6.0 Existing Conditions Analysis / Documentation Primary School

OVERVIEW

During the summer of 2014, following their preparation of existing conditions base floor plan layout drawings, the Johnson Roberts Associates team performed a visual assessment of each Leicester Public School facility. This ***Tab 6*** includes the existing conditions information relevant to the Primary School.

PROCESS & PRIORITIES

In addition to the review of existing documents, drawings, and previously prepared reports, the Johnson Roberts Associates team visually reviewed and evaluated each school facility with critical attention paid to: compliance with current applicable life safety and accessibility codes; the determination of the potential life expectancy of existing materials and finishes; and a schedule for the proposed rehabilitation and/or expansion.

All visual observations were documented. Prioritized recommendations have been made as to facility modifications and/or repairs which will likely be required within the next ten years. Priorities have been based on the following:

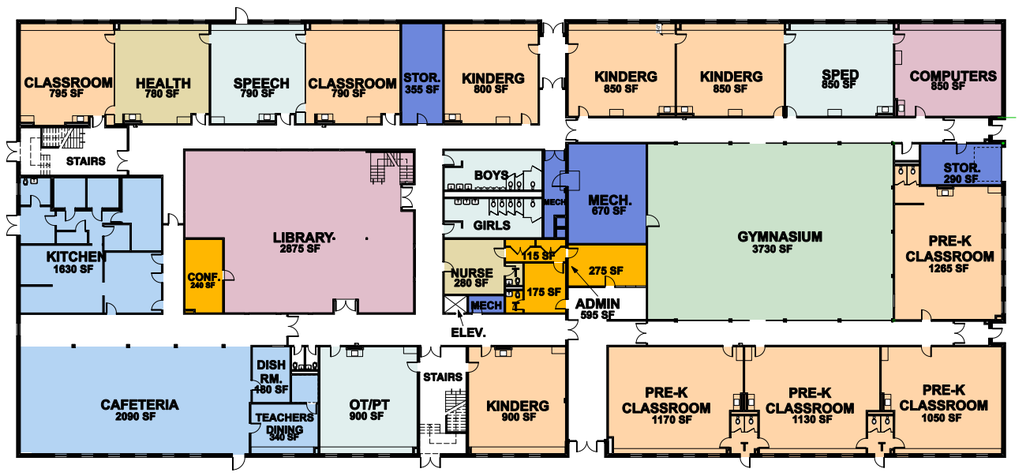
- **Priority 1**: Life safety / code compliance: Issues which require immediate action.
- **Priority 2**: Short term: Issues which will likely need to be addressed within the next 1-3 years.
- **Priority 3**: Long term: Issues which will likely need to be addressed within the next 4-10 years.

A budgetary cost has been assigned to each recommendation, please refer to ***Tabs 10, 11,*** and ***12*** for additional information.

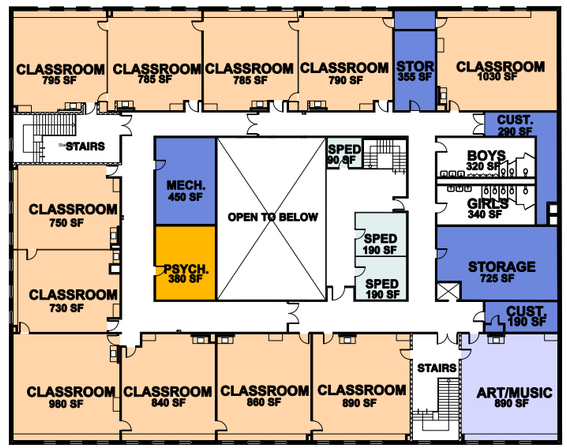
INDIVIDUAL REVIEW DOCUMENTS

The following documents summarize and document the design team's visual assessments:

- Existing Conditions **Site Plan**
- Existing Conditions **Layout Plan.**
- Summary of **Environmental Regulatory Constraints.**
- **Civil / Landscape** Assessment Items.
- Summary of **Existing Conditions Observations – architectural.**
- Prioritized **List of Recommended Work** – architectural components.
- Relevant existing conditions photos – architectural components.
- Structural engineering observations.
- Prioritized **MEPFp Scope of Work** summary sheet.
- **Plumbing / Fire Protection** Existing Conditions Systems Report.
- **HVAC** Existing Conditions Systems Report.
- **Electrical, Security, & Technology** Existing Conditions Systems Report.



MAIN LEVEL PLAN
37,200 SF



UPPER LEVEL PLAN
20,780 SF

- CLASSROOMS
- SPED
- ART/MUSIC
- VOCATIONS/TECH.
- HEALTH/PE
- LIBRARY
- AUDITORIUM
- DINING/FOOD
- MEDICAL
- ADMIN/GUID
- CUSTODIAL/ MAINT/STOR.
- DISTRICT WIDE SPACE

