ANDREW JACKSON/ HORACE MANN SCHOOL

CIPR

Date: April 09, 2019

Facility Address: 40 Armington Street, Allston

0.INDEX

1. TEAM INTRODUCTION

Machado Silvetti - Architecture, Interiors, Site Planning

Machado Silvetti is an architecture, urban design and master planning firm, known for distinctive spaces and unique works of architecture in the United States and abroad. We provide traditional and emerging professional services including programming, design, documentation, administration and evaluation. In everything we believe that design should exceed the merely functional or inevitable, and that architecture can meaningfully advance society and culture.

Our portfolio reflects the breadth of the firm's experience, displaying special expertise in Art and Teaching Museums, Education and Institutional environments and facilities, Conservation, Cultural Heritage, Re-Use, Urban Design and Planning. We work across scales and project types, utilizing our expertise in finding formal, spatial and material solutions for unique architectural and urban conditions.

MACHADO SILVETTI

BLW Engineering - Mechanical, Plumbing, Electrical, Fire Alarm-Protection

Our mission at BLW is to continually provide the excellent quality of service that our clients have come to expect, while using innovative ways to reinvent the way we do business. We pride ourselves on our ethical business practices, our honest, long-term client relationships, and our in-house, full-service engineering design capabilities. Our commitment to providing exceptional engineering services has been an essential component to our continued growth since we opened our doors in 1999.

With more than 30 employees and counting, we're able to provide complete and coordinated designs on a big company schedule with small company enthusiasm. Our clients' satisfaction is our number one priority and we deliver on our promise to provide our clients the most talented engineers in our industry to ensure you have a complete and operable system that suits your needs.

BLW

Simpson Gumpertz and Heger (SGH) - Roof

Simpson Gumpertz & Heger (SGH) designs, investigates, and rehabilitates constructed works in the United States, Canada, and in more than thirty additional countries. Our goals are simple: earn the lasting trust of our clients, gain the respect of our most capable peers, and further the standards of practice in all areas of our profession. Our industry-recognized experts with diverse specialties: collaborate with clients and project team members, engage our extensive expertise, focus on delivering successful results, and respond to project challenges.

SIMPSON GUMPERTZ & HEGER
Engineering of Structures and Building Enclosures

Van Deusen and Associates (VDA) - Elevator

VDA offers comprehensive design and engineering services for elevators, escalators, moving walks, dumbwaiters and lift systems in new and existing structures. The firm also provides design and specification services for cost-effective material and mail handling systems in commercial and healthcare facilities.

Our staff is dedicated to meeting clients' needs for vertical transportation consulting services. In addition to our NJ headquarters, we maintain branch offices conveniently located to our major client markets, and are continually looking for highly qualified people to expand our geographic capabilities.

Ellana - Cost Estimation

Incorporated in 1998, ELLANA, Inc. is a certified Woman-owned Business Enterprise (WBE) and Disadvantaged Business Enterprise (DBE) construction consultant firm that provides four core services consisting of cost management, project controls, owner representation and professional training services to a wide range of A/E/C industry clients. We are also a certified WBE through the Woman's Business Enterprise National Council (WBENC).

With offices in New York, New Jersey, Pennsylvania and Massachusetts, we can service our clients locally; however, the combined experience of our staff positions us to participate in projects virtually anywhere in the world. Our staff includes architects, engineers and construction experts poised to provide quality cost estimating, scheduling, administration and project cost control services at all stages of design and construction.

2. BOSTON PUBLIC SCHOOLS AND ANDREW JACKSON/ HORACE MANN OVERVIEW

Boston Public Schools Overview

As the birthplace of public education in this nation, the Boston Public Schools is committed to transforming the lives of all children through exemplary teaching in a world-class system of innovative, welcoming schools. They partner with the community, families, and students to develop in every learner the knowledge, skill, and character to excel in college, career, and life.

Their responsibility is to ensure every child has great teachers and great school leaders. In the Boston Public Schools, they tailor instruction to meet the individual needs of every student. Together, they are:

- Strengthening teaching and school leadership
- Replicating success and turning around low- performing schools
- Deepening partnerships with parents, students, and the community
- Redesigning district services for effectiveness, efficiency, and equity

By securing new flexibilities and resources, they have intervened in their lowest-performing schools, many of which are showing greater growth than the district average. By partnering with community organizations and expanding grant opportunities, they have expanded science, arts, athletics and doubled summer learning opportunities to end the cycle of summer learning loss.

Federal stimulus dollars allowed Boston Public Schools to create Parent University, one of the first in the nation, to deepen the home-school connection. They have increased the

https://www.bostonpublicschools.org/Page/860
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number of schools serving students with disabilities with inclusive settings from four to 26 and are moving toward inclusive settings in every school. Investments in teacher training and stronger assessments have enhanced our ability to serve English Language Learners, who in 2013 saw a graduation rate increase of over seven percent.

Today they remain focused on ensuring every school is one that any parent would be happy to choose.

Andrew Jackson/ Horace Mann Overview

The Andrew Jackson/ Horace Mann School community is reflective of the Boston Public Schools and the City of Boston: We are Unique Yet United! They are a caring community, as evidenced by achievement scores, our nurturing and enriching school environment, and core curriculum.

The Andrew Jackson/ Horace Mann schools use a range of social emotional supports to assist children in their development. Included are the wellness project, running and walking clubs, and mental health services. They welcome students from all over and have a sheltered English instruction (SEI) program K2- grade 8. They are a special education inclusion school, and they have a successful autistic program. They also have many fabulous partnerships with universities and other agencies.

Andrew Jackson/ Horace Mann Special Features

- A caring community with a nurturing and enriching school environment and strong core curriculum
- Instructional focus on literacy, math, and closing the achievement gap
- Boston University Siblings program
- Tutoring and small group work from Boston College interns and in our after school program with Jackson/Mann Community Center for students who need extra help
- Workshops for parents on school and child development issues developed by the staff, City Connects, and Leaders of Tomorrow
- College for Every Student program
- City Connects program and services co-sponsored by Boston Public Schools and Boston College
- Parent-teacher conferences and ongoing telephone contact between home and school
- Extended day school, including a school day and beyond partnership with West End Boys and Girls Club.
- Apprentice Learning program with local businesses including WGBH.

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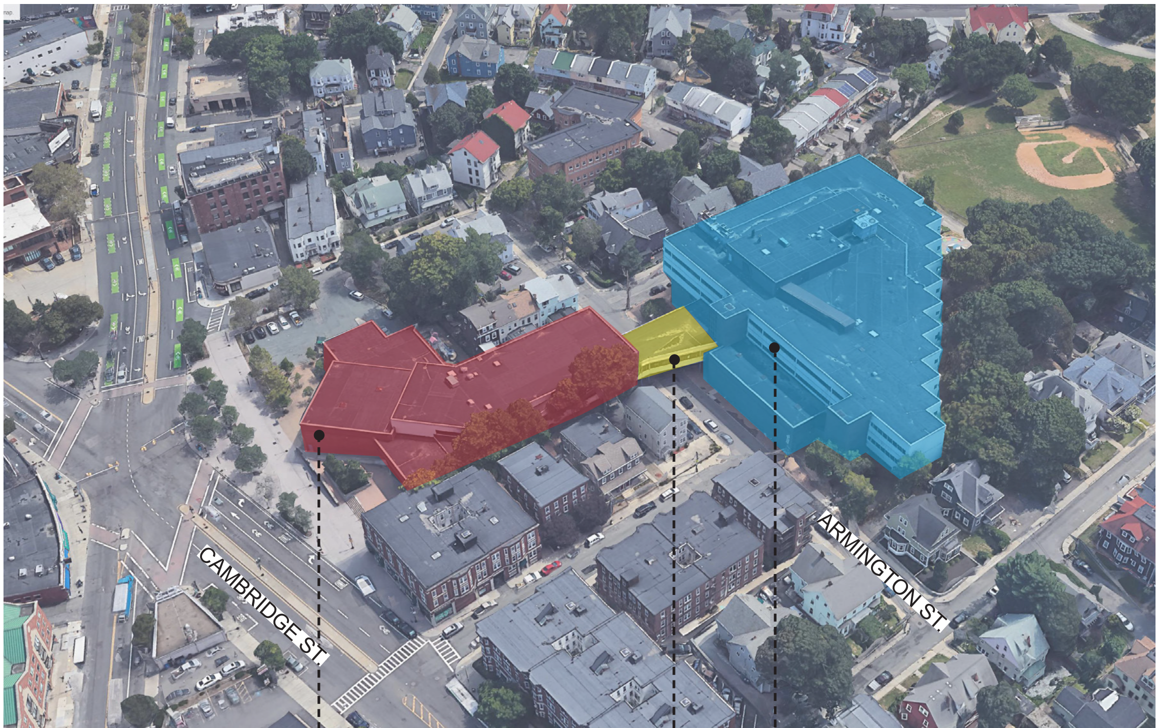
3. EXECUTIVE SUMMARY



Front Building (approx. 47,300 sq ft)

Bridge (approx. 3,000 sq ft)

Back Building (approx. 172,300 sq ft)

Executive Summary

The Andrew Jackson / Horace Mann School is 220,600 SF serving a K-12 School population. The school is comprised of three parts: The Front Building gives the school a presence on Cambridge Street and provides access to public space and public programming; the Back Building which houses the majority of the classroom space, is placed is adjacent to the playfields and has its own entrance on Armington Street. The Bridge connects these two buildings without disrupting the flow of drop off/pick up and neighborhood traffic along Armington Street.

As this CIPR outlines, we are recommending extensive replacements of major building systems including the exterior envelope at the metal panels, all windows throughout the buildings, all interior ceilings and demountable partitions, all floor finishes, the roof for all three buildings (front, bridge, back), MEP systems and Fire Alarm and Fire Suppression systems. We are also recommending the replacement of the two existing elevators. In addition we are recommending upgrades to the ramp and egress stairs, and we are also recommending updates to several exterior spaces.

There are perhaps alternative paths to more incremental or less-exhaustive replacements. However, as you will see in the following reports, **problems related to the good use of the building for the occupants, current code conformance, and sub-standard energy performance are pervasive and not easily solved on a case-by-case basis. It is, in our collective opinion, most cost effective and efficient to do the full and exhaustive work in one effort.**

The exterior of the building is either masonry or a metal wall panel system. The masonry, including brick and block, appears to be in decent shape and is thus not considered in this CIPR. The metal wall panel system however is deteriorating and sub-standard in terms of its thermal performance and resistance to water penetrations. Old windows throughout the building are reducing the effectiveness of the mechanical systems and, in some cases, creating sub-standard conditions for teaching such as window sashes that cannot close, insulated glazing units full of water, and of course leaking.

The building's roof, in particular the back building, has reached its useful life expectancy and is likely the source of many internal leaks.

The interior organization of the back building is based on a modular system where custom suspended ceilings and demountable partitions divided expansive interior space into rooms, nooks and crooked corridors defined by a saw-tooth (zig-zag) wall in plan. Building systems, including mechanical, electrical and plumbing are mostly original equipment from the 1970's that have outlived their use and now present significant problems for maintenance and upkeep. This equipment needs to be substantially replaced which, in tandem with a new exterior envelope and interior partitions, will significantly increase energy effectiveness and breathe healthy life into the building.

Finally, as with many public buildings from the 1970's, there is no comprehensive fire suppression systems throughout the building. Fire sprinklers are recommended.

Constructability and Potential for Phasing

As just mentioned at the end of the Executive Summary it is, in our collective opinion, more cost effective and efficient to do the full and exhaustive work in one effort.

The school extends across the centrally located Armington Street and abuts primarily residential buildings on its West and East Sides. Along the north is Cambridge Street which is a very busy street. On the South are play-fields toward the east but toward the west is an enormous and uneven rock cropping underneath a heavy tree canopy. Given that the proposed renovations and replacements are so extensive, it is possible that the entire building would be under construction or phased front to back or vice versa. In either case laydown areas might be available in the parking lot at the North-East corner, the play-fields, or along Armington Street with traffic rerouting. Nevertheless, access to the exterior walls, in particular along the West Façade, are going to be extremely challenging.

This effort could potentially occur in either of two scenarios. All-At-Once or Phased.

The **All-At-Once** scenario would require temporary relocation of most or all of the school's operation during construction. The primary reason for this suggestion is the extent of work to be done throughout all parts of the building and the construction efficiency that would be had by having access to the entire building at the same time. Another reason to consider this scenario is the complex and limited access to the site and the related constructibility challenges. The All-At-Once scenario is the basis for the Base Cost Estimate. The cost of relocation would need to be considered in addition to the cost of the renovation itself.

The **Phased** scenario is an option for incremental construction that would support continuous building occupation. However, as the construction would affect all areas of the building over an extended period of time, this scenario would require temporary movement of programs and the efficient consolidation of useable space throughout construction. There is a potential premium of 15-20% that would be added to the Base Cost Estimate to account for an extended construction schedule and the complexity of incremental, phased work. There are many possible scenarios for phasing, for instance Phase 1 could be the building envelope, roof and penthouse, Phase 2 would then be floor-by-floor renovations of the Back Building, Phase 3 could then be the renovation of the Front Building and Bridge with Phase 4 including the exterior spaces.

The recommendation for short term solutions prior to finalization of the long term plan is to perform the following maintenance projects.

1. **Roof -** Monthly inspections and repairs of existing roof. Estimated approximately $5,000 per month until installation of new roof.

2. **HVAC -** Insulating of piping and HVAC repairs to prevent condensation dripping onto acoustical ceiling. Approximately $30,000.

3. **Acoustical Ceiling Tiles -** Replace damaged, missing, or stained acoustical ceiling tiles. Replace acoustical ceiling in small gymnasium (Former dance studio). $45,000.

4. **Windows** - Repair cracked or leaking windows, $15,000.

5. **Flooring** - Remove stained/torn carpet and replace with vinyl tile (VCT). Patch any additional loose flooring. $50,000.

6. **Plaster/Paint** - Perform various plaster repairs throughout school and minor repainting. $30,000

7. **Lighting and Minor Electrical repair** - Repair classroom and corridor lighting and miscellaneous outlets that are not working. $30,000.

4.A EXTERIOR WALL ASSEMBLY AT EXTERIOR METAL WALL PANELS

1. Summary

The exterior of the building is either masonry or a metal wall panel system. The masonry, including brick and block, appears to be in decent shape and is thus not considered in this CIPR. The metal wall panel system, however, is deteriorating and sub-standard in terms of its thermal performance and resistance to water penetrations. **We are recommending the full removal and replacement of the entire exterior wall assembly wherever there is currently a metal wall panel.**

2. Existing Conditions

The problems of the exterior metal wall can be grouped into five categories: Insulation and Energy Performance, Weather Barrier, Material Deterioration, Interface with Roofs, and Visual Appearance.

Insulation and Energy Performance: The original construction drawings from 1974 do not show any continuous insulation either outside of the metal studs that hang from the structural slab or within the metal stud wall cavity itself. It is possible that the exterior "Metal Wall System", as called out in the 1974 drawings, was to be an insulated metal panel, but from observation it appears that much of this insulation may have already deteriorated intermittently or entirely. In addition, the metal wall panel is attached directly to metal studs which are either placed between slabs or hung proud of the slab off of steel angles apparently bolted directly to the concrete slab. These connections, as well as poorly designed details at the windows, create tremendous opportunities for thermal bridges. All told, while we do not know the exact existing composition of the exterior wall assembly at every location where there is metal panel, we do think that the wall is not acting as a good thermal envelope and is thus contributing to the energy loads and the sub-standard condition of interior finishes due to uncontrolled condensation, humidity and temperature fluctuations.

Weather Barrier: From the drawings and observation it is not clear to us if there is or is not a dedicated weather barrier behind the metal cladding. However, we think that the responsibility of the weather barrier is largely given to the sealing of the metal panel system. Sealant joints and overlapping details suggest that rain and moisture are not supposed to penetrate the metal panel barrier and if it does there is no secondary backup. However we have visually observed evidence of leaks throughout.

Material Deterioration: Overall the metal panel itself appears to be holding up well though we have not seen the inside face of the panel. The metal panel does appear to be locally rusting at key details, in particular at exposed corners.

Interface with Roofs: The metal panel facades meets both lower roofs and higher roofs. At the lower roof intersection the existing roof membrane does not have sufficient dimension to turn up the parapet wall and terminate properly. Thus there is potential for water penetration. At the higher roofs the parapet (that is a continuation of the metal panel wall) is also not the recommended 18" high for good roof membrane termination and thus the metal coping (part of the metal wall system) is acting as the membrane termination. In some cases the membrane is pulling out of the coping exposing the entire backside of the metal panel to moisture. *(See Section 4.C for more detail on the roof.)*

Visual Appearance: The visual appearance of the metal panel from afar is not bad. Its uniformity and monotony is perhaps a bit dated. Upon closer inspection, the metal panel appears cheap because the metal panels have lost the integrity of their square shape and the resulting bowing or bumpiness of the façade is displeasing to the eye.

Wall Assembly Type 1 (Metal Framing Between Slab): 2,170 approximate sq ft
Wall Assembly Type 2 (Metal Framing Hung in Front of Slab): 29,460 approximate sq ft
Wall Assembly Type 3 (Mechanical Penthouse): 4,940 approximate sq ft

Approximate Total sq ft of exterior metal wall panels: 36, 570

3. Recommendation

We recommend the complete removal of the entire exterior metal wall assembly including studs and interior finish. This includes all exterior wall assemblies at the areas described above on the front building, bridge building, back building and back-building penthouses. The total surface area of this demolition is: **36, 570 SF**

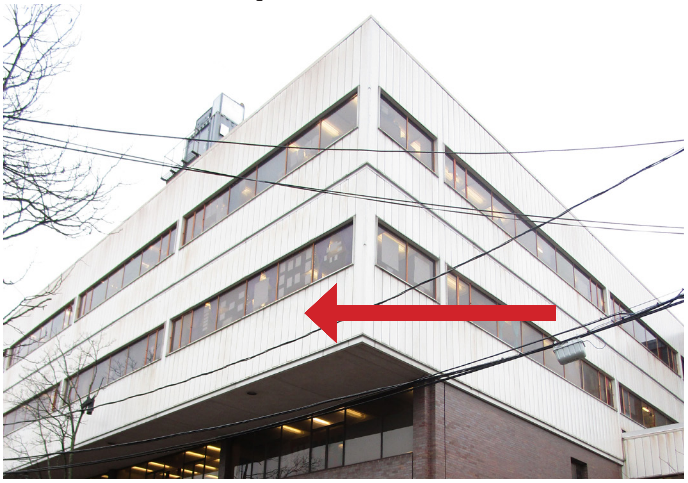
Our recommended replacement will be a new exterior wall assembly typical of a metal panel rain-screen application. We do not recommend an insulated metal panel system given the risks of thermal bridges and deterioration of insulation. We recommend adding 18” of height to all metal wall panels to provide an extended parapet that will accommodate roofing termination. Thus the total surface area of the new exterior wall assembly is: **39,247 SF.**

Please note that any new building envelope must comply with all applicable energy and building codes.

The layers of the exterior assembly may be as such, from interior to exterior:

1. 5/8” Painted Drywall;
2. Cold Formed Metal Steel Studs placed BETWEEN slabs at the edge of slab;
3. Exterior Grade sheathing;
4. Commercial Weather Barrier;
5. Horizontal Z-GIRT with Continuous Exterior Insulation;
6. Painted Aluminum Rain-Screen (Similar to Dri-Design Panel Systems)

View from East of Bridge

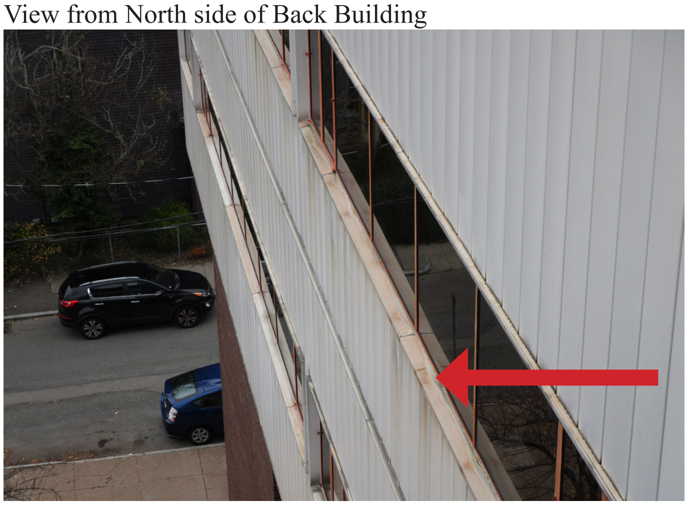


NOTE: The metal panel, apparently now at least partially uninsulated, covers vast portions of the building's exterior. This weak thermal envelope represents a significant burden on the mechanical systems and increases the energy use far beyond current and applicable energy standards.

View of North side of Back Building

NOTE: Rusting visible on the North side of the Back Building

View from North side of Back Building



NOTE: Rusting visible on window sill and jamb of Back Building. The interface detail between metal panel and window is a thermal bridge with an inadequate weather barrier. This represents a significant risk for energy loss and water infiltration.

