5.0 Existing Conditions Analysis / Documentation
Central Office Building

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 5* includes the existing conditions information relevant to the Central Office Building.

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:

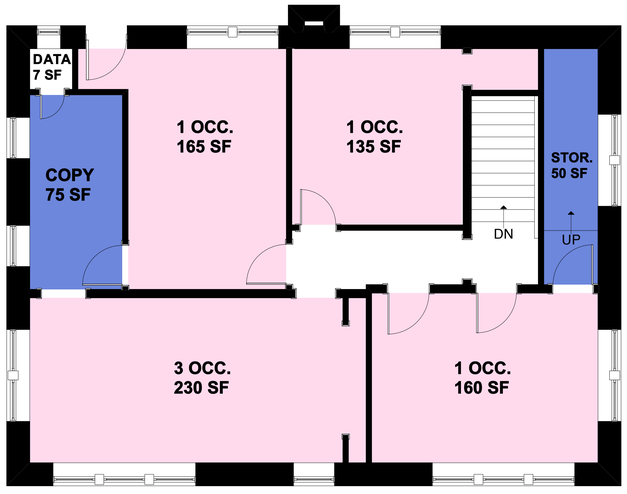
- **Priority 1**: Life safety / code compliance: Issues which require immediate action.
- **Priority 2**: Short term: Issues which will likely need to be addressed within the next 1-3 years.
- **Priority 3**: Long term: Issues which will likely need to be addressed within the next 4-10 years.

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

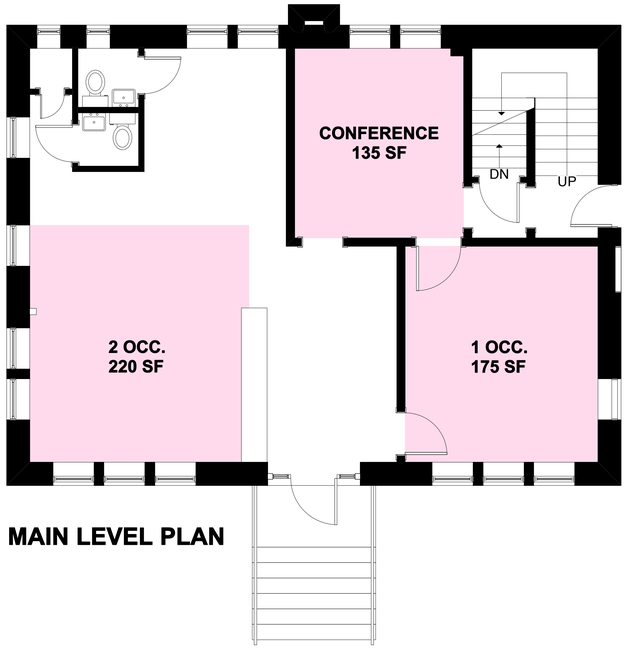
INDIVIDUAL REVIEW DOCUMENTS

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

- Existing Conditions **Layout Plan.**
- Summary of **Environmental Regulatory Constraints.**
- 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.



UPPER LEVEL PLAN



MAIN LEVEL PLAN

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

0 5 10 15 20 25 FT

CENTRAL OFFICE BUILDING

9/24/2014

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:

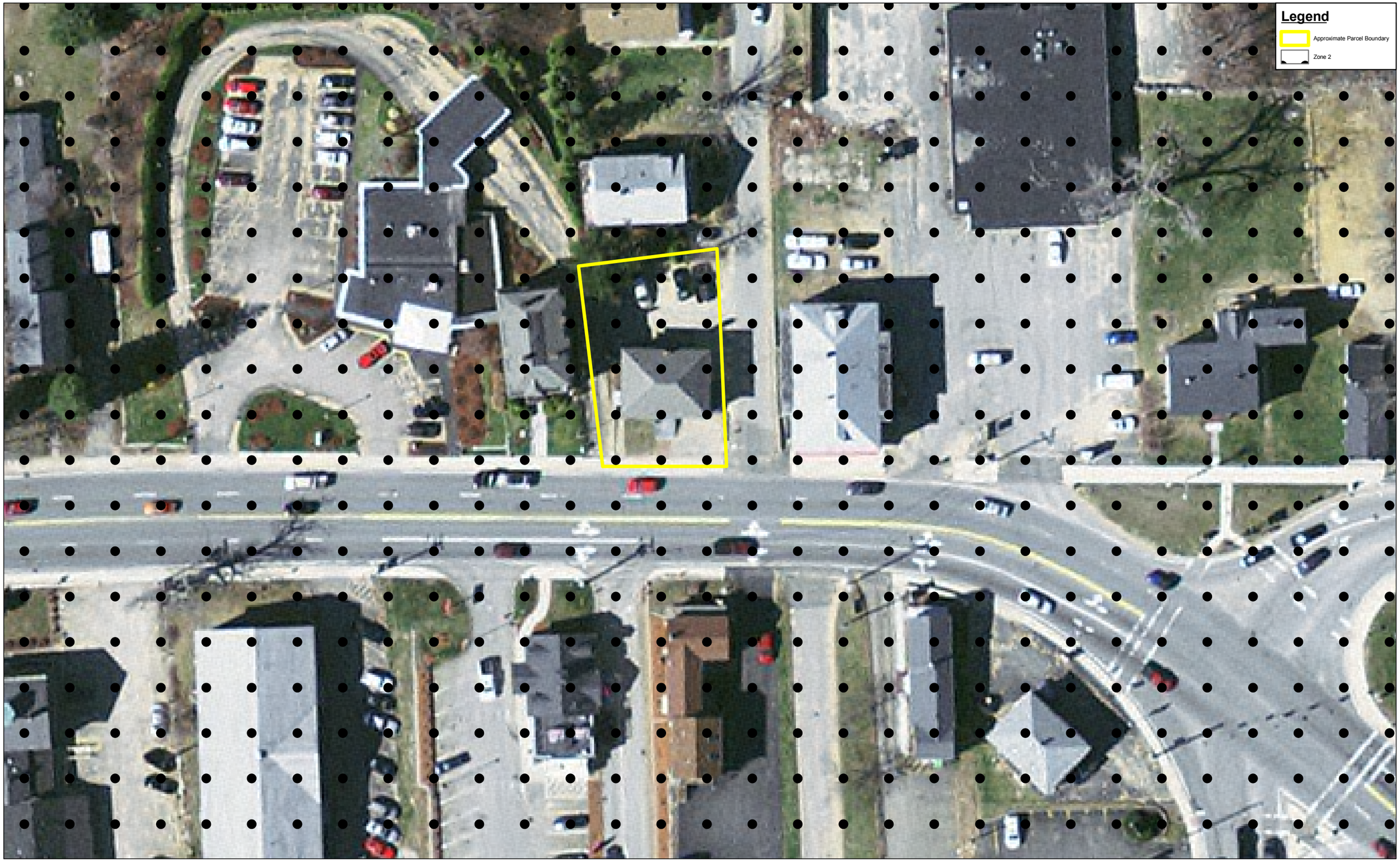
This line represents a river that generally flows all year without drying up and has a 200-foot regulatory buffer. Work within this buffer is subject to DEP and local Conservation Commission approval. Generally this area is to be avoided regarding development.

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 Public School Central Office
Leicester, MA

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

Aerial Photo with Environmental Constraints
Date 8.13.14

N

Data Source: MASSGIS from 2009

0 20 40 80 Feet

JOHNSON ROBERTS ASSOCIATES INC. ARCHITECTS

LEICESTER PUBLIC SCHOOLS CENTRAL OFFICE BUILDING

1078 Main 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 good, age-appropriate condition, the building does not appear to be fully handicapped-accessible.
The building is currently used for offices and is classified as Business Use (B).

Refer to Appendix A for more information and Prioritized List of Recommended Work.

EXISTING CONDITIONS

Building Description

Leicester School Department's Central Office is located in a two-story building with full basement and concrete foundations, brick exterior walls, wood-framed floors and roof, with wood windows and doors. It appears to have been originally constructed as a residence, but later was converted to serve as Office Space for School Department of the Town of Leicester. There is no vestibule in the building.
There are no existing as-built drawings for this building. Our findings, based on visual field surveys, review of existing Town reports and assumption of continued use of this building for business/office use.

Exterior Walls

The exterior walls are generally in good condition. There appear to be a few areas that may require repointing in the near future. There is also some efflorescence on and below the brick window sills.
• Some caulking repair is needed around doors, windows, louvers and infilled openings.
• Investigate & repair leak at rear basement wall.

Roof

The roof appears to be near the end of its life and will need a replacement within 3-6 years.

Exterior Windows and Doors

• The exterior windows are double hung wood windows, with added aluminum storm windows. The wood windows appear to be original to the building, are at the end of their expected life and may require a renovation or replacement within 3-6 years.