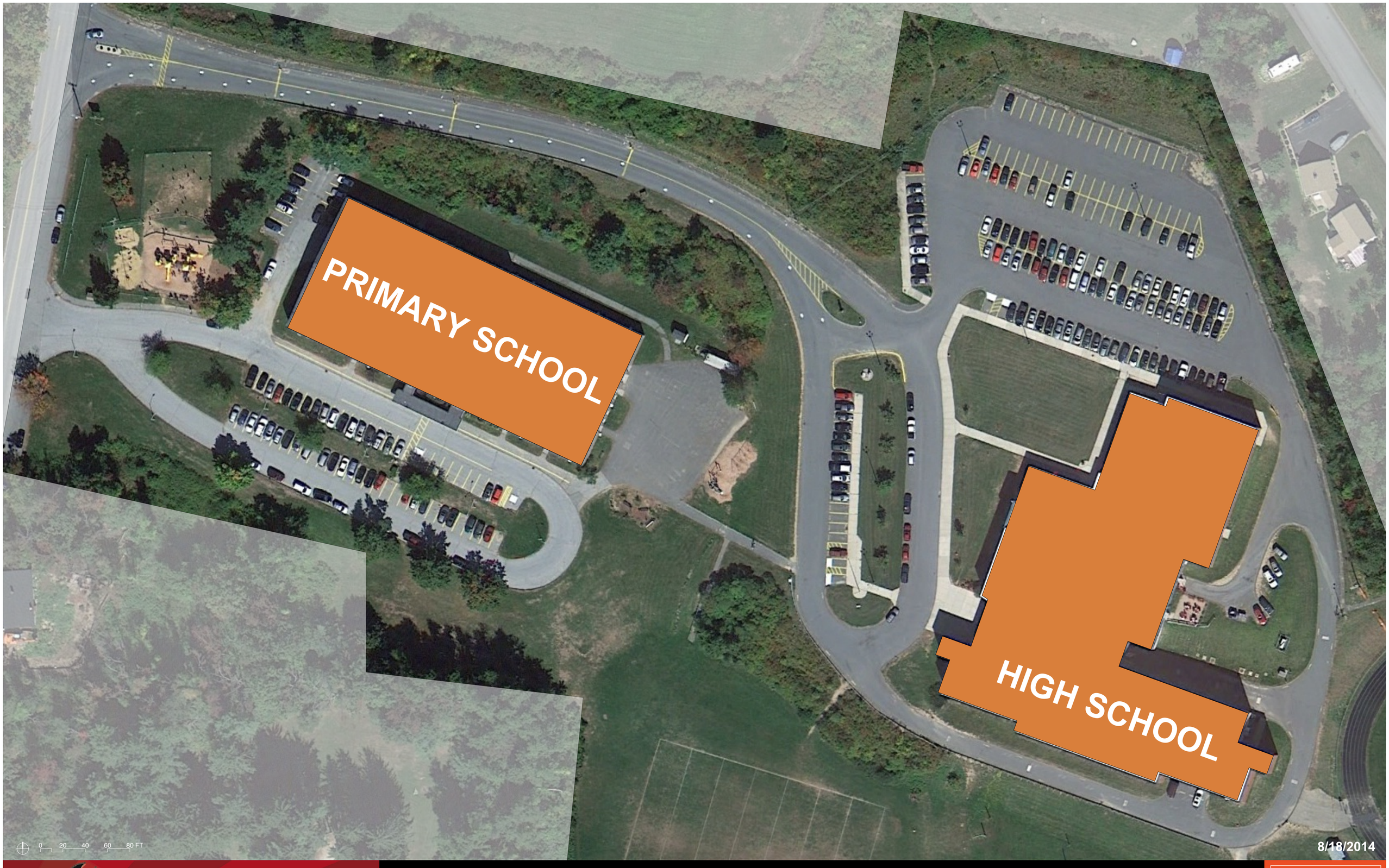
LEICESTER PRIMARY SCHOOL

8/18/2014

LEICESTER PUBLIC SCHOOLS

SCHOOL FACILITIES STUDY

JOHNSON ROBERTS ASSOCIATES INC. ARCHITECTS

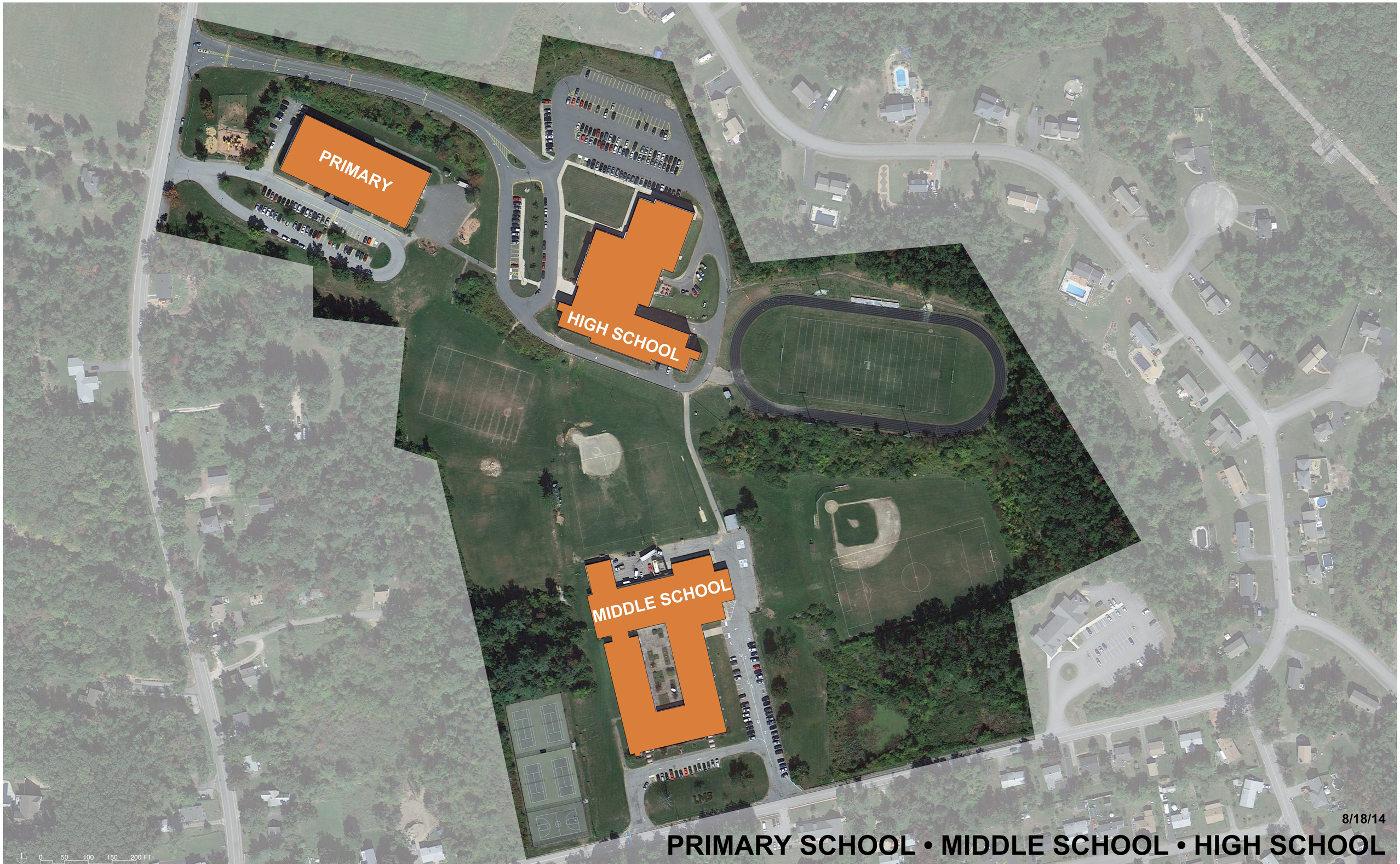


LEICESTER PUBLIC SCHOOLS

SCHOOL FACILITIES STUDY

JOHNSON ROBERTS ASSOCIATES INC.

ARCHITECTS



8/18/14

PRIMARY SCHOOL • MIDDLE SCHOOL • HIGH SCHOOL

LEICESTER PUBLIC SCHOOLS

SCHOOL FACILITIES STUDY

JOHNSON ROBERTS ASSOCIATES INC.

ARCHITECTS

SCHOOL FACILITIES STUDY
FOR THE LEICESTER PUBLIC SCHOOL DISTRICT

Overview of regulatory constraints that appear on the GIS DRAFT study and identified in the legend
Provided by DeVellis Zrein Inc.
August 14, 2014

Surface Water Supply Protection Zone C

Delineates an area under the Massachusetts Drinking Water Regulations as Surface Water Supply Protection Zones. Zone A represents generally land between a surface water source and the upper boundary of a bank. Zone B represents an area generally ½ mile from the bank and Zone C represents an area not A or B but within the watershed of a Class A surface water source. This zone generally prohibits high intensity uses or potential contamination uses such as landfills, automotive/junk yards, graveyards, petroleum terminals etc. This zone does not prohibit schools.

Interim Wellhead Protection Areas and Zone 2's (below) of public water supplies are specifically identified as nitrogen sensitive areas. Title 5 (septic systems) has special requirements for repairing failed systems and for the construction of new systems in Nitrogen Sensitive Areas.

Interim Wellhead Protection Area Zone 2

For public water systems using wells or wellfields, the DEP will apply this interim wellhead protection area. This zone prohibits uses such as landfills, automotive/junk yards, graveyards, petroleum terminals etc. This zone does not prohibit schools. Generally this area should not affect this type of development.

Interim Wellhead Protection Areas (above) and Zone 2's of public water supplies are specifically identified as nitrogen sensitive areas. Title 5 (septic systems) has special requirements for repairing failed systems and for the construction of new systems in Nitrogen Sensitive Areas. Generally this area should not affect this type of development.

Wetlands DEP:

This area represents wetlands (soils and vegetation, ponds, lakes etc.) and has a 100-foot regulatory buffer. Work within this buffer is subject to DEP and local Conservation Commission approval.

USGS Perennial Stream:

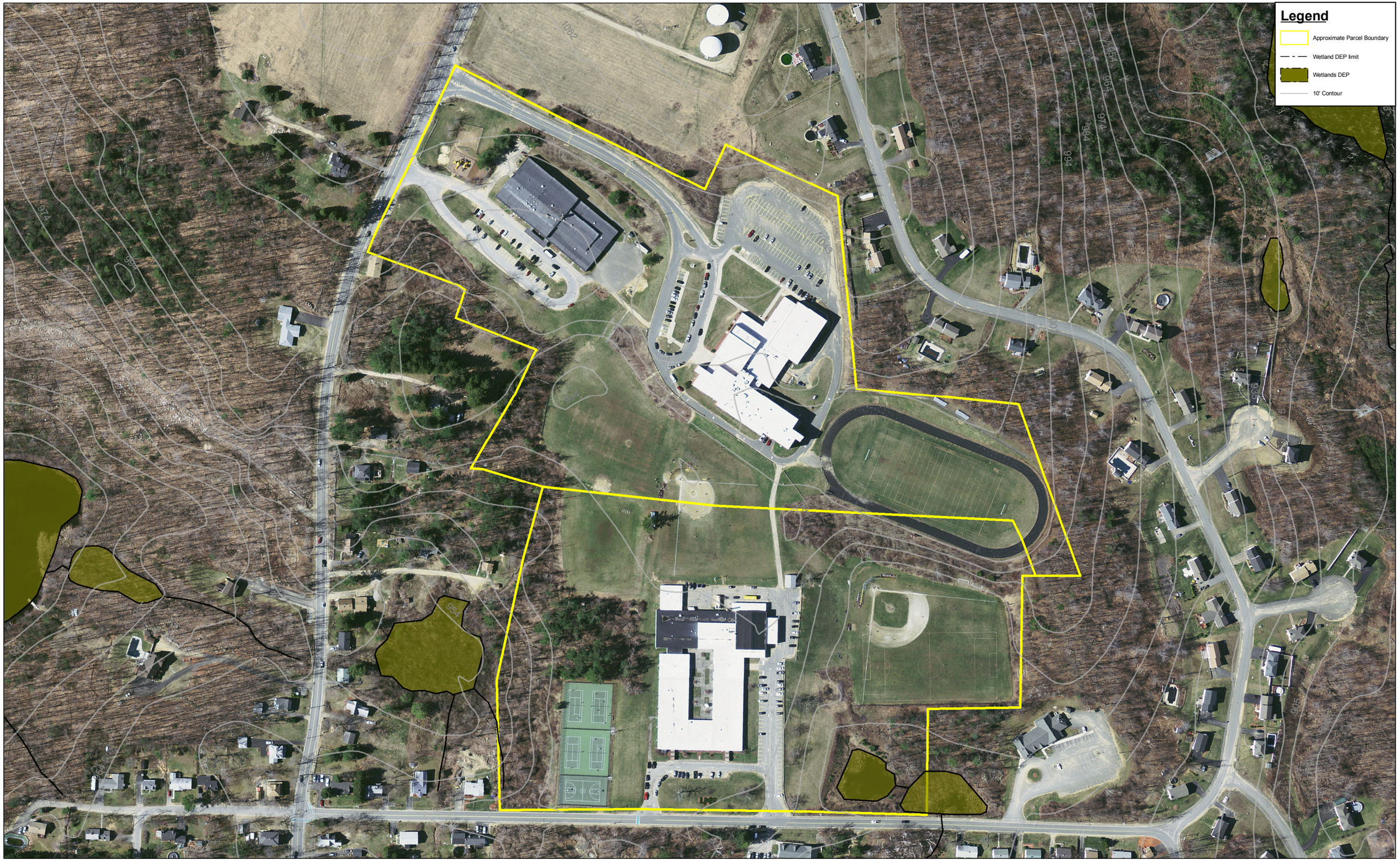
This line represents a river that generally flows all year without drying up and has a 200-foot regulatory buffer. Work within this buffer is subject to DEP and local Conservation Commission approval. Generally this area is to be avoided regarding development.