View of West Side of Ramp

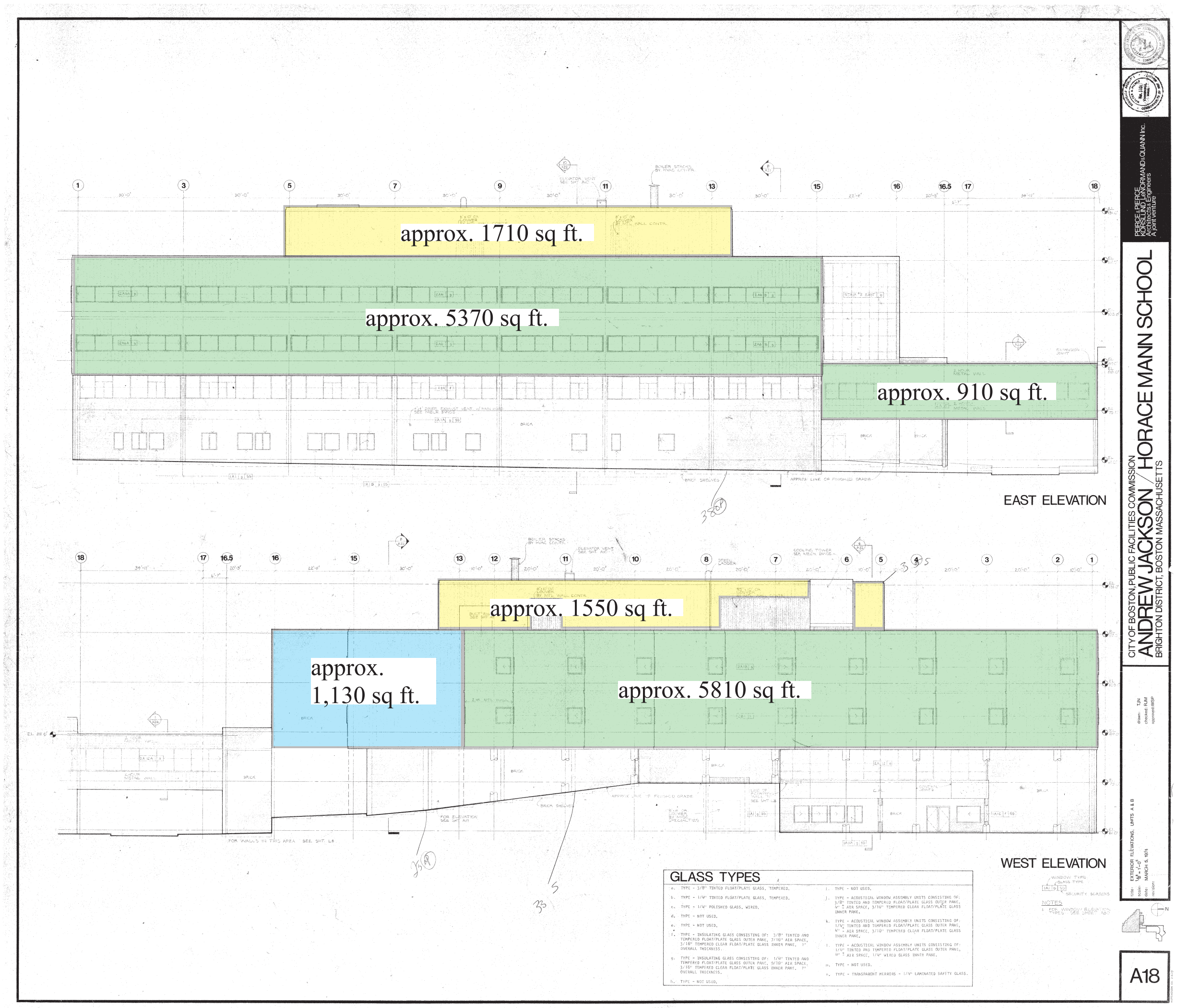
NOTE: Rusting and dirt on ramp connecting the Front and Back building.

Mechanical Penthouse

NOTE: The existing metal wall panel does not extend far enough above the roof to provide a sufficient termination for the roof membrane. When the metal panel meets a lower roof there is not sufficient space to provide good termination details.

View from North side of Connecting Path

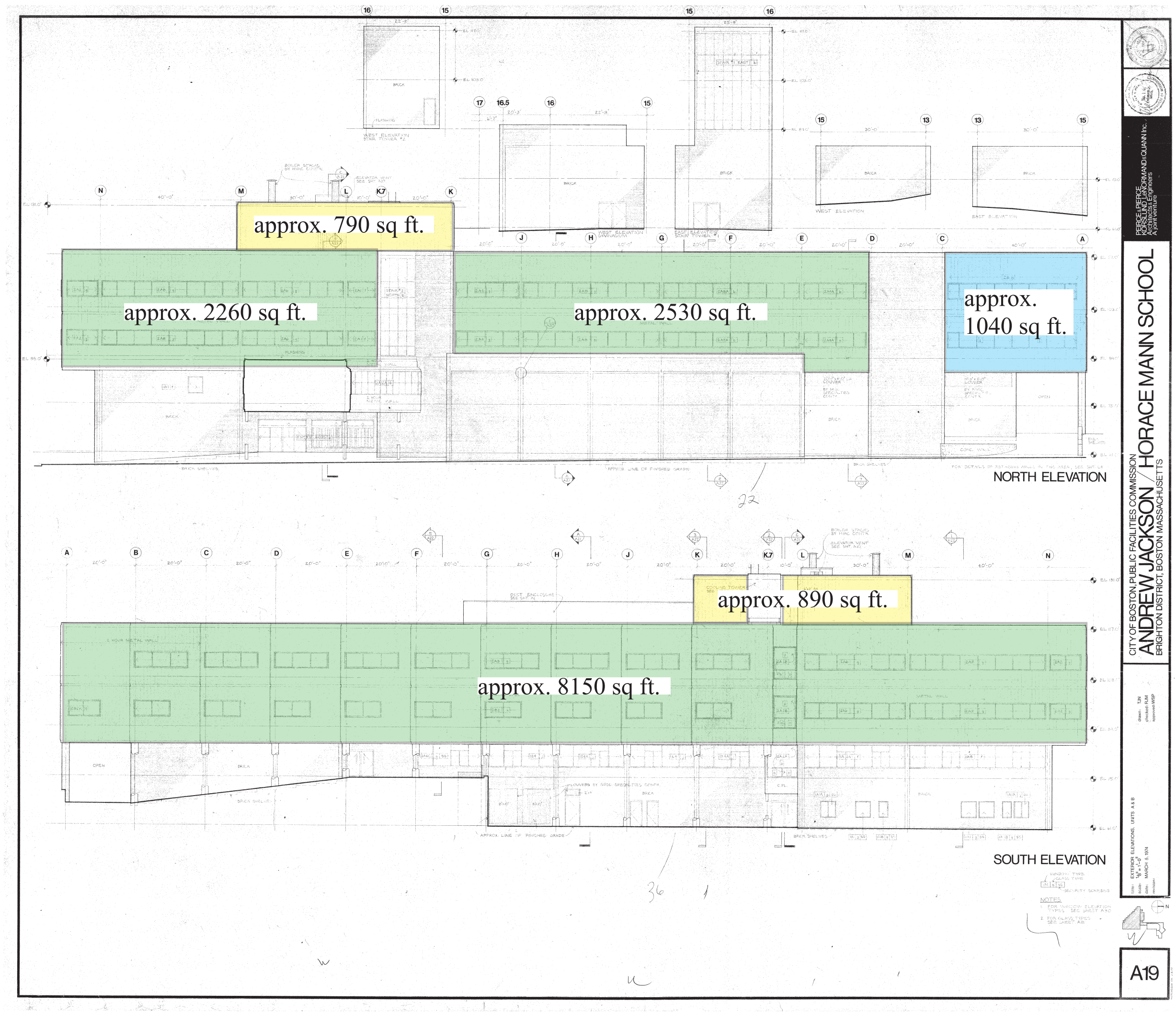
NOTE: Joints between metal panels and at the interface with masonry are sealed with caulking that appears to be failing in most areas.



Type 1: Metal Framing Between Slab

Type 2: Metal Framing Hung in Front of Slab

Type 3: Mechanical Penthouse



Type 1: Metal Framing Between Slab

Type 2: Metal Framing Hung in Front of Slab

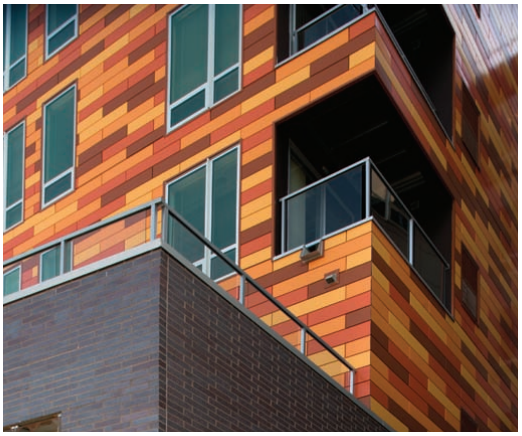
Type 3: Mechanical Penthouse

Type 1: Metal Framing Between Slab

Type 2: Metal Framing Hung in Front of Slab

Type 3: Mechanical Penthouse

RECOMMENDED REPLACEMENT EXAMPLE CUT-SHEET



Available in any color, with the ability to match colors of your choice without expensive up charges – Dri-Design Painted Aluminum Panels offer the ultimate design flexibility for exterior and interior applications. Panels are painted using industry leading Fluoropolymer based paints for long lasting finish durability, while our finishers use a 100% air capture system to destroy the VOCs produced, so there is no adverse environmental impact.

PAINTED ALUMINUM

Technical Information:

System Depth - 1 ¼" nominal

Material - Aluminum

Material Thickness - .080" standard (other gauges available)

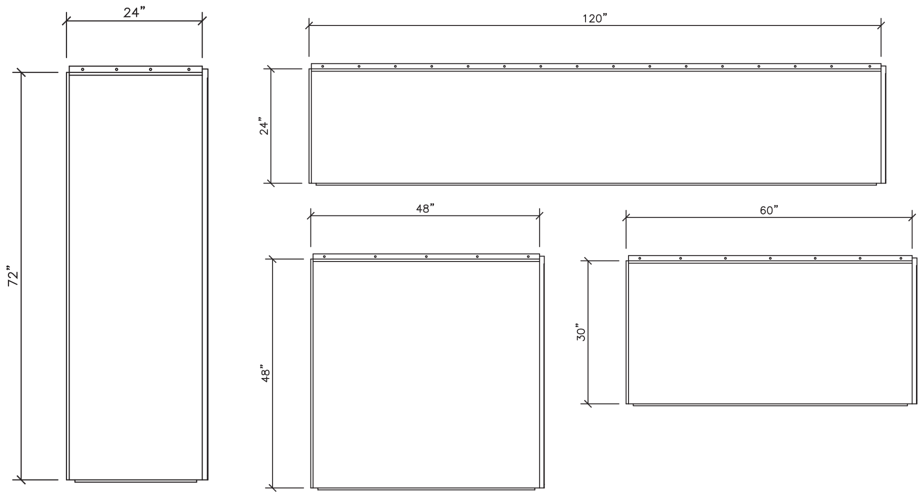
Panel Joints - ½" nominal standard (1/8" – 1" available)

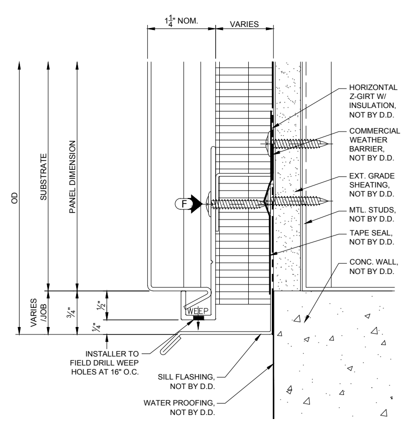
Finish - Fluoropolymer, unlimited color palette

Finish Warranty - 20 year standard

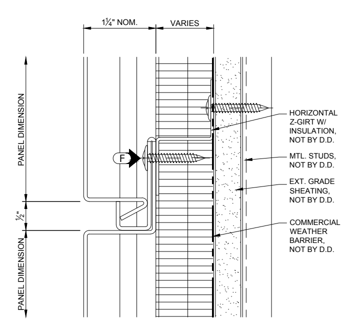
Weight - Less than 2 pounds per square foot

Panel Size Parameters:
These are the recommended maximum size panel guides. If the panel you would like fits inside these guides, Dri-Design can easily manufacture it. For larger sizes, please contact a Dri-Design representative to discuss your specific requirements.





Typical Sill Detail



Typical Horizontal Joint

RECOMMENDED REPLACEMENT
EXAMPLE PROJECT THAT USES DRI-DESIGN METAL PANEL SYSTEM

The John W. Olver Design Building at the University of Massachusetts, Amherst features the durable Dri-Design system of copper-colored anodized aluminum panels. The building was completed in January 2017, and the design is targeted for LEED Gold Certification.

4.B EXTERIOR WINDOWS

1. Summary

Old exterior windows throughout the building are reducing the effectiveness of the mechanical systems and, in some cases, creating sub-standard conditions for teaching such as window sashes that cannot close, insulated glazing units full of water, and of course leaking. **We are recommending the removal and replacement of all windows whether in masonry or the metal wall panel.**

2. Existing Conditions

The problems of the exterior windows can be grouped into five categories: Variability, Seals at Frames, Water Infiltration, Operable Lites, Solar Gain and Visible Light Transmittance.

Variability: There are at least 46 different window types at the school. This variability is a result not only of size and shape but of type. Some windows are single pane, some are laminated double pane with wire safety mesh, some are standard Insulated Glazing Units, some are Ventilated Glazing Units, some are operable and some are fixed. The variability is high for any building but in particular for a school where maintenance becomes a unique challenge for each window type.

Seals at Frames: We observed failing seals at nearly every window, as seen from the interior. This ranged from non-existent sealant to deteriorating sealant. It is likely that the poor exterior detailing of the interface between window and metal wall panel is responsible for much of this issue.

Water Infiltration: Water is getting into the building through the interface between window and metal panel. There are signs of leaking throughout the building on sills and at floors below windows. Furthermore, some Insulated Glazing Units are failing to the degree that water is infiltrating the air space and filling the air space with water. This latter problem may lead to window cracking and air infiltration. Both forms of leaking represent a serious burden on the energy use of the building.

Operable Lites: There are several places in the building where we observed non-functional operable lites and even in some cases latches were missing so that windows were left open even on very cold days. Screens were missing from many of these operable lites.

Solar Gain and Visible Light Transmittance: In the original construction there may have been curtains installed at windows to control solar gain and glare. However the curtains have been removed in most cases, leaving a dysfunctional and ugly curtain rod behind. It appears that some other solutions have been attempted including the application of interior film that is now peeling off. Overall the windows do not appear to have any coating that reduces solar gain, thus increasing the load on the air handlers, and without adequate shading implements the classrooms are subject to glare and a high visible light transmittance.

3. Recommendation

We recommend replacement of all exterior windows, including openings at the major entrances. Approximately 5% of the windows occur in a brick masonry façade. The other 95% of the windows are located in the exterior wall assembly. As such, demolition of this entire assembly will not only necessitate removal of the windows but provides an opportunity to standardize the windows and implement a design more befitting the 21st century K-8 classroom. Thus our recommendation is to replace the existing area of glazing but reduce the window types to 4 (1. Typical Entry; 2. Typical Classroom; 3. Typical Public Space and 4. Typical Stairway). The approximate total existing area of glazing is 13,603 SF and will be replaced by the same, though again in a new design and configuration when in the area of the exterior metal wall assembly.

Window types may be similar to the Kawneer TR-700 Window Wall. This versatile systems provides options of fixed glass and operable lites and can be arranged to appear as separated “windows” or a continuous window wall, reflecting the variety of visible conditions in the existing façade design. The aluminum frame and thermal break technology will pair well with the replaced exterior wall system.

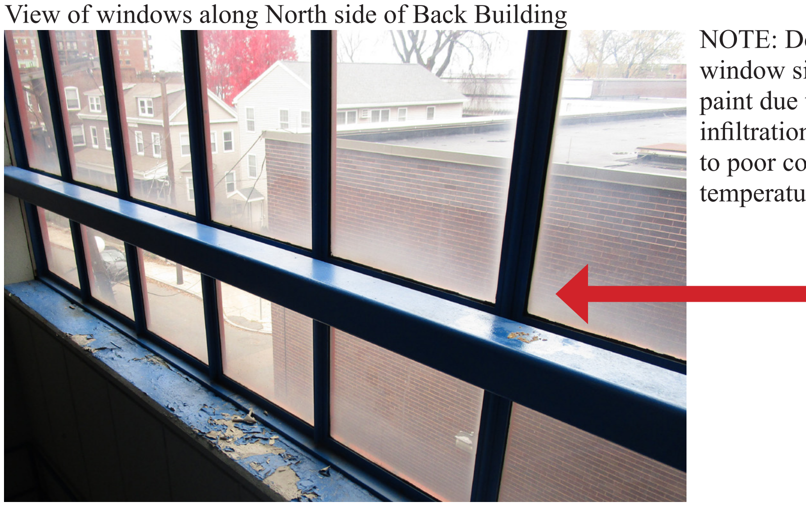
View of stairwell windows in Back Building

NOTE: An extensive window wall covers 1/2 the wall surface of the two primary egress stairs in the back building. Upon visual inspection and review of available documentation, it is not clear that these windows are appropriately fire rated.

View of windows along North side of Back Building

NOTE: Rusting at window sill

View of windows along North side of Back Building



NOTE: Deterioration at interior window sill and chipping of paint due to both direct water infiltration and condensation due to poor control of humidity and temperature at the perimeter.

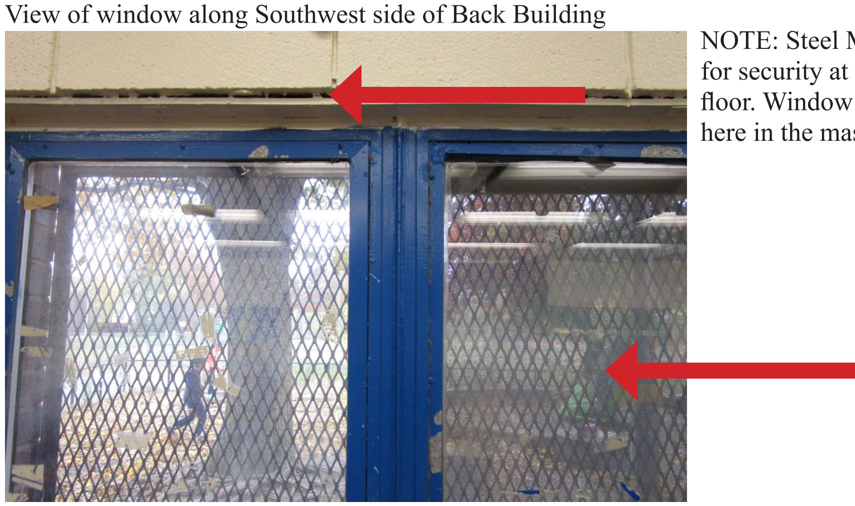
View of window in Back Building

NOTE: Steel Mesh screen used for security at windows in ground floor. Window sealant is failing here in the masonry wall.

View of Entry of Back Building at Armington Plaza

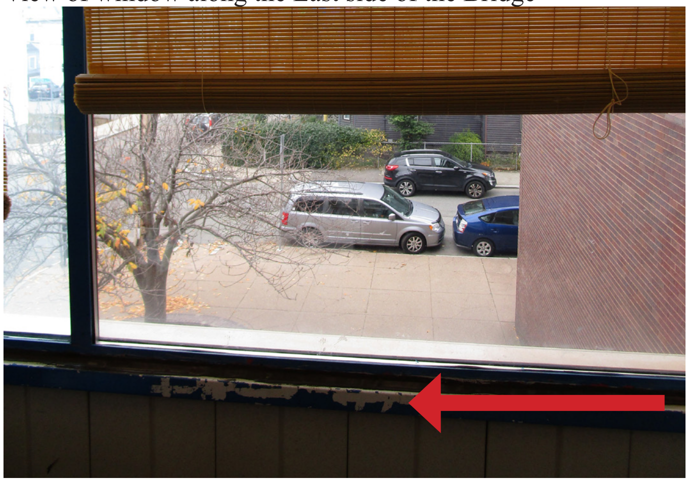
NOTE: Single pane glazing at entrances without a properly separated vestibule creates paint chipping around windows

View of window along Southwest side of Back Building



NOTE: Steel Mesh screen used for security at windows in ground floor. Window sealant is failing here in the masonry wall.

View of window along the East side of the Bridge



NOTE: Paint chipping at window sill

View of windows along North side of Back Building

NOTE: Window with large gap between glass panes and wire mesh

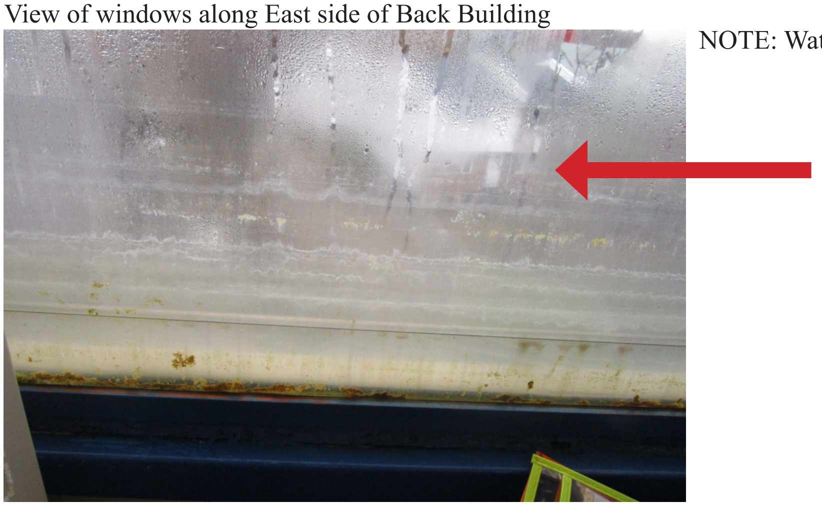
View of windows along East side of Back Building

NOTE: Window with large crack and water in glass

View of windows along East side of Back Building

NOTE: Window with large crack and water in the air space of the insulated glazing unit.

