EXISTING CONDITIONS, BASIS OF DESIGN & PROGRAMMING

20 PELHAM ROAD, LEXINGTON, MASSACHUSETTS

LEXINGTON MULTIPLE SCHOOL PROJECT

18 DECEMBER 2015

As part of the Lexington Multiple Schools Construction Project, DiNisco Design Partnership was requested to perform a preliminary study of a privately owned school property at 20 Pelham Road for its possible use as a 12-section elementary School.

This preliminary study document is comprised of two sections:

SECTION ONE:

- Existing Conditions and Basis of Design
- Preliminary Soils Evaluation
- Hazardous Materials (Asbestos, Lead Paint & Misc.) Limited Survey Report
- Indoor Air Sampling (PCB) Report

SECTION TWO:

- Programming Overview and Options
- Programming Meeting Report
- Existing Floor Plan
- Program Test Fit Options
- Proposed Space Summary

SECTION ONE: EXISTING CONDITIONS & BASIS OF DESIGN

- Existing Conditions Report with Basis of Design Narrative
- Preliminary Soils Evaluation
- Hazardous Materials Limited Survey Report
- Indoor Air Sampling Report

20 Pelham Road

Property Data

Address:	20 Pelham Road Lexington, MA 02421
Use:	Private School (Nursery - Grade 8)
Site Area:	8.4 Acres
Date Built:	1961
Renovations:	None
Occupancy Group:	E - Educational
Construction Class:	Type II Non-Combustible/Unprotected
Zoning District:	RS - Single Dwelling

Building Data

No. Floors:	One story
Gross Area	46,800 SF
Foundation/Frame:	Steel columns and steel beams with steel roof deck and concrete slab on grade. Roof construction over boiler room area is cast-in-place flat slab concrete.
Exterior Walls:	Brick with concrete masonry unit backup.
Roofing:	Single ply membrane
Window Systems:	Original aluminum fixed and operable windows with uninsulated clear glass vision panels and opaque spandrel panels. Original aluminum storefront system at entrances.
Exterior Doors:	Aluminum (at entries).
Interior Doors:	Solid core wood, natural finish. Glazed at corridors and other vision areas.
Interior Walls	Painted concrete block at exterior walls and demising partitions, painted concrete block and glazed ceramic tile at corridors. Main lobby features exposed brick masonry and ceramic mosaic tile.

Floors:	Original 9 x 9 inch vinyl tile. Concrete in mechanical areas, ceramic tile in toilets and lobby, carpet in “Nursery” classroom and library. Gym flooring is 12 inch square vinyl tile with an elevated wood stage.
Ceilings:	12 inch square concealed spline suspended acoustic tile ceilings throughout. Suspended 24 x 24 inch lay-in acoustic tile in Lobby, corridor and Admin areas. Gym has 24 x 24 inch acoustic tile with painted exposed steel roof deck over the stage. Exposed concrete roof decks in boiler and mechanical rooms.
Sprinklers:	None
HVAC:	Steam - Gas Fired with unit ventilators
Sewerage:	City Sewer
Electric:	Service size unknown

Introduction

The purpose of this section is to report the physical conditions of the existing building in order to identify the maintenance needs, conditions and capacity of existing systems, and to establish a basis of design for a twelve section K-5 school at 20 Pelham Road. Information has been obtained from photo documentation of a 12 August 2015 site visit by DDP, a Hazardous Materials survey by ECMS on 02 and 03 September 2015, and an Indoor Air Quality survey by EH&E on 03 September 2015. No test openings or intrusive investigations have been performed to date.

General

The Armenian Sisters Academy has operated a prekindergarten through Grade 8 school at 20 Pelham Road since 1982; the school ceased operation after the 2014-2015 school year.

The school fronts Pelham Road and abuts the town teen and community center and the Scottish Rite Masonic Museum and Library to the south (accessed from Marrett Road). To the east the site abuts Youville Place (assisted living housing). Wetlands and town conservation land define the western bound of the school site.

The school building was constructed in 1961 and is of the typical midcentury one story design with overhanging flat roofs and expanses of brick masonry and window walls. The school consists of a ten-classroom wing with interior support spaces and a limited administration area, and a “core” function wing housing the cafeteria (with full kitchen) and a gymnasium (with high school sized basketball court) with a stage.

Design Intent

The existing conditions of the site, building envelope, mechanical and electrical systems and interior finishes will be evaluated for continued service as part of the proposed 12 section, K-5 school. The design intent is to maintain the use of serviceable building components, if practical and cost effective to do so, through cleaning and/or repair, as applicable. Building components will be recommended to be replaced if they are determined not to be serviceable over a five year period. Observations with recommendations on site and building systems follow.

SITE

Site Limitations

- The most significant issue of concern is the Massachusetts Avenue and Pelham Road intersection.
  - Limited line-of-sight visibility eastbound on Massachusetts Avenue creates a dangerous condition, especially for left turning vehicles from Pelham Road to Massachusetts Avenue.
  - Another significant issue on Pelham Road is its steep incline (8.5%) from Massachusetts Avenue for approximately 300 feet. One possible alternative to mitigate these two issues may be the relocation of the Pelham Road intersection south along Massachusetts Avenue. This presumes cooperation from Youville Place for an easement to relocate Pelham Road, which would reduce the grade slope and improve visibility.
  - Other Pelham Road issues to be confirmed are the width of the existing road easement (approximately 50 feet) and potential for an MAAB compliant sidewalk.
- Accessible curb cut ramps do not meet the dimensional requirements, transitions and/or detectable pavement materials of the current ADA and MAAB code.
- Accessible parking spaces lack the striping and signage that is required by the current ADA and MAAB code.
- One accessible space should be signed and sized as a van accessible space.
- All exterior doors are at grade, making meeting ADA and MAAB code requirements for accessible entry and egress easily achieved where not already compliant.