FEMA Flood:

This area represents a 100- year floodplain that prohibits filling unless there is contiguous replacement. Generally this area is to be avoided regarding development.

NHESP Estimated and Priority Habitat:

This area represents an area delineated by the Natural Heritage and Endangered Species Program of the Division of Fisheries and Wildlife. This delineation is provided to screen projects and activities that may impact state-listed rare species and their habitats. There is no buffer, however the area will be subject of study and the activities of the species will determine the limits of the area. Generally this area is to be avoided regarding development.



Leicester Educational Campus
Leicester, MA

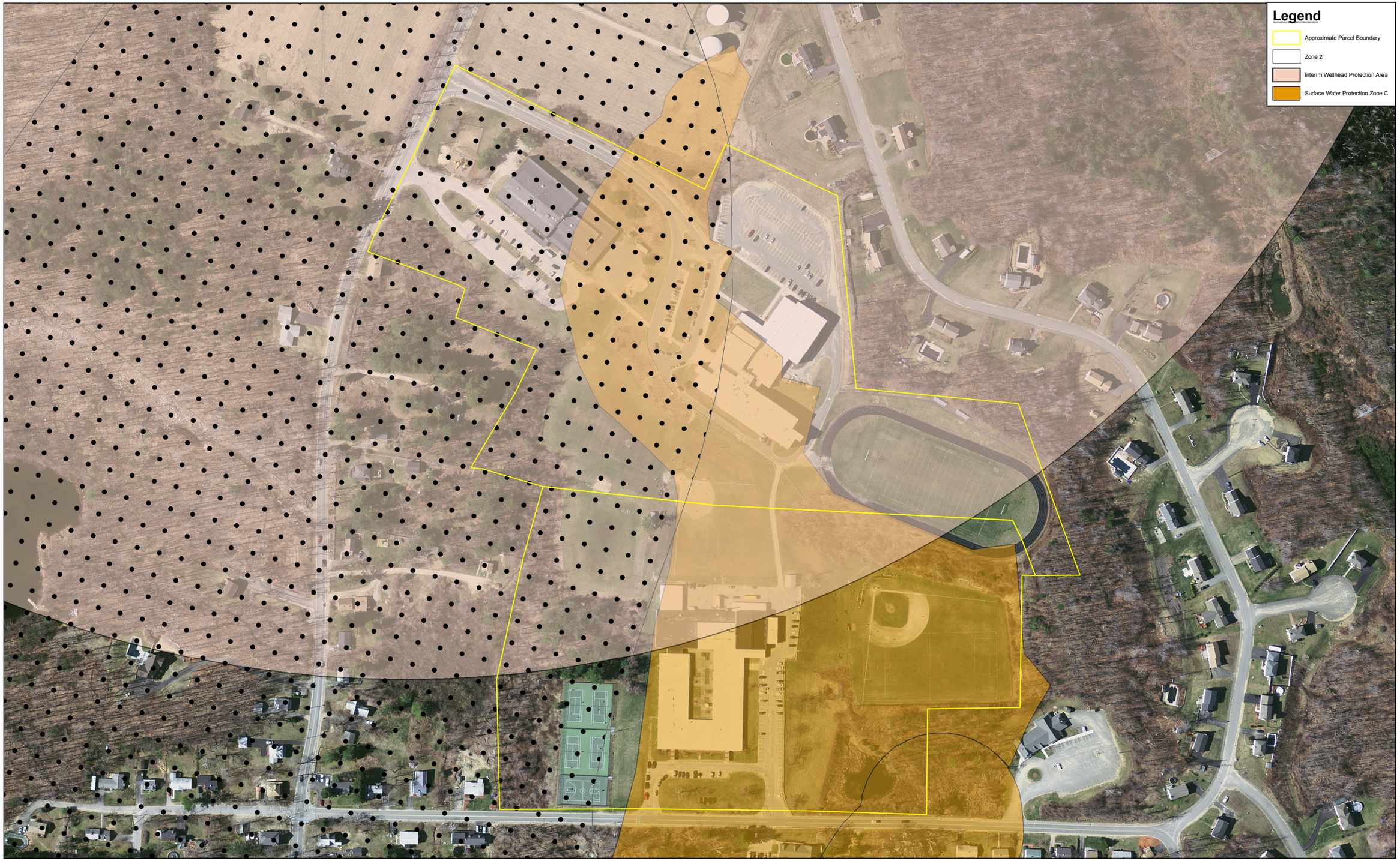
DZI
Site Planning Civil Engineering Landscape Architecture
Po Box 307
Foxborough, MA
508.393.8583 phone
develliszrein.com
DeVellis Zrein Inc.

Aerial Photo with Hydrology and Topography

Date 8.13.14

Data Source: MASSGIS from 2008

0 50 100 200 Feet



Leicester Educational Campus
Leicester, MA

DZ I
Site Planning Civil Engineering Landscape Architecture
Po Box 307
Foxborough, MA
508.393.8583 phone
devillaszrein.com
DeVellis Zrein Inc.