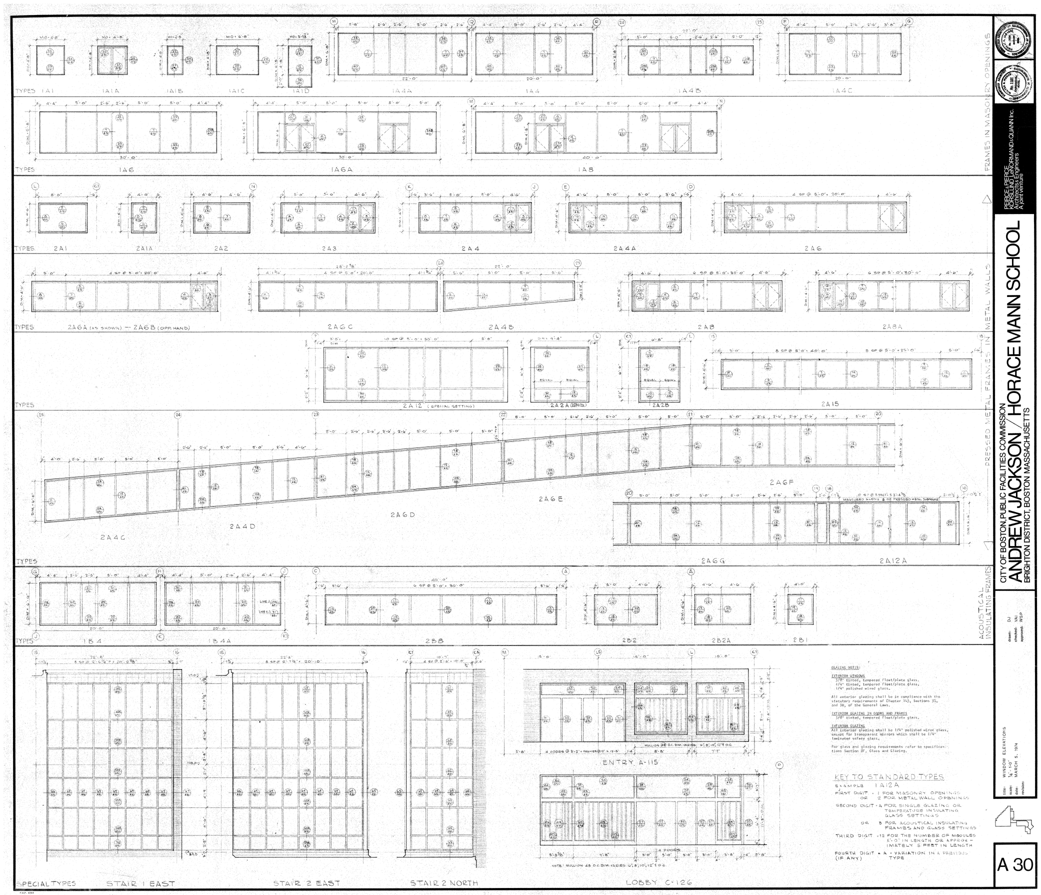
View of windows along East side of Back Building



NOTE: Water damage to window

View of window

NOTE: View of window with large opening at sill



Depicted above are the 46 different window types in the Jackson/Mann school.

Approximate total square footage: **13,603**

Approximate area in masonry: **1,475**

Approximate area in exterior metal wall: **12,128**

TR-700 Window Wall

Multifaceted Window System for Flexible Design

The Admiral at the Lake, Chicago, Illinois, USA
Architect: Perkins + Will, Dallas, Texas, USA
Window Installer: Softer Lite Window Company, Chicago, Illinois, USA
Photography: © FotoGraphix

Sleek aesthetics, strength and substantial thermal performance are a few of the reasons TR-700 Window Wall is specified by architects and building owners alike. With a range of configurations and finish options as well as flexibility in installation, TR-700 Window Wall platform delivers a tremendous performance-to-value ratio.

Made from aluminum, this high-performing window wall is versatile enough to blend into historic applications and contemporary enough to add a unique element to new construction. A 4-5/8" frame depth provides extra coverage for larger wall cavities, while an integrated thermal break effectively separates the interior from the exterior. With TR-700 Window Wall, you don't have to sacrifice aesthetics or performance to achieve your design vision or meet code requirements.

KAWNEER
AN ARCONIC COMPANY

Performance

Kawneer's commitment to providing high-performing thermal solutions is underscored with TR-700 Window Wall. Standard 1" insulating glass enhances thermal performance. And, thermal efficiency makes the windows ideal for buildings seeking to earn Leadership in Energy and Environmental Design (LEED®*) certification points with the U.S. Green Building Council (USGBC).

The system can be pre-engineered and pre-glazed, eliminating much of the labor and time spent on site. For increased durability, TR-700 Window Wall offers a 1/8" wall thickness. A dual glazing option creates additional interior comfort. Window vent corners are reinforced with gussets before crimping, while vent members are double tubular extrusions.

TR-700 Window Wall features a vent and frame design that negates air infiltration and water penetration under the most severe weather conditions. Aluminum construction not only provides structural integrity, but the windows will never rot, warp or buckle due to moisture and weather exposure, and they attain outstanding condensation resistance. The windows are fully tested and meet or exceed the minimum requirements for the Architectural Window (AW) performance class and have been life-cycle tested to the AAMA standard. In addition, this window series delivers outstanding air, water and structural performance, making it ideal for new and retrofit applications.

Aesthetics and Versatility

Featuring a slab-to-slab application and an integrated slab edge cover, TR-700 Window Wall delivers a sleek and streamlined appearance, providing an appealing look for any application type. With several window configurations available – including casement, projecting and fixed – this versatile architectural-grade window features a 4-5/8" frame depth and uninterrupted sightlines for increased aesthetics. Curved wall capabilities also increase design flexibility. An optional concealed vent maintains a neat appearance. Additional features include a structural three-piece mullion and male/female connection. The windows' receptor and subsill fully integrates installation. Terrace and sliding doors are available as well.

Painted or anodized finishes are available in many standard choices.

MODEL	AW RATING	FUNCTION
TR-710	80	Casement Flush Outswing
TR-720	80	Casement Flush Inswing
TR-740	80	Flush Project In
TR-750	80	Flush Project Out
TR-780	80	Fixed

The Admiral at the Lake, Chicago, Illinois, USA
Architect: Perkins + Will, Dallas, Texas, USA
Window Installer: Softer Lite Window Company, Chicago, Illinois, USA
TR-700 Window Wall with
TR-710 – 4-5/8" Offset Casement Thermal Aluminum Windows (Outswing)
TR-750 – 4-5/8" Offset Projected Thermal Aluminum Windows (Project Out)
TR-780 – 4-5/8" Offset Depth Fixed Thermal Aluminum Windows

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4.C INTERIORS (CEILINGS, WALLS, FLOORS)

1. **Summary**

The interior organization of the Back Building is based on modular systems where custom suspended ceilings and demountable partitions divide expansive interior space into rooms, nooks and crooked corridors defined by a saw-tooth (zig-zag) wall in plan. This modular system was a very innovative system to accommodate the open-classroom concept that was implemented when the building was opened in the 1970s. The system promised the ability to rearrange the partitions and thus change space configurations as the needs of the school might have changed.

However, the custom dimensions of the ceiling, the unique details of the ceiling and walls, and the cumbersome activity of moving the partitions has meant the layout apparently remains largely as originally planned in 1974. The ceiling tiles are not easily replaced though a large majority are showing significant wear and tear, and the walls are insufficient to acoustically isolate classrooms or accommodate the demands of new technology in the classroom. The result is what appears to be an underutilized floor plate with many programs including classrooms, libraries, food spaces, offices, etc., all using piece meal solutions to “make the spaces work”.

We are recommending the removal and replacement of all interior ceilings, all demountable partitions, and all floor finishes throughout all buildings. Please note that the Front Building and the Bridge do not contain modular systems, and we are not recommending any demolition for those interior walls, though we are still recommending replacement of the ceilings and floor finishes.

CEILINGS

2. **Existing Conditions**

The problems of the ceilings can be grouped into five categories: Variability, Uniqueness & Maintenance, Water Damage, Contact Damage, and MEP work.

Variability: There are at least 10 ceiling types throughout the school. Each type has its own problems in terms of difficulty of maintenance and states of disrepair.

Uniqueness & Maintenance: The majority of the drop Acoustic Ceiling is a custom coffered system with non-standard dimensions and parts. While this ceiling creates an incredible coffered ceiling that controls light fall and acoustics in an innovative way, it also has created a major problem for maintenance and replacement. Any failing tiles need to be replaced by custom tiles and often require unique field cutting to fit. In addition to the tiles, the ceiling is a modular system with a rail grid that serves as location for conduit runs, air return, and also as the receiver of the modular demountable partitions. Thus these ceilings place significant constraint on the space layouts and organization and the effective delivery of new conduit for 21st century technology in the classroom.

Water Damage: There is visually observable water damage throughout the building probably due to a range of roof leaks, some mechanical or plumbing leaks, but also from the variable and uncontrolled humidity in the building that results from the ineffective exterior envelope and ventilation systems. In many cases this water damage not only creates unsightly panels but also weakens the integrity of the panel.

Contact Damage: In addition to water damage, there is evidence of damage by means of objects (balls, etc.) coming into contact with the ceiling

MEP and FP work: The comprehensive MEP replacement and FP installation recommended in this CIPR necessitate substantial access and potential reconfiguration of the ceiling spaces throughout the building. The current coffered ceilings are very difficult to work around and the other ceiling types, excepting the open type, would require similarly comprehensive access and adjustments for new sprinkler heads, diffusers and AV equipment.

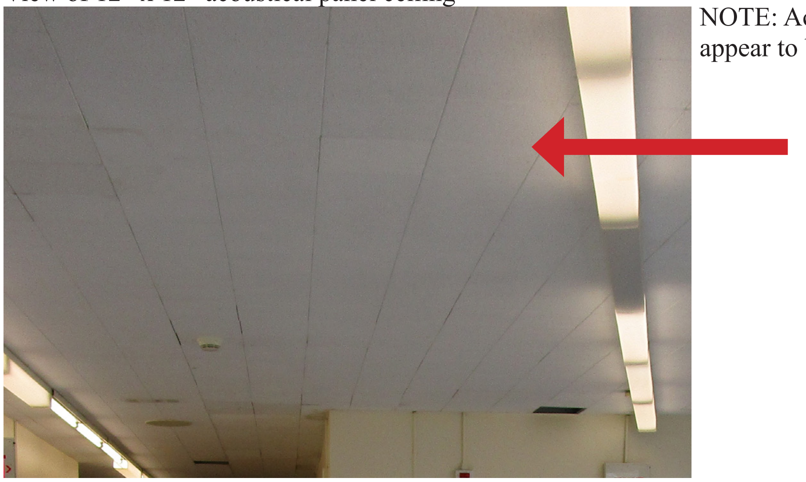
3. Recommendation

Owing partially to the poor condition of the existing ceilings and the necessity of ceiling access for the addition of fire-sprinklers and reworking of all MEP systems, we are recommending the complete demolition and replacement of 100% of the ceilings, excepting those mechanical, storage and other areas with open and/or currently unfinished ceilings.

The total ceiling area affected by this is **193,911** GSF.

Of this area we recommend holding 80% as a standard 2x2 suspended acoustic ceiling. The remaining 20% should be considered specialty ceilings for areas such as the music classrooms, small gyms, lunch-room, etc. Ceiling will be standardized to accept standard 2x2’ light fixtures, mechanical dampeners, return air grills, and all other AV/IT and FP systems required.

View of 12” x 12” acoustical panel ceiling

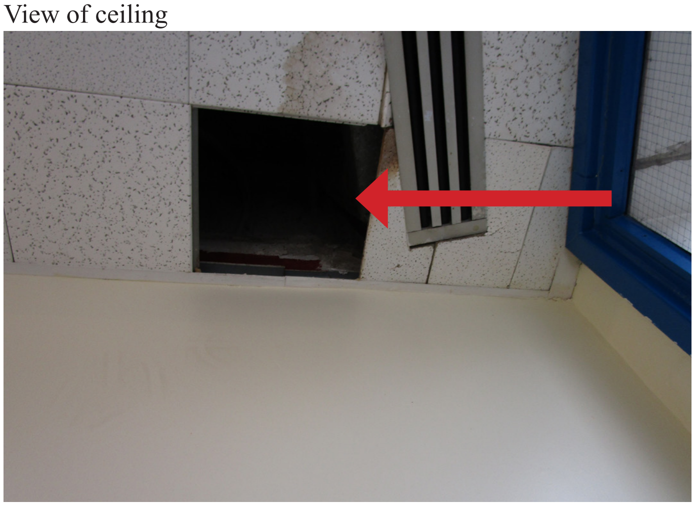


NOTE: Acoustical tile ceiling appear to be worn

View of coffer ceiling

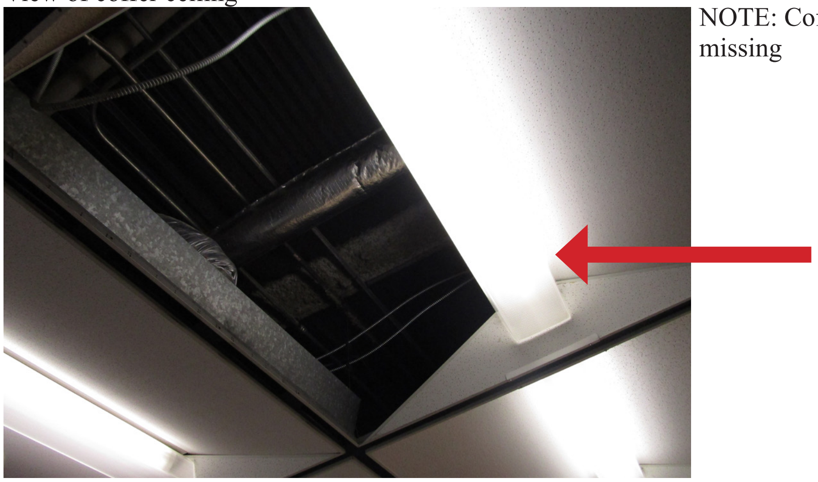
NOTE: Typical coffer ceiling

View of ceiling



NOTE: Ceiling panel missing in room

View of coffer ceiling

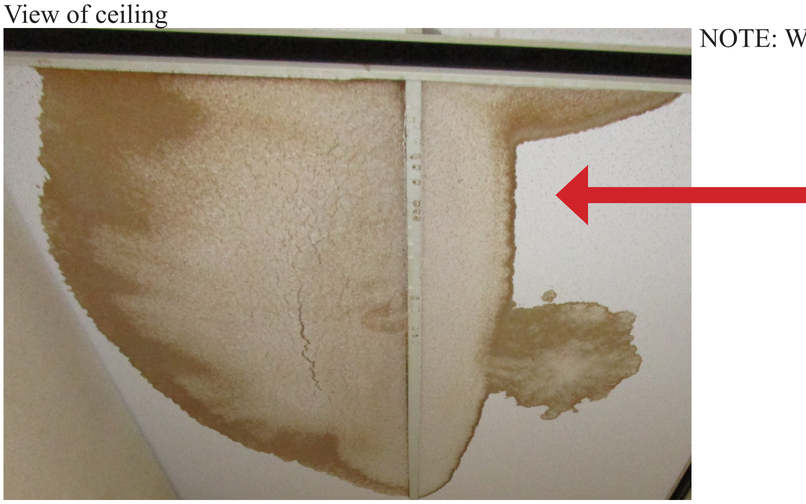


NOTE: Coffer ceiling panel missing

View of ceiling

NOTE: Ceiling panels do not touch and they leave an opening

View of ceiling



NOTE: Water damage at ceiling

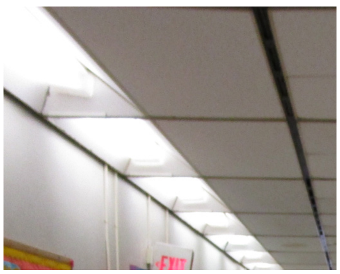
CEILING TYPES

Modular Type 1: Coffer

Approx. sq ft: 89,339

Modular Type 2: Mini Coffer

Approx. sq ft: 5,314



Modular Type 3: Flat Ceiling with Surface Mounted Fluorescent fixture

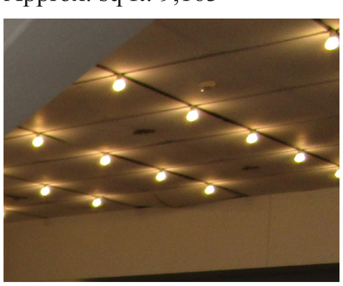
Approx. sq ft: 2,742

Modular Type 4: Flat Ceiling with Recessed Fluorescent fixture

Approx. sq ft: 1,720

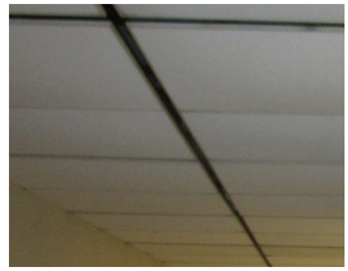
Modular Type 5: Flat Ceiling with Incandescent Fixtures

Approx. sq ft: 9,163



Modular Type 6: Flat Ceiling with Two Lay In Panels

Approx. sq ft: 21,384

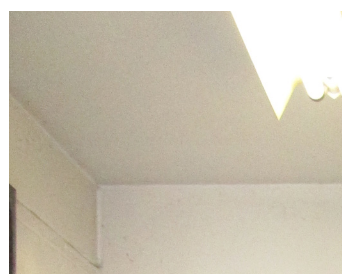


Type 7: 12”x12” Concealed Spline Acoustical Tile

Approx. sq ft: 14,748

Type 8: Concrete

Approx. sq ft: 22,569



Type 9: Plaster

Approx. sq ft: 9,046

Type 10: Open

Approx. sq ft: 17,886

INTERIOR PARTITIONS

2. Existing Conditions

The problems of the walls can be grouped into two categories: Demountable Wall System, All Other Interior Walls

Demountable Wall Systems: The demountable walls do not currently provide sufficient acoustic isolation, spatial separation, capacity for new electrical, and AV/IT cabling. These are 3” wide pre-fabricated panels that snap into floor and ceiling tracks. They are not easily reconfigurable, and as currently laid out, may not be making the full and best use of the floor plate area. As this system is directly reliant on the modular ceiling system, the replacement of the ceilings essentially necessitates replacement of the wall system.

All Other Interior Walls: From our observation all other interior walls, including masonry and study walls with a range of lathe and plaster, GYP, paint, tile, etc. is all in relatively decent condition but may require a finish touch-up to clean up broken corners and give visual unity to the building.

3. Recommendation

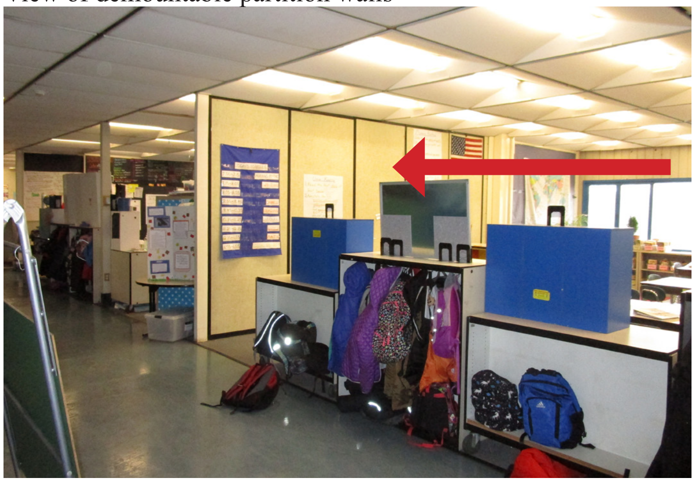
We recommend full replacement of any non-structural and non-core demountable partitions. As demonstrated above the demountable walls clip into and are arranged by the modular ceiling above. Removal of the modular ceiling requires either substantial custom bracing for the existing partitions or the replacement of said partitions. In addition, new partitions would give an opportunity to customize room sizes, improve layouts, improve classroom definition and acoustic properties, and incorporate the electrical conduit that currently runs on the face of the existing modular partitions.

Replacement of the demountable walls will also require replacement of doors. It is expected that the majority of the existing hollow-metal doors can be salvaged and repainted but their metal frames are sized for the 3” partition wall and would need to be replaced.

The total linear feet of new walls should be the existing partition length of **4,494** LF + 25% to account for some amount of transformation from an open-classroom concept to a more standard closed classroom concept. Thus the total new interior partition length is **5,617** LF. Typical replacement partition should be a simple cold-formed metal stud with 5/8” Painted GYP on either side with acoustic batt insulation.

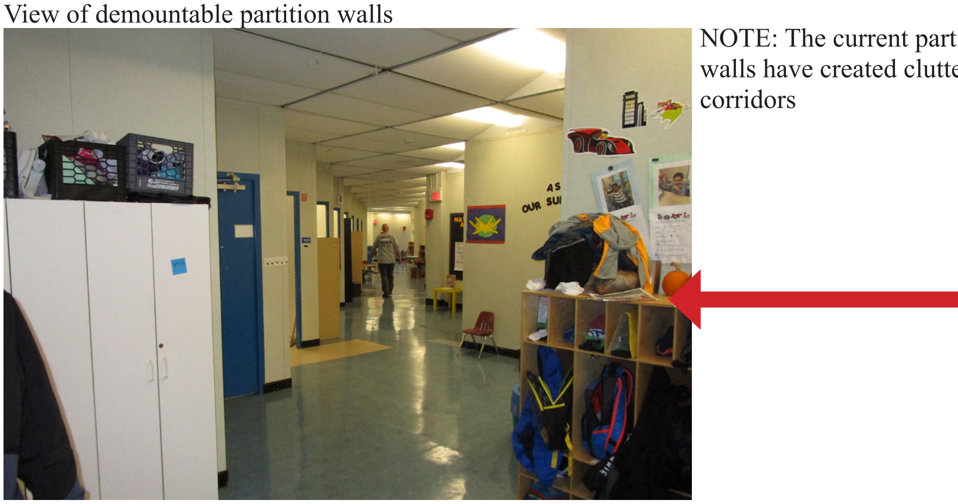
Note that all other interior non-demountable partition wall surfaces will require light refinishing work (i.e., painting, new tile in the restrooms, etc.).