Site Access - Vehicular

A semi-circular, one-way drop-off drive extends to the main entrance from Pelham Road. From this drive a paved receiving / play area at the west end of the building is accessed. A two-way curb cut and driveway exists at the east end of the site off Pelham Road. This driveway sweeps to be adjacent to the east end of the classroom wing for drop-off and continues on to a 42-car parking lot at the southeast corner of the site.

Curbing is a combination of vertical granite and sloped granite.

The vehicular paving and curbs are in serviceable condition for the near term.

Site Access - Pedestrian

A formal walkway approach connects the main entry on the north side of the building with Pelham Road. In addition, sidewalk is provided along the inside curb of the north drop off loop that provides vehicular access to the main entrance, and a sidewalk exists along the two-way driveway at the east end, providing access to the east entry. The classroom wing, gymnasium and cafeteria all have exit doors direct to the outside, which are connected by a system of paved walkways.

Pedestrian sidewalk paving is concrete. The pedestrian paving is in serviceable condition, near term.

Because the building is sited a few feet lower than Pelham Road, it must be verified that on-site walkways do not exceed the maximum 2% slope required by the current ADA and MAAB code.

Views

Overall, the building is located in a beautiful campus like setting bucolic in nature with mature shade trees in a quiet neighborhood.

Fencing

No fencing separating the school property from adjacent uses was observed.

Play Areas

At the west end of the building there is a very small playfield and an area with play structures. The condition of the play structures has not been inspected, however they could potentially be salvaged and reused if desired by the school, and if they meet the current MAAB and ADA codes.

Landscape

Lawn areas and shrubbery around the immediate building are well maintained.

There are significant trees along Pelham Road, and the entry areas are landscaped with shrubs. Immediately to the west and south of the school are heavily wooded areas that provide visual screening, and the western property line abuts town conservation land. Other than the formal lawn areas at the north and east vehicular drop-offs and the small play area at the west end of the building, there is limited open space not given over to drives, parking and walkways.

Miscellaneous

There are a few decorative globe site lighting fixtures on low poles that provide light along the drop-off areas. Parking lot lighting is provided by at least one tall pole with multiple heads.

One (1) dumpster is located on the eastern side of the property at the edge of the parking area.

GEOTECHNICAL INVESTIGATIONS

PRELIMINARY SOILS EVALUATION REVIEW

Schofield Brothers has researched published soils and geologic information for the site, and their report dated 23 November 2015 is appended to this report.

STORMWATER MANAGEMENT SYSTEM

The following is based on a site visit on 12 August 2015 to view general field conditions and review of the Lexington GIS information available on Lexington's website.

The developed southerly portion of the site slopes toward the wetlands in the west area of the site.

The existing school, parking lots and play areas appear to be drained via a conventional piped drainage system. The GIS information shows the area in front (north of the school) draining to 5 manholes and the area at the east end of the school draining to 4 manholes, with an area drain at the southwest corner of the building. The remainder of the site is open space that appears to drain via overland flow to the wetlands.

Other than the catch basins, there appears to be no water quality or recharge Best Management Practices designed into the existing system. As noted in Schofield Brothers soil report, the poor permeability of the subsurface soils will impact the ability of the site to receive stormwater recharge that will be necessary to meet current stormwater management requirements. On-site testing will be necessary to determine whether this will limit the amount of additional impervious surfaces that may be allowed at this site.

WATER UTILITY

The following is based on a review of the Lexington GIS information available online on the town's website.

The existing building is served by City Water from the water main in Pelham Road in the front of the site. It is not known at this time if there are capacity or pressure issues relative to the main. The existing building does not have a fire protection (sprinkler) system. If one must be provided, a new service connection to the main would be necessary. There is a fire hydrant in front of the school.

SANITARY SEWER

The following is based on a review of the Lexington GIS information available on the town's website.

There is an existing 8-inch public sewer main in Pelham Road and in Bennington Road to the west of the school.

It is not known at this time if there are capacity issues with the existing sewer main.

GAS UTILITY

Based on a consultation with National Grid (the gas utility supplier for Lexington) and observation of existing gas fire equipment, gas is available at the site at Pelham Road.

BASIS OF DESIGN - SITE

The existing site is to remain as-existing, with work limited to the following:

- Patch existing vehicular and pedestrian pavements as required. Note that over the long term, existing bituminous pavements should be overlaid.

- Provide MAAB compliant accessible parking with signage and curb cuts. Repair and/or replace sections of pedestrian pavement as required to provide an accessible route to the building and to outdoor play areas.

- Repair as required existing site lighting. Provide additional exit lighting when required by code.

- Clean existing catch basins. Note that any addition to the building will require investigation of the existing stormwater system because of the resultant increase in impermeable surface (i.e. building roof).