Aerial Photo with Water Supply Constraints

Date 8.13.14

Data Source: MASSGIS from 2008

0 50 100 200 Feet

SCHOOL FEASIBILITY STUDY FOR LEICESTER PUBLIC SCHOOL DISTRICT

SITE AND LANDSCAPE DRAFT ASSESSMENT SEPT 19, 2014

		QUANTITY	UNIT
LEICESTER HIGH SCHOOL (9-12)			
1	1-1/2 " BITUMINOUS OVERLAY OVER ALL PAVED SURFACES	150,000	SF
2	NEW CURBING AT THE TIME OF PAVING OVERLAY	5749	LF
3	BRING HC PARKING SPACES UP TO CODE (SIGNAGES, STRIPING)	4 SPACES	LS
4	NEW SITE LIGHTING	LIGHTING ALLOWANCE	LS
5	NEW PEDESTRIAN ACCESS AROUND BUILDING, EGRESS DOORS, FROM HC SPACES, CEMENT CONCRETE TO INCLUDE CURB CUTS	9800	SF
6	PROVIDE DUMPSTER ENCLOSURE	1	EA
8	ID AND INFO SIGNAGE THROUGHOUT SITE	SITE SIGN PACKAGE ALLOWANCE	LS
9	ADDITION OF DRAINAGE WATER QUALITY STRUCTURE AT SITE OUTLETS PRIOR TO DISCHARGE	3	EA
10	REPLACE STAIRS AND INSTALL RAMP FROM PARKING AREA TO LOWER LEVEL	520	SF
11	HANDRAILS FOR ABOVE MENTIONED RAMP	100	LF
12	MISC LANDSCAPING IMPROVEMENTS	LANDSCAPE ALLOWANCE	LS
LEICESTER MIDDLE SCHOOL (6-8)			
1	3" FULL DEPTH PAVEMENT REPLACEMENT	57000	SF
2	NEW CURBING AT THE TIME OF PAVING OVERLAY	2500	LF
3	REPLACE CONNECTION BETWEEN MIDDLE AND HIGH SCHOOL WITH COMPLAINT WALK (CEMENT CONCRETE)	3789	SF
4	PROVIDE SITE SEPARATION ELEMENTS BETWEEN SCHOOL USE AND SCHOOL MAINTENANCE AREA (EQUIP/PERSONNELL ETC)	FENCING ALLOWANCE FOR 80X80 SFT AREA	LS
5	BRING HC PARKING SPACES UP TO CODE (SIGNAGE AND STRIPING)	3 SPACES	LS
6	NEW PEDESTRIAN ACCESS AT FRONT OF BUILDING, FLUSH ENTRANCES, AAB COMPLIANT CURB CUTS AND CONNECTIONS CEMENT CONCRETE	3337	SF
7	PEDESTRIAN EGRESS WALKWAY, FLUSH ENTRANCES (BITUMINOUS CONCRETE)	2000	SF
8	PROVIDE DUMPSTER ENCLOSURE	1	EA
9	PROVIDE MECH UNIT ENCLOSURE	FENCING ALLOWANCE FOR 20 X 20 FT AREA	LS
10	ID AND INFO SIGNAGE THROUGHOUT SITE	SITE SIGN PACKAGE ALLOWANCE	LS
11	ADDITION OF DRAINAGE WATER QUALITY STRUCTURE AT SITE OUTLETS PRIOR TO DISCHARGE	4	EA
12	REPLACE GUARD RAIL	600	LF
13	NEW SITE LIGHTING	LIGHTING ALLOWANCE	LS
14	MISC LANDSCAPING IMPROVEMENTS	LANDSCAPE ALLOWANCE	LS
LEICESTER PRIMARY SCHOOL (PK-2)			
1	1-1/2 " BITUMINOUS OVERLAY OVER ALL PAVED SURFACES	55,000	SF
2	NEW CURBING AT THE TIME OF PAVING OVERLAY	3000	LF
3	REPLACE BIT CONNECTION BETWEEN HIGH SCHOOL AND PRIMARY SCHOOL WITH HP COMPLIANT RAMP (CEMENT CONCRETE)	700	SF
4	COMPLIANT HANDRAILS FOR AFOREMENTIONED RAMP ASSUME AT LEAST HALF WILL BE RAMP/HALF SIDEWALK	100	LF
4	BRING HC PARKING SPACES UP TO CODE (SIGNAGE AND STRIPING)	3 SPACES	LS
5	NEW SITE LIGHTING	SITE LIGHTING ALLOWANCE	LS
6	NEW PEDESTRIAN ACCESS AT FRONT ENTRANCE, FLUSH ENTRANCES AND CURB CUTS ALONG FAÇADE (CEMENT CONCRETE)	3000	SF
7	PEDESTRIAN WALKWAY AROUND BUILDING FOR EGRESS FLUSH ENTRANCES BITUMINOUS CONCRETE	700	SF
7	PLAY STRUCTURE AREAS FOR AGE GROUPS	(1) 5-12Y PLAYGROUND ALLOWANCE(1) 3-5Y PLAYGROUND ALLOWANCE	EA
8	ID AND INFO SIGNAGE THROUGHOUT SITE	SITE SIGNAGE ALLOWANCE	LS
9	ADDITION OF DRAINAGE WATER QUALITY STRUCTURE AT SITE OUTLETS PRIOR TO DISCHARGE	3	EA
6	PROVIDE DUMPSTER ENCLOSURE FOR MIN. 3 DUMPSTERS AND RECYCLING	1	EA
10	REPLACE STAIRS AT PARKING DIVIDE CEMENT CONCRETE	100	SF
	REPLACE HANDRAILS AT STAIRS WITH COMPLIANT RAILS	50	LF
11	MISC LANDSCAPING IMPROVEMENTS	LANDSCAPE ALLOWANCE	LS
ATHLETICS			
TRACK AND FIELD		HS SPORTS HIGH PERFORMANCE STADIUM ALLOWANCE	LS
	REMOVE AND REPLACE 6-LANE TRACK WITH NEW 8-LANE TRACK		
	REPLACE GRASS FIELD WITH UNDERDRAINED HIGH PERFORANCE MULTI-SPORT TURF FIELD		
TENNIS COURT			
	CRACK SEAL AND SURFACE TREATMENT FOR MAINTENANCE	35000	SF
SOFTBALL (GRASS COVERED UNDER GENERAL TOPDRESS)			
	SKIN	11,000	SF
	BACK STOP	HS SOFTBALL BACKSTOP (NEW)	LS
	TEAM BENCHES	2	LS
	VIEWING BENCHES	4	LS
BASEBALL			
	SKIN	12000	SF
	BACK STOP	HS BASEBALL BACKSTOP	LS
	DUGOUTS	2 HS BASEBALL DUGOUTS	LS
	VIEWING BENCHES	4 VIEWING BENCHES	LS
	BATTING CAGES	2 MOVEABLE BATTING CAGES	LS
GRASS FIELDS			
	AERATION, MINOR GRADING, GENERAL TOPDRESS	240,000	SF

JOHNSON ROBERTS ASSOCIATES INC. ARCHITECTS

LEICESTER PRIMARY SCHOOL

170 Paxton Street • Leicester, MA • 01524

Architectural Existing Conditions Observations

OBJECTIVE

- To assess the condition of building and its components and, when necessary, recommend further action.
- To identify level of compliance with the current Massachusetts State Building Code, Energy Code, and ADA/Mass Architectural Access Board Codes.
- Hazardous Materials were not reviewed as part of this study. Refer to the LPS AHERA plan.

SUMMARY

Although well maintained and in age-appropriate condition, the Primary School building does not appear to be fully handicapped-accessible.
The exterior envelope materials, as well as most applied interior finish materials, appear to be original to the building, near the end of their expected life and require repair or replacement.
The building's overall current condition ranges from good to fair.

Refer to Appendix A for more information.

EXISTING CONDITIONS

Building Description

Leicester Primary School was built in 1972, to serve as a Primary School for Town of Leicester. The two-story portion of the Primary school contains classrooms, cafeteria, library and accessory spaces, while the gym and surrounding classrooms are housed in a one story portion. There is no basement. The building is served by two stairs and an elevator, original to the building.

Exterior Walls

The exterior walls are comprised of unreinforced CMU block walls with brick veneer. Wall insulation does not meet the requirements of the current Energy Code. If a major renovation is undertaken, insulation should be added to meet applicable Energy Code requirements.

Roof

The roof is reported to be in poor condition. Existing roof insulation ranges from 1.5" to 2" in thickness. When a roof replacement is undertaken, the roof system will need to be re-evaluated for compliance with applicable Energy Code requirements.

Exterior Windows and Doors

• The strip window system consists of aluminum non-thermally broken frames, with some hopper operable sashes, some have opaque infill panels. Generally, all windows are approaching the end of their expected life and should be considered for replacement in the near future.

• There are several types of doors used in the building. Most doors show deterioration and will soon require refurbishment and/or replacement.

Building Accessibility

In determining the building's accessibility, we have visually surveyed the building and site, and reviewed the Leicester ADA Transition Plan, prepared by Kessler McGuinness & Associates in 2011.

The building has one main entrance and five emergency exit doors.

• The stairs, guardrails and handrails are not compliant with current Code requirements.

• Classroom doors don't comply with Access requirements. Some doors lack required clearances on the latch side. Some counters don't have required clearances for wheelchair users and/or are too high to comply with Access Code.

• Restrooms lack required clearances and are not accessible. Most plumbing fixtures are not accessible.

• Drinking fountains don't meet current requirements. A hi-lo type of fountain is required.

• Front entry is not accessible.

• Room Signage is missing or is non-compliant.

• There is no accessible route to the park and/or fields.

Applied Building Finishes

Most applied finishes are original to the building, show excessive wear and need to be replaced.

• Wood doors are deteriorating and should be replaced.

• Casework is in need of replacement.

• Floor finishes are original to the building and show excessive wear, with a lot of obvious patching done over the years.

• Ceilings range from fair to poor condition, with some visible damage. Some patches and mismatched acoustical tile replacements were done over the years.

Kitchen and Servery Equipment

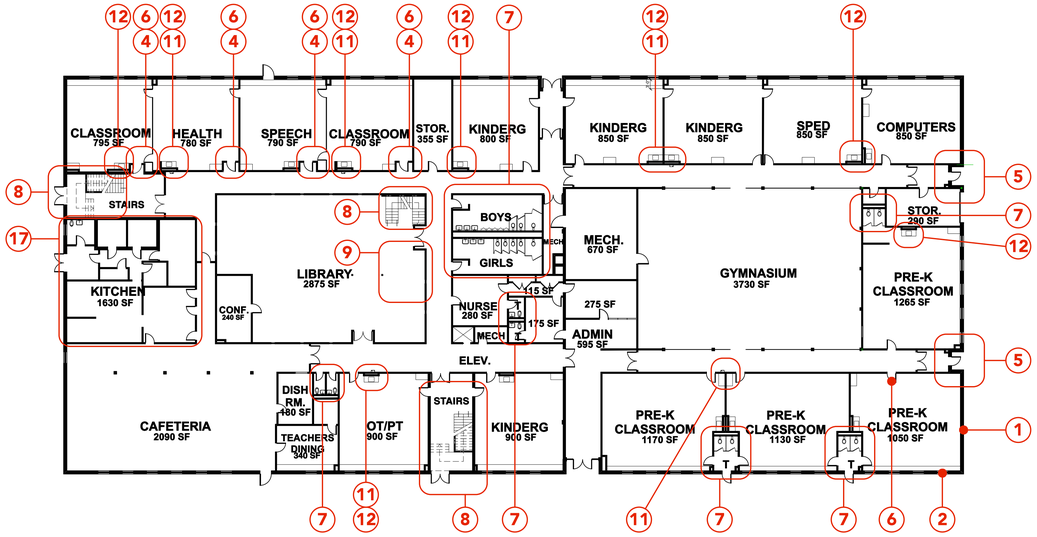
• The equipment original to the building has exceeded its expected life and will soon need to be replaced.