View of demountable partition walls



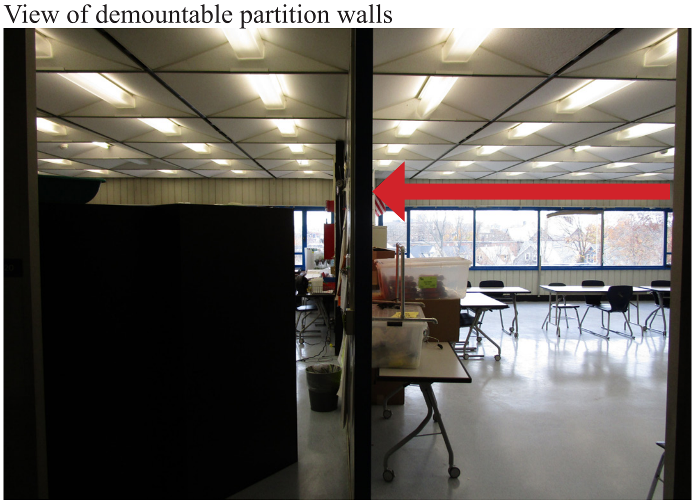
NOTE: Typical partition wall used to separate classrooms

View of demountable partition walls



NOTE: The current partition walls have created cluttered corridors

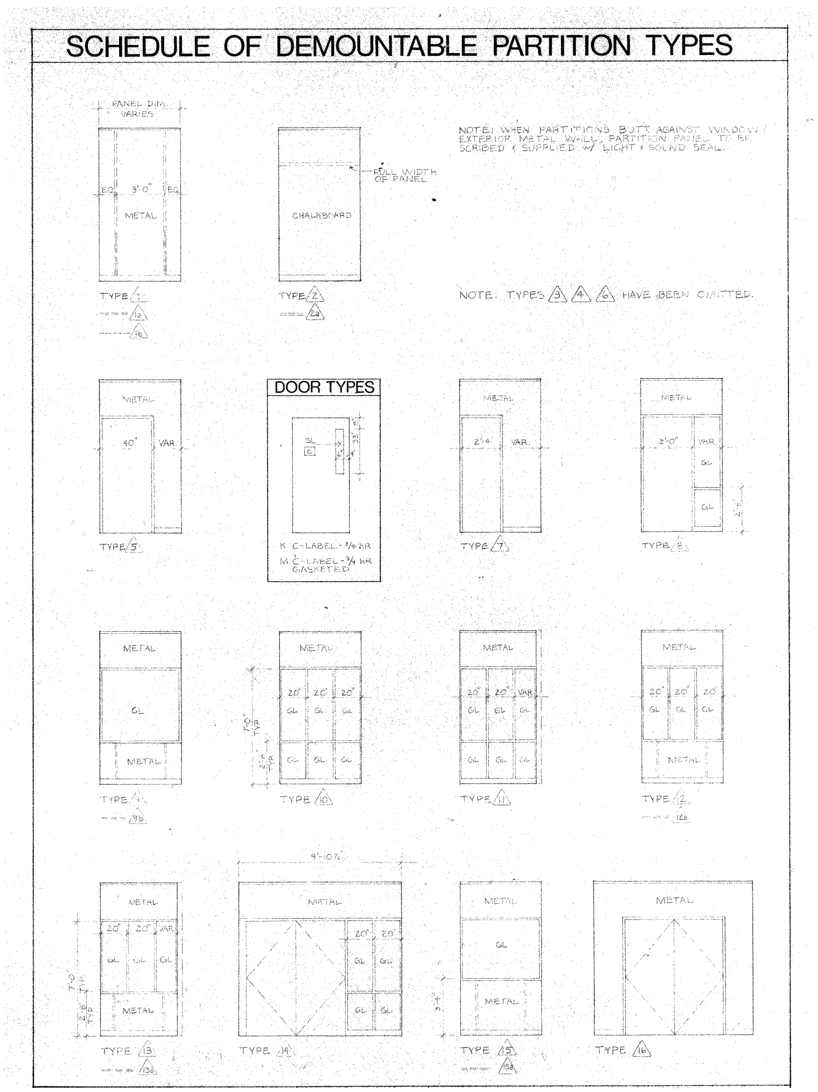
View of demountable partition walls



NOTE: The thin demountable partition visually separates classrooms, but doesn't stop noise traveling between rooms.

View of other interior partitions.

NOTE: Dull corridor with no natural light



Shown above are the different types of demountable partition walls from page A33 of the original 1974 Construction Document Set.

FLOORS

2. Existing Conditions

While we have not conducted a full survey of every floor surface in the building we have inferred, through limited visual observation, that the problems of the floor finishes can be grouped into three categories: General Wear and Tear, Water Damage, and Accessibility.

General Wear and Tear: Regular wear and tear can be seen throughout the building on all types of floor finishes including carpet, tile and linoleum.

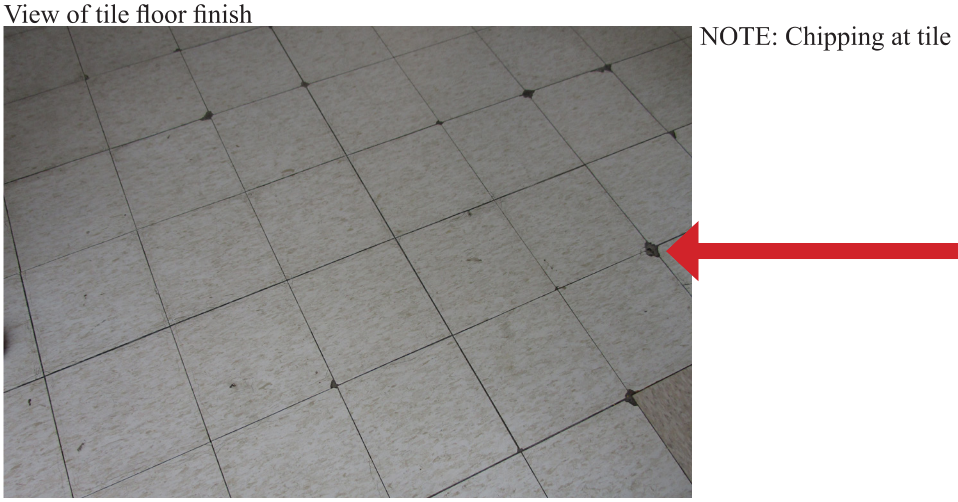
Water Damage: At many windows and under water damaged ceiling areas, we have observed damage due to leaks. The water damage is both visible on the surface and in some cases can be seen to be affecting the seal of the finish to the slab below.

Accessibility: Warping and fraying floor finishes represent tripping hazards. The non-intuitive use of flooring type is surprising with floor materials seemingly placed ad-hoc in many locations. Tactile warning and guiding strips are only intermittently used.

3. Recommendation

We recommend full replacement of all non-masonry floor finishes. This affects the total building area of **208,200** SF.

View of tile floor finish



NOTE: Chipping at tile floor

View of floor finish

NOTE: Extremely worn flooring

View of carpet floor finish

NOTE: Worn carpet that needs to be replaced

View of floor finish

NOTE: Worn flooring that needs to be replaced

4.D ACCESSIBILITY

1. Summary

There are two areas in particular that should be updated to improve accessibility in the building. These are the ramp that connects the Front Building to the Bridge and the railings inside Stair Halls #1 and #2.

INTERIOR RAMP

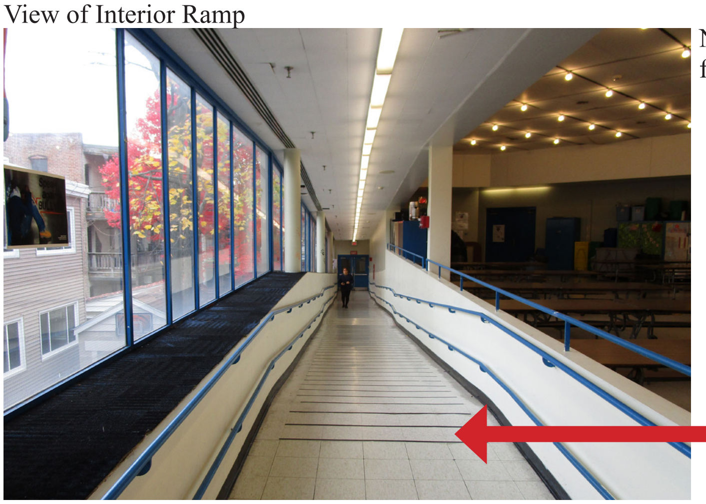
2. Existing Conditions

Currently the Ramp begins at a landing that is several feet above the ground floor lobby of the Front Building. Thus the ramp itself does not connect the ground floor to bridge and thus serves no purpose of ADA accessibility. ADA access is only provided between the buildings by use of elevator, thus making the elevator the only non-interrupted means of moving back and forth between the two buildings. The ramp appears to have a slope of 1:12 sufficiently dimensioned for slope distance and landings. However, a full ramp from the Second Level and the Ground Floor Lobby would require extending or rebuilding the ramp to make up the distance between the lower landing and the Lobby.

3. Recommendation

We recommend extending the ramp into the lobby space. This represents a new length of ramp of approximately 60’ in length. The configuration would be the subject of design, but will likely require some form of switchback to fit in the lobby space. This work would require demolition of some existing stairs and the lower landing. We do not think this would require reconstruction of the existing portion of the ramp, but its finishes would need to be updated in keeping with the recommendation for interior finishes previously mentioned.

View of Interior Ramp



NOTE: Existing Ramp as seen from the Second Floor.

EGRESS STAIR

2. Existing Conditions

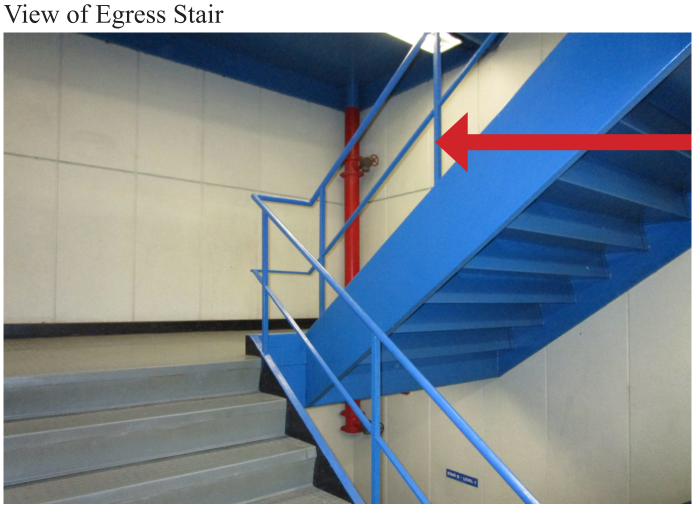
Currently the stairs have open railings that provide no protection and are not in conformance with current code. The railings are painted steel bar welded to the steel tube stringer.

Both Stair Halls have double switchback stairs with the open railing running down the center of each switchback. Thus there are 16 switchback railings.

3. Recommendation

We recommend removal of the existing railings, replaced by a new code-compliant painted steel guardrail with integrated hand railings at two heights. It is assumed that the existing steel tube stair stringer can accommodate the additional load of these new rails.

View of Egress Stair



NOTE: Open railings do not conform to current codes.

View of Egress Stair

NOTE: Typical wear and tear at egress stair landing

4.E ROOF

1. EXECUTIVE SUMMARY

The existing 25 yr old roofing at the Andrew Jackson / Horace Mann Schools exhibits numerous widespread deficiencies (e.g., holes, unadhered lap seams and membrane, etc.) and fundamental shortcomings (e.g., little to no slope to drain, low base flashing heights, etc.). Due to these two factors, the underlying materials are soft, deteriorated, and deformed. While the existing conditions are most severe at the Back Building, both buildings exhibit numerous and widespread evidence of water leakage at the interior (i.e., staining, bulging, displacement of ceiling tiles at top floors). Thus, the roofing systems at the Andrew Jackson / Horace Mann Schools are beyond their serviceable life and should be replaced.

Based on the extent of deterioration observed during our site visit and widespread leakage reported by others, we recommend replacing the existing roofing with a new roofing system that is more durable and reliable, such as heat-welded single-ply polyvinyl chloride (PVC) roofing. Additionally, we recommend that the roofing replacement scope of work address the inherent shortcomings of the current design, such as improving slope to drain and increasing base flashing heights to provide more-reliable terminations.

2. SUMMARY FINDINGS

2.1 Existing Exterior Conditions

Back Building Roof

Based on our preliminary review of the construction drawings for the Andrew Jackson / Horace Mann Public Schools, dated 5 March 1974, the original roofing system consisted of the following (from bottom to top):

- Structural concrete or metal deck.
- 2 in. thick insulation.
- Composition or built-up roofing.

The original roofing system described above was reportedly replaced circa 1994-1995 with a new EPDM roofing system; however, it is unclear whether the original insulation and roofing indicated above was fully removed or whether it was incorporated into the EPDM roofing assembly. We did not make exploratory openings to evaluate the composition and condition of the underlying roof materials.

During our site visit on 5 December 2018, we observed the following typical roofing conditions at Horace Mann School:

- **Roofing Membrane:** The roofing membrane is single-ply adhered EPDM (Photos 1 and 2) containing numerous stamps, such as “VersiGard 060 EPFR L7 14 VII 94” and “VersiGard 060 EPFR G7 06 VII 95,” indicating the membrane is almost 25 years old.
    - The EPDM exhibits numerous obvious deficiencies that likely contribute to water infiltration:
        - Most lap seams are unadhered (Photo 3).
        - Numerous holes or gaps are present in the field of the EPDM (Photo 4).
        - Previous repairs that are generally debonded, bubbled, or wrinkled (Photo 5).
        - Projecting fasteners and blocking are visible beneath the EPDM (Photos 6 and 7, respectively)
    - The EPDM is generally not well adhered to the substrate and tenting, which is readily visible near the perimeter of the roof where the EPDM is pulling away from the coping (Photos 8 and 9).
- **Concealed Roofing Materials:** The materials concealed beneath the EPDM are buckled, soft, and deformed (Photos 1 and 10).
    - Deterioration of the underlying materials is evident at the finished surface of the EPDM (i.e., we can hear/feel materials crush under foot pressure, the top surface of the EPDM is mounded and irregular, etc.), which creates localized low points for ponding water (Photo 1).
- **Drainage/Slope:** There is little to no visible slope to drain at many portions of the roof (Photos 1 and 2).
    - The EPDM is covered in several areas with ponded water, both near drains and where a depression in the roof surface exists.
    - Drains are about 4 in. diameter and are covered by strainers that are often clogged with leaves and debris (Photos 11 and 12).

- No scuppers existing in the parapet walls, and we did not observe dedicated overflow drains.

- **Rooftop Equipment:** We noted the following equipment on the roof:

    - Limited mechanical equipment atop the roof with approximately 4 in. to 8 in. base flashing heights (Photos 1 and 2).
    - Conduits on wood sleepers that bear directly on the EPDM in some locations (Photo 13).
    - Lightning protection attachments are adhered directly to the EPDM (Photo 14).

- **Base Flashing Heights and Perimeter Terminations:** We observed a variety of base flashing and perimeter termination conditions, all of which provide less than 8 in. of flashing (industry standard minimum) (Photo 15). It is not clear, without removing the metal cap flashing at the perimeter parapet walls, whether the membrane extends onto the top horizontal surface of the parapet. We also noted the following conditions:

    - Termination bar at rising walls generally less than 4 in. above the finished surface; some terminate on the horizontal (Photo 16).
    - The top seven to eight courses of brick at the parapets appear to have been rebuilt or constructed subsequent to the 1974 construction, reportedly to increase the parapet height as part of the installation of EPDM roofing circa 1994-1995. Weeps are present along the bottom of the more recent coursing and a fabric flashing is exposed at reentrant corners (Photos 17 and 18)

Front Building Roof

We observed similar roofing conditions at the Front Building (e.g., unadhered EPDM, open lap seams, repairs that are bubbled/failed, holes in he membrane, etc.) (Photos 19 – 21) and stamps that indicate the EPDM is contemporary with that at the Back Building (i.e., about 25 yrs old). However, we observed the following roofing conditions to be less severe than that of the Back Building:

- Little to no water is ponded on the roof, likely due in part to visible crickets and slope to drain with more-closely-spaced roof drains (Photos 19 and 20)

- The base flashing heights at the Front Building are generally more than 8 in. above the roof surface at rising walls and perimeter copings (Photo 22).

- Rising wall terminations are concealed by a metal counterflashing that is in good condition and is installed beneath older flashing (Photo 23).

- Fewer roof penetrations and less mechanical equipment.

These design features are likely the reason why the extent and severity of deterioration/deformation in the underlying materials is less evident at the Front Building. However, based on the age and deteriorated condition of the EPDM membrane, as well as interior evidence of widespread water infiltration beneath this roofing system, it is likely that the underlying materials are deteriorated and/or deformed to some extent and require replacement.

2.2 Existing Interior Conditions

At both the Front Building and Back Building we observed that the ceiling finishes below the roof deck are frequently stained, buckled, displaced, or otherwise exhibiting signs of water infiltration (Photos 24 – 26). Where buckled, displaced, or extensively deteriorated, the ceiling panels pose potential falling hazards and should be removed. Based on our review of the existing interior conditions, water infiltration is ongoing throughout the top floors, both near the perimeter of the building and beneath the field of the roof. This is consistent with the widespread deteriorated condition of the roofing above (i.e., the EPDM exhibits numerous deficiencies and is generally unadhered from the underlying materials). Thus, water bypassing the membrane via holes, unadhered seams, etc., can migrate horizontally through the underlying materials until it reaches the interior.

3. RECOMMENDATIONS

We recommend you plan to fully remove and replace the EPDM roofing assemblies (i.e., all roofing and underlying materials, down to the structural deck) at the Andrew Jackson / Horace Mann Schools. There are multiple options for the replacement roof membrane. Modified bitumen is a robust and durable multi-ply roofing system with good puncture resistance and a long track record of successful installation. Both PVC and EPDM are single-ply membrane systems with long track records of successful installation and can be installed as part of either adhered or mechanically fasted systems. EPDM membrane relies on adhered seams while PVC membrane seams are welded, typically resulting in a more durable and less maintenance intensive system. Another single-ply membrane option is TPO; however, the current formulation of TPO lacks a long-term track record of successful installation, so long-term durability and performance cannot not certain. We base our recommendations below on the assumption that a cost-efficient and durable roof membrane is most practical for this project.

We recommend that the roofing replacement include the following general scope of work:

- Remove and dispose of all roofing assembly materials down to the structural deck.

- Provide a new roofing assembly, consisting of the following (from bottom to top):

    - Existing Structural Deck: Expose and evaluate the condition of the structural roof deck. Repair the deck, and prepare the top surface as needed to accommodate the new roofing assembly.
    - Drain Bowls and Strainers: Remove and replace drain bodies, clamping rings, and strainers to provide a reliable/warrantable roofing termination at drains.
    - Air barrier and vapor retarder.
    - Cover Board and Tapered Insulation: Provide cover board and tapered insulation to provide 1/4 in. per foot minimum slope to existing drains throughout the roof and as needed to satisfy energy code requirements (i.e., R-30 min. for new roofing).

        - Note that providing additional insulation may affect door thresholds, base flashing heights at rising walls and mechanical equipment, coping/parapet walls heights, attachments for conduits and lightning protection, etc.

- Install single-ply polyvinyl chloride (PVC) sheet membrane, which consists of heat-welded seams that are more reliable when subjected to prolonged periods of moisture than sheet-applied roofing membranes with adhered seams and has a long-term successful track record.

  - PVC membrane terminations at rising walls require a minimum of 8 in. base flashing height. This may require removal of some exterior wall panels, elevating mechanical equipment, etc.
  - PVC membrane terminations at copings/parapets should be integrated with waterproofing below the metal coping/parapet cap. This may require increasing the height of copings/parapets.

- Evaluate the existing parapet walls, via water testing and/or exploratory openings, to determine whether repair or rebuilding the existing parapet walls is required to provide a watertight roofing termination and building enclosure.

We did not evaluate or consider the possible presence of hazardous materials in the existing roof or ceiling finishes in our above recommendations. This should be evaluated by a certified industrial hygienist or other specialist prior to proceeding with material removal. We appreciate the opportunity to be of service on this project and await your direction for future work.

Photo 1

Overview of roofing. Note localized raised areas where the underlying materials are buckled, soft, and deformed (red arrows) and create localized low points where water ponds.

Photo 2

Overview of roofing.

Photo 3

EPDM lap seams are generally unadhered.

Photo 4

Numerous holes in the field of the EPDM.

Photo 5

Previous EPDM repair is debonded and bubbled.

Photo 6

Projecting fastener is visible beneath EPDM.

Photo 7

Blocking is visible beneath the EPDM.

Photo 8

EPDM is generally not well adhered to the substrate and tenting near the perimeter of the roof (area indicated in red).

Photo 9

EDPM can be moved by hand and has pulled away from the perimeter coping in some locations.

Photo 10

Portions of the buckled/deformed substrate visibly project into the surface of the EPDM.

Photo 11

Drain strainers are generally clogged with leaves and debris (note standing water around drain).

Photo 12

We measured several drains to be about 4 in. diameter.

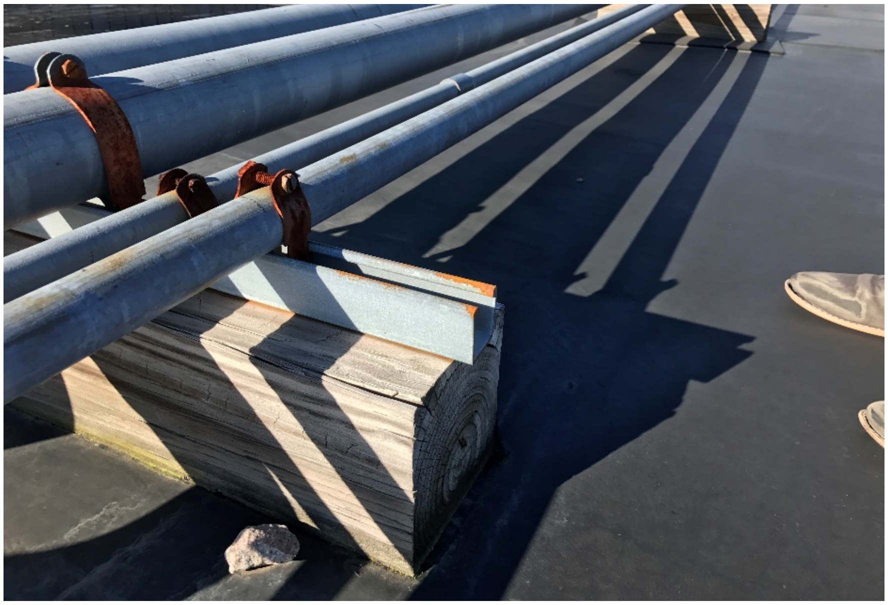


Photo 13

Conduits on wood sleepers that bear directly on the EPDM in some locations (bottom of photo).

Photo 14

Lightning protection attachments adhered to EPDM.

Photo 15

Base flashing heights at perimeter are generally less than 8 in.