• Water damage is evident on the carpet next to windows in Copy Room. This area needs to be examined for source of water leak and repaired.
• There are several types of doors used in the building. A few doors show deterioration and require refurbishment/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 public entrance at Main Street and one emergency exit door on the driveway side.
• Front entrance is not accessible without assistance – there is no ramp, only steps with handrails that don't comply with current Code. The main door threshold is too high and presents a tripping hazard.
• There is no accessible parking or accessible path from parking to front entry.
• There is no elevator between floors.
• The interior stair and handrails are not compliant with current Code.
• Door Hardware doesn't comply with Access requirements. Doors lack required clearances on latch side. Most doors and openings are too narrow.
• Reception desk doesn't have required clearances for wheelchair users and does not comply with Access Code.
• Restrooms lack required clearances and are not accessible. Plumbing fixtures are not accessible and grab bars are not installed.
• Drinking fountain is not provided. If desired, a hi-lo type of fountain will be required. (Optional - not required for less than 15 occupants)
• Access-compliant signage (with braille) is not installed.

Applied Building Finishes

Some of the applied finishes show excessive wear, most appear to be original to the building and need to be repaired.
• Some wood doors are at the end of their expected life and should be replaced.
• Floor finishes show excessive wear and will need to be replaced.
• Water damage is evident on the carpet in Copy Room. New carpet or alternative floor finish is needed in this area.
• Ceilings range from fair to good condition, with little apparent water damage. Some repair may be needed.

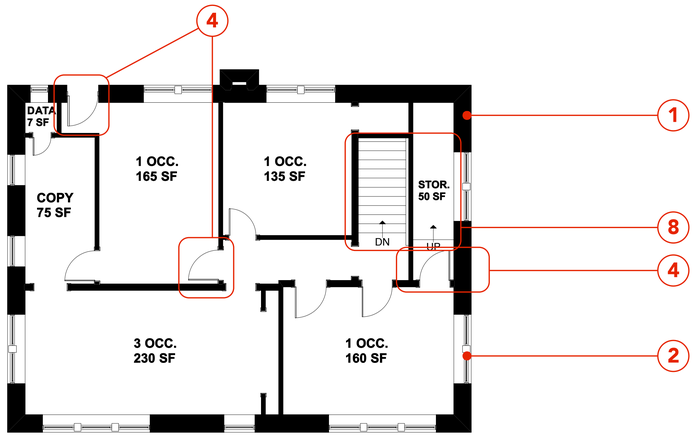
Egress and Safety

• Some doors and door openings are too narrow, are no longer Code-compliant and should be replaced.
• Egress path width and continuity. Egress path narrows towards egress door, the step risers and treads have differing height. Stair will need to be rebuilt to comply with Code.
• Overflowing storage and equipment present potential fire and tripping hazard. Excess materials and equipment should be removed and/or proper storage should be provided.

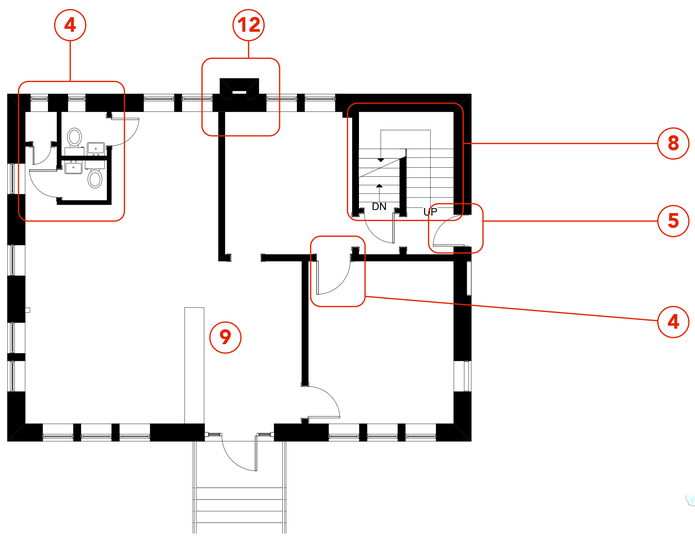
Hazardous Materials

• If building renovations are undertaken, any encountered hazardous materials should be addressed in accordance with applicable guidelines.