Egress and Safety

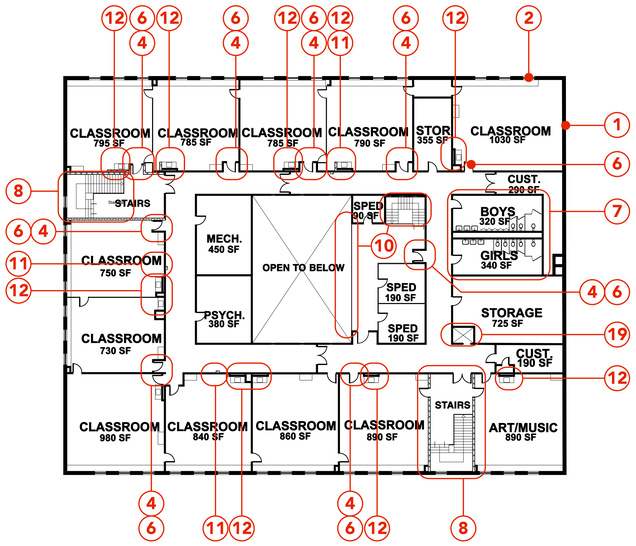
• Wire glass in some doors is no longer Code-compliant and must be replaced with safety glass.

• Egress path width and continuity needs to be maintained, some barriers need to be removed. Stairs are not compliant with current Codes.

LEICESTER PRIMARY SCHOOL
170 Paxton Street • Leicester, MA • 01524



FIRST FLOOR PLAN



SECOND FLOOR PLAN

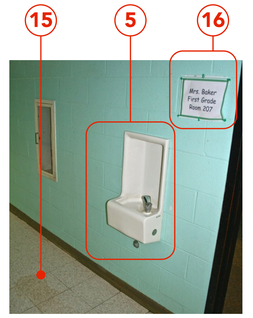
0 10 20 30 40 50 FT

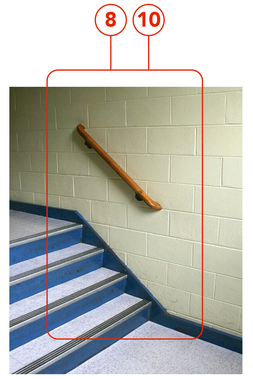
JOHNSON ROBERTS ASSOCIATES INC. ARCHITECTS

PRIORITIZED LIST OF RECOMMENDED WORK

	ISSUE	RECOMMENDATION	PRIORITY
1	EXTERIOR WALLS DO NOT COMPLY WITH CURRENT ENERGY CODE REQUIREMENTS.	ADD INSULATION AND FINISH	3
2	EXTERIOR WINDOWS DO NOT COMPLY WITH CURRENT ENERGY CODE REQUIREMENTS AND HAVE EXCEEDED THEIR EXPECTED LIFE	REPLACE WINDOWS THROUGHOUT	3
3	ROOF NEEDS REPLACEMENT. ROOF INSULATION DOES NOT MEET CURRENT ENERGY CODE	INSTALL NEW ROOFING AND ADDED INSULATION TO COMPLY WITH ENERGY CODE.	3
4	INTERIOR DOOR DOES NOT HAVE CODE-REQUIRED CLEARANCE	INSTALL AUTOMATIC DOOR OPENER	1
5	EXTERIOR DOOR DOES NOT COMPLY WITH ADA REQUIREMENTS.	INSTALL AUTOMATIC DOOR OPENER	1
6	DOOR HARDWARE DOES NOT COMPLY WITH ACCESS REQUIREMENTS. WOOD DOORS SHOW DETERIORATION. WIRE GLASS DOES NOT COMPLY WITH CURRENT BUILDING CODE. TYP.	INSTALL NEW DOORS AND HARDWARE. TYPICAL ALL INTERIOR DOORS	1
7	RESTROOMS DO NOT COMPLY WITH ACCESS REQUIREMENTS.	PROVIDE ADA-COMPLIANT RESTROOMS	1
8	GUARDRAILS, HANDRAILS, TREADS AND RISERS DO NOT COMPLY WITH ACCESS AND CURRENT BUILDING CODE REQUIREMENTS. TYP.	REPLACE GUARDRAILS AND HANDRAILS	3
9	CIRCULATION DESK DOES NOT COMPLY WITH ACCESS REQUIREMENTS.	PROVIDE ADA-COMPLIANT ADDITION TO DESK	1
10	GUARDRAILS DO NOT COMPLY WITH ACCESS AND CURRENT BUILDING CODE REQUIREMENTS. TYP.	REPLACE GUARDRAILS	1
11	DRINKING FOUNTAIN DOES NOT COMPLY WITH ACCESS AND CURRENT BUILDING CODE REQUIREMENTS. TYP.	INSTALL CODE-COMPLIANT HI-LO DRINKING FOUNTAIN, BUILD WING WALLS	1
12	SINK AND CASEWORK DO NOT COMPLY WITH ACCESS REQUIREMENTS.	PROVIDE ACCESSIBLE SINK AND CASEWORK	1
13	CEILINGS IN POOR CONDITION AND HAVE EXCEEDED EXPECTED LIFE	INSTALL NEW CEILINGS THROUGHOUT	3
14	CASEWORK IN POOR CONDITION AND HAS EXCEEDED EXPECTED LIFE	REPLACE CASEWORK THROUGHOUT	3
15	FLOORING IN POOR CONDITION AND HAVE EXCEEDED EXPECTED LIFE	INSTALL NEW FLOORING THROUGHOUT	3
16	ROOM SIGNAGE IS NONCOMPLIANT	INSTALL CODE-COMPLIANT ROOM SIGNAGE THROUGHOUT	1
17	KITCHEN EQUIPMENT IS ORIGINAL TO BUILDING AND HAS EXCEEDED EXPECTED LIFE	INSTALL NEW EQUIPMENT	3
18	REQUIRED CLEARANCE IS NOT MET AT INSTALLED EQUIPMENT	RECONFIGURE EQUIPMENT LAYOUT	3
19	ELEVATOR IS NOT COMPLIANT WITH CURRENT CODES	RECONFIGURE AND INSTALL NEW ELEVATOR	3
20	THERE IS NO ACCESSIBLE ROUTE TO THE FIELDS	PROVIDE ACCESSIBLE COMPONENTS	1

PRIORITY KEY:
PRIORITY 1: IMMEDIATE (LIFE SAFETY/CODE COMPLIANCE)
PRIORITY 2: SHORT TERM (1-3 YEARS)
PRIORITY 3: LONG TERM (4-10 YEARS)





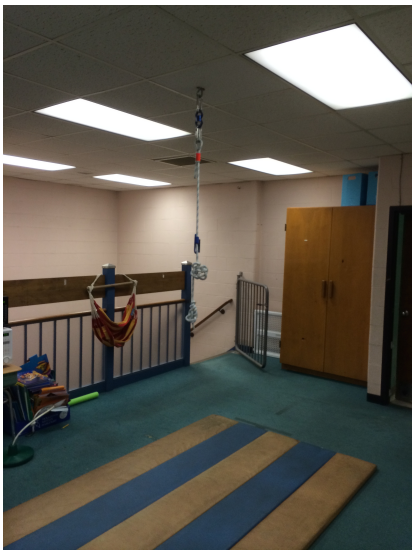
6.0 Existing Photos – PRIMARY SCHOOL

Gymnasium

Cafeteria

Kitchen

Interior – Reception Area

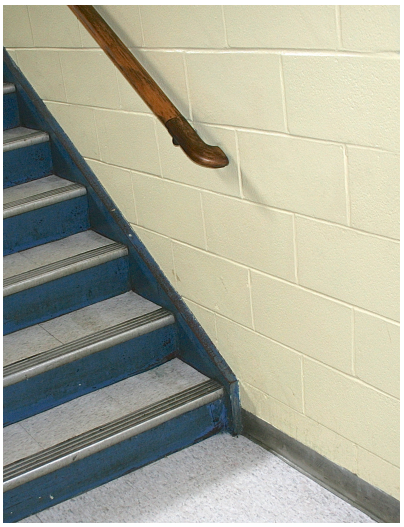


Interior – Second Floor Stair Landing

Typical Interior Door & Hardware

6.0 Existing Photos – PRIMARY SCHOOL

Library Entrance & Stair



Existing Stair, typical

Typical Signage & Drinking Fountain

Library & Conference Room

Library – Circulation Desk

Storage Room

ROOME & GUARRACINO, LLC

Consulting Structural Engineers

48 Grove Street Somerville, MA 02144

Tel: 617.628.1700 Fax: 617.628.1711

July 28, 2014

Mr. Jeffery Davis A.I.A.
Johnson Roberts Associates, Inc.
15 Properzi Way
Somerville, MA 02143

Reference: Primary School-Leicester, MA
Existing Conditions Study

Dear Jeff:

This letter summarizes our findings regarding the present condition of the structure of the Primary School Building in Leicester, Massachusetts, and our recommendations regarding future uses of the structure. These observations and recommendations are based on information provided to us by your office, as well as, our field observations of July 16, 2014. There are some limited existing Architectural and Structural drawings for the building, so we have a good idea of how the building is framed, and the loads that it was designed for. Our field observations were only visual surface observations, we have not cut any holes in building finishes, to verify structure, nor have we done any testing to determine the structures underlying condition.

Existing Conditions

On July 16, 2014, I toured the existing Primary School Building with Natalie Eringros from your office. The existing structure was built in 1972, to be the Town's primary school, and has functioned as such ever since. The main class room building is two stories, with a single story portion that houses the gym area and some classrooms. The main level is a slab-on-grade (there is no basement). The school's library is in the two-story portion of the building, and is open to the roof, except for a small mezzanine/balcony at the second floor level. The building has a brick veneer, and the roof is a large gable with a fairly flat pitch.