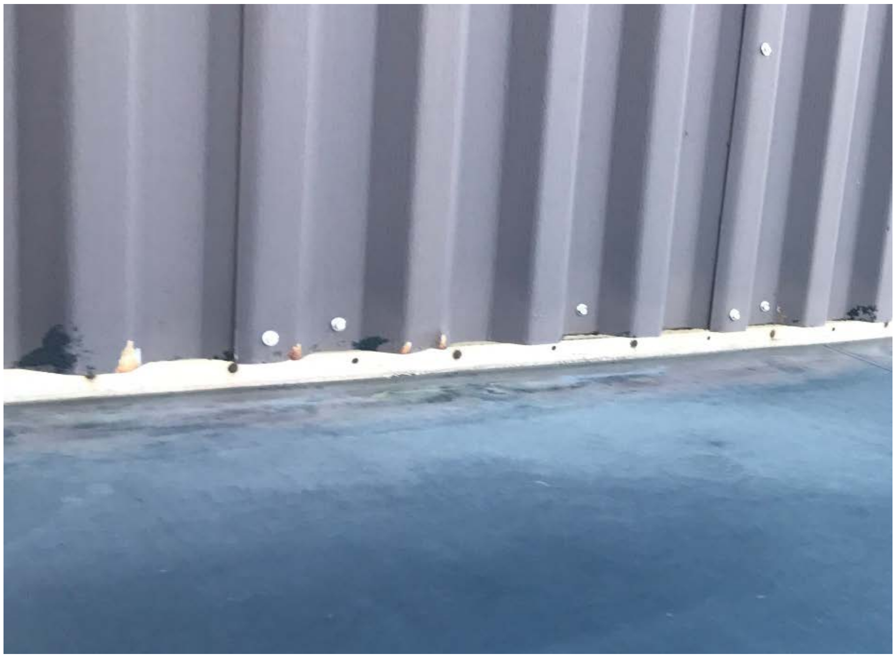


Photo 16

Termination of EPDM at rising walls at the Back Building are typically less than 4 in. above the surface of the membrane.

Photo 17

The upper courses of brick at the parapet wall appear to have been rebuilt or constructed more recently than the adjacent brick. Weeps are located at the base of the reconstructed areas. See Photo 18 for a close-up the area indicated in red.

Photo 18

Fabric flashing (red arrow) is visible at the edge of parapet walls that appear to have been partially rebuilt or constructed subsequent to the adjacent brick.

Photo 19

Overview of roofing.

Photo 20

Overview of roofing.

Photo 21

EPDM is bubbled at previous repairs and seam laps.

Photo 22

Height of parapet wall and base flashing is more than 8 in.

Photo 23

Rising wall terminations are concealed by reglet-set or through-wall copper flashing that is installed beneath older flashing.

4.F ELEVATORS

1. SUMMARY

The Andrew Jackson / Horace Mann School is equipped with one (1) in ground jack type hydraulic passenger elevator. Based on data available on site, the elevators were installed around 1975. Each elevator has a rated capacity of 4000#, operates at 75 fpm and are equipped with 3’-6” wide x 7’-0” high center parting type power operated doors.

The objective of our assessment of the elevators was to establish the condition of the existing equipment and to define any recommendations for equipment upgrading. Our equipment review was performed on Monday, November 19, 2018.

The majority of the equipment is still original to the installation and is outdated, maintenance ıntensive and in some cases, obsolete. The need for a complete modernization of each unit within the next 1-2 years is prevalent.

2. EXISTING CONDITIONS

The majority of the existing components in place at the time of our review date back to the time of the original installation in 1975. The only newer components are new hydraulic power units and new closed loop door operators that were recently installed.

The original relay logic control and motion system, car and hall signal fixtures, cab enclosure, car and landing door equipment (door panels, hangers, tracks, interlocks and closers) are all part of the original installation. The level of preventive maintenance being performed could be considered average for an installation of this type.

The original components are of an older technology and at this point have become inefficient.

If the elevators are continued to be used primarily for service and ADA accessibility only, then the current number of elevators is sufficient for the building.

3. RECOMMENDATIONS

Based on the condition and age of the equipment, it is our recommendation that a comprehensive modernization program for both elevators be implemented within the next 1-2 years, to provide a reliable, efficient, and compliant elevator system. Following is an outline summary of the recommended scope for the modernization.

- Replace existing relay logic motion and control systems with a new solid-state system.
- Provide all new machine room/hoistway wiring, traveling cable and floor selector systems.
- Retain existing (newer) hydraulic power units (tank, pump, motor, control valve)
- Retain existing inground hydraulic jack units (plunger, cylinder, oil line).
- Retain existing car guide rails in place.
- Retain existing top and bottom car guide shoes and refurbish as needed.
- Retain existing closed loop door operators (newer) and refurbish as needed.
- Provide new landing door panels, hangers, tracks, interlocks and closers, retain existing door frames in place.
- Provide new vandal resistant, ADA compliant car and hall signal fixtures (car operating panel, hall push button stations, direction lanterns).
- Provide a new car top control station that meets current code requirements.
- Provide a complete new cab enclosure with durable, vandal resistant type finishes, including new two speed ventilation fan.

We would estimate that budget pricing for this work to be in the range of $90K-$100K per elevator. This pricing is based on current market conditions and may vary depending on when the work is actually performed. This pricing does not include any related work by other trades in association with the modernization such as GC, electrical, alarm, HVAC, etc. Below is a summary of the work by other trades. Pricing for this work is not included as it is outside of our area of expertise.

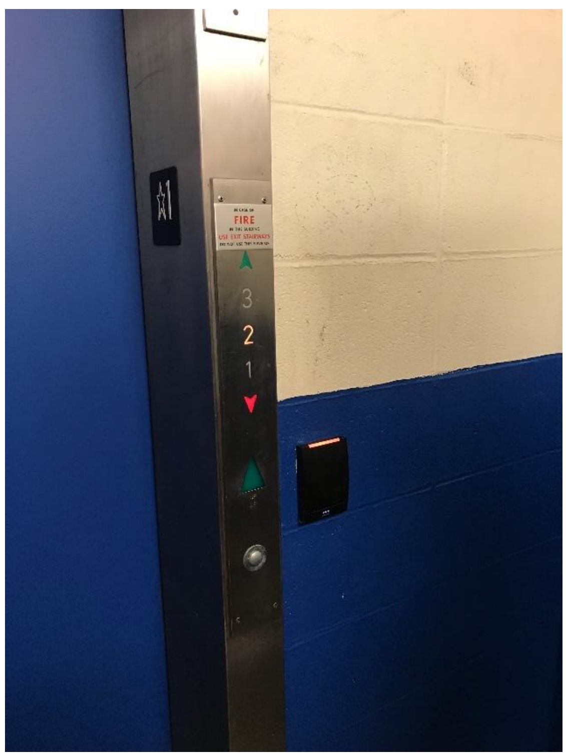
- Expansion of elevator machine room in K-8 school building to facilitate code required working clearances around equipment.
- Provide new fused, lockable main line disconnect switch in machine room with bonded ground wire.
- Provision of smoke detectors in each machine room and elevator lobby for fireman's recall operation.
- Closing off vents between machine room and hoistway, and vents at top of hoistway to outside air.
- Fused, lockable 110V disconnect in machine room for separate cab lighting and fan supply.
- GFCI type receptacles in machine room and pit.
- HVAC system in machine room to maintain temperature between 50-90F.
- Provision of access ladder in each elevator pit.

PHOTOGRAPHS

EXISTING RELAY LOGIC CONTROL SYSTEM

EXISTING FLOOR SELECTOR SYSTEM

EXISTING CAR OPERATING PANEL



EXISTING HALL PUSH BUTTON STATION

4.G MECHANICAL

1. Summary

The majority of the existing heating, ventilation and air conditioning systems were installed in 1974 and have long exceeded their life expectancy, are in various states of disrepair, are extremely energy inefficient, have little to no automatic controls, and are in need of replacement. In addition, the current constant maintenance required to keep the system operational is expensive and time consuming.

Replacement of existing heating, ventilating and air conditioning systems with new, higher efficient equipment and control strategies would result in significant improvements in occupant comfort, system control, and system operating efficiency.

2. Existing Conditions

MECHANICAL PENTHOUSE

The existing mechanical room is located in the upper level of the building. The mechanical room houses the heating, cooling and ventilating equipment for the building. The building is provided with two (2) gas fired boilers, Weil McLain rated for 5,364.3 MBH net output. The boilers were converted from fuel oil to natural gas at some point; the underground fuel oil tank was abandoned in place. From the boilers, a hot water distribution piping system transports heating water to the hot distribution water piping system. The two hot water lead/standby base mounted circulated pumps (480 gpm at 30'TDH) that serves the four (4) penthouse air handling units, the domestic hot water indirect heaters/tanks and the building secondary pumps; the two secondary hot water lead/standby base mounted circulated pumps (420 gpm at 40'TDH) that serves the building heating terminal equipment including air handling units, HV units, unit heaters, etc. The heating system includes combustion air provisions, water specialties and automatic temperature controls. The existing boilers, pumps and associated equipment were installed in 1974 and are in various levels of disrepair; the anticipated life expectancy of this equipment is 25 years which has been long exceeded. In addition, the boilers are standard operating efficiency and significantly less efficient than new available heating equipment.

The hot water heating system is supplemented by the two 250KW cogeneration units located on the roof in a shipping container; the cogeneration unit provides preheating to the heating hot water and domestic hot water systems through plate/frame heat exchangers, an insulated piping system, pumps and automatic temperature controls. Building chilled cooling is provided by a Dunham Bush 420 ton water cooled screw chiller, cooling tower on roof, chilled water pumps and condenser water pumps. The two chilled water lead/standby base mounted circulated pumps (800 gpm at 60'TDH) that serves the four (4) penthouse air handling units and the two air handling units serving Dining and Theater. The two condenser water lead/standby base mounted circulated pumps (1,200 gpm at 40'TDH) are piped to the cooling tower located on the roof adjacent to the mechanical room. The cooling systems include water specialties and automatic temperature controls. The existing chiller, cooling pumps and associated equipment were installed around 2000 appear to be in satisfactory operating condition but are near the end of their anticipated life expectancy of 20 years.

Heating, Ventilating and Air Conditioning are provided with four (4) 20,000 CFM air handling units with hot water heating, chilled water cooling and variable speed drive fans for the supply and return fans located in roof level mechanical penthouses. Note: Units have 3-way valve control.

Each air handling unit provides conditioned air (55F) through hot water heating, chilled water cooling or economizer operation to an insulated duct distribution system through vertical shafts/horizontal distribution to terminal units with hot water reheat coils (159 total) in each zone. Air is returned from ceiling plenums into a return duct distribution system up through vertical shafts to the respective air handling unit. Shafts penetrations have been provided with fire dampers. Each zone has been provided with a space sensor for space temperature control. The anticipated life expectancy of this equipment is 25 years which has been long exceeded.

BUILDING HEATING, VENTILATION AND AIR CONDITIONING

Heating, Ventilating and Air Conditioning are provided with four (4) 20,000 CFM air handling units with hot water heating, chilled water cooling and variable speed drive fans for the and return fans located in roof level mechanical penthouses. Each air handling unit provides conditioned air (55F) through hot water heating, chilled water cooling or economizer operation to an insulated duct distribution system through vertical shafts/horizontal distribution to terminal units with hot water reheat coils (159 total) in each zone. Air is returned from ceiling plenums into return duct distribution system up through vertical shafts to the respective air handling unit. Shafts penetrations have been provided with fire dampers. Each zone has been provided with a space sensor for space temperature control. Note: Units have 3-way valve control.

General building exhaust is provided by exhaust duct distribution systems and exhaust fans.

GENERAL BUILDING ROOF UPBLAST EXHAUST FAN SCHEDULE:

EF-6 3rd Floor Proj Area E: 2,500 cfm, 0.5”w.c., 0.75hp, 460/3/60

EF-7 4th Floor Science: 2,000 cfm, 0.5”w.c., 0.5hp, 460/3/60

EF-8 3rd Floor W: 1,300 cfm, 0.5”w.c., 0.33hp, 120/1/60

EF-9 4th Floor Proj Area E: 2,5000 cfm, 0.5”w.c., 0.75hp, 460/3/60

EF-10 4th Floor W: 1,300 cfm, 0.5”w.c., 0.33hp, 120/1/60

EF-12 3rd Floor Proj: 1,400 cfm, 0.5”w.c., 0.33hp, 120/1/60

EF-16: Comm Comp, 4,200 cfm, 0.5”w.c., 0.5hp, 460/3/60

EF-18: Comm First Floor, 3,200 cfm, 0.75”w.c., 1hp, 460/3/60

GENERAL BUILDING INLINE EXHAUST FAN SCHEDULE:

EF-11 2nd Floor Proj Area W: 1,200 cfm, 0.5"w.c., 0.33hp, 120/1/60

The equipment is in various states of disrepair; the terminal unit controls, dampers and linkages have mostly failed and have been set to the open position resulting in extremely high energy demands for the building. The anticipated life expectancy of this equipment is 25 years which has been long exceeded.

GYMNASIUM

The two zone Gym has been with heating and ventilating from a heating/ventilating unit, HV-2, associated return/exhaust fan and an insulated duct distribution system located in Mechanical Room 2. HV-2 is rated for 18,000 cfm and is provided with a hot water heating coil and two zone dampers. Outdoor air to the unit for ventilation is provided through a wall mounted intake louver. Note: Units have 3-way valve control.

The unit provides tempered air through a duct distribution to each zone system along the side of gym; each zone damper is controlled by a wall mounted temperature near the return register. Air is returned from each zone from a wall mounted return register located low in the space by the return/exhaust fan that either returns air to the unit or exhaust air to the outdoors through a wall mounted louver. Note: Portions of return duct to Zone 2 appear to be located in under gym floor in a trench and is noted to be Transite. The anticipated life expectancy of this equipment is 25 years which has been long exceeded.

The multi-zone operation of the equipment is extremely energy inefficient for current available equipment; the anticipated life expectancy of this equipment is 25 years which has been long exceeded.

DANCE/LOCKER ROOMS

The Dance/Locker Rooms have been with heating and ventilating from an energy recovery type heating/ventilating unit, HV-3, and an insulated duct distribution system located in Mechanical Room 2. HV-2 is rated for 7,675 cfm and is provided with a hot water heating coil and energy recovery wheel. Outdoor air to the unit for ventilation is provided through a wall mounted intake louver. The unit provides tempered air through a duct distribution with hot water reheat coil to each zone (4 zones); each hot water reheat coil is controlled by a wall mounted temperature near the return register. Air is returned from each zone by the unit exhaust fan for heat recovery and then is discharged to the outdoors through a wall mounted louver. Note: Units have 3-way valve control.

The locker room toilet area is provided by exhaust through ceiling mounted exhaust register(s) to provide exhaust by roof mounted exhaust fan, EF-5 rated for 820 cfm at 0.75"w.c. at 0.5hp/460v/3ph/120hz, through a low pressure duct distribution system. Each exhaust fan will operate continuously during occupied hours and be deenergized during unoccupied hours.

The efficiency of the energy recovery wheel has been compromised by years of accumulation; the anticipated life expectancy of this equipment is 25 years which has been long exceeded.

COMM THEATER/RAMP

Heating, Ventilating and Air Conditioning are provided with a multi-zone air handling unit, AHU-5, located in Mechanical Room. The air handling unit is rated for 21,825 cfm and is provided with 8 zone dampers, hot water heating, chilled water cooling and variable speed drive fans for the supply and return fans. The air handling unit provides conditioned air through hot water heating, chilled water cooling or economizer operation to each zone as required to maintain the space temperature setpoint. Air is returned from ceiling plenums into return duct distribution system back to air handling unit. Note: Units have 3-way valve control.

The multi-zone operation of the equipment is extremely energy inefficient for current available equipment; the anticipated life expectancy of this equipment is 25 years which has been long exceeded.

TOILET EXHAUST

Each toilet has been provided with exhaust through ceiling mounted exhaust register(s) to provide exhaust from the space by roof mounted exhaust fans through a low pressure duct distribution system. Each exhaust fan will operate continuously during occupied hours and be deenergized during unoccupied hours. Heating is provided by hot water terminal equipment.

TOILET ROOF EXHAUST FAN SCHEDULE:

EF-1 Toilets S: 2,880 cfm, 0.75"w.c., 1.5hp, 460/3/60

EF-2 Toilets N: 2,330 cfm, 0.75"w.c., 0.75hp, 460/3/60

EF-3 Toilets E: 1,120 cfm, 0.75"w.c., 0.75hp, 460/3/60

EF-4 Toilets W, 2,460, 0.75"w.c., 1hp, 460/3/60

EF-14: Comm 2nd Floor Toilets, 810 cfm, 0.5"w.c., 0.25hp, 120/1/60

The exhaust fans are in various states of disrepair; the anticipated life expectancy of this equipment is 25 years which has been long exceeded.

SWITCHGEAR ROOM

The Switchgear Room has been provided with a supply air fan to provide outdoor air ducted from a wall mounted outdoor air intake louver for heat dissipation to the space. The inline fan, SF-1 rated 3,200 cfm @ 1"w.c. at 1hp/460v/3ph/120hz, will operate to maintain the space temperature setpoint as sensed by a wall mounted thermostat.

The anticipated life expectancy of this equipment is 25 years which has been long exceeded.

PARKING GARAGE

The Parking Garage has been with heating and ventilating from a heating/ventilating unit, HV-1, and duct distribution system located in Mechanical Room 2. HV-2 is rated for 17,260 cfm and is provided with a hot water heating coil to temper air from 0F to 65F. Outdoor air to the unit for ventilation is provided through a wall mounted intake louver. The unit provides tempered air through a duct distribution along the length of garage. Note: Units have 3-way valve control.

The Parking Garage is provided by exhaust duct distribution system to two (2) roof upblast exhaust fans, EF-17 and EF-17A each rated for 8,130 cfm cfm @ 0.75"w.c.at 0.25hp/ 460v/3ph/120hz. The exhaust fans will interlock with HV-1.

The existing system continual operation based on 1.5 cfm/sf and no carbon monoxide/ carbon dioxide detection system is extremely inefficient; the anticipated life expectancy of this equipment is 25 years which has been long exceeded.

MISCELLANEOUS

Miscellaneous entry, stair and miscellaneous other spaces in the building have been provided with a hot water cabinet unit heater.

Miscellaneous spaces, such as storage rooms, are provided with hot water heating, where required, and an exhaust air system.

The anticipated life expectancy of this equipment is 25 years which has been long exceeded.

AUTOMATIC TEMPERATURE CONTROLS

All existing automatic temperature controls are pneumatic and a DOS based front end; the system has degraded over time, and is not maintainable due to unavailable replacement parts. The building has many air leaks and that has left the building with little to no control in most areas.

The pneumatic controls are mostly in a state of failure or disrepair resulting in extremely high building operating costs; the anticipated life expectancy of this equipment is 25 years which has been long exceeded.

GENERAL NOTE

The existing insulation is original to the building , and there is a high probability of asbestos on pipe elbows and equipment.

3. Recommendation

The majority of the existing heating, ventilation and air conditioning systems were installed in 1974 and have long exceeded thier life expectancy, are in various states of disrepair, are extremely energy inefficient, have little to no automatic controls and in need of replacement. In addition, the current constant maintenance required to keep the system operational is expensive and time consuming.

PENTHOUSE MECHANICAL ROOM

1. Remove all existing equipment, controls and appurtenances for equipment noted to be replaced.
2. Replace existing boilers with five (5) new gas fired condensing boilers rated for 2,000 MBH input capacity (to maximize rebates) complete with new primary/secondary piping system, individual boiler pumps (192 gpm at 40’TDH), combustion air/boiler venting water specialties.
3. Provide two new hot water lead/standby base mounted circulated pumps (480 gpm at 30’TDH) with variable speed drives to maintain differential pressure.
4. Replace two secondary hot water lead/standby base mounted circulated pumps (420 gpm at 40’TDH) with variable speed drives to maintain differential pressure.
5. Replace existing cogeneration plate/frame heat exchangers, an insulated piping system, pumps and automatic temperature controls.
6. Replace existing 420 ton water cooled screw chiller.
7. Replace existing cooling tower on roof.
8. Replace two chilled water lead/standby base mounted circulated pumps (800 gpm at 60’TDH)
9. Replace two condenser water lead/standby base mounted circulated pumps (1,200 gpm at 40’TDH)
10. Replace four (4) 20,000 CFM air handling units with hot water heating, chilled water cooling and variable speed drive fans for the and return fans located in roof level mechanical penthouses. New air handling units to be provided with 2-way control valves.
11. Replace all insulation for existing duct/piping/equipment abated of asbestos containing materials to remain.
12. Clean all ductwork to be reused.
13. Rebalance existing duct distributions systems.
14. Provide all new direct digital type automatic controls for all new equipment.
15. Commission new equipment.

BUILDING HEATING, VENTILATING AND AIR CONDITIONING

1. Replace variable air volume terminal units with hot water reheat coils (159 total) in each zone.
2. Replace existing roof/inline fans for general building exhaust.
3. Replace all insulation for existing duct/piping/equipment abated of asbestos containing materials to remain.
4. Clean all ductwork to be reused.
5. Rebalance existing duct distributions systems.
6. Provide all new direct digital type automatic controls for all new equipment.
7. Commission new equipment.

GYMNASIUM

1. Replace existing multi-zone heating/ventilating unit, HV-2 (18,000 cfm) with hot water heating and variable speed drive fans and return fans. New heating/ventilating unit to be provided with 2-way control valves
2. Replace all insulation for existing duct/piping/equipment abated of asbestos containing materials to remain.
3. Replace/relocate existing Transite return duct.
4. Clean all ductwork to be reused.
5. Rebalance existing duct distributions systems.
6. Provide all new direct digital type automatic controls for all new equipment including demand control ventilation for each Gym zone.
7. Commission new equipment.

DANCE/LOCKER ROOMS

1. Replace existing energy recovery unit, HV-3 (7,675 cfm) with hot water heating. New energy recovery unit to be provided with 2-way control valves.
2. Replace existing reheat coils (4 total).
3. Replace existing toilet area exhaust fan, EF-5.
4. Replace all insulation for existing duct/piping/equipment abated of asbestos containing materials to remain.
5. Clean all ductwork to be reused.
6. Rebalance existing duct distributions systems.
7. Provide all new direct digital type automatic controls for all new equipment.
8. Commission new equipment.