STRUCTURAL REVIEW

INTRODUCTION

GENERAL DESCRIPTION

The Armenian Sisters Academy school building is located at 20 Pelham Road in Lexington, Massachusetts. The school is a one-story (with below slab utility tunnels), steel framed building, constructed in 1961. The total, gross floor area of the building is approximately 46,800 square feet.

The school was constructed in a site depression with grades varying from Elevation 234.0 +/- feet (finish floor and surrounding exterior grade) to Elevation 242 and higher (along Pelham Road at the north and at the parking and site areas south of the building).

STRUCTURAL SYSTEMS DESCRIPTION

General Structural Construction: Generally, roof construction appears to be steel framed with metal deck, with the exception of the mechanical room area, where the roof deck appears to be flat slab concrete. The roof construction is concealed by suspended acoustic tile ceilings, excepting the stage in the gym, where the W section steel roof purlins and steel roof deck are exposed to view. It is assumed that the suspended ceilings have no fire resistance rating, and the construction classification is non-combustible unprotected (Type 2B). The floor is concrete slab-on-grade with HVAC pipe distribution tunnels formed in concrete.

The building structure appears to have performed satisfactorily over time; there are no obvious indications of structural overstress or failure. A comprehensive investigation and evaluation of the structural capacity is beyond the scope of this report.

Subsurface Soils and Foundations: Refer to Schofield Brothers soils report, attached. It is assumed that the existing building employs a conventional foundation with spread footings.

Wall Construction: Exterior wall construction consists of brick veneer over concrete block backup and aluminum window units. It is to be determined whether the exterior masonry walls have been constructed with a cavity between the brick veneer and the concrete block backing.

Interior partitions are primarily concrete block.

Fire Resistance*:* The exposed steel roof framing over the Gym stage is exposed (unprotected) and has no fire resistance rating. The classroom area roof structure is concealed from view by a suspended acoustic tile ceiling, which is assumed to have no fire resistance rating, and thus is unprotected.

Lateral Load Resistance: The school was designed and constructed prior to the introduction of seismic design codes. As the building is a one-story, low-rise structure, wind loads may not have been considered in the structural design of the building. Accordingly, there is likely no defined lateral load resisting system. Perimeter and interior, unreinforced masonry walls provide a degree of lateral force resistance; however, the construction of these walls presumably does not meet current code requirements. Lateral force resistance and unreinforced masonry wall issues would need to be addressed in conjunction with a future, major renovation of the building.

STRUCTURAL CONDITION/COMMENTS

Generally speaking, floor and roof construction appears to be performing satisfactorily; there was observed no obvious evidence of structural distress that would indicate significantly overstressed, deteriorated or failed structural members.

Foundations appear to be performing adequately; there are no obvious signs of significant differential settlements.

Structural/structurally related conditions observed are noted below:

1. Snow Loads: The current code would require a typical flat roof design snow load of 43 psf for a school building in Lexington (plus drifting snow, where applicable). One area of concern would be the main roof areas adjacent to the higher Gymnasium where snow drifting could occur. It is recommended that this condition be addressed as part of a potential, future renovation of the school. In the interim, this condition should be monitored during periods of heavy snow. Except at the boiler room roof area, there are no parapets, so the potential for ponded water is minimal. Nonetheless, internal roof drains should be periodically inspected and maintained to ensure that they are functioning properly, in particular at the boiler room.

2. Masonry Walls: Interior (typically non-load bearing) masonry walls generally appear to be in satisfactory condition. Further review and evaluation is recommended, in conjunction with potential, future renovation of the building. The anchorage/bracing of interior masonry walls as well as the height-to-thickness ratios will also need to be evaluated (per code) if the building is renovated in the future.

RENOVATIONS AND ADDITIONS - MEBC REQUIREMENTS

General comments relating to potential renovations, alterations and additions to the Armenian Sisters Academy School building are presented in this section. Renovations, alterations, repairs and additions to existing buildings in Massachusetts are governed by the provisions of the Massachusetts State Building Code (MSBC - 780 CMR 8th Edition) and the Massachusetts Existing Building Code (MEBC). These documents are based on amended versions of the 2009 *International Building Code (IBC)* and the 2009 *International Existing Building Code (IEBC)*, respectively. Note that it is anticipated that the 9th Edition of the MSBC will be in effect in mid 2016, and that there will be no "grace period" during which time the 8th Edition may continue to be used. Revised requirements of the 9th edition could affect additions and renovations to the existing building.

The MEBC defines three (3) compliance methods for the repair, alteration, change of occupancy, addition or relocation of an existing building. The method of compliance is chosen by the Design Team (based on the project scope and cost considerations) and cannot be combined with other methods.

Regardless of the compliance method chosen, the MEBC currently requires that buildings with unreinforced masonry walls (as present at the Armenian Sisters Academy) be evaluated with respect to the provisions of Appendix A1 of the IEBC, if the work area exceeds 50% of the total building area. An assessment of masonry shear stresses, wall slenderness, parapets, wall anchorage, diaphragm anchorage, etc. is required (as applicable); and the existing building must be capable of resisting at least 75% of the seismic loading required by the code for new construction.