The building appears to have conventional shallow foundations, with perimeter frost walls, spread footings, and a main level slab-on-grade. There are steel columns (both W-section and HSS) in the interior corridor walls, as well as in the exterior walls, that support the second floor and roof framing. Unreinforced masonry block walls are built around the steel posts. The second floor is framed with steel beams and open web joists supporting metal deck and a 4 inch thick concrete slab. The roof is framed with steel roof deck supported on steel beams and open web joists. The exterior walls appear to be unreinforced masonry, with steel columns, that support the structure above, and exterior brick veneer. There are steel diagonal cross bracing frames that provide lateral stability for the building under wind and seismic loadings. Steel angle lintels support the brick veneer at the exterior openings.

We were able to verify the allowable gravity loading capacity of the framed floors and roof, using the existing framing plans. Those calculations, along with our observations of the way the floors and

roof have performed, indicate that the floors and roof framing meet required code loadings for their intended uses. The Building Code requires that classrooms have a minimum live load of 50 PSF, and that upper level corridors have a live load of 80 PSF. The code mandated roof snow load of 35 PSF is the same today as when the building was originally designed.

While the structural framing for most of the building is not visible, as finishes cover the framing, there is no evidence of major structural distress. There is no evidence of major foundation settlement or foundation wall cracking. There is some very minimal cracking in the interior masonry corridor walls, and there is some evidence of minor cracking in the main level slab-on-grade, neither of which is unexpected or of structural concern. The upper floor and the roof show no evidence of structural problems. The exterior of the building is in good condition, with only some minimal cracking of masonry that will need repointing. The building structure generally appears to be in good condition and well maintained.

Addition/Renovation Feasibility

A renovation without a "Change of Use" to a higher "Occupancy Category", without Structurally Connected Additions (Vertical or Horizontal), usually need only address the following triggers and implications:

1. If an increase of 5% in gravity loads on any element, or reduction in capacity- then the specific element must comply or be made to comply with current IBC gravity loads.
2. If an increase of 10% in lateral load "Demand-Capacity Ratio" of any element- then those specific elements must comply or be made to comply with (reduced) current IBC lateral loads. [Except the entire structure's lateral system shall be made to comply due to the increase of 10% D-C Ratio in any element if "Prescriptive Method" is used.
3. Regardless of Demand-Capacity Ratio, if "Work Area Method Alteration Level 3 Substantial" applies due to >50% Work Area and >30% of the building's structure is being altered (based on area tributary to the altered elements), -then the entire structure's lateral system shall be made to comply with IBC Wind and IBC Reduced Seismic loading.
4. If "Work Area" exceeds 50% of the aggregate area of the building,- then wall anchors for concrete and masonry buildings shall be investigated and shall comply or be made to comply with reduced IBC seismic forces.
5. If "Work Area" exceeds 50% of the aggregate area of the building,- then unreinforced masonry parapets shall be investigated and braced as required by code.

(In general, the look back for work area calculations is 12 months, but the "Cumulative Effects" look back for engineering calculations is since original construction.)

Generally, minor structural changes to the original structure, such as those required to modify stairs and elevators, and add small mechanical penetrations, do not have a major impact on the existing building structure. New openings required for ducts, piping, etc. in the roof deck or in the framed floors can be accommodated as long as the openings fall between the existing framing members and do not interfere with the framing. Small openings, 12" or less, can be accommodated without any additional framing. The existing steel diagonal cross bracing frames must be left intact, as they provide the lateral stability for the building, and increasing the lateral shear in any of them by more than 10% would trigger a code mandated seismic upgrade, which must be avoided.

Major additions are recommended to be structurally separated from all existing buildings with seismic expansion joints, since connected additions trigger an evaluation and often an upgrade of the existing building's entire lateral system. In the event that there were a new addition, the roof structure of the existing building would need to be checked and possibly strengthened for any new drifted snow loading that may be caused by the higher roof line of a new adjacent structure. Any new structure could then be as large as desired and still be in accordance with the latest codes. For cost and flexibility reasons, we would recommend that any new addition be framed in structural steel with composite steel and metal deck floors and steel roof deck for a roof. Based on the information that we were able to glean from the existing drawings it appears that any new foundations would be conventional shallow foundations with frost walls, spread footings, and slabs-on-grade.

If you have any further questions, or if we can be of any further assistance, please do not hesitate to call.

Very truly yours,

Roome & Guarracino LLC

Reginald Roome II, P.E.
Partner

LEICESTER PUBLIC SCHOOLS

P R E L I M I N A R Y

1411 / School Facilities Study

PRIMARY SCHOOL

MEPFp SCOPE OF WORK: '*REPAIRS ONLY*' OPTION
revised 9/24/2014

TOTAL AREA: 57,980
MAIN LEVEL: 37,200 GSF
UPPER LEVEL: 20,780 GSF

PRIORITY 1: CODE COMPLIANCE / LIFE SAFETY
PRIORITY 2: SHORT TERM (0-3 YEARS)
PRIORITY 3: LONG TERM (4-10 YEARS)

	ITEM	PRIORITY
PLUMBING		
P.1	Install mixing valve on domestic hot water heater	1
P.2	Install hot water handles on all lavatories and sinks, provide individual mixing valves at lavatories and sinks	1
P.3	Install individual mixing valves at all lavatories and sinks	1
P.4	Replace domestic hot water recirculation system	1
P.5	Clean out boiler room floor drain	1
P.6	Replace all existing plumbing fixtures (toilet room, kitchen, classrooms) with code compliant fixtures	1
P.7	Provide new HC compliant drinking fountains	1
P.8	Replace existing electric HW heater with high efficiency condensing water heater	3
P.9	Install 2" backflow preventer on incoming water service	3
FIRE PROTECTION		
FP.1	Install code compliant fire protection system	3
HVAC		
H.1	Service/repair all unit ventilators	2
H.2	Insulate hot water expansion tank	2
H.3	Replace hot water piping insulation	2
H.4	Provide new combustion air fans for boilers	2
H.5	Replace all unit ventilators	3
H.6	Provide ventilation to all interior office / administrative spaces	1
H.7	Provide new high efficiency condensing boilers	3
H.8	Provide new inline system pumps with premium efficiency motors and variable frequency drives	3
H.9	Provide new indoor air handling units with premium efficiency motors and variable frequency drives	3
H.10	Provide new DDC system including control valves, digital thermostats with feedback, damper actuators with feedback, freezestat alarms, unit controllers, graphic software with trending and web access.	3
H.11	Service / repair all existing exhaust fans	1
H.12	Provide packaged rooftop units for air conditioned spaces with digital scroll compressors and ECM condensor fan motors	3
ELECTRICAL		
E.1	Re-label main switchboard voltage to read correct voltage	1
E.2	Provide new fire alarm system including voice evacuation, addressable, with early warning smoke detection system in egress paths and ADA/NFPAA 72 compliant notification appliances	1
E.3	Remove existing ROMEX wiring and replace with MC type cable (assume 10% of total area)	1
E.4	Provide GFI protection on kitchen receptacles w/in 6 feet of any sink	1
E.5	Provide new emergency system with (2) transfer switches, re-use existing generator, provide new panelboards, provide new 2-hour rated emergency enclosure	1
E.6	Provide new exterior placed emergency generator	3
E.7	Provide new LED exit signs and connect to emergency generator (with constant-on circuitry)	2
E.8	Provide new exterior building mounted lighting (connected to emergency circuitry) with photocell ON / timeclock OFF	2
E.9	Provide new wireless GPS/LAN based master clock system with wireless secondary clocks	2
E.10	Provide new CAT 6 tel/data cabling network with conditioned MDF room	2
E.11	Provide new VOIP telephone system	2
E.12	Provide additional electrical receptacles throughout building	3
E.13	Provide a new power distribution system with new secondary switchboard in dedicated electric room (provide new panelboards in dedicated electric rooms)	3
E.14	Provide new exterior LED lighting in parking /road areas with photocell ON / timeclock OFF	3
E.15	Provide ceiling mounted occupancy sensors in offices/work spaces	3
E.16	Provide new building intercom system with bell scheduling capabilities and telephone system interface	3
E.17	Provide new security system with card access, CCTV - integrate/modify existing intrusion system.	3
E.18	Provide new lightning protection system	3

JOHNSON ROBERTS ASSOCIATES INC. ARCHITECTS

Leicester Public School District Facilities Study
Primary School
Leicester, MA
Plumbing/Fire Protection Existing Conditions Systems Report
J#330 038 00.00
L#45295/Page 1/August 22, 2014

PLUMBING/FIRE PROTECTION

Executive Summary:

The Primary School Building systems and plumbing fixtures are mostly original. The building has been well maintained however, the building requires all new plumbing fixtures. Presently there is no domestic hot water to lavatories or classrooms. Provide a water heater independent of the boiler and a master mixing valve. Restore domestic hot water to all plumbing fixtures as required by the Plumbing code.

The building is serviced by municipal water, municipal sanitary sewer and fuel oil.

Fixtures:

The fixtures are original or have been replaced as needed over the years. Many of the fixtures do not meet the requirements for handicap accessibility or the water conservation requirements of the Plumbing Code.

