly yours,

Mayor Breanna Lungo-Koehn

Medford Public Schools

March 27, 2023

489 Winthrop Street, Medford, Massachusetts 02155 Dr. Marice Edouard-Vincent, Superintendent of Schools

Medford City Council % President Nicole Morrell
85 George P. Hassett Drive, Room 207
Medford, MA 02155

Re: Upcoming MSBA Core Program Application

Dear President Morrell and Honorable Members of the Medford City Council:

As you may recall, one year ago the Medford Public Schools submitted to your honorable body a request for authorization to submit a Statement of Interest to the Massachusetts School Building Authority (MSBA) on behalf of Medford High School. We were delighted in the summer of 2022 when we learned that representatives from the MSBA would be conducting what is known as a "senior student" visit to MHS, which occurred in October of 2022. While we ultimately did not move forward to the next stage of the process last year, known as the eligibility period, we were both heartened and

encouraged when the MSBA communicated to us our hope that we would resubmit our application during the application period for 2023. It is for that reason that we will, via a mayoral communication, submit to you at your first meeting in April the required statutory language in the hope that you will again authorize the submission of our SOI.

The Statement of Interest (SOI) is a preliminary step in seeking support from the MSBA to examine our community's options with respect to the future of Medford High School. It does not commit the city to any specific plan or course of action, nor would acceptance of the SOI necessarily represent a commitment on the part of the MSBA to support a specific strategy with regard to either extensively renovating or potentially rebuilding Medford High School. However, in order to get into the MSBA's pipeline for consideration of a potential project, submission of the SOI is a necessary first step. For that reason we have engaged in ongoing consultations with experts in the field of school construction and rehabilitation, specifically vendors with significant experience and involvement in other successful MSBA projects, to determine how to best position our application for favorable consideration by the MSBA. As I relayed to you last year at this time, should we be successful, there will be a lengthy, inclusive, and professionally guided process by which to determine the potential options before the Medford community.

It is not uncommon for communities to advocate before the MSBA for projects over a period of years, and in addition to 2022, your honorable body unanimously approved applications like this in 2018 and 2019. I again would respectfully ask for your support. Thank you as always for your continued support of the Medford Public Schools.

Yours in Continued Partnership,

Marice Edouard-Vincent

Dr. Marice Edouard-Vincent,
Superintendent of Schools

CC: Medford School Committee

Councillor Collins moved to waive reading of the paper in lieu of a synopsis from the Superintendent (Councillor Caraviello second)—approved.

Addressing the Council:

Dr. Marice Edouard-Vincent, Superintendent of Schools

Councillor Knight moved for approval (Vice President Bears second)—approved on a roll call vote of seven in favor and zero opposed.