In addition, Section 101.5.4.0 of the Massachusetts Amendments requires that the existing building be investigated in sufficient detail to ascertain the effects of the proposed work on the work area under consideration and the entire building or structure and its foundations, if impacted by the proposed work. The results of this investigation must be submitted to the Code Official in written form. Note that this investigation is required regardless of the compliance method chosen by the Design Team.

The *Prescriptive Compliance Method* (IEBC Chapter 3) duplicates Sections 3403 through 3411 of Chapter 34 in the IBC and prescribes specific minimum requirements for construction related to additions, alterations, repairs, fire escapes, glass replacement, change of occupancy, historic buildings, moved buildings and accessibility. If the impact of the proposed alterations and additions to structural elements carrying gravity loads and lateral loads is minimal (less than 5% and 10% respectively), seismic upgrades to an existing building are generally not required, except for buildings with masonry walls in Massachusetts (as in this case), which must comply with the requirements of IEBC Appendix A1, if the work area exceeds 50% of the total building area.

The *Work Area Compliance Method* (IEBC Chapters 4 through 12) is based on a proportional approach to compliance, where upgrades to an existing building are triggered by the type and extent of work. The Work Area Compliance Method includes requirements for three levels of alterations, in addition to requirements for repairs, changes in occupancy, additions, historic buildings or moved buildings. A complete seismic evaluation of the existing building is required for the following: Level 2 alterations where the demand to capacity ratio of lateral load resisting elements has been increased by more than 10%, all Level 3 alterations, where a change in occupancy to a higher category (not applicable in this case) and where structurally attached additions (vertical or horizontal) are planned. Alterations to less than 50% of the aggregate building area would be classified as a level 2 alteration, whereas altering more than 50% of the aggregate building area would be classified as a Level 3 alteration. As the building has interior and exterior masonry walls, compliance with the requirements of IEBC Appendix A1 would be required.

The *Performance Compliance Method* (IEBC Chapter13) duplicates Section 3412 of Chapter 34 in the IBC and provides for evaluating a building based on fire safety, means of egress and general safety (19 parameters total). This method allows for the evaluation of the existing building to demonstrate that proposed alterations, while not meeting new construction requirements, will maintain existing conditions at their current levels (at a minimum) or improve conditions, as required. A structural investigation and analysis of the existing building is required to determine the adequacy of the structural systems for the proposed alteration, addition or change of occupancy. A report of the investigation and evaluation, along with proposed compliance alternatives must be submitted to the Code Official for approval.

The *Work Area Compliance Method* would likely be the most appropriate method for the renovation to this building.

Additions - General Comments:

The design and construction of any proposed addition to the existing school would be conducted in accordance with the code for new construction. Additions should be structurally separated from the existing building by an expansion (seismic) joint to avoid an increase in gravity loads or lateral loads to existing structural elements.

Renovations / Alterations - General Comments:

Where proposed alterations to existing structural elements carrying gravity loads result in a stress increase of over 5%, the affected element will need to be reinforced or replaced to comply with the code for new construction. An example would be bracing required to support new rooftop HVAC equipment, or removal of a column to reconfigure space.

As noted above, compliance with Appendix A1 of the IEBC will be required by the MEBC in the event a major renovation to the building is undertaken. Additional seismic upgrades/reinforcing will be required; including the addition of new lateral force resisting elements (shear walls and/or lateral bracing) so the building can resist 75% of the seismic forces required by the code for new construction. Significant alterations to *existing* lateral force resisting elements should be avoided, if possible. Essentially, this means that removal of, or major alterations to the existing, unreinforced masonry walls in the building should be minimized. If this is unavoidable, the scope of seismic upgrades/reinforcing will further increase.

Hazardous Materials Survey

1. Environmental and Construction Management Services, Inc. (ECMS) performed a limited Asbestos Containing Materials, (ACM) Lead Based Paint (LBP), and Miscellaneous Hazardous Material investigation. ECMS's report dated 11 September 2015 is appended to this report.

2. Environmental Health and Engineering (EH&E) performed air sample testing for polychlorinated biphenyl (PCB) in indoor air. EH&E's report dated 16 September 2015 is appended to this report.

Hazardous Materials:

Asbestos containing materials, PCB containing material and lead paint shall all be mitigated consistent with Lexington Public School standards.

ARCHITECTURAL SYSTEMS

1. Exterior Walls

Exterior walls at classrooms and cafeteria consist of panels of fenestration (see #3 “Windows”) between deep brick piers supporting the roof overhang. At the ends of the classroom wing and at the gym and utility areas (boiler room, kitchen), walls are full height brick with concrete block back up, with punched openings.

Given the period during which the building was constructed, it is assumed that the exterior walls are uninsulated. No obvious significant damage or distress was observed during the walkthrough.

2. Roofing

The existing roof was not inspected during the site visit. From available aerial photographs, it appears that the roof system over the high gym may have been installed at a different time (lighter in color) than the main roof (darker in color). From the interior, the insulation fasteners are visible through the exposed steel deck over the gym stage, which is evidence that this roof area is likely a fully adhered single ply membrane. The aerial photo also graphically depicts the approximately 90 skylights employed to bring natural light into the interior spaces. Despite this unusually high number of skylight penetrations, significant staining of ceiling tiles was not observed that would be indicative of chronic roof leaks.