COMM THEATER/RAMP

1. Replace existing multizone (8 zones) air handling unit, AHU-5 (21,825 cfm) with hot water heating, chilled water cooling and variable speed drive fans for the supply and return fans. New air handling unit to be provided with 2-way control valves.
2. Replace all insulation for existing duct/piping/equipment abated of asbestos containing materials to remain.
3. Clean all ductwork to be reused.
4. Rebalance existing duct distributions systems.
5. Provide all new direct digital type automatic controls for all new equipment including demand control ventilation for Theater.
6. Commission new equipment.

COMM DINING/KITCHEN

1. Replace existing multi-zone (9 zones) air handling unit, AHU-6 (21,200 cfm) with hot water heating, chilled water cooling and variable speed drive fans for the and return fans. New air handling unit to be provided with 2-way control valves.
2. Replace existing Faculty Dining roof mounted exhaust fan, EF-13 rated for 1,700 cfm @ 0.5”w.c. at 0.5hp/460v/3ph/120hz.
3. Replace existing Kitchen Hood upblast exhaust fan, EF-15 rated for 1,750 cfm @ 1.0”w.c. at 1hp/460v/3ph/120hz.
4. Replace existing grease duct system.
5. Replace all insulation for existing duct/piping/equipment abated of asbestos containing materials to remain.
6. Clean all ductwork to be reused.
7. Rebalance existing duct distributions systems.
8. Provide all new direct digital type automatic controls for all new equipment including demand control ventilation for Dining areas.
9. Commission new equipment.

TOILET EXHAUST

1. Replace existing roof/inline fans for toilet exhaust.
2. Replace all insulation for existing duct/piping/equipment abated of asbestos containing materials to remain.
3. Clean all ductwork to be reused.
4. Rebalance existing duct distributions systems.
5. Provide all new direct digital type automatic controls for all new equipment.

SWITCHGEAR ROOM

1. Replace inline fan, SF-1 rated 3,200 cfm @ 1”w.c. at 1hp/460v/3ph/120hz.
2. Replace all insulation for existing duct/piping/equipment abated of asbestos containing materials to remain.
3. Clean all ductwork to be reused.
4. Rebalance existing duct distributions systems.
5. Provide all new direct digital type automatic controls for all new equipment.

PARKING GARAGE

1. Replace existing heating/ventilating unit, HV-1with hot water heating and a variable speed drive fan. New heating/ventilating unit to be provided with 2-way control valves.
2. Replace two (2) roof upblast exhaust fans, EF-17 and EF-17A with variable speed drive fans. The exhaust fans will be interlocked with HV-1.
3. Provide new carbon monoxide/carbon monoxide detection system to operate HV-1, EF-17 and EF-17A; resize equipment based on current code requirements (0.75cfm/sf).

MISCELLANEOUS HEAT

1. Replace existing miscellaneous heat in building.
2. Replace all insulation for existing duct/piping/equipment abated of asbestos containing materials to remain.
3. Provide all new direct digital type automatic controls for all new equipment.

AUTOMATIC TEMPERATURE CONTROLS

All new automatic temperature controls shall be direct digital type with dynamic controls with remote read/adjustment and alarming capabilities.

Replacement of existing heating, ventilating and air conditioning systems with new, higher efficient equipment and control strategies would result in significant improvements in occupant comfort, system control and system operating efficiency.

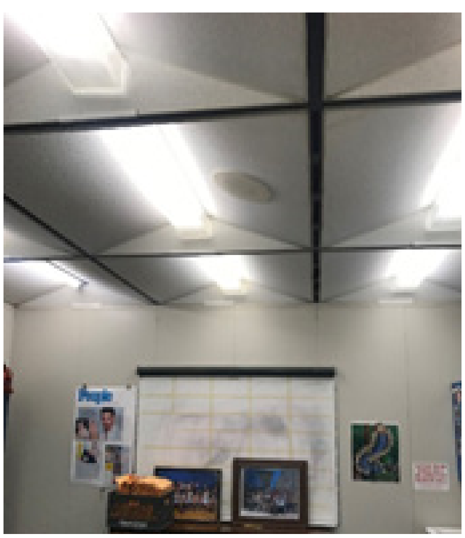
Summer Gas Fired Water Heater

Existing Pneumatic Control

Existing Cogeneration Container

Existing Cogeneration Unit

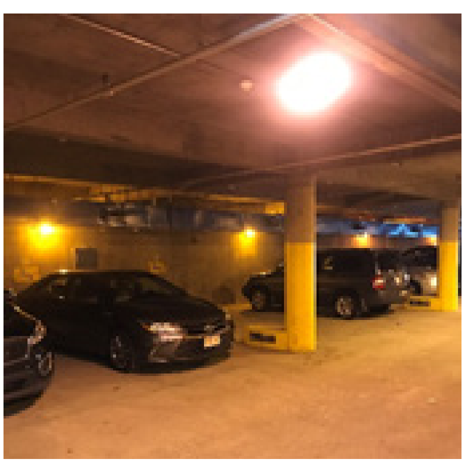
Existing Gas Fired Boiler



Existing Ceiling Supply Linear Diffusers

Existing Hot Water Pumps

Existing Inline Fan



Existing Garage System

Existing Roof Fan

Existing Penthouse Air Handlling Unit

Existing Multizone Unit

Existing Multizone Duct Work

Existing Unit/Return Fan

4.H ELECTRICAL

1. Summary

The electrical report is based on a brief site visit to the Jackson/Mann K-8 School, not involving any extensive exploratory work or building life safety assessment with respect to future building alterations. The electrical systems were visually noted and inspected for signs of deterioration and major compliance issues.

The majority of the electrical systems' distribution and lighting equipment were installed in 1974, have long exceeded their life expectancy, are in various states of disrepair, and are not energy efficient. In addition, the probability of equipment failure and down time is much greater now that replacement parts are not readily available.

2. Existing Conditions

ELECTRICAL SERVICE AND SERVICE ENTRANCE EQUIPMENT

Primary power provided by NSTAR originates from an NSTAR 13.8kV utility vault located in a space adjacent to the main electric room. The main switchboard, located in the main electric room, is type "AV Line" manufactured by General Electric (GE), rated 3000A, 277V/480V, 3-phase, 4-wire. This main switchboard "MSB" has multiple sections, the middle section has a CT and pull section with a 3000A main circuit breaker. The other sections are distribution sections serving the building. There is also a transformation section of the board located on the end of the gear. The switchboard provides bolted pressure switch distribution for frame sizes 800A and above. Below 800A, switches and circuit breakers distribute the remainder of loads to secondary distribution panelboards and miscellaneous loads located throughout the two buildings.

Voltage: The building's service is 480V, 3 phase, 4 wire. All larger equipment, including large motors, HVAC equipment, building exterior, interior, and site lighting are fed from 480V panels. General purpose receptacles, computer equipment, small motors, smaller HVAC loads, and other miscellaneous branch circuits are all supplied from the 208Y/120V distribution system's dry type transformers.

Condition: The general condition of the main switchboard was observed to be in fair condition. However, the board has passed the end of its useful life and spare parts are difficult to obtain as is evident by the several field modifications that have been made to the gear to allow for expansion of the board's distribution capabilities. In addition, disconnects have been mounted to the exterior of the gear for taps that have been made to the main bus. It is suspected that these taps were made due to failing switches within the main switchboard.

Capacity: The existing 3000A service at 277/480V equates to 2500 kVA which allows for approximately 12W/sqft based on the approximated overall school size of 206,000sqft (not including the parking garage area). Given the building size and occupancy 12W/sq ft is appropriate. Billing demand information obtained helps to confirm this assertion. From the bills provided the max demand over the last 12 months is 703kVA. This equates to approximately 850A or 30% of the overall service capacity.

POWER DISTRIBUTION

All power distribution originates from the main switchboard and feeds distribution and branch circuit panels located throughout the building. Transformation from 480V to 120/208V exists in both the main electric room and satellite electrical closets via dry type transformers. Existing electrical condition drawings were not available at the time of survey to verify all panel locations. The power distribution is routed to multiple areas within the facility as follows:

- Mechanical penthouse
- Emergency Generator Room
- Multiple electrical closets
- Garage area

In general, the electrical distribution equipment in the building is predominantly from the original build in 1974 and over 44 years old. Over the years there have been several panel additions made to accommodate growing technology needs. These newer panels are from a variety of different time periods.

EQUIPMENT MANUFACTURERS

The power and emergency distribution equipment manufacturers currently utilized throughout the facility were noted as:

- Demco
- Eaton
- General Electric

These manufacturers are all of known quality, reputation, and continued service. However, for the majority of the older gear, replacement parts and system components are not readily available for repairs, renovation, or system upgrades because of the age of the equipment.

EMERGENCY POWER GENERATION AND DISTRIBUTION EQUIPMENT

The facility is currently served by one emergency generator which serves Life Safety equipment and is located in the first floor emergency generator room. This generator is manufactured by Demco and was installed in 1974. The corresponding Automatic Transfer Switches (ATS), manufactured by Russ Electric, is also located within this room. The generator and ATS are in a dedicated space, however, there does not appear to be proper separation of life safety and normal power panelboards throughout the building as is required by the current electrical code.

The generator has a continuous standby rating of 250kW/312.5kVA at 277/480V, 3 phase, 4 wire. Based on the kVA rating, this generator is capable of delivering 400A at 480V. The generator control panel indicates that the generator has 533 hours of run time or approximately 12 hours per year. This is consistent with a system that has been exercised once a month.

The Russ Electric transfer switch is rated 400A and is of the same vintage as the generator, circa 1974. Once again field modifications to the transfer switch have been made to provide for a load test switch, this modification is not consistent with the listing of the equipment.

Capacity: At 250kW, the existing generator size is capable of providing power to a minimum of life safety loads throughout both buildings including lighting and elevators.

CABLE AND CONDUIT

Power distribution is predominantly accomplished utilizing conduit and conductor. Observed wiring consists of copper conductors with thermoplastic insulation. Conduit types varied throughout the building dependent upon area and usage. Galvanized rigid metal conduit is used in areas subject to constant moisture and/or physical damage. Electrical metallic tubing (EMT) is used in interior spaces.

A large portion of the building interior walls are modular type construction, as part of an overall wall and distribution system the wiring is fed down from the ceiling through dedicated wireways at the wall seams. In many cases these dedicated wireways have begun to fail and have detached from its associated wall.

LIGHTING SYSTEM

The lighting system installed throughout the building consists predominantly of fluorescent lamped fixtures. There is a variety of utility strip, direct/indirect, pendant, and down light fixtures. As part of a building-wide retrofit 5-10 years ago, most fluorescent fixtures were provided with more efficient 22W T8 lamps. Many fixture lenses were observed to be dirty, cracked and or missing.

In most cases, lighting fixtures are controlled via wall toggle switches, and in some cases ceiling mounted occupancy sensors (mostly in corridors). Emergency lighting is fed from the emergency generator and has been supplemented by battery units with dual heads in select areas. Exit signage also appears to be fed from the emergency generator, but many more supplemental battery backup exit signs were observed.

Exterior lighting fixtures surface mounted to walls are visible lens type which offer poor visual quality. Garage and exterior fixtures utilize inefficient High Intensity Discharge lamps, with undesirable lamp color temperatures.

With the exception of the building wide lamp replacement to a more efficient T8 (22W), and some small scale lamp replacements to LED style, there does not appear to have been any major renovations to either building’s lighting fixtures.

FIRE ALARM SYSTEM

There are two fire alarm control panels. One is located within the Back Building main office. The other is located in the Front Building main office. Each control panel is a Simplex 4100U which are addressable, voice evacuation Fire Alarm Systems. Each fire alarm system is approximately 12 years old. All detection, initiation and notification devices appear to meet current code requirements and there does not appear to be any deficiencies with either system.

PA & INTERCOM SYSTEMS

Hearing Enabled PA and Intercom

The existing Hearing Enabled PA and Intercom systems were installed in 2006 at the same type of the hearing-impaired PA system. The intercom system allows individual classrooms to communicate with the main office via a push button setup. The PA system is building wide with controls located in the main office. The coverage appears to be adequate for interior spaces as hallway and stair well coverage were observed to have adequate ceiling speaker coverage. There were no issues or maintenance problems reported with the hearing enabled PA or intercom systems.

Hearing Impaired

There is a PA system for the hearing impaired that utilizes a series of blinking colored lights for coded messages to the students. The system is manufactured by Space Age and was installed in 2006. The system does not cover the entire building just the portions of the building where hearing-impaired students attend classes. The head end equipment of the system is located in the main office space and the system appears to be in good working order with the exception of regular maintenance required for lights that have failed.

The hearing-impaired PA system operates independent of the fire alarm system. The standard fire alarm system signal is a white flashing strobe emanating from independent fire alarm devices. There is a blinking white light code within the hearing impaired system but both signals are separate and distinct.

During the time of the engineers walk through, the operation of the PA system was not able to be observed, however the operation and condition of both PA systems was discussed on a conference call with Hon Ng (Boston Public Schools, Chief Supervisor of Fire Alarm).

3. Recommendation

Electrical distribution equipment and components are expected to have a useful life of 30 years. Switchboards, panelboards, transformers, generators, and wiring systems are typically serviceable for 10 to 20 years beyond this time if properly maintained and not subjected to repeated overloading or short-circuiting conditions. Given the building's construction date of 1974, at this time electrical systems, equipment and components have been in service for over 44 years and have past the end of their useful life. The equipment observed by BLW appears to have been

adequately maintained, however determining the event of equipment failure is not possible and without proper replacement parts available, failure of parts could result in extended periods of downtime.

As an alternative to equipment replacement, there are several electrical tests available to confirm the exact condition of an electrical system. In some cases, this testing can help better predict the potential for failure based on current operating conditions. Potential testing includes, but is not limited to:

1. Meggar testing for conductor insulation integrity.
2. Infrared testing to identify increased operating temperatures and electrical stresses.
3. Breaker function to confirm the operability of breakers and switches.
4. Transformer insulation integrity testing.

This type of testing on a building wide system can be cost prohibitive. Given the age of the existing electrical systems, and potential remaining service life, testing does not appear to be a cost-effective solution. In general BLW recommends replacement of most electrical systems as detailed below.

The following recommendations by BLW Engineers are based upon information obtained through observable field conditions. All available record drawings were provided, but electrical drawings were not included in the set.

ELECTRICAL SERVICE AND SERVICE ENTRANCE EQUIPMENT

The service size (available power) does appear to be more than adequate for the building size and use, however the switchboard is being recommended for replacement for the reasons touched upon in the existing conditions section and the following:

1. In the event of equipment failure, the age of the system will require increased downtime due to the lack of available replacement parts.
2. There is no spare capacity (physical space) available in the switchboard.
3. Because of the lack of space in the switchboard, several field modifications and taps have been made to provide additional space. These field modifications to the gear have not all been made in a manner that is consistent with the listing of the gear.

It is recommended that the existing switchboard be replaced with a new 3000A, 277/480V switchboard.

The new gear would consist of the following cubicle sections:
- CT/Pull and main circuit breaker section
- Two distribution sections

POWER DISTRIBUTION

The older portions of the distribution system are being recommended for replacement for the following reasons:

1. In the event of equipment failure, the age of the system will require increased downtime due to the lack of available replacement parts.
2. Transformer windings and insulation will begin to degrade over time making the unit less energy efficient and more prone to failure.
3. As older HVAC equipment is replaced with newer energy efficient equipment and individual controls, the controls within the motor control center become obsolete.

It is recommended that consideration be given to consolidating and replacing these older portions of the existing distribution equipment:

- While no record electrical drawings were available for review, it is estimated that there are approximately 15-20 older electrical panels between the sizes of 100A to 225A. These panels are both 480V and 208V.
- In the mechanical penthouse area there is a 1200A motor control center that is recommended for replacement with a 1200A distribution panelboard. As mechanical equipment is upgraded, controls and VFD's are typically supplied on a one for one basis, eliminating the need for a motor control center.
- It is estimated that there is approximately 750kVA of transformation from 480V to 208V in the form of multiple transformers located in the main and both buildings remote electrical rooms. All transformers are recommended for replacement.

EMERGENCY POWER AND DISTRIBUTION EQUIPMENT

While the generator size does appear to be adequate for life safety loads throughout both building, it is recommended that emergency power and distribution equipment be replaced for the following reasons:

1. The overall age of the generator is 44 years (533 hours of runtime) and the risk of failure is higher.
2. In the event of equipment component failure, the age of the system will require increased downtime due to the lack of available replacement parts.
3. Although the generator and ATS are in a dedicated space, not all emergency equipment and feeders throughout the building are properly separated in accordance with current codes.
4. Antiquated ATS technology does not allow for flexibility and increased loading on the generator

In addition to the equipment replacement recommended below, evaluation of existing electrical spaces should be further explored and additional space created as needed to allow proper separation.

- The existing 250kW diesel generator and 400A automatic transfer switch are recommended to be replaced in kind.
- Approximately four Emergency panels between the sizes of 100A and 225A are recommended for replacement. Feeders to these panels should be replaced with 2 hour rated feeders (mineral insulated cable).

CABLE AND CONDUIT

It should be assumed that all conductors will need to be replaced.

- Additional investigation will be needed to recommend existing conductors for reuse.

Conduit can be reused to the extent it is practical, given the existing layout and what will be the new layout of the power distribution system.

All conduit and conductor distribution for the modular wall systems will need to be replaced as it is understood the majority of partition walls will be removed.

LIGHTING

Because of the overall condition of lighting fixtures throughout both buildings, and inefficiency of the controls, all lighting fixtures and controls are recommended for replacement:

- The type of interior replacement fixtures will depend on the recommendations made in the architectural section and the intended overall look and feel of the building. Most likely the predominant fixtures throughout both buildings will be recessed 2x2 and 2x4 LED volumetric fixtures with recessed LED downlight accents.
- All exterior fixtures should also be replaced with new LED fixtures. These fixtures should be full cutoff fixtures to reduce glare and up light.
- Interior lighting control should be vacancy sensors in classrooms and occupancy sensors in corridors. All new lighting controls shall meet the requirement of the International Energy Conservation Code.
- Provide photocell “ON” timer switch “OFF” means of control or local occupancy sensors for exterior lighting control.

FIRE ALARM SYSTEM

The fire alarm systems in both buildings have been recently updated and meet current code requirements, therefore no action is recommended for the fire alarm system.

PA AND INTERCOM SYSTEMS

The intercom and both PA systems work as intended without issues. With regard to the hearing impaired PA system, there are several new technologies that can more effectively communicate messages to all of the school’s hearing impaired population. Newer technologies can also allow for communication between systems (eg. fire alarm, PA and hearing-impaired PA).

If major building wide renovations are planned, it is BLW’s recommendation to replace the hearing-impaired system with newer technology including either scrolling variable message signs or LED displays. These are specialty systems and additional research and discussion with school personnel is recommended prior to BLW making a recommendation on the exact system type.

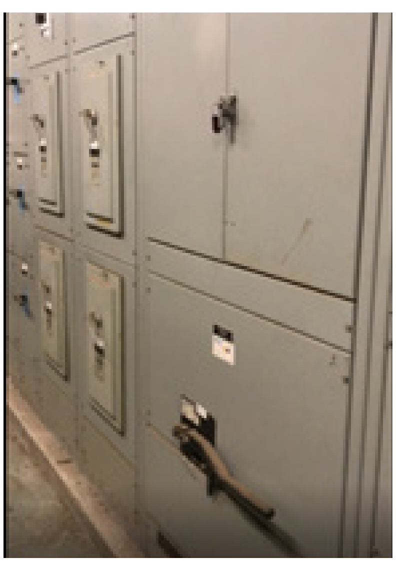
Field modifications made to allow for expansion

Switchgear nameplate rating

Typical switch within the main switchboard

Typical switch within the main switchboard

3000A Main disconnect bolted pressure switch



Switchboard sections

1200A motor control center located in the mechanical penthouse

Example of the typical GE branch circuit panelboard

New panel added to accommodate HVAC and technology needs

Generator control panel

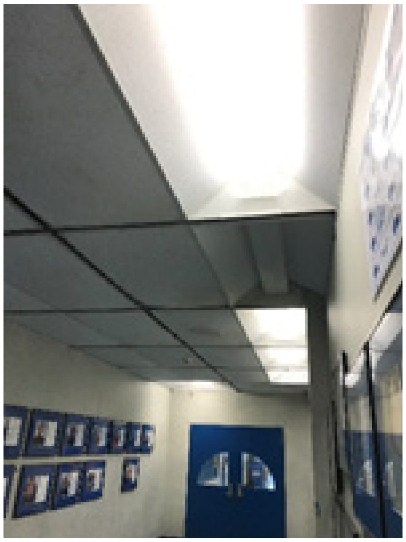
Generator nameplate information

Automatic transfer switch

Automatic transfer switch

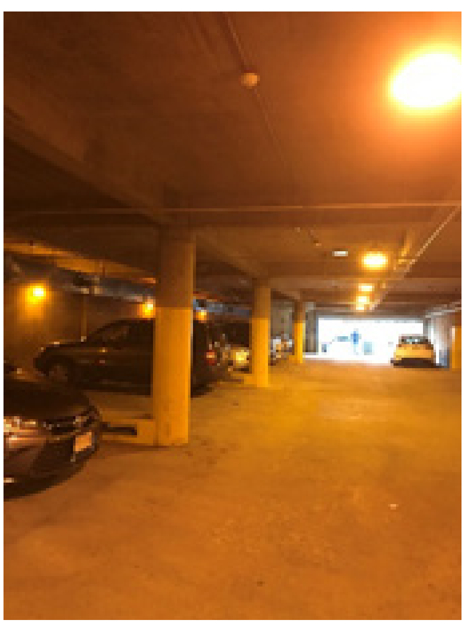
Wireway system in disrepair

Wireway on right side of hall detaching from wall behind it



Typical corridor lighting fixtures

Stairwell lighting fixtures



HID Parking Garage lighting fixtures

Exterior doorway lighting

Exterior fixture below corridor walkway above

Battery back-up exit sign

Typical main fire alarm control panel
(one each in each building)

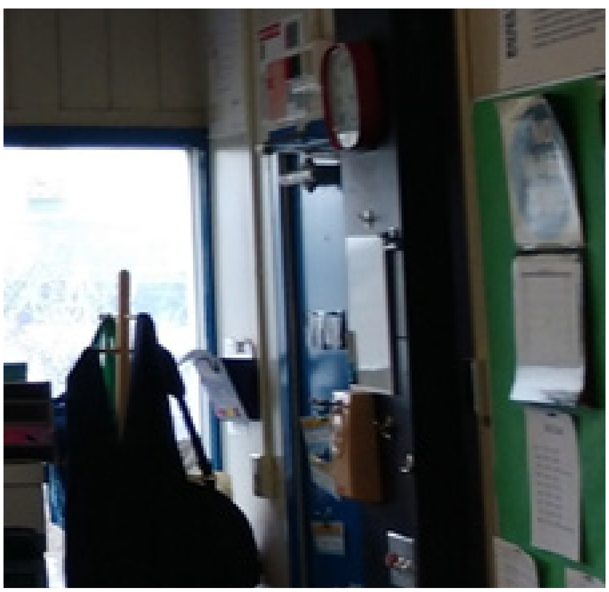
Fire alarm annunciator

Typical notification device

Typical pull station and speaker strobe

Typical duct smoke detector

Typical corridor smoke detector and system PA speaker



Typical classroom Intercom/ PA system with abandoned wall mounted handset

4.I PLUMBING

1. Summary

The plumbing report is based on a brief site visit to the Jackson/Mann K-8 School, not involving any extensive exploratory work to determine the internal plumbing systems condition or their performance. The plumbing systems were visually noted and inspected for signs of deterioration and major compliance issues.