LEICESTER PUBLIC SCHOOLS CENTRAL OFFICE BUILDING
1078 Main Street • Leicester, MA • 01524



SECOND FLOOR PLAN



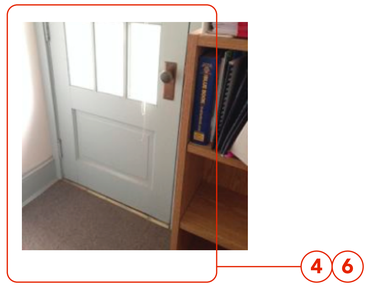
FIRST FLOOR PLAN

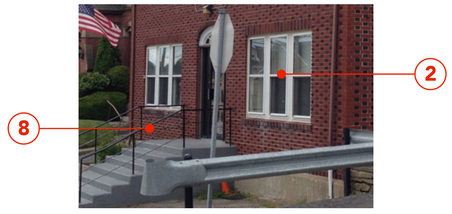
0 5 10 15 20 25 FT

PRIORITIZED LIST OF RECOMMENDED WORK

	ISSUE	RECOMMENDATION	PRIORITY
1	EXTERIOR WALLS DO NOT COMPLY WITH CURRENT ENERGY CODE REQUIREMENTS.	ADD FURRING, INSULATION AND DRYWALL	3
2	EXTERIOR WINDOWS DO NOT COMPLY WITH CURRENT ENERGY CODE REQUIREMENTS, EXCEEDED LIFE EXPECTANCY	REPLACE WINDOWS THROUGHOUT WITH ENERGY EFFICIENT UNITS	3
3	ROOF IS APPROACHING END OF LIFE EXPECTANCY	INSTALL NEW ROOFING AND ADDED INSULATION AS NEEDED TO COMPLY WITH ENERGY CODE.	3
4	DOOR DOES NOT HAVE CODE-REQUIRED CLEARANCE (MAAB)	INSTALL AUTOMATIC DOOR OPENER	1
5	EXTERIOR DOOR DOES NOT COMPLY WITH ACCESSIBILITY REQUIREMENTS.	REVERSE SWING, INSTALL AUTOMATIC DOOR OPENER	1
6	DOOR HARDWARE DOES NOT COMPLY WITH ACCESSIBILITY REQUIREMENTS. WOOD DOORS EXCEEDED LIFE EXPECTANCY	INSTALL NEW DOORS AND HARDWARE. TYPICAL ALL INTERIOR DOORS	1
7	RESTROOMS DO NOT COMPLY WITH ACCESSIBILITY REQUIREMENTS.	PROVIDE ADA-COMPLIANT RESTROOMS	1
8	GUARDRAILS, HANDRAILS, TREADS AND RISERS DO NOT COMPLY WITH ACCESSIBILITY AND CURRENT BUILDING CODE REQUIREMENTS	REPLACE GUARDRAILS AND HANDRAILS	3
9	RECEPTION DESK DOES NOT COMPLY WITH ACCESSIBILITY REQUIREMENTS.	PROVIDE CODE-COMPLIANT MODIFICATION TO DESK	1
10	SECOND FLOOR IS NOT HANDICAPPED-ACCESSIBLE	INSTALL ELEVATOR	3
11	ACCESSIBLE DRINKING FOUNTAIN NOT PROVIDED	INSTALL CODE-COMPLIANT HI-LO DRINKING FOUNTAIN	3
12	LEAK AT NORTH SIDE OF BASEMENT	INVESTIGATE, REPAIR WALLS	1
13	PLASTER AND PAINT FINISHES AT END OF EXPECTED LIFE	PATCH AS NEEDED, APPLY NEW FINISHES	3
14	PAPER GOODS ARE BEING STORED IN WET CONDITIONS	RELOCATE/PROPERLY STORE RECORDS AND MATERIALS	1
15	FLOORING IN POOR CONDITION, EXCEEDED LIFE EXPECTANCY	INSTALL NEW FLOORING THROUGHOUT	3
16	ROOM SIGNAGE IS NOT CODE-COMPLIANT	INSTALL CODE-COMPLIANT ROOM SIGNAGE	1
17	THERE IS NO ACCESSIBLE PATH TO PARKING, NO HANDICAPPED PARKING PROVIDED	ADD ADA-COMPLIANT PARKING, RECONFIGURE SIDE DOOR TO ALLOW FOR HANDICAPPED ACCESS	1