3. Windows

All building areas retain their original clear anodized aluminum storefront / sash with single pane glass. In classrooms and the cafeteria, the curtain wall extends from pier to pier and from floor to roof. In classrooms, the lower section of the storefront is glazed with opaque glazing panels (noted in the ECMS report as being transite), backed by continuous below sill bookcases.

4. Exterior Doors

There is a main building entrance on the north side(at the main office lobby) and secondary entrances at the end of the classroom wing and the core / service wing. In addition, there are exterior exit doors from every classroom and from the gym and cafeteria. All exterior entry and classroom doors are the original glazed aluminum doors. The exception is the gym exterior exit doors, which are solid doors without vision panels.

5. Interior Walls

The interior surface of the classroom exterior wall construction consists of exposed brick piers, infill storefront fenestration and sill height wood bookcases. Walls between classrooms, etc. are painted concrete block. Corridor walls are painted concrete block with door height ceramic tile wainscot, with recessed metal lockers. Toilet room walls are glazed ceramic tile, and the main lobby features exposed brick and patterned mosaic ceramic wall tiles. The gym, library and cafeteria walls are painted CMU, and the kitchen has glazed ceramic tile walls. In general, interior walls are in sound condition but are in need of some patching and paint throughout.

6. Interior Doors

The interior natural finish wood doors with vision panels and painted hollow metal frames are in good physical condition, but are in need of refinishing. The knob-type locksets appear to be original.

7. Floors

Most classrooms, corridors and the cafeteria have 9 x 9 inch vinyl tile floors in good condition, but which have been found to contain asbestos (refer to ECMS report). The library and “nursery” rooms are carpeted; the carpet is in fair condition. The lobby floor is a patterned ceramic mosaic tile in good condition.

The Gymnasium has a more recently installed 12 x 12 inch vinyl tile floor with game lines, and the gym stage has wood floors. While in good condition, the gym vinyl tile floor, being installed over the concrete slab, provides no cushioning for play activities. Toilet rooms have ceramic tile floors in good condition.

8. Ceilings

The classrooms and cafeteria have the original 12 x 12 inch concealed spline suspended acoustic ceiling. The main lobby corridor and the gym have been retrofitted with a 24 x 24 inch lay in acoustic tile ceiling. All ceilings are in fair to good condition. As noted under the roofing section, there are dozens of dome skylights that bring natural light into corridors and interior spaces.

9. Lockers/Cubbies

Full height recessed metal lockers are provided along the classroom corridor walls. Wood cubbies are provided in the “nursery” room.

A sink with countertop and cabinet for student use is provided along the demising wall in each classroom. The countertops and doors are in poor condition. Rows of fixed lab benches with integral power outlets are provided in the science classroom.

10. Building Code

Stairs - The one story building only has short flights of stairs to access the lower boiler room floor and the stage. The basement/mechanical room, being a "hazardous" location, is not required to be accessible.

Egress - In general, the building meets current code requirements for quantity, location, and capacity of egress elements.

Building Envelope - Any renovations to/replacing of the uninsulated/under insulated building elements (exterior walls and roof and the existing single glazed windows) will require compliance with the current energy code. While unconfirmed, given the age of the building it is assumed that there is no effective vapor barrier in the walls, roofs and floors. Replacing resilient flooring on an existing concrete slab-on-grade without a vapor barrier will require moisture mitigation for the new floor.

11. Accessibility (MAAB) Code

General: The entire building is on a single level with the exception of the raised gym stage. The classroom entry doors are in recesses that do not provide the dimensional clearances required by MAAB, and all door hardware has knobs, and not levers as required.

Classrooms have secondary (non-required) at-grade exit doors directly outside, which are nearly flush with exterior concrete walks.

Doors: In addition to the classrooms, the doors of smaller rooms, such as offices and toilet rooms, likely do not meet the dimensional requirements (push / pull / width).

Stage: The stage is only accessible by stairs; a chair lift or ramp is required for access from the gym floor level.

Toilet Rooms: Generally toilet rooms do not meet accessibility requirements. Many toilet rooms do not have an accessible toilet, urinal or sink. Doors do not typically have the required push and pull clearances, and some of the gang toilet rooms do not meet turning radius requirements. There are privacy toilet rooms that similarly do not meet MAAB requirements (undersized room, narrow doors, fixtures and accessories not per requirements).

Accessible Student Sinks: The sink and counter top provided for student use in each classroom is not accessible.

Drinking Fountains: Accessible chilled water bubblers have been retrofitted.

Basis of Design - Architectural Systems

Building Code: The anticipated scope of renovation to the existing building (mechanical repairs, roof and window replacement, interior finish upgrades and minimal room reconfiguration), fall under Level 2 Alterations under the International Existing Building Code (IEBC)

- Egress: Existing egress is sufficient
- Structural: Alterations shall comply with new code for gravity loads (new equipment, drifting snow loads)
- Seismic: Scope likely will not require upgrades, but voluntary upgrades (masonry partition clips) recommended.
- Energy: Entire building not required to meet code. New building elements must meet code (HVAC, Lighting, Roof, Windows, etc.)