The water closets are wall hung, exposed flush valve type fixtures.

The urinals are wall mounted vitreous china with exposed flush valve.

The lavatories are wall hung vitreous china. The faucets are widespread hot and cold water mixing type however the hot water handles have been removed due to water temperature concerns.

The service sinks are wall hung, rolled rim, cast iron enamel with service sink mixing faucet. The faucet does not have a vacuum breaker or in-line check valves on the water supply piping.

The drinking fountains are wall hung, semi-recessed vitreous china fixtures with push button operator. Fixtures are generally not handicapped accessible.

The classroom sinks are single bowl, self-rimming stainless steel sink. The faucet is a hot and cold water mixing faucet with a swivel spout and lever handles. Some hot water handles have been removed.

Typical Water Closet

Typical Urinals

Typical Lavatory Missing HW Handle

Typical Janitor's Sink

Typical Drinking Fountain

Typical CR Sink Missing HW Handle

Water System:

The domestic water piping consists of copper tubing with wrought copper fittings. The piping appears to be in fair condition with no history of pinhole leaks. The piping is generally insulated throughout the building.

The domestic water service enters the ground floor of the building. The 4" domestic water service is located in the Storage Room. There is a 2" water meter on the water service; however, there is no backflow preventer on the incoming service which is not required by code but will need to be verified if required by the water department. There is a reduced pressure type backflow preventer on the boiler water make-up.

Domestic hot water for the building is provided by a vertical tank/heat exchanger type heater using boiler water. This requires the boiler to run throughout the year if domestic hot water is desired in the non-heating months. There is no thermostatic mixing device on the hot water system which protects the patrons from scalding. There is a recirculation system with a recirculation pump.

There is an electric hot water booster in the kitchen under the counter.

Water Heater

Kitchen Electric Booster Heater

Boiler Make-up Backflow Preventer

Drainage System:

The sanitary drainage system is piped with cast iron. The exposed piping is in good condition.

The sanitary drainage system appears to be piped to a municipal sewer system.

There is a passive grease interceptor fully recessed in the floor which serves the 3 pot sink. We are advised the grease interceptor is cleaned each summer. The Boiler Room has a floor drain which appears to have a problem draining properly based on the look of the floor.

The roof is flat with roof drains and rain leaders which collect the rainwater and discharge it to a leaching basin. There was no access to the roof to allow inspection.

There is no history of reoccurring surcharges in the sanitary or storm drainage systems.

Water Service and Meter

Grease Interceptor Recessed in Floor

Boiler Room Floor Drain

Fire Protection:

The building has no automatic fire sprinkler system.

RECOMMENDATIONS

The following is our professional opinion on what recommendations are required by code and would also improve energy and water conservation. (Code required upgrades would only be required if a significant renovation is planned.)

Priority #1 – Life Safety / Code Compliance

- Install a master mixing valve on the domestic hot water heater. Store hot water at 140 degrees to avoid Legionnaires' Disease.
- Install hot water handles on all lavatories and sinks. Provide lavatories and sinks with individual mixing valves if there is a concern with students coming in contact with 120 degree water.
- Confirm the domestic hot water recirculation system is working and fix any deficiencies.
- Rod, clean out and camera the Boiler Room floor drain to clear any blockages.

Priority #2 – Short Term (Next 3 Years)

- Replace the existing plumbing fixtures with fixtures that meet the requirements of the plumbing code for water conservation and the MAAB for the requirements of accessibility.

Priority #3 – Long Term (3 – 10 Years)

- Replace the existing water heater with a new high efficiency oil or gas fired water heater so the boiler can be shut down in non-heating months. Natural gas is preferred if available, in which case a high efficiency condensing water heater may be used.

Leicester Public School District Facilities Study
Primary School
HVAC Existing Conditions Systems Report
J#385 001 00.00
L#45307/Page 1/August 22, 2014

HVAC

Executive Summary

The Primary School has received poor maintenance on the heating system and equipment over the past years. The boiler system presently installed is original to the building and is currently in poor operating condition. Controllability of the present system utilizes pneumatic controls which should be upgraded to achieve better efficiencies and to reduce energy consumption.

Heating Plant

The existing oil fired cast iron boilers are manufactured by HB Smith, each have a capacity of 2045 MBH and are equipped with Power Flame oil fired burners. Each burner has a firing rate of 21.1 GPH. No.2 fuel oil is stored in an outdoor above ground storage tank which has a capacity of 10,000 gallons. There is a monitoring system installed which is manufactured by Omntec, this system monitors the volume of oil within the tank. Fuel oil travels within schedule 40 black steel pipes between the outdoor tank and the indoor day tank through the use of the fuel oil pumps. The fuel oil pumps maintain pressure and oil within the day tank and the burners feed from the day tank which appears to be relatively new and operating satisfactorily. The day tank is provided with a rupture tank in the event there is a failure in the tank itself. The boilers generate hot water and supply heat to the entire building through the use of wall mounted unit ventilators for all classrooms and indoor air handling units for the large group spaces such as the Gym and library. Hot water is distributed throughout the building through the use of two inline pumps manufactured by Chicago Pump Company. The pumps each have a 3HP motor with typical starters. The heating hot water piping distribution is schedule 40 black steel piping insulated with fiber glass insulation. Majority of the insulation appears original and in some locations the insulation is soiled and damaged. Majority of the elbows appear to be asbestos. Expansion for the heating hot water system utilizes a non-insulated vertical expansion tank. The system does not appear to be equipped with an air separator. For minimal energy saving the system is equipped with a compensated water valve and associated piping. Combustion gases generated from the boiler exhaust to an existing masonry chimney through a galvanized steel breeching system which is insulated with what appears to be calcium silicate. Combustion air for both boilers is provided through a mechanical fan assisted system. There are two combustion air fans which do appear to work however, they are original to the building and some components do appear to be broken. The boiler is provided with all operating and safety controls including high and low limit. At this time the boiler, associated controls and piping system appear to be operating however, due to the antiquated nature of the system replacement parts are becoming scarce. The boilers themselves are showing signs of future failures, there is currently wear and tear, corrosion and signs of leakage on the main barrels connecting to the cast iron sections. Their current condition is poor as well as the inline pumps which are also showing signs of failure and leakage.

HW Boiler Plant

Fuel Oil Burner

Typical Inline Pump

Main Boiler Barrel Condition

Outdoor 10,000 Gallon Oil Tank

Boiler Breeching

Classroom Heating & Ventilation

All the classrooms located throughout the building are provided with wall mounted unit ventilators as its main heating and ventilation source. Each unit ventilator is equipped with supply fan, filter, hot water coil, pneumatic control valve, outside air ducted connection/louver and discharge and inlet grilles. The unit ventilator provides ventilation air to the space through its ducted outside air louver, each louver is equipped with an outside air damper which is pneumatically controlled through the units onboard and the buildings central control system which consists of pneumatic tubing, a central air compressor located in the boiler room and control relays. The hot water coil generates heat to temper the mixed return air/outside air and delivers into the space through the vertical discharge grille. The hot water flow within the coil is modulated through the use of a pneumatic control valve and actuator. The actuator's function is

similar to that of the outside air damper. The unit ventilators themselves appear to be in fair to poor condition. They currently are operational and functioning as required however; several issues arise often throughout the school year mainly due to the control system and non-maintained components such as fan lubrication, filter changes and debris within the hot water piping system. Yearly maintenance should be performed on each unit consisting of filter change, fan motor lubrication, hot water piping treatment/cleaning and control valve exercising. Leakage within the pneumatic tubing throughout the building leads to issues with control valves and outside air damper not functioning. This in turn can relate to coil freeze ups and uncomfortable temperature swings.

Typical Unit Ventilator

Typical Pneumatic Thermostat

Office Heating Ventilation & Air Conditioning

All the office spaces are heating through the use of wall mounted fintube radiation. The flow of hot water within the fintube is controlled via a wall mounted pneumatic thermostat which functions the pneumatic control valve to open or close based on the occupants temperature set point. Ventilation air for the majority of the offices is through operable windows. However, there are some interior spaces which do not have any operable windows and therefore have no ventilation air. This is not code compliant and should be modified. Air conditioning for the office space's utilize residential style window air conditioners, ceiling fans or for interior spaces portable units were utilized. This method of cooling consumes increased levels of energy and provides overcooling which in turn increases discomfort. The fintube in many of these spaces was covered or concealed with storage. The functionality of the fintube requires that there is adequate space in front of the radiation to allow the convection process to occur. This blockage does not allow the fintube to reach its full potential which in turn requires the heating plant to work harder to maintain temperature, thus increasing energy usage.