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





JOHNSON ROBERTS ASSOCIATES INC.
ARCHITECTS

5.0 Existing Photos - CENTRAL OFFICE

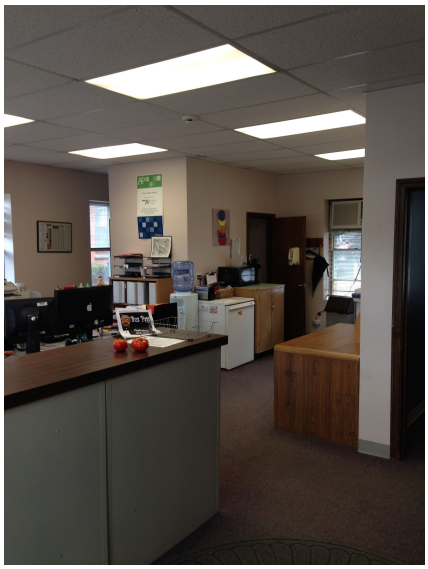
View from Main Street

View from parking lot

View from driveway

Interior – Reception Area

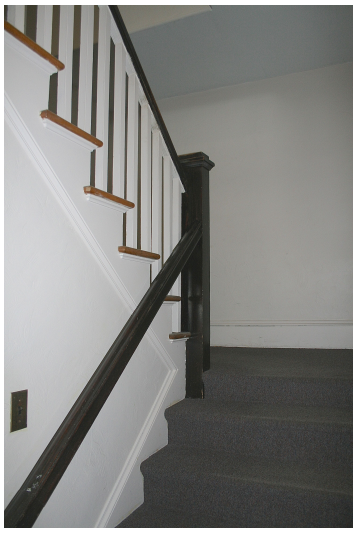
Interior – Storage Area, First Floor



Interior – Copy Area, First Floor

5.0 Existing Photos - CENTRAL OFFICE

Existing Main Stair



Existing Main Stair

Interior Stair – Second Floor

Interior – Second Floor egress balcony door

Interior - Basement

Interior - Basement

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: School Administration Building-Leicester, MA
Existing Conditions Study

Dear Jeff:

This letter summarizes our findings regarding the present condition of the structure of the School Administration 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 do not appear to be any existing structural drawings for this building, and as such, our comments are based solely on our field observations and experience. 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 structure's underlying condition.

Existing Conditions

On July 16, 2014, I toured the existing School Administration Building with Natalie Eringros from your office. This building appears to have been originally built as a residence and at some point in the past was converted into the administrative offices for the town's school department. The structure is a two story building with a full basement. Both the first and second floors are presently being used as offices, and the basement is being used for record storage.

The building has a full basement with cast-in-place foundation walls on the perimeter and a slab-on-grade. There are steel pipe posts down the center that support the upper floor framing. The exterior of the building is brick masonry. (It is unknown whether this is a veneer on a stud wall back-up, or multi-wythe bearing masonry). The floors are conventionally wood framed. The roof is a large hip and is most likely wood framed. The exterior (either wood framed walls or unreinforced masonry) walls act as shear walls to provide lateral stability for the building under wind and seismic loadings. Steel angle lintels support the brick veneer at the exterior openings.

We were not able to definitively determine the allowable gravity loading capacity of the framed floors and roof, due to the lack of original drawings and the fact that finishes covered all the framing with the exception of some first floor framing visible from the basement. Based on what we could determine, it appears that the first floor has an allowable floor live load generally compatible for office use (70 PSF). The actual allowable live load of the second floor is not possible to determine due to the fact that we were not able to determine the actual framing, but based upon the way the floor was performing, a live load of 50 PSF seems appropriate. The allowable loading capacity of

the building's roof was also not discernable, but appeared to be adequate based on its performance.

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 minor cracking in the basement floor slab-on-grade. The upper floors 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. The building structure generally appears to be in good condition and well maintained.

Addition/Renovation Feasibility

We understand that the town is considering changing the use of this building from an office use to an educational use. Since this building is so small, it is our opinion that this change of use would not move the structure into a higher "Occupancy Category". 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 <u>entire structure's lateral system</u> 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 <u>entire structure's lateral system</u> 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 to 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 masonry walls should be left intact, as much as is possible, as increasing the lateral shear in any masonry wall 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 our site visit, it appears that any new foundations would be conventional shallow foundations with spread footings and slabs-on-grades.