Accessibility / MAAB: Even with the anticipated limited reconstruction and reconfiguration of the existing building, the construction cost of anticipated work over the first two years of use is assumed to be more than 30% of the assessed value of the building and will require the entire building to be made accessible. The work required includes but is not limited to:

- Lever door hardware (all) and pull / push clearances (all classrooms and many other spaces)
- Student and staff toilet rooms
- Counters
- Gym stage platform (ramp or lift access)
- A percentage of lockers shall be accessible

Building Envelope: The following building envelope improvements are anticipated to be required within the first two years of town ownership.

- New PVC roof with tapered insulation, 7 inch average thickness
- New aluminum window system with 1 inch Low E / argon filled glass
- Minor masonry repair and repointing
- New expansion joint sealants
- To be considered: Roof infill at dome skylights when reroofing (≈90 skylights)

Interior Construction and Finishes: To the greatest extent practical, the design intent is to limit interior reconfiguration of rooms to "space mining" of existing rooms that are larger than similar spaces in existing Lexington elementary schools (i.e. Cafeteria, Gymnasium). This reclaimed "oversized" space would provide needed program space. In general, all existing ceiling and concrete block walls shall remain as is, with work limited to patching as required. New partitions will be painted gypsum wallboard on metal studs. All existing vinyl and asbestos tile floors will be removed and replaced.

The scope of work for the various spaces is outlined below.

Classroom: (Grades 1-5)

Floor: New linoleum tile and vinyl coved base

Ceiling - Existing 1 x 1 concealed spline acoustic tile to remain

Walls - Existing CMU to remain ("as is" - no repainting), except for one "teaching wall" in each classroom which shall be furred with new gypsum wallboard with new marker and tack boards installed.

Millwork - Modify cabinet at sink to make accessible. Install new countertop and drawer and door fronts on existing cabinets. Existing bookcases along exterior wall to remain as is.

Doors - New doors / frames / hardware in new masonry recess for accessibility clearances.

Kindergarten Rooms:

As above for classrooms, with the following additional work:

Toilet Room - Construct new HP accessible privacy toilet room in kindergarten classroom. Walls to be gypsum board on metal stud with a 4' high ceramic tile wainscot, ceramic tile floor, and 2 x 2 acoustic tile ceiling.

Millwork - New student cubbies in classroom.

Library:

As above for classrooms, except floor to receive new carpet.

Cafeteria:

Floor - New linoleum tile and vinyl cove base

Ceiling - Existing 1 x 1 concealed spline acoustic tile to remain

Walls - Existing CMU to remain as is (no paint), except where new gypsum board partitions are added by "space mining"

Doors - New panic devices with lever handles on existing doors.

Gymnasium:

Floor - New resilient sheet multipurpose / sports floor

Ceiling - Existing 2 x 2 suspended acoustic tile ceiling to remain

Walls - Existing CMU to remain as is (no paint), except new gypsum board partitions at “space mining”

Doors - New panic devices with lever handles on existing doors

Stage - No work, except to provide access via ramp or lift.

Main Lobby:

Floor - Existing ceramic tile to remain

Ceiling - Existing 2 x 2 acoustic tile ceiling to remain

Walls - Existing exposed brick and ceramic tile to remain

Doors - Existing wood doors to remain, with new lever handles on existing lockets

Corridors:

Floor - New linoleum tile

Ceiling - Existing 2 x 2 acoustic tile ceiling to remain

Walls - Existing lockers and ceramic tile wall finish to remain

Doors (except as noted for classrooms) - Existing wood doors to remain with new lever handles on existing locksets.

Toilet Rooms:

Work limited to that required to provide one accessible water closet (and/or urinal) and lavatory per toilet room. Existing ceramic wall and floor tile to be patched as required by work at removal / new plumbing fixtures. Except where modified for accessibility, existing toilet partitions shall remain.

Kitchen:

Existing equipment to remain - repair as required.

HVAC, Plumbing and Electrical Work:

See respective report sections.

PLUMBING

Fixtures

Existing water closets in gang toilet rooms are wall hung flush valve type, and those serving the "Nursery" are floor mounted tank type. All lavatories are wall hung type with non ADA manual faucets. The majority (if not all) of the plumbing fixtures where accessibility is required are not ADA complaint. Any toilet room renovations would require MAAB accessibility compliance and may force the loss of at least one water closet. The existing plumbing fixtures will need to be verified for adequacy in quantity based on planned occupancy.

A number of accessible drinking fountains were observed. Whether sufficient accessible drinking fountains are provided in all areas where required must be verified.

The full service cooking kitchen includes on two-bowl pot / scullery sink. It is not known whether the sink drains to an interior and/or exterior grease interceptor per current code.

Most of the fixtures are of original vintage condition and are not of the water saving type. It was not determined whether maintenance has been routinely performed on faucets, toilet flush valves, etc.

During a substantial renovation and/or addition project, it would be required that all the water closets, lavatories, urinals, etc. be modified with ultra-low flow, water conservation type faucets and flush valves. This is required to meet the prerequisite set forth by Massachusetts high performance criteria requirements of 20% less water consumption than code. In addition, the building code will require plumbing fixtures to meet NSF 61 standard for low lead content and a certain percentage of plumbing fixtures to be ADA complaint fixtures.

Domestic Cold Water Service

The size of the water service and the condition of the domestic cold water piping system should be verified. Due to the pipe age, there is a probability that the water service could have lead containing solder in the fittings or contain high lead content brass pipe. We recommend that the water quality be tested and monitored for any possible lead contamination and corrected if found to be a problem. If the project involves substantial renovation, we would recommend complete replacement of all domestic water piping, valves and accessories. A new backflow flow preventer will be required at the main supply line.

