

5.2 Greens Farms Elementary School

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5.0 Existing Facility Survey

Master Plan Facility Study for Westport Public Schools

GREENS FARMS ELEMENTARY SCHOOL

5.2.1 Architectural Conditions Analysis

Existing Building The Greens Farms Elementary School is a Y-shaped structure located at 17 Morningside Drive South, just south of the Boston Post Road. The Tudor Revival style school was first built in 1925, with its first addition constructed in 1950, and a renovation and second addition built in the late 1990's. It was added to the National Historic Registry in 1991.



Currently twenty-three (23)* classrooms serve approximately 373 students from Kindergarten to 5th Grade, spread across the three main wings of the structure which radiate out from a central gymnasium. In addition to the classrooms, the students are served by a: Music Room, Auditorium, Library, Computer & Media Rooms, and Cafeteria & Kitchen. Administrative offices and a Nurse's Station are located in the older main block near the original main entry.

The original 1925 two-and-one-half-story brick structure sits atop an elevated site, set on an exposed stone foundation with steep pitched gabled roofs. In 1950, the school was expanded with an addition built to the south, angled slightly to the west and stepping down the slope of the terrain. This two-story, flat-roofed addition was constructed in a Neo-Tudor style of brick and limestone, and also provided a new main entrance. After declining enrollment in the 1980's, the school closed for

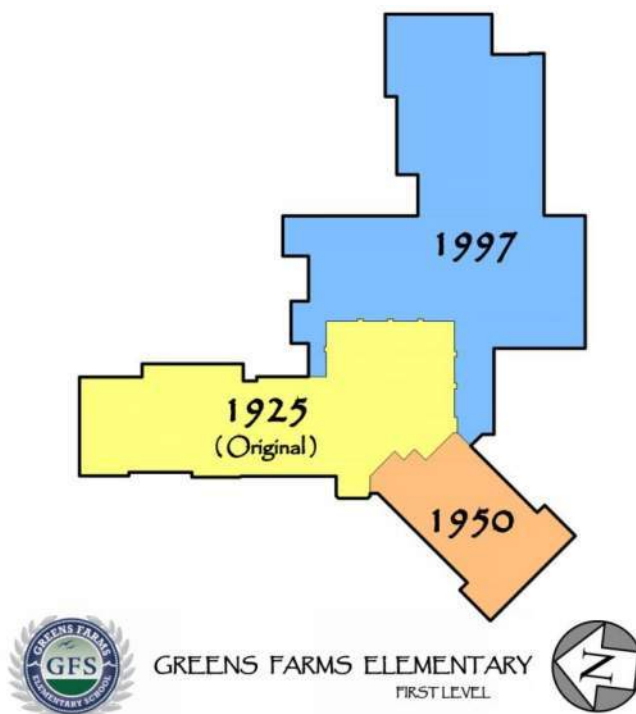
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5.2.1 Architectural Conditions Analysis

several years. By the mid 1990's with increasing enrollment, Town officials decided to re-open Greens Farms with a major renovation and addition, completed in approximately 1997. The sizeable new addition was built to the east of the original main block and provided not only a new wing for classrooms, but also a new gymnasium, library, and entrance for student drop off. Continuing in the Tudor style of the original structure, the addition was built of a masonry veneer with a series of steeply pitched gable roofs.



The facility provides approximately 94,900 SF on three different levels. The First Floor, at about 54,000 SF, consists of classrooms, the Gymnasium, Library, Auditorium, Computer & Media Rooms, Music Room, Nurse's Station, and Administrative Offices. The Second Floor, at approximately 29,300 SF, is primarily made up of classrooms. A large mechanical room is also located near the center of the floor. The Lower Level (basement), at about 11,600 SF, is separated into two primary locations; one at the north of the original structure, and the other to the south, in the second addition. The basement area of the original structure is mostly mechanical space, although there is also a Conference

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5.2.1 Architectural Conditions Analysis

Room. The southern basement is made up primarily of the Cafeteria and the Kitchen.

There have been no major renovations or upgrades since the last renovation in the 1990's.

Student bus drop off and Administrative parking is located in the northwest corner of the site. There is also additional parking to the west and south sides.

This report includes descriptions of the various systems, the areas they serve, system capacities, existing conditions, areas of concern, and recommendations for each system. Existing Code-related items and issues are reviewed for conformance with building codes presently in effect at the time of this Study.

*** Represents physical room count. Actual classroom space uses may differ in practice.**

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5.2.1 Architectural Conditions Analysis

Building Profile

Greens Farms Elementary School
17 Morningside Drive South
Westport, CT 06880

Grades:	Kindergarten – 5th Grade
Original Construction:	1925
Addition #1:	1950
Addition #2:	1997
Lot Size:	8.68 acres
Zoning:	A
Number of Parking Spaces:	101 spaces, incl. six (6) handicapped
Building Façade:	Brick and stone veneer
Roof Construction:	Gabled Roof – Asphalt Shingles Flat Roof – EPDM
Occupancy Classification:	E, Educational A-3, Assembly B, Business
Construction Type:	IIIA – Protected-Combustible
Fire Protection System:	Yes (Sprinklered)
Emergency Generator:	No
Handicap Accessible:	Yes (Elevator)
Number of Floors:	Three Floors (including Lower Level / basements)
Existing Total Floor Area:	94,900 SF (gross area)

GREENS FARMS ELEMENTARY SCHOOL

5.2.1 Architectural Conditions Analysis

Building Envelope Building Envelope – Exterior Walls

The exterior walls of the facility are constructed of brick and stone veneer with concrete masonry unit backup. The total wall thickness varies in the different wings, but is on average 16". The masonry façade varies in coursing and mortar style dependent on the portion of the structure. The original 1925 school's brick pattern is a rustic Flemish bond with an over grout mortar joint. The addition in 1950 uses a traditional Common bond, and the 1997 addition, a Running bond. Limestone parapets, lintels, and arches provide accents to the 1925 and 1950 sections of the facility.