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

Reginald Roome II, P.E.
Partner

LEICESTER PUBLIC SCHOOLS

P R E L I M I N A R Y

1411 / School Facilities Study

CENTRAL OFFICE

MEPFp SCOPE OF WORK: '*REPAIRS ONLY*' OPTION

revised 9/24/2014

TOTAL AREA: 3,460 GSF

LOWER LEVEL: 1,130 GSF

MAIN LEVEL: 1,200 GSF

UPPER LEVEL: 1,130 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 Provide a new drinking fountain at main and upper levels	2
P.3 Provide a new janitor sink at main and upper levels	2
P.4 Replace water closet seats with open seats (no covers)	1
P.5 Insulate all cold water piping	2
P.6 Install new appropriately sized HW heater	3
P.7 Replace all existing plumbing fixtures with code compliant fixtures	3
FIRE PROTECTION	
No work noted	n/a
HVAC	
H.1 Provide combustion air at the boiler room	1
H.2 Provide new insulation at all HW heating piping	2
H.3 Provide new condensing boiler, premium efficiency pumps w/ VFD's and hot water fin tube radiation	3
H.4 Provide a new forced air cooling system utilizing high efficiency indoor air handling units	3
H.5 Provide a new DDC control system	3
ELECTRICAL	
E.1 Connect smoke detector in basement to the fire alarm system	1
E.2 Provide GFI coverage to outlets in basement	1
E.3 Replace light in second floor corridor	1
E.4 Provide occupancy sensors in all rooms	3
E.5 Provide battery emergency lights in all egress corridors	1
E.6 Connect service electrode on load side of water meter	1
E.7 Provide new exterior building mounted lighting with photocell ON / timeclock OFF	1
E.8 Provide new security system with card access, CCTV - integrate/modify existing intrusion system.	3
E.9 Upgrade service to 120/208V, 3 phase , 4 wire service (for elevator installation)	3

JOHNSON ROBERTS ASSOCIATES INC. ARCHITECTS

Leicester Public School District Facilities Study
High School
Leicester, MA
Plumbing/Fire Protection Existing Conditions Systems Report
J#330 038 00.00
L#45299/Page 1/August 22, 2014

PLUMBING/FIRE PROTECTION

Executive Summary:

The Central Office building has been well maintained however we have the following recommendations:

- Install a master mixing valve on the domestic hot water heater. Store hot water at 140 degrees to avoid Legionnaires' Disease.
- Repair leak in basement wall to protect stored items.
- 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.
- Provide a drinking fountain per floor to comply with the plumbing code minimum fixture requirements. Bottled water does not meet the requirements of the plumbing code.
- Provide a janitor's sink per floor to comply with the Plumbing code minimum fixture requirements.
- The 40 gallon gas water heater provides much more water than the two lavatories can use and appears to be greatly oversized.
- Insulate water piping.

The building is serviced by municipal water, municipal sanitary sewer and natural gas.

Fixtures:

The water closets are floor mounted, 1.6 gallons per flush, round front, tank type, not elongated bowl, with closed front seat and cover. The water closet is not handicap accessible.

The lavatories are compact, wall hung vitreous china. The faucets are center-set hot and cold water mixing type with knob handles. The lavatories are not handicap accessible or metering type.


Typical Water Closet


Typical Lavatory

Water System:

The domestic water piping consists of copper tubing with wrought copper fittings. The piping appears to be in fair condition. The piping is generally not insulated throughout the building.

The domestic water service enters the basement of the building. The 3/4" domestic water service is located in the front Storage Room. There is a 3/4" water meter located on the 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 Watts 9D backflow preventer on the boiler water make-up. The vent on the backflow device is piped to the floor and may discharge water onto nearby stored items.

Domestic hot water is provided by a storage type gas heater with 40 gallon storage capacity and 40,000 BTUH input. There is no thermostatic mixing valve on the hot water system which protects the patrons from scalding.


Water Meter


Water Heater


Watts 9D Backflow on Boiler

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.

The Basement Mechanical/Storage Room does not have a floor drain. Rain or ground water appears to be leaking through the rear exterior wall by the boiler flue penetration. Water is collecting on the floor and may damage nearby stored paper items.

The roof is pitched with continuous gutters draining to two downspouts on the front of the building and onto grade.

Gas Meter

Gas Regulator

Gas Boiler

Natural Gas System:

The Gas service enters the front basement storage area and connects to the gas meter and regulator. The regulator vent is piped to the exterior. Natural gas is supplied to the boiler and domestic water heater.

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.
- Repair leak in basement wall to protect stored items.
- Replace the water closet seats with open seats less the cover to comply with code.

Priority #2 – Short Term (Next 3 Years)

- Provide a MAAB drinking fountain per floor to comply with the plumbing code minimum fixture requirements. Bottled water does not meet the requirements of the plumbing code.
- Provide a janitor's sink per floor to comply with the plumbing code minimum fixture requirements.
- Insulate cold water piping to prevent condensation and hot water piping to conserve energy.

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

- The 40 gallon gas water heater provides much more water than the two lavatories can use and appears to be greatly oversized. Provide a smaller electric water heater.