Domestic Hot Water Service

The domestic hot water needs of the building appear to be primarily supported by an indirect fired storage tank, which utilizes the heating boiler plant steam to generate domestic hot water. The storage tank is believed to be original to the building. The piping in the boiler room is insulated with asbestos containing material and is in significant disrepair. (Refer to the ECMS report.)

It should be verified if there are problems with pressure, quality and hot water temperature. Due to the pipe age, there is a probability that the water service line could be deteriorated and lead-containing solder may exist in the fittings or contain high lead content brass pipe. We recommend pressure testing and water quality testing for any possible lead contamination. If the project involves substantial renovation, we would recommend complete replacement of all domestic water piping, valves and accessories. It should be verified whether there exists a two temperature hot water system. This is required to satisfy code requirements for occupant fixtures (bathroom sinks) to discharge hot water at a temperature no greater than 110-112°F for safety reasons, whereas the service fixtures (janitor's sinks, kitchen sinks, etc.) are required to have hot water temperatures in excess of 120°F for sanitation reasons. The two temperature tempering system can be addressed via a separate pipe system or locally at fixtures

Soil Waste & Vent

The sanitary sewer flow is by gravity and the all the piping run below the slab and exit the building to a municipal sewer system. No obvious problems with the existing plumbing piping were observed.

Roof Drainage

The flat roof is drained via roof drains with interior piping to below slab. The size and capacity of the roof drain piping should be verified.

Fuel Utilities

The facility has natural gas for heating. A gas pipe enters the boiler room and supplies gas to two gas fired boilers. The size / capacity of the gas service piping should be verified.

Basis of Design - Plumbing Systems

General: It is intended that under the limited renovation work being considered, the existing plumbing systems would remain to the greatest extent practical, and be repaired as required.

During a substantial renovation and addition project, the code would require that all the water closets, lavs, etc. be modified to be of the water conservation type. The MAAB thresholds will require that a certain percentage of the fixtures must be ADA complaint. In addition, water of the appropriate temperature would need to be supplied to fixtures whether by a two temperature piping system or through the use of tempering valves and/or fixtures. The main cold water supply shall be protected with a back flow preventer.

Due to the age of the water piping and to meet the latest NSF low lead act it is typically recommended to replace all the domestic cold water and hot water piping within the building.

Horizontal above and underground waste and storm piping should be changed during a substantial renovation due to its age and its susceptibility for excessive corrosion. In addition, new fixture layouts could likely require replacement of a good deal of the piping.

Drinking Fountains: At least five chilled water fountains have been observed throughout the building. The supply water to these fountains should be checked for lead content, and the piping replaced if lead is detected.

Plumbing Fixtures: Work to existing plumbing fixtures limited to installing accessible sinks in classrooms and accessible toilets and lavatories in existing toilet rooms.

Kitchen: Install code required equipment (i.e. interior grease trap at pot washing sink) and make repairs as required.

Domestic hot water system: Repairs as required. All asbestos containing pipe insulation will be removed and the existing piping reinsulated.

FIRE PROTECTION

There is no active fire suppression system in the school building. The building has no automatic sprinklers, no hose cabinets, no corridor fire extinguishers or fire department standpipes present.

Fire Protection Code Deficiencies and Improvement Summary

If the existing building is renovated to any substantial degree or if **any** additions are made to the existing building, the entire building shall be upgraded with the installation of a fire suppression system per latest Massachusetts Building Code 780 CMR Chapter 9. A new 6" dedicated fire service to the building will be required to feed an automatic fire sprinkler system having coverage throughout the building. Hydrant flow test should be taken from a nearby site hydrant to determine whether a fire pump is required.

HVAC

Fuel Source

The boilers are fired with gas.

Heating Plant

The two boilers are gas fired cast iron sectional low pressure steam boilers. It appears (but should be verified) that all boiler room equipment is original to the building and is at or near the end of its useful life.

Piping in the boiler room is insulated with asbestos containing materials in significant disrepair. (Refer to ECMS report.)

Heat Distribution

Low pressure steam from the boiler header is distributed throughout the school through trenches.

Condition of the condensate return system is unknown at this time.

Classrooms

The classroom spaces are served by unit ventilators installed in the bookcases at the window system. The unit ventilator has a steam heating coil and appears to be equipped with the original vintage pneumatic controls.

The unit ventilator outside air intake louver is only a few inches off the ground, exposing the system to possible ingestion of rain water and snow. In addition, many unit vents are located adjacent to drop-offs where the exhaust from idling vehicles could be drawn into the building. There was observed no general exhaust system to assure fresh air being pulled through the unit ventilator.

The Indoor Air Quality report prepared by EH&E notes that there was no measurable (or barely measurable) outside air into all ten classrooms because the pneumatic controls have been disconnected and the dampers shut. Also, one outside air intake was observed to be filled with spray foam insulation. Ad hoc means such as these were commonly performed during the energy crisis of the 1970s. A comprehensive inspection of all systems is recommended in order to assure intended operation.