Typical Fintube Radiation

Typical Window Air Conditioner at Interior Space

Typical Ceiling Fan

Typical Portable Air Conditioner at Interior Space

Large Group Spaces

The heating and ventilation systems for the Gym and Library consist of indoor hot water air handling units. The air handling units are located in storage rooms adjacent to the spaces. The horizontal air handlers utilize a hot water coil for a heat source which creates tempered air which is delivered to the associated spaces. The ventilation requirements for the spaces are provided through roof mounted hoods which are ducted to the units. The ductwork combines with the return ductwork prior to entering the unit. There are pneumatic dampers installed at each of these ducts which help regulate the amount of outside air and return air that is introduced into the unit. The duct distribution system associated with the indoor air handling units consist of galvanized sheet metal ductwork which travels within the ceiling space of the rooms. The ductwork terminates at the ceilings and walls through the use of diffusers. The return air for the system is brought back to the unit through low or high wall return grilles. The return grilles have galvanized sheet metal ductwork associated with it which communicates back to the air handling unit. The supply and return ductwork is insulated with what appears to be rigid fiberglass insulation. Majority of the insulation appears to falling off the ductwork and is need of replacement. The units appear to be original to the building and have reached the end of their serviceable life, replacement parts have become scarce and hard to come by. Yearly maintenance should be performed on each unit consisting of filter change, fan motor lubrication, hot water piping treatment/cleaning and control valve exercising. Leakage within the pneumatic tubing throughout the building leads to issues with control valves and outside air damper not functioning. This in turn can relate to coil freeze ups and uncomfortable temperature swings.

Typical indoor Air Handling Unit

Typical Duct Insulation

Typical Hot Water Piping at AHU

Typical Air Handling Unit

Exhaust Systems

General exhaust for the building is provided through roof mounted mushroom style exhaust fans. These fans are located throughout the building and provide exhaust for classrooms, storage rooms and toilet rooms. The duct distribution system associated with the exhaust fans consist of galvanized sheet metal ductwork which travels within the ceiling space of the building. The ductwork terminates at the ceilings and walls through the use of registers and travels up to the roof fans were it exists the building. All of the fans are controlled via a building time clock and operate on a time of day basis. The fans were functioning and appeared to be in fair condition.

Typical Roof Mounted Exhaust Fan

Typical Classroom Exhaust Register

Miscellaneous Spaces

General hot water heating was provided for corridors, vestibules and toilet rooms. Typical method of heating for these spaces was through the use of fintube radiation, convectors or cabinet unit heaters. Each unit was individually controlled via a wall mounted pneumatic thermostat which provided the hot water control valve function as well as fan control for the cabinet unit heaters. Majority of the equipment was original to the building but was observed to be functioning.

Typical cabinet Unit Heater

Typical Bathroom Fintube

Temperature Controls

The automatic temperature control system is of the pneumatic type and is manufactured by Powers. The system is provided with a single storage tank with duplex compressors and motors. The system is provided with a refrigerated air dryer as well as an oil and water separators. Each space or piece of equipment is controlled via a wall mounted pneumatic thermostat which communicates directly with the device and the buildings central air compressor and relays located in the boiler room. Within the boiler room there is a main Powers pneumatic control board which provides minimal control over the buildings equipment. The panel board does provide day/night control and temperature setbacks. Some of the thermostats located throughout the building were damaged and inoperable. It does appear that these compressors are operating properly however, due to the overall age of the pneumatic lines the system is not maintaining adequate pressure to maintain temperature control throughout the building thus requiring the compressor to operate frequently and increasing energy usage.

Pneumatic Control Air Compressor

Refrigerant Air Dryer

Powers Control Panel

Typical Thermostat

RECOMMENDATIONS:

The following is our professional opinion on what recommendations could help in improving, overall system performance, temperature controllability and energy savings,

Priority #1 – Life Safety/Code Compliance:

- Ventilation requirements for interior spaces.
- Removal of asbestos.

Priority #2 – Short Term:

- Insulate the hot water expansion tank.
- Repair/replace hot water piping insulation.
- Confirm and verify/replace combustion air fans for boilers.
- Provide complete service and maintenance of existing unit ventilators.
- Provide complete service and maintenance of existing exhaust fans.
- Provide complete filter changes quarterly per year.
- Provide complete service and maintenance of existing boilers.

Priority #3 – Long Term:

- Provide new high efficiency condensing boilers.
- Provide new inline system pumps with premium efficiency motors and variable frequency drives.
- Provide new indoor air handling units with premium efficiency motors and variable frequency drives.
- Provide a new direct digital control system including control valves, digital thermostats with feedback, damper actuators with feedback, freezestat alarms, unit controllers, graphic software with trending and web access and integrate it into a town wide control system network.
- Provide packaged rooftop units for air conditioned spaces with digital scroll compressors and ECM condenser fan motors.

Leicester Public School District Facilities Study
Primary School
Leicester, MA
Electrical, Security & Technology Existing Conditions Systems Report
J#330 038 00.00
L#45305/Page 1/August 22, 2014

ELECTRICAL:

The main switchboard is located in the main electric room on the second floor. The switchboard is rated for 1200 amperes at 120/208V, 3phase, 4 wire. It shall be noted that the main switchboard voltage is incorrectly labelled and should be addressed. The 1200Ampere main circuit breaker contains GFI protection.

There is an 110.88KW photovoltaic system that has recently been installed. The PV system seems to be connected upstream of the main switchboard as no PV circuit breaker was noted on the switch board.

The existing generator is diesel fueled, municipal water cooled, rated at 25KW 120/208V. Make and model are Kohler/30R084S9420A29.42, serial # 402326.

Emergency lighting does not meet current code separation requirements; however was code compliant at the time of installation.

Exterior site lighting consists of pole mounted cobra head fixtures for parking lot lighting, wall mounted flood lights around the building for general perimeter lighting, and recessed canopy lighting at entry / egress points. The fixtures are in fair condition but utilize HID sources which are relatively inefficient and quickly becoming obsolete.

Interior lighting has been upgraded to fluorescent fixtures throughout the building with the occasional exception in storage closets. The lighting is in fair condition.

Lighting control consists of line voltage local switching and keyed switches in the common areas. This method of control does not comply with the latest energy codes.

Receptacles have been added to support technology equipment. Installations vary in quality. Use of surface wiremold/raceway is frequent were computers have been added.

The fire alarm system is a twenty zone conventional panel manufactured by Standard electric time. The fire alarm system is obsolete and beyond its serviceable life. Detection consists of heat detectors only. There are many disabled and damaged fire alarm devices throughout the building. Most notification devices along with pull stations do not meet ADA requirements. The fire alarm system does not meet the current code requirements for fire alarm systems in educational use group facilities.

Various locations were noted where non-metallic sheathed cable was used “ROMEX”.

No GFI protection noted on outlets in kitchen within 6 feet of sinks.

SECURITY:

Intrusion system is a Honeywell system consisting of keypads, door contacts and motion sensors. The system is in fair condition.

There is an AIPHONE intercom station at the front entrance with a CCTV camera and monitor located in the admin office for front door release. The system is in working order.

TECHNOLOGY:

The telephone system is a COMDIAL MP5-BCH located on the second floor main electric room. The system is obsolete.

Master Clock system is non-operational.

There is no dedicated data closet for network equipment. The equipment is located in a storage closet on shelving and a chair. No cooling is present in this room, a fan has been installed and aimed at the data equipment as a temporary measure.
Data cabling is Category 6 however network drops are minimal.
The paging system is a Bogen model MCP-35. The system is operational however is beyond its serviceable life.

CATV is a coax system in poor condition.

Telephone handsets in classrooms do not meet ADA requirements for height.

RECOMMENDATIONS:

Priority #1 – Life Safety/Code Compliance:

- The Main switchboard voltage label shall be changed to read the correct voltage this could be potentially hazardous for anyone working on the gear.
- Fire alarm system upgrade to voice evacuation addressable type system with early warning smoke detection located in egress paths and ADA/NFPA72 compliant notification apliances.
- Remove any ROMEX wiring and replace with MC type cable.
- Provide GFI protection on receptacles in the kitchen within 6 feet of any sink.

- Emergency system upgrade with two transfer switches. Emergency system equipment to be separated from normal equipment. Existing generator could be reused. Panelboards to be provided for emergency lighting and for separate optional standby loads. New 2 hour rated feeders and emergency room required.

Priority #2 – Short Term:

- New LED exit signs should be provided and connected to emergency generator, constant-on circuitry.

- Exterior building mounted fixtures of the cut-off type to be provided and connected to emergency circuitry. Fixtures should be controlled with photocell ON, timeclock OFF.

- Provide a wireless GPS/LAN based wireless master clock system with wireless secondary clocks.

- Provide CAT 6 tel/data cabling network with a dedicated conditioned data closet were cables terminate and network equipment can be installed. Data drops in each room shall be installed to meet the schools technology needs.

- A new VOIP telephone system with VOIP telephone handsets should be installed.

Priority #3 – Long Term:

- Additional receptacles to be provided in offices with dedicated neutrals for computer usage.

- The power distribution system upgrade with a new secondary switchboard housed in a dedicated electric room. A system of new panelboards to be provided and housed in dedicated electric rooms.

- Exterior lighting for parking areas to be replaced with cut-off luminaires possibly of the LED type controlled with photocell on, timeclock off.

- Provide ceiling mounted occupancy sensors in offices/work spaces to turn lights OFF.

- Upgrade the paging system to a classroom intercom station with bell scheduling capabilities and telephone system interface.

- Provide a security system consisting of card access, CCTV and integration and modification of the existing intrusion system.