- 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.

Leicester Public School District Facilities Study
Central Office
HVAC Existing Conditions Systems Report
J#330 038 00.00
L#45306/Page 1/August 18, 2014

HVAC

Executive Summary

The Central Office Building has received average maintenance on the heating system and equipment over the past years. The boiler system presently installed is not original to the building and has been upgraded and is currently in good operating condition. Controllability of the present system requires an upgrade to achieve better efficiencies and to reduce energy consumption. Considerations should be made to converting the entire system to hot water to provide a more energy efficient heating median.

Heating Plant

The boiler located in the basement level is a Burnham gas fired tube boiler which generates steam and supplies heat to the entire building through floor mounted cast iron radiators. The main heating boiler utilizes schedule 40 black steel piping for distribution. The piping system appears to be insulated with fiber glass insulation on the mains which is original to the building. The elbows however, appear to asbestos. Combustion gases generated from the boiler exhaust to an existing masonry chimney through a galvanized steel uninsulated breeching system. Combustion air for both boilers is provided through natural building infiltration which is not code compliant and requires an upgrade. 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 satisfactorily however, piping insulation is in need of being replaced.

HW Boiler Plant

Boiler Breeching & Piping

Typical Cast Iron Radiator

Piping Insulation

Air Conditioning

Air conditioning is provided through the use of residential style window mounted air conditioners. These are located in each space and have built in control panels.

Typical Window Air Conditioner

Ventilation

Ventilation air is provided for each space through the use of operable windows. For natural ventilation IMC 2012 requires that the operable portion of the window is a minimum of 4% of the floor area of which it serves. This should be verified for code compliance.

Toilet Room

The toilet rooms are provided with residential style ceiling mounted exhaust fans which exhaust directly to the outdoors. These fans operate via the light switch.

Typical Ceiling Mounted Exhaust Fan

Temperature Controls

The automatic temperature control system is a standalone system which consists of the cast iron radiators having built in controls and adjustments on the unit itself. The system is operating but this style of control has a tendency to overheating the spaces. Each radiator is equipped with a thermostatic control valve which allows heat setting to be manually adjusted by the occupant. The main boiler plant is controlled via a wall mounted programmable thermostat which is equipped with a scheduled program and night set back features. This thermostat will activate the boiler based on overall space temp and time of day.

Typical Thermostatic Control Valve

Programmable 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 each space must be verified with the current operable window area.
- Provide combustion air for the boiler plant to meet National Fuel Gas Code 2002.
- Removal of asbestos.

Priority #2 – Short Term:

- Provide new 1-1/2" heating hot water fiberglass insulation on all piping.

Priority #3 – Long Term:

- Provide new heating hot water system with high efficiency condensing boilers, premium efficiency pumps with VFD's and hot water fin tube radiation.
- Provide forced air cooling system utilizing high efficiency indoor air handling units.
- Provide a direct digital control system with web access for the entire building and integrate it with a town wide control system network.

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ELECTRICAL:

Electrical Distribution System:

Three phase primary service runs overhead across the street.

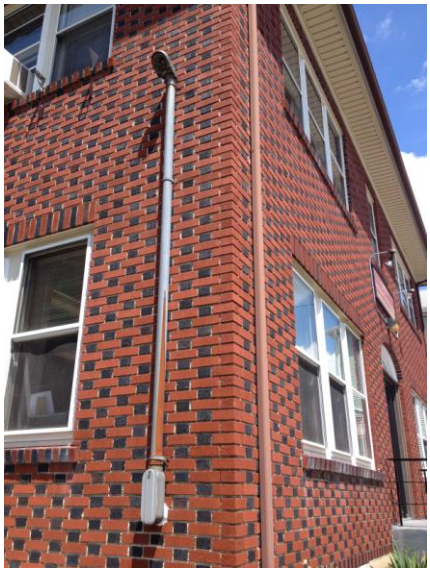
Secondary service runs overhead across Main Street to utility pole # 120-1 at the rear of the parking lot. Two meter sockets, one inactive, are located on exterior of the building. A second service drop weatherhead has been abandoned in place, conductors have been removed.

Utility Pole with Transformer

Service Drop & Meter

Building has two incoming services consisting of two set of 3#1AWG aluminum service cables between meter socket and two load centers.

Load Center



Abandoned Second Service Weatherhead

Two (2) 100 ampere main breaker load centers, 120/240 volt, 1 phase, 3 wire are located in the basement. Panels are full and in fair condition. Both panels have been combined into one common service. The meter number is 75757862.