2. Existing Conditions

The Jackson/Mann K-8 building is currently provided with City supplied water distribution system, two sanitary sewer connections, and natural gas service supplied by the local utility company. Based on an existing plans available for the building, it was determined that the plumbing systems were installed around 1974-1975. Following the existing plan designation the building is comprised of three sections, Unit A and Unit B (located in the Back Building) and Unit C (located in the Front Building). Visually it appears that some fixtures and equipment were replaced and upgraded in recent years. Two sanitary connections are indicated for the Building's separate units. The lower Unit C (Front Building) is currently served by a 6" sanitary connection coming from Islington Street. Unit A and Unit B (Back Building) are served by an 8" sanitary connection coming from Armington Street. 4" water service connection enters the building at the lower Unit C (Front Building) level of the School and through a booster pump is augmented through the building's domestic and non-potable distribution systems to supply the plumbing fixtures, HVAC equipment and all other equipment and fixtures requiring water. Storm drainage is provided, but is not clear if it is dedicated or is combined at the street with the sanitary sewer. The School has a central domestic hot water plant connected to the heating boilers and a back-up gas fired water heater utilized during the summer months. The most recent upgrade by adding a Cogen system, the domestic hot water system was upgraded with a plate and frame heat exchanger. Master mixing valve has been provided and with visible signs of corrosion. The natural gas system is supplied via 6" low pressure gas main with dual metering connection. Observed was a gas booster which appears to be supplying gas to the HVAC equipment at the Mechanical Room at roof level of the building. Plumbing fixtures appear to be partially updated and in good working conditions.

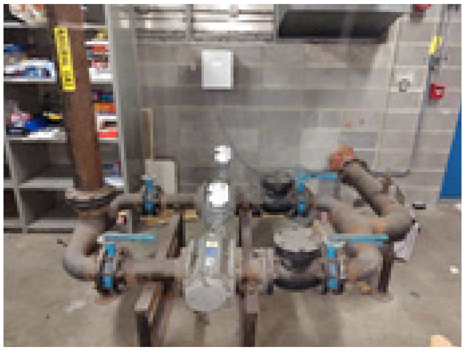
3. Recommendation

The sanitary system shall be video inspected and machine cleaned. All plumbing fixtures shall be serviced and tested for proper operation. The booster pump shall be serviced and inspected for proper operation. Domestic hot water system shall be replaced with new direct gas fired water heaters with better efficiency than the current configuration. The master mixing valve shall be replaced with new digital unit that can be remotely monitored. Possible roof replacement will require an upgrade to the current storm drain system by adding an emergency drain parallel to the existing system or by adding scuppers.

4” Main water service

2” Water Meter

Domestic water booster



Natural Gas service

Natural gas booster

Domestic indirect hot water heaters

Master mixing valve

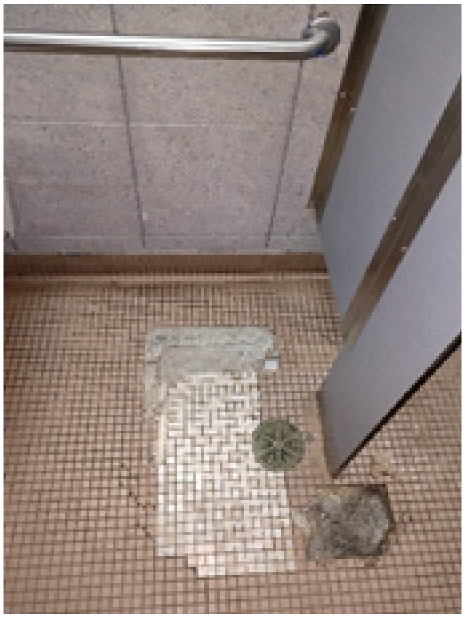
Water Heater – Summer usage

Cogen Supplied Domestic Hot Water Heat Exchanger

Domestic Hot Water Recirculating Pump

Public Bathroom Water Closet

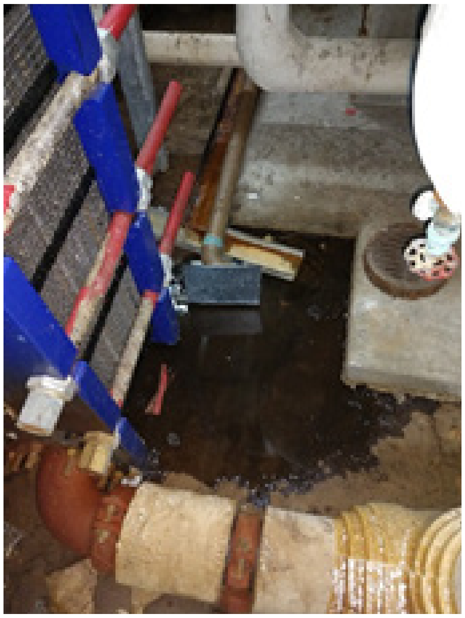
Public Bathromm Plumbing Fixtures



Public Bathroom Floor Drain

Roof Drain Body

Storm Drain Piping



Mechanical Room Floor Drain

HVAC Water Make-up

Boiler Gas Train

4.J FIRE AND SPRINKLER

1. Summary

The fire protection report is based on a brief site visit to the Jackson/Mann K-8 School, not involving any extensive exploratory work or building life safety assessment with respect to future building alterations. The automatic fire protection systems were visually noted and inspected for signs of deterioration and major compliance issues.

2. Existing Conditions

The Jackson/Mann K-8 building is currently provided with an automatic fire sprinkler system consisting of an automatic standpipes and partial sprinkler coverage, providing exposure protection for the larger openings in close proximity to an adjacent property at the Back Building. The Front Building appears to have a complete sprinkler protection for the enclosed parking garage. Based on existing plans available for the building, it was determined that the system was installed around 1974-1975 and visually appears to be in a good working conditions. The system is supplied via dedicated fire service main 6” in diameter. Fire pump was observed at the service entrance, immediately after the backflow preventer. The fire pump is energized via limited –service controller (LSC). The fire pump shows signs of a recent motor replacement. A jockey pump, or pressure maintenance pump, has not been observed at the current system configuration. Backflow preventer which installation appears to be the reason for sprinkler piping reconfiguration. Inspection tag indicated that the system is serviced and tested periodically and as required by code. All valves appeared to be electrically supervised and monitored by the fire alarm system. The system is also supervised for flow and pressure fluctuation. Standpipes are located at each stairwell and are equipped with a 2-1/2” hose valves. Additional hose valves installed in a recessed hose cabinets were observed throughout, assuming provided to accommodate the areas exceeding the maximum hose connection reach. The sprinklers observed are an old standard response, with fusible link dating back from the original system installation.

2. Existing Conditions

The system shall be inspected internally in order to determine the system piping corrosion status. The existing sprinkler heads are approaching the 50 year testing requirement, per NFPA 25, Standard for Inspection, Testing and Maintenance of Water-Based Fire Protection Systems. Based on the current sprinkler head count it shall be considered to be completely replaced with a new quick response sprinkler heads and possibly extend the sprinkler coverage for the entire building throughout. Upon completion of the internal obstruction investigation it will be determined if the entire existing system would need to be replaced or reconfigured to accommodate the complete sprinkler coverage throughout. Based on new hydraulic calculations, it shall be determined if the existing fire pump is still required or if it can be completely removed. If the hydraulic calculations prove the need of the fire pump, Boston Fire Prevention shall be consulted with regards to the use of the existing limited-service controller as it is mandated by NFPA 20, Standard for Installation of Stationary Pumps for Fire Protection.

NOTE: Existing 6” fire service main entrance

NOTE: Existing 6” fire serivce backflow preventer

NOTE: Existing fire Pump

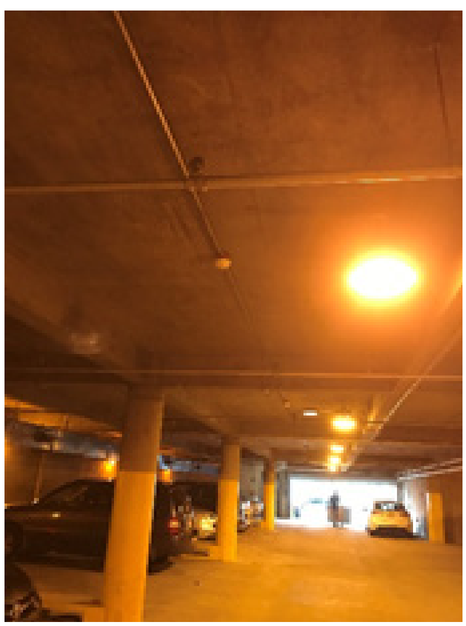
NOTE: Fire Pump

NOTE: Fire Pump Controller

NOTE: Fire Protection Equipment

NOTE: Inspection sticker

NOTE: Sprinkler heads



NOTE: Sprinkler heads in garage

4.K SITE

1. Summary

From a building massing perspective, The Andrew Jackson / Horace Mann School is a remarkable example of integrating the size and diversity of a K-8 School into a neighborhood. However, at the ground there is room for significant improvement in the interface between the building the neighborhood as well as for improvements to the functionality of the outdoor areas.

2. Recommendation

CAMBRIDGE STREET ENTRY PLAZA

We recommend minor upgrades to the Cambridge Street Entry Plaza to improve both accessibility and to create a more welcoming image to the School. This would include fixing the stair interface with the sidewalk, minor landscape improvements and adjustments to the ramp. Recommend providing a $50,000 allowance for this work.

WALKWAY LINK

We recommend redesigning this link to be a safer, pedestrian friendly and more inviting connection between Cambridge Street and Armington Street. Work would include eliminating the dark corner under the lower portion of the bridge by pulling out the perimeter of the building. Additional work would include landscape, materials, benches, lighting and wayfinding. We recommend providing a $50,000 allowance for this work.

ARMINGTON STREET PLAZA

We recommend redesigning this important entry plaza to drastically improve ADA accessibility and usefulness for student drop off and pick-up. This work would include full regrading and all new pavers with the ramps and stairs that may be required. Additional work will include some green landscaping and ample lighting under the bridge.

SOUTH PLAY YARD

We recommend a complete replacement of the play area underneath the south portion of the building. This space could be dramatically improved, in terms of accessibility, safety and overall child enjoyment, by new play surface, custom playground equipment that takes advantage of the building (i.e., a slide wrapping a structural column) and the introduction of a lighting scheme that adjust for daytime shadows as well as night-time enjoyment.

View of Cambridge Plaza

NOTE: Stair and sidewalk interface needs to be fixed

View of Cambridge Plaza

NOTE: Ramp and landscaping additions could make entry more welcoming

View of Connecting Plaza

NOTE: Lighting and wayfinding would help create a friendlier and more functional environment

View of Connecting Plaza

NOTE: Pulling the building surface under the bridge forward would create a safer environment

View of Armington St. Plaza

NOTE: The entry into the Back Building appears very dark, needs additional lighting

View of Armington St. Plaza

NOTE: The entry into the Back Building needs a new ADA compliant ramp and a new paving system

View of Rear Covered Play Area

NOTE: Play area would benefit from new playground furniture

View of Rear Covered Play Area

NOTE: Play area needs additional lighting and new surface area

5. FF&E EXPLANATION

In addition to any commercial equipment and fixed furnishings that may be associated with the renovations previously described there may be need for replacement of loose furniture. This is described as soft-cost FF&E, or Furniture, Fixtures and Equipment. Typically the FF&E is a line item separate from the hard-project costs of construction.

Given our observation that some, but only a limited amount, of existing furnitures may be reused we are recommending a budget target of $1,500/student. At an enrollment of 765 this would total to $1,147,500.00.

This amount may cover the following:

- Miscellaneous Classroom Furniture
- Office Furniture
- Library Furniture
- Metal Storage Shelving
- Cafeteria Furniture
- Gymnasium/Fitness Equipment
- Business Machines/Copiers
- Custodial/Grounds Equipment
- Health Equipment
- Misc Teaching Aids
- Some allowance for Music, Art and Science equipment

5. COST ESTIMATE

Andrew Jackson/Horace Mann School

40 Armington St.,
Allston, MA

Conceptual Estimate
February 22, 2019

Machado Silvetti
560 Harrison Ave., Suite 301
Boston, MA 02118

ELLANA
Construction Cost Consultants

98 North Washington St., #109
Boston, MA 02114

Jackson/Mann School
Allston, MA
Conceptual Estimate

February 22, 2019
Cost Summary

			BUILDING AREA (bgsf)		**220,600**
			Subtotal Trade	**Total**	**Cost/sf**
A	**SUBSTRUCTURE**			**21,000**	**0.10**
	A10 Foundations		21,000		0.10
	A20 Basement Construction		-		-
B	**SHELL**			**8,923,205**	**40.45**
	B10 Superstructure		263,812		1.20
	B20 Exterior Enclosure		5,566,765		25.23
	B30 Roofing		3,092,628		14.02
C	**INTERIORS**			**9,833,512**	**44.58**
	C10 Interior Construction		4,754,554		21.55
	C20 Stairs		216,000		0.98
	C30 Interior Finishes		4,862,958		22.04
D	**SERVICES**			**19,857,758**	**90.02**
	D10 Conveying		200,000		0.91
	D20 Plumbing		1,257,140		5.70
	D30 HVAC		7,068,204		32.04
	D40 Fire Protection		968,580		4.39
	D50 Electrical		10,363,835		46.98
E	**FITTINGS & FIXED EQUIPMENT**			**941,200**	**4.27**
	E10 Equipment		500,000		2.27
	E20 Fixed Furnishings / Millwork		441,200		2.00
F	**SPECIAL CONSTRUCTION & DEMOLITION**			**3,020,390**	**13.69**
	F10 Special Construction		-		-
	F20 Selective Building Demolition		3,020,390		13.69
G	**SITEWORK**			**650,000**	**2.95**
	G10 Site Preparation		25,000		0.11
	G20 Site Improvements		625,000		2.83
	G30 Site Mechanical Utilities		-		-
	G40 Site Electrical Utilities		-		-
	G90 Other Site Construction		-		-
	TOTAL DIRECT COST		**$ 43,247,066**	**43,247,066**	**196.04**
	Design Contingency	20.00%		8,649,413	
	Construction Contingency	0.00%		By Owner	
	Subtotal - Direct Construction Cost + Contingencies			**51,896,479**	**235.25**
	General Requirements	15.00%		7,784,472	*Constrained site*
	General Conditions, OH&P	12.50%		6,487,060	
	TOTAL ESTIMATED CONSTRUCTION COST			**$ 66,168,010**	**299.95**
	Escalation *(Calculated at 3.75% p.a. through constr. mid-point of Jan 2022)*	12.03%		7,957,457	
	TOTAL ESTIMATED CONSTRUCTION COST *(ALL-AT-ONCE SCENARIO)*			**$ 74,125,468**	**336.02**
	15% Premium for Phased Construction Scenario	15.00%		11,118,820	
	TOTAL ESTIMATED CONSTRUCTION COST *(PHASED SCENARIO)*			**$ 85,244,288**	**386.42**
	FFE PACKAGE (not included above)			**$ 1,147,500**	

Jackson/Mann School
Allston, MA
Conceptual Estimate

22 Feb 19

		Report Pg #	Description	Quantity	Unit	Unit Price	Total $	Subtotal Trades	
1			**Qualifications:**						
2			Estimate based on Machado Silvetti CIPR Draft report dated 12.14.18						
3			Estimate assumes partial gut and renovation, and partial upgrade of existing facility						
7									
8	**A**		**SUBSTRUCTURE**						
9	**A10**		**FOUNDATIONS**						
10		A1010	Standard Foundations						
11			Standard Foundations		cy	-	-		No scope
12									
13			Sub Total : Standard Foundations				**-**		
14									
15		A1020	Special Foundations						
16			Special Foundations		cy	-	-		No scope
17									
18			Sub Total : Special Foundations				**-**		
19									
20		A1030	Slab On Grade						
21			Concrete switchback ramp in the lobby space	60	lf	350.00	21,000		
22									
23			Sub Total : Slab On Grade				**21,000**		
24									
25									
26	**A20**		**BASEMENT CONSTRUCTION**						
27		A2010	Basement Excavation						
28			Basement Excavation						No scope
29									
30			Sub Total : Basement Excavation				**-**		
31									
32		A2020	Basement Walls						
33			Basement Walls		cy	-	-		No scope
34									
35			Sub Total : Basement Walls				**-**		
36									
37			**SUBTOTAL FOR SUBSTRUCTURE**				**End of Trade**	**$ 21,000**	
38									
39									
40	**B**		**SHELL**						
41	**B10**		**SUPERSTRUCTURE**						
42		B1010	Floor Construction						
43			Floor Construction		ton	-	-		No scope
44									
45			Sub Total : Floor Construction				**-**		
46									
47		B1020	Roof Construction						

ELLANA Construction Cost Consultants

Jackson/Mann School
Allston, MA
Conceptual Estimate

22 Feb 19

		Report Pg #	Description	Quantity	Unit	Unit Price	Total $	Subtotal Trades	
48		54	Ex. Structural Deck: Expose and evaluate the condition of the structural deck. Repair the deck and prepare the top surface to accommodate the new roofing assembly	22,090	sf	9.00	198,812		Assumes 30% repair
50			Roof dunnage for new MEP equipment	1,000	sf	65.00	65,000		
51									
52			Sub Total : Roof Construction				**263,812**		
53									
54									
55	**B20**		**EXTERIOR CLOSURE**						
56		B2010	Exterior Walls						
			Removals with Demolition						
58		11	Exterior wall assembly: Painted Aluminum Panel Rain-Screen (Similar to Dri-Design Panel Systems), including light gauge framing system	39,247	sf	95.00	3,728,465		
59		11	Painted Aluminum Panel Rain-Screen at removed wall assembly	36,570	sf	incl	-		Alucabond or equal
60		11	Painted Aluminum Panel Rain-Screen at an extended parapet 18'H	2,677	sf	incl	-		
61									
62			Masonry						
63			Evaluate the ex. parapet wall - assume 50% repair,50% rebuild	*2,886*	*lf*		-		
64			Repair	1,443	lf	15.00	21,645		
65			Rebuild	1,443	lf	65.00	93,795		
66									
67			Sub Total : Exterior Walls				**3,843,905**		
68									
69		B2020	Exterior windows						
			Removals with Demolition						
71		20	Exterior window (type similar to the Kawneer TR-700 Window Wall). The versatile systems provides options fixed glass and operable lites, separate window and continuous window wall.	13,603	sf	120.00	1,632,360		Assumes no Hazmat or PCB issues, outside asbesto allowance in Division F
72		20	Typical Entry			incl	-		
73		20	Typical Classroom			incl	-		
74		20	Typical Public Space			incl	-		
76		20	Typical Stairway			Excluded - F/R	-		Fire rating requirement?
77									
78			Sub Total : Exterior windows				**1,632,360**		
79									
80		B2030	Exterior doors						
81			Exterior						
82			Aluminum entrance doors; dbl	8	pr	6,000.00	48,000		4 extg; code?
83			Aluminum entrance doors; sgl	10	ea	4,250.00	42,500		
84									
85			Sub Total : Exterior doors				**90,500**		
86									
87									
88	**B30**		**ROOFING**						
89		54	New roofing assembly; PVC system	73,634	sf	42.00	3,092,628		Removal with Demolition

ELLANA Construction Cost Consultants

Jackson/Mann School
Allston, MA
Conceptual Estimate

22 Feb 19

		Report Pg #	Description	Quantity	Unit	Unit Price	Total $	Subtotal Trades	
90		54	Deck repair		sf	w/roof const.	-		
91		54	Drain Bowls and Strainers: Remove and replace drain bodies, clamping rings, and strainers to provide a reliable/warrantable roofing termination at drains		sf	incl	-		
92		54	Air barrier and vapor retarder		sf	incl	-		
93		54	Cover board and tapered insulation (R-30): provide cover board and tapered insulation to provide 1/4" per foot min. slope to existing drains		sf	incl	-		
94		54	Install PVC sheet membrane		sf	incl	-		
95									
96			Sub Total : New roofing assembly; PVC system				**3,092,628**		
97									
98			**SUBTOTAL FOR SHELL**				**End of Trade**	**$ 8,923,205**	
99									
100									
101	**C**		**INTERIORS**						
102	**C10**		**INTERIOR CONSTRUCTION**						
103		C1010	Partitions						
104			CMU						
105			None						
106									
107			Drywall						
108		43	Demountable Partition (cold-formed metal stud, 5/8" GWB both sides and acoustical batt insulation)	73,021	sf	11.00	803,231		
109			Furring system on interior face metal panel system and spandrel glass; light gauge framing with exterior wall system	39,247	sf	4.75	186,423		
110			Repairs to extg partitions to remain	1	ls	75,000.00	75,000		
111									
112			Interior Glazing						
113			Interior Glazing	1,000	sf	50.00	50,000		Qty allowance
114									
115			Rough Carpentry; blocking, OSHA requirements, etc,	220,600	sf	1.75	386,050		
116									
117			Sub Total : Partitions				**1,500,704**		
118									
119									
120		C1020	Interior Doors						
121			Interior doors, frames, hardware	220,600	gsf	4.25	937,550		
122									
123			Sub Total : Interior Doors				**937,550**		
124									
125									
126		C1030	Fittings						
			Specialties & Fittings	220,600	gsf	8.00	1,764,800		
128			Visual Display Boards				incl		
129			Display Cases				incl		
130			Signage				incl		
131			Toilet Compartments				incl		