Gymnasium

Gymnasium space appears to be heated and ventilated by a ducted air handling unit. Because there is no HVAC equipment visible on the roof, it is assumed that the gym unit is located in a mezzanine mechanical room.

Cafeteria

This space is served by unit ventilators at the exterior window system as for classrooms.

Automatic Temperature Controls (ATC)

All ATC appears to be the original vintage pneumatic type which is well past its useful life and is an outdated, inefficient technology. As noted previously, in many instances the controls have been disconnected. At minimum, all controls shall be repaired to be fully functional; total replacement with direct digital controls (DDC) is recommended.

Basis of Design - HVAC Systems

General: It is intended that the entire existing HVAC system (including steam boilers, classroom unit ventilators, exhaust fans, heating and ventilating units and pneumatic controls) remain in use. Existing equipment shall be inspected and repairs made as required in order for the equipment to operate at its original design performance. When repair is not feasible, or where made necessary by space reconfiguration, HVAC equipment will be replaced in kind.

Piping and Ductwork: All existing asbestos containing insulation shall be removed and the piping / equipment reinsulated.

Air Conditioning: Where air conditioning is desired, new window units or split system air conditioners will be added as appropriate.

ELECTRICAL

Existing Conditions Evaluations:

Electrical Service

The switchboard is located in an electric room adjacent to the boiler room. The switchboard appears original to the building and was manufactured by Federal Pacific. The Federal Pacific Electric Company went out of business several years ago, and replacement parts and breakers may be difficult to locate.

Electrical Distribution

The large majority of distribution panels are believed to be original to the building. Based on the age of the panels and switchboard, a new electrical distribution system would likely be required during a significant renovation project.

Emergency Light and Power System

A Fairbanks Morse emergency generator is located in a generator room adjacent to the boiler room. It is unknown at this time whether the generator is fueled by diesel or natural gas. It is also not known what lighting and power systems are connected to the generator, and whether the emergency lighting levels meet current code requirements. The ECMS report noted the existing generator as “inoperable” which could mean that there is presently no emergency lighting, a serious life safety concern and code infraction.

Lighting and Receptacle Systems

The lighting fixtures throughout the building are 1‘ x 4’ surface mounted sheet metal “box” fixtures with flat acrylic lens and fluorescent lamps. Gym fixtures are 2’ x 4’ recessed fluorescent fixtures that appear to have been relatively recently installed with the 2’ x 2’ ATC ceiling. Cafeteria fixtures are 2’ x 4’ fixtures of the same type used in classrooms. The interior of the building is well lit by natural light from the dozens of skylights in corridors and interior spaces.

All lighting appears to be controlled by local switch including corridors. The presence of occupancy sensors in the portions of the building toured was not observed.

Site lighting consists of decorative pole mounted globe fixtures at the two drop off drives, and a multiheaded fixture pole serving the parking lot.

There is a limited number of receptacles in all classrooms and offices. Receptacles in surface mounted raceways have been added in classrooms in some areas, however the quantity of receptacles is insufficient for current classroom and office requirements.

Fire Alarm System

The building is not sprinklered. The fire alarm system has been updated at some time, with the main panel located in the main lobby and pull stations and warning strobes observed in various building areas. The condition and adequacy of the entire fire alarm system must be verified, especially if significant renovation work is undertaken.

Exit Signs

The illuminated ceiling mounted exit signs in the corridors appear to have been replaced with the new ATC ceilings installed, and appear to be in good condition. The original illuminated wall mounted exit signs in the gym were observed to be in poor condition, with a non-illuminated paper exit sign affixed to one exterior exit door. Paper exit signs are also taped to the exterior cafeteria exit doors. The code requires all exit signs to be illuminated.

Communications / Technology

The type and condition of existing telecommunication, public address and clock systems were not observed during the site visit and should be investigated. There is a “phone closet” with a telecommunication backboard having open wiring to terminal blocks.

Limited data outlets were observed in classrooms. Some classrooms were observed to have flat screen monitors; all classrooms inspected have manual pull-down projector screens, and no permanently mounted interactive whiteboards or projection equipment was noted. The library includes an area where several desktop PC’s are available to students.

Security Systems

There is a doorbell system at the main entrance.

There was not observed any security cameras or intrusion alarm system in the building.

Sound Systems

There is a sound system in the gym for the stage area. The system includes wall speakers and appears to be relatively recently installed, while its functionality was not verified. The system should be equipped with either wireless microphone receivers or assistive listening transmitters, if not so equipped at this time.

Basis of Design - Electrical Systems

Distribution: The existing switchboard and distribution system shall be maintained. Additional panels will likely be required in order to add outlets to classrooms and reconfigured spaces.

Lighting: All existing surface mounted lighting fixtures shall remain. Where required by reconfigured areas, new 2 x 2 foot high efficiency recessed fixtures shall be employed.

Fire Alarm: The fire alarm system shall be repaired or replaced if found to be required to maintain life safety per code.

Emergency Generator: It has been reported that the emergency generator is currently inoperable. In order to maintain life safety, full code required emergency lighting and "exit" signage shall be provided, either by repair or replacement of the existing generator, or by installation of new battery powered emergency lighting and signage.

Communications: Communication and educational technology systems shall be installed consistent with all Lexington Public Schools.

Security: Building access control, video monitoring and intrusion alarm systems shall be installed consistent with all Lexington Public Schools.