The load centers are Square D, QOC. A 12 pole subpanel was added, fed from a 40A/2P breaker.

Wiring method is generally Romex. Romex in basement is generally improperly supported. Fire alarm wiring is low energy cable.

120 volt smoke detectors exist in basement. System smoke detector in basement is not connected. System smoke detectors are located in each room. Horn/strobe units are ADA compliant. Fire alarm panel and intrusion system share a common panel by Honeywell. A knox box is located outside adjacent to side entrance door.

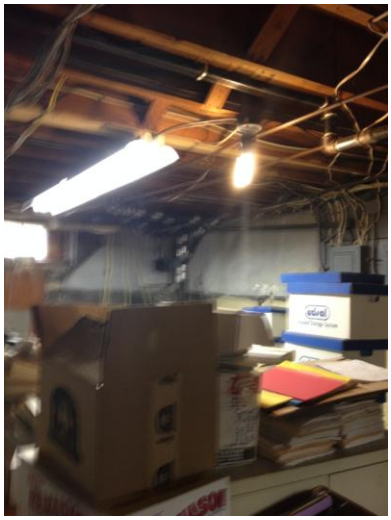
Knox Box

Horn/Strobe

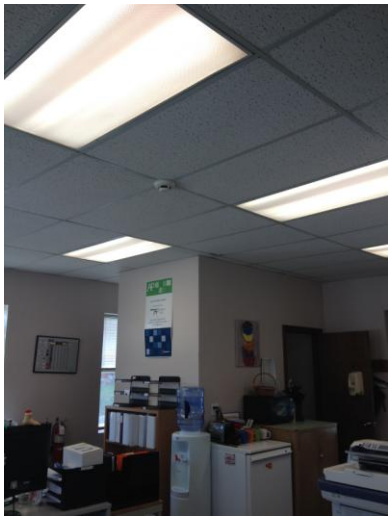
Exterior lights consist of HID wall packs and mini sconces over doors.

Exterior Lights

Interior lighting consists of industrial strips and open grid 2x4 troffers in basement. First floor offices have recessed 2x4 troffers with T8 lamps. Second floor has open channel strips with T8 lamps. Second floor corridor has a porcelain socket with a pull chain. An open fluorescent circline fixture without lens is located in stairwell. Offices have wall mounted occupancy sensors.

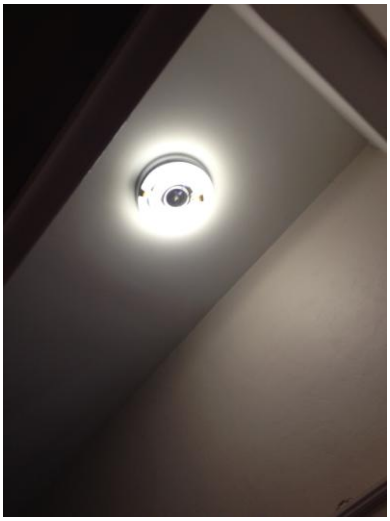


Basement Lights



First Floor Office Lights

Second Floor Office Lights



Stair Fixture

Basement receptacles are not GFI.

Building does not have a lightning protection system.

Emergency boiler shut-off switch exists at top of basement stair.

SECURITY:

Honeywell intrusion alarm system with motion detection and door contacts are in fair condition.

TECHNOLOGY:

Telephone demark is located in the basement. It seems to have been added to and modified many times and the labeling and condition of the wiring is poor. The environment in which it is located is damp and non-conducive to electronics.

Fiber optic district network connection is located on the third floor in a dedicated data closet that also houses servers and the telephone system.

Telephone system is new and in good condition. Manufacturer is ESI model ESI-50.

Cat 6 data cables are sparsely located resulting in long patch cables run from wall to above ceiling to respective piece of equipment.

RECOMMENDATIONS:

Priority 1: Life Safety/Code Compliance:

- Connect system smoke detector in basement to fire alarm system.
- Change basement receptacles to GFI.
- Replace porcelain socket in second floor corridor and provide occupancy sensors.
- Supplement egress paths with battery operated emergency lights and exit signs.
- Connect service electrode also on load side of water meter.

Priority 2: Short Term (Next Three Years):

- Replace exterior lights with LED cut-off fixtures.
- Properly support Romex wiring in Basement.

Priority #3 – Long Term:

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

- Upgrade service to 120/208V, 3 phase, 4 wire. If an elevator is ever added, a three phase service would be required.