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		Report Pg #	Description	Quantity	Unit	Unit Price	Total $	Subtotal Trades	
132			Folding Partitions				incl		
133			Toilet Accessories				incl		
134			Janitor Room Accessories - allow				incl		
135			Fire Protection Specialties				incl		
136			Lockers				incl		
137			Other Specialties				incl		
138			Entrance Mats and Frames				incl		
139									
140			Sealants & Caulking	220,600	sf	1.00	220,600		
141									
142			Firestopping	220,600	sf	1.50	330,900		
143									
144			Sub Total : Fittings				**2,316,300**		
145									
146	**C20**		**STAIRCASES**						
147		C2010	Stair Construction						
148			New code-compliant painted steel guardrail w/ integrated hand railing at two heights	24	flts	9,000.00	216,000		Replace at all stairs; extg stairs to remain
149									
150			Sub Total : Stair Construction				**216,000**		
151									
152		C2020	Stair Finishes						
153			Stair Finishes		flt	-	-		Not req
154									
155			Sub Total : Stair Finishes				**-**		
156									
157	**C30**		**INTERIOR FINISHES**						
158		C3010	Wall Finishes						
159		43	Paint demountable partition & doors	146,042	sf	2.25	328,595		
160		43	Light refinishing work at non-demountable partition (painting, new tile in the restrooms, etc.)	1	allow	150,000.00	150,000		
161									
162			Specialty wall surfacing	1	allow	150,000.00	150,000		
164			Miscellaneous painting / touch-ups at project completion	220,600	sf	1.00	220,600		
165									
166			Sub Total : Wall Finishes				**849,195**		
167									
168		C3020	Floor Finishes						
169		CT	Tile Floor						
170			Ceramic floor tile & base	31,230	sf	24.00	749,520		
171									
172			Carpet						
173		CPT	Carpet tile flooring		sy	35.00	-		
174									
175			Resilient						
176			Floor tile & base	176,970	sf	6.00	1,061,820		
177									

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		Report Pg #	Description	Quantity	Unit	Unit Price	Total $	Subtotal Trades	
178			Floor prep; shot blast	208,200	sf	3.50	728,700		
179			Moisture Mitigation	-	sf	3.75	-		Not req
180									
181			Sub Total : Floor Finishes				**2,540,040**		
182									
183									
184		C3030	Ceiling Finishes						
185			New ceiling/soffits	*193,911*	*sf*				
186			2x2' suspended acoustic ceiling, 80%	155,129	sf	6.75	1,047,119		
187			Specialty ceiling in music classrooms, small gyms, lunch-room, etc, 20%	38,782	sf	11.00	426,604		
188									
189			Sub Total : Ceiling Finishes				**1,473,724**		
190									
191			**SUBTOTAL FOR INTERIORS**				**End of Trade**	**$ 9,833,512**	
192									
193									
194	**D**		**SERVICES**						
195	**D10**		**Elevators**						
196			Recondition and renovate existing elevators	2	ea	100,000.00	200,000		
197									
198			**Sub Total : Elevators**				**200,000**		
199									
200	**D20**		**Plumbing**						
201		92	Inspect and machine clean sanitary system	1	ls	25,000.00	25,000		
202		92	Service and text all plumbing fixture	146	ea	1,200.00	175,200		
203		92	Service and inspected booster pump	1	ls	5,000.00	5,000		
204		92	Replace domestic hot water system w/ new direct gas fired water heaters	2	ea	35,000.00	70,000		
205		92	Replace master mixing valve w/ new digital unit that can be remotely monitored	1	ls	25,000.00	25,000		
206		92	Upgrade current storm drain system, incl. new an emergency drain parallel or scuppers	73,634	sf	10.00	736,340		At roof; drains with roof system
207		93	Shut downs, tie ins, commissioning, etc	220,600	sf	1.00	220,600		
208									
209			**Sub Total : Plumbing**				**1,257,140**		
210									
211	**D30**		**HVAC**						
212			Penthouse / Mechanical Room	*6,300*	*gsf*				
213			Remove all equipment; boilers, etc.	6,300	sf	10.00	63,000		
214			Gas-fired condensing boiler; 2000MBH, including pumps, etc	5	ea	101,568.00	507,840		
215			Hot water heater / standby circulation pump; 480gpm	2	ea	15,214.00	30,428		
216			Secondary hot water pump; 420gpm	2	ea	15,214.00	30,428		
217			Heat Exchanger Plate and Frame	1	ls	68,640.00	68,640		
218			Water cooled screw chiller; 420 ton	1	ea	219,520.00	219,520		
219			Chilled water centrifugal pump; 800gpm	2	ea	18,752.00	37,504		
220			Condenser water centrifugal pump; 1,200gpm	2	ea	23,520.00	47,040		
221			Cooling Tower (Roof); 500 tns	1	ea	82,984.00	82,984		

	Report Pg #	Description	Quantity	Unit	Unit Price	Total $	Subtotal Trades	
222		AHU Variable Volume; 20,000cfm	4	ea	138,708.00	554,832		
223		Balance	4	ea	690.00	2,760		
224		Distribution	6,300	sf	9.40	59,220		0.85lbs/sf new
225		Piping	1	ls	135,500.00	135,500		
226		Controls	1	ls	232,800.00	232,800		
227		Commissioning	1	allow	20,700.00	20,700		
228								
229		Gymnasium	*7,915*	*gsf*				
230		Heating Ventilating Unit, HV-2; 18,000cfm	1	ea	102,460.00	102,460		
231		Insulate extg ductwork	7,915	sf	3.75	29,681		
232		Piping	1	ls	4,000.00	4,000		
233		Insulate Piping	1	ls	5,000.00	5,000		
234		Clean ductwork	7,915	sf	0.58	4,562		
235		Balance	1	ea	690.00	690		
236		New DDC controls	1	h&v	24,000.00	24,000		
237		Commissioning	1	allow	1,700.00	1,700		
238								
239		Dance / Locker Rooms	*6,580*	*gsf*				
240		Heating Ventilating Unit, HV-3; 7,675 cfm	1	ea	45,948.00	45,948		
241		Replace reheat coils	4	ea	10,780.00	43,120		
242		Exhaust Fan EF-5; 820cfm. Roof	1	ea	1,430.00	1,430		
243		Insulate extg ductwork / replace missing insulation	6,580	sf	3.75	24,675		
244		Clean ductwork	6,580	sf	0.58	3,793		
245		Balance	1	ea	850.00	850		
246		Piping	1	ls	4,000.00	4,000		
247		New DDC controls	1	h&v,ex	25,500.00	25,500		
248		Commissioning	1	allow	1,500.00	1,500		
249								
250		Comm Theater / Ramp	*4,650*	*gsf*				
251		AHU; 21,825cfm	1	ea	140,892.00	140,892		
252		Insulate extg ductwork / replace missing insulation	4,650	sf	3.75	17,438		
253		Clean ductwork	4,650	sf	0.58	2,680		
254		Balance	1	ls	690.00	690		
255		Piping	1	ls	6,500.00	6,500		
256		New DDC controls	1	ahu	33,600.00	33,600		
257		Commissioning	1	allow	2,000.00	2,000		
258								
259		Comm Dining / Kitchen	*6,950*	*gsf*				
260		AHU; 21,200cfm	1	ea	140,892.00	140,892		
261		Replace Faculty Dining roof mounted exhaust fan; 1,700cfm	1	ea	2,297.80	2,298		
262		Replace Kitchen Hood upblast exhaust fan; 1,750cfm	1	ea	3,065.80	3,066		
263		Balance	2	ls	1,330.00	2,660		
264		Replace grease duct system	60	lf	1,500.00	90,000		
265		Piping	1	ls	6,500.00	6,500		
266		New DDC controls	1	ahu&ex	36,600.00	36,600		
267		Commissioning	1	allow	2,800.00	2,800		
268								
269		Parking garage	*20,150*	*gsf*				

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270		Heating Ventilating Unit, HV-1; 17,260cfm	1	ea	102,460.00	102,460		
271		Roof upblast exhaust fan; 8,130cfm	2	ea	4,786.80	9,574		
272		Balance	2	ls	1,330.00	2,660		
273		Provide carbon monoxide detection system for equipment	*20,150*	sf	1.50	30,225		
274		New DDC controls	1	h&v,ex	27,000.00	27,000		
275		Commissioning	1	allow	1,700.00	1,700		
276								
277		General Exhaust						
278		Replace roof / inline fans for exhaust	1	ls	20,680.20	20,680		
279		Clean ductwork	1	ls	259.38	259		
280		Balance	1	ls	1,130.00	1,130		
281		New DDC controls	1	ls	13,500.00	13,500		
282								
283		Toilet Exhaust						
284		Replace roof / inline fans for toilet exhaust	1	ls	11,489.00	11,489		
285		Clean ductwork	1	ls	144.10	144		
286		Balance	1	ls	650.00	650		
287		New DDC controls	1	ls	7,500.00	7,500		
288								
289		Switchgear Room		*gsf*				
290		Replace inline fan; 3,200cfm	1	ea	4,927.80	4,928		
291		Insulate extg ductwork / replace missing insulation	-	sf	3.75	-		
292		Clean ductwork	1	ls	57.64	58		
293		Balance	1	ls	690.00	690		
294		New DDC controls	1	ls	1,500.00	1,500		
		Building HVAC (Remaining areas)		*gsf*				
		Core & Shell / BoH	*50,417*	*gsf*				
		Classroom & Support	*117,639*	*gsf*				
		Replace VAV's w/reheat coils & Sound attenuator	159	ea	1,650.00	262,350		
		Insulate extg ductwork / replace missing insulation	168,055	sf	2.25	378,124		
		Clean ductwork	168,055	sf	0.58	96,866		
		Balance	168,055	sf	0.25	42,014		
		New DDC controls	168,055	sf	-	see below		
		Commissioning	1	allow	7,800.00	7,800		
		Ductwork						
		New ductwork as required	168,055	sf	6.80	1,142,774		0.65lbs/sf new - supplement
		Miscellaneous Heat (Remaining Areas)	*168,055*	*gsf*				
		Replace miscellaneous heat in bldg	168,055	sf	1.00	168,055		
		Insulate extg ductwork / replace missing insulation	168,055	sf	-	with above		
		Commissioning	1	allow	1,700.00	1,700		
		Automatic Temperature Controls (Remaining areas)	*168,055*	*gsf*				
		New ATC system	168,055	sf	8.25	1,386,454		
		Common Work Results for HVAC	220,600	gsf	2.00	441,200		

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			Sleeves, Cutting, Patching & Fire Stopping				incl		
			Pipe identification, valve tags, and charts				incl		
			Clean, flush & test piping				incl		
			Vibration and Seismic Controls				incl		
			Rigging Hoisting and Equipment Handling				incl		
			Coordination, Shop Drawings, Manuals				incl		
			Level of Work Difficulty (high Space)				incl		
			Commissioning Assist / LEED				incl		
326									
327			**Sub Total : HVAC**				**7,068,204**	**32.04**	
328									
329	**D40**		**Fire Protection**				-		
330		94	Inspect internally fire system	1	ls	15,000.00	15,000		
331		94	Replace sprinkler heads	2,206	heads	210.00	463,260		Assume 50% replacement
332		94	Extend the sprinkler coverage	44,120	sf	6.00	264,720		Assume 20% uncovered
333		94	Inspect fire pump with an open gate valve	1	ls	5,000.00	5,000		
334		93	Shut downs, tie ins, commissioning, etc	220,600	sf	1.00	220,600		
335									
336			**Sub Total : Fire Protection**				**968,580**		
337									
338	**D50**		**Electrical**						
			Selective electrical demolition						
340			Disconnection o existing power service	1	ls	4,500.00	4,500		
341		87	Demo 1200A motor control center at mechanical penthouse	1	ea	9,000.00	9,000		
342		87	Demo existing panelboards & conduit system	1	ea	72,000.00	72,000		
343						-	-		
344			Power Distribution			-	-		
345		87	New 3000A, 277/480V switchboard	1	ea	54,000.00	54,000		
346		87	3000A, 480V disconnect switch	1	ea	25,200.00	25,200		
347		87	CT cabinet	1	ea	4,500.00	4,500		
348			225A, 480V panelboards	20	ea	7,155.00	143,100		
349		88	1200A panelboard at mechanical penthouse	1	ea	25,380.00	25,380		
350			750kVA, 480V transformers	1	ls	270,000.00	270,000		
351						-	-		
352		88	Emergency Power			-	-		
353		88	Replace 250kW diesel generator	1	ea	225,000.00	225,000		
354		88	400A automatic transfer switch	1	ea	7,204.50	7,205		
355			225A panelboards	4	ea	7,155.00	28,620		
356			Conduit & wiring	1	ls	320,000.00	320,000		
357		88					-		
358		88	Lighting	220,600	sf	12.50	2,757,500		
359			Recessed 2'x2' LED volumetric fixtures w/ recesse LED downlight accent				included		
360			Recessed 2'x4' LED volumetric fixtures w/ recesse LED downlight accent				included		
361		89	New exterior LED fixtures				included		
362		89					-		
363		89	Lighting control	220,600	sf	5.50	1,213,300		
364			Vacancy sensor				included		
365			Occupancy sensor				included		

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	Report Pg #	Description	Quantity	Unit	Unit Price	Total $	Subtotal Trades	
366	89	Photocell "on", "off" timer switch				included		
367	89					-		
368	89	Branch circuit devices	220,600	sf	7.00	1,544,200		
369		Duplex receptacles				included		
370		Automatic half controlled quad receptacle				included		
371	89	Quad receptacles				included		
372		GFI receptacles				included		
373		Floor power/communication receptacle				included		
374	89	Elevator pit assembly (GFI receptacle, switch, light)				included		
		3/4" conduit				included		
		# 12 wire				included		
		Mechanical Requirements	220,600	sf	4.00	882,400		
		VFD - F.B.O.				included		
		125 Amp circuit breaker				included		
		VAV box				included		
		Fan coil unit				included		
		Cabinet unit heaters				included		
		AHU unit				included		
		Hot water pumps HWP-1, HWP-2				included		
		Fan				included		
		Hot water heater HWH-1				included		
		Domestic hot water circulation pump CP-1				included		
		Pumps GWP-1, GWP-2, CHP-1, CHP-2, SCHP-1, SCHP-2				included		
		Duplex sewage ejector pump SE-1				included		
		Elevator sump pump ESP-1				included		
		Unit heater				included		
		Elevator 30HP				included		
		Conduit and wire				included		
		Fire Alarm System				-		
		Programming, testing & commissioning	220,600	sf	4.00	882,400		Assume new
						-		
		PA System for the Hearing Impaired	220,600	sf	1.00	220,600		Portion of Building only
		Communications & Security						
		Telecommunications (empty conduit)	220,600	sf	2.25	496,350		
		Security system (empty conduit)	220,600	sf	1.50	330,900		
		Access control reader				included		
		Magnetic lock/electric strike				included		
		Request-to exit pushbutton				included		
		Camera				included		
		12" x 12" x 6" box				included		
		3/4" conduit						
		Audio/ Visual system (empty conduit)	220,600	sf	1.80	397,080		
		Power to equipment/devices (F & I B.O.)				included		

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		Report Pg #	Description	Quantity	Unit	Unit Price	Total $	Subtotal Trades	
			Motorized partition (F.B.O.)				included		
			Electronic plumbing faucets (F.B.O.)				included		
			Projector (F.B.O.)				included		
			Projection screen (F.B.O.)				included		
			Lightning protection system	1	ls	-	-		Excluded
			Temporary power and light	220,600	sf	1.00	220,600		
			Grounding & bonding	1	ls	50,000.00	50,000		
			Vibration isolation/seismic restraint	1	ls	100,000.00	100,000		
			Sleeves/firestopping	1	ls	80,000.00	80,000		
425									
426			**Sub Total : Electrical**				**10,363,835**		
427									
428			**SUBTOTAL FOR SERVICES**				End of Trade	**$ 19,857,758**	
429									
430									
431	**E**		**EQUIPMENT & FURNISHINGS**						
432	**E10**		**Equipment**						
433		E1010	Commercial Equipment						
434			New commercial grade kitchen	1	allow	500,000.00	500,000		
435									
436			**Sub Total : Commercial Equipment**				**500,000**		
437									
438		E1020	Institutional Equipment		allow	-	-		
439									
440			**Sub Total : Institutional Equipment**				-		
441									
442		E1030	Vehicular Equipment						
443			Loading Dock equipment		ea	-	-		
444									
445			**Sub Total : Vehicular Equipment**				-		
446									
447		E1090	Other Equipment						
448			Other Equipment		allow	-	-		
449									
450			**Sub Total : Other Equipment**				-		
451									
452									
453	**E20**		**Furnishings**						
454		E2010	**Fixed Furnishings**						
455			Furnishings & Millwork:						
456			Furnishings & Millwork	220,600	sf	2.00	441,200		
457									
458			**Sub Total : Fixed Furnishings**				**441,200**		
459									
460			**SUBTOTAL FOR EQUIPMENT & FURNISHINGS**				**End of Trade**	**$ 941,200**	
461									

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		Report Pg #	Description	Quantity	Unit	Unit Price	Total $	Subtotal Trades	
462									
463	F		**SPECIAL CONSTRUCTION & DEMOLITION**						
464	F10		**Special Construction**						
465			Special Construction		sf	-	-		
466									
467			**Sub Total : Special Construction**				**-**		
468									
469									
470	F20		**Selective Building Demolition**						
471		F2010	**Building Elements Demolition**						
472			Site Demolition						
473									
474			Building Demolition						
475		11	Remove the entire exterior metal wall assembly at the front building, bridge building, back building and back-building penthouses, incl. studs and interior finish	36,570	sf	10.00	365,700		
476		10	Temporary Protection	36,570	sf	2.00	73,140		
477		11	Wall Assembly type 1: Metal Stud Wall Built between Slab	2,170	sf	incl	-		
478		11	Wall Assembly type 2: Metal Stud Wall Built in front of Slab	29,460	sf	incl	-		
479		11	Wall Assembly type 3: Mechanical Penthouse	4,940	sf	incl	-		
480							-		
481		20	Remove all exterior windows, incl. opening at the major entrances	13,603	sf	10.00	136,030		
482		10	Temporary Protection	13,603	sf	2.00	27,206		
483		20	Window in a brick masonry façade, 5%	1,475	sf	incl	-		
484		20	Window in the exterior metal wall, 95%	12,128	sf	incl	-		
485							-		
		29	Ceiling removals	193,911	sf	1.50	290,867		
		30	Remove all non-masonry floor finishes, incl. base	208,200	sf	4.00	832,800		
							-		
		48	Remove existing stairs and the lower landing in Lobby space in order to built new ramp	1	flight	15,000.00	15,000		
		50	Remove existing railings at Egress Stair	1	ls	5,000.00	5,000		
		54	Remove the EPDM roofing assemblies, incl. all roofing and underlying materials, down to the structural deck	73,634	sf	5.75	423,396		
		43	Remove interior non-structural and non-core demountable partitions and	40,446	sf	2.00	80,892		
		28	Remain interior partition at Front Building and the Bridge	1	ls	-	-		
		46				-	-		
			Misc. work, patching, protection, removals, clean-up, etc	220,600	sf	1.00	220,600		
496									
497			**Sub Total : Building Elements Demolition**				**2,470,630**		
498									
499		F2020	**Hazardous Components Abatement**						
500			Abate affected areas	109,952	sf	5.00	549,760		Per asbestos report
501									
502			**Sub Total : Hazardous Components Abatement**				**549,760**		
503									
504			**SUBTOTAL FOR SPECIAL CONSTRUCTION & DEMOLITION**				**End of Trade**	**$ 3,020,390**	

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		Report Pg #	Description	Quantity	Unit	Unit Price	Total $	Subtotal Trades	
505									
506									
507	**G**		**SITEWORK**						
508	**G10**		**Site Preparation**						
509		G1010	Site prep, erosion control, demo	1	ls	25,000.00	25,000		
510									
511			Site Remediation						
512			Hazardous soils conditions				Excluded		Assume none
513									
514			**Sub Total : Site Preparation**				**25,000**		
515									
516	**G20**		**Site Improvements**						
517		95	Minor upgrade Cambridge Street Entry Plaza, incl.	1	allow	125,000.00	125,000		
518		95	Fix the stair interface with sitework	incl					
519		95	Minor landscape improvements	incl					
520		95	Ramp adjustments	incl					
521									
522		95	Redesign Walkway Link, incl.	1	ls	125,000.00	125,000		
523		95		incl					
524		95	Addition work incl. landscape, materials, benches, lighting and wayfinding	incl					
525									
526		95	Redesign Armington Street Entry Plaza, incl.	1	ls	225,000.00	225,000		
527		95	Full regrading	incl					
528		95	New pavers	incl					
529		95	New ramp	incl					
530		95	New stairs	incl					
531		95	Green landscaping	incl					
532		95	Ample lighting under the bridge	incl					
533									
534		95	Replacement South Play Yard, incl.	1	ls	150,000.00	150,000		
535		95	Remove play area underneath the south portion of the building	incl					
536		95	New play surface	incl					
537		95	Custom playground equipment that a slide wrapping a structural column	incl					
538									
539			**Sub Total : Site Improvements**				**625,000**		
540									
541	**G30**		**Site Mechanical Utilities**						
542			Site Mechanical Utilities						No work
543									
544			**Sub Total : Site Mechanical Utilities**				-		
545									
546	**G40**		**Site Electrical Utilities**						
547			Site Electrical Utilities						No work
548									
549			**Sub Total : Site Electrical Utilities**				-		
550									

ELLANA Construction Cost Consultants

Jackson/Mann School
Allston, MA
Conceptual Estimate

22 Feb 19

		Report Pg #	Description	Quantity	Unit	Unit Price	Total $	Subtotal Trades	
551	**G90**		**Other Site Construction**						
552			Other Site Construction		allow	-	-		
553									
554			**Sub Total : Other Site Construction**				**-**		
555									
556			**SUBTOTAL FOR SITEWORK**				**End of Trade**	**$ 650,000**	