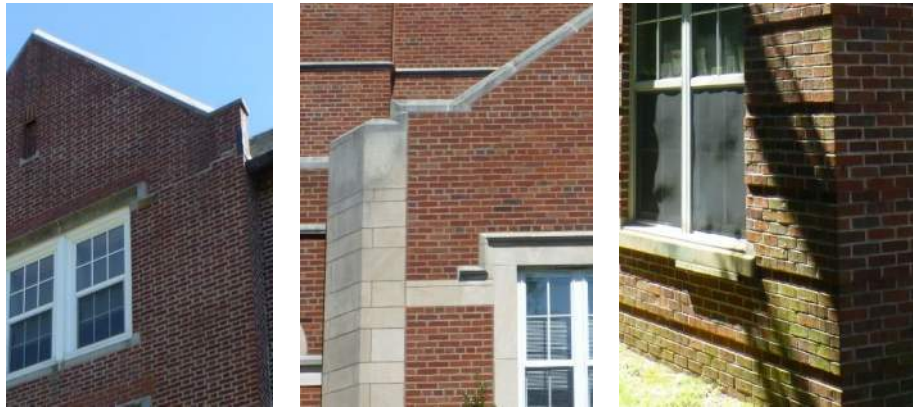
Overall, there were no obvious cracks in the masonry and stone veneer, and it appears to be in good condition. Mortar joints and caulk joints also appear to be free of deterioration and shrinkage.

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5.2.1 Architectural Conditions Analysis

Several locations throughout the façade were noted to be in need of cleaning. Black and green algae were observed on the north gable as well as many of the limestone sills, headers, and corners throughout. It was also observed along the masonry walls of the southeast corner of the school.



Black staining was noted on the CMU walls along the southwestern façade.



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5.2.1 Architectural Conditions Analysis

Lichen at the limestone parapet roof coping can be found along the southwestern portion of the school.



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5.2.1 Architectural Conditions Analysis

Building Envelope – Roofs

The school roof consists of two distinct types: asphalt shingles at the gabled roofs; and EPDM at the flat roofs. Both roof systems appear to be in fairly good condition.



Other than exhaust fans, there are no major mechanical equipment units on the roofs. There are two (2) skylights; one located on the First Floor roof over the corridor near the administrative office, and the other is on the Second Floor at the southern portion of the north wing. They are plexiglass barrel vaults protecting glass tiles in the ceiling structure. The barrel vaults appear to be in good condition. The glass tile will be discussed further in the Ceiling section.

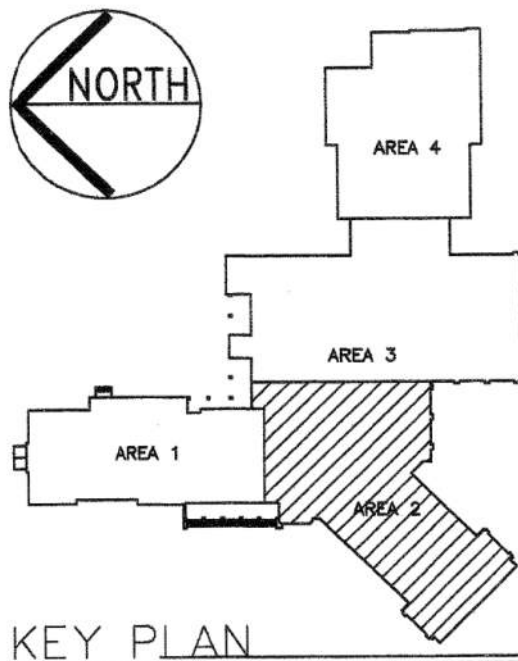


GREENS FARMS ELEMENTARY SCHOOL
5.2.3 Structural Conditions Analysis

Michael Horton Associates, Inc. was retained by Antinozzi Associates to review the current structural conditions of the School. This report includes descriptions of the existing conditions, areas of concern, and recommendations for any remedial measures required.

Structural

The structure consists of three distinct structures. The original structure (Area 1) built in 1925, a subsequent addition constructed to the south and angled to the west (Area 2) circa 1950, followed by an addition to the east of the original structure (Areas 3 & 4) constructed in 1997. Please refer to the Key Plan below.



Generally, the overall structure is in fair condition. The structure appears to have been well maintained. There are minor structural issues throughout with regard to cracks in concrete slabs, cracks in concrete masonry unit (CMU) and brick masonry walls, spalling concrete roof slabs, and some severe corrosion of the lintels in certain areas. There is some minor corrosion of exposed steel and lintels within the structure.

Moisture to varying degrees has infiltrated the wall systems and is evident in the corrosion of lintels, spalling of the masonry/precast elements, as well as the observed efflorescence on the masonry and peeling of paint finishes. Some of the conditions observed are indicated below.

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5.2.3 Structural Conditions Analysis

Original Building
Area I

Building Envelope – Exterior Walls

The typical exterior walls of the Original Building consist of a multi-wythe brick supported on a mortared stone foundation wall. Decorative cast stone copings and window trim were used.

On the front elevation of the building, one location was observed, where the precast concrete window head is cracking at the second floor window. Please refer to Photograph Exhibit GF-1. This stone should either be repaired with a pressure injected epoxy adhesive or be removed and replaced. The Architect would provide a detail for this work.

On the front elevation of the Original Building, the west basement window lintels at the north end are severely corroded and exhibit delamination and excessive deflection. The mortar joint above the lintel has been repointed in the past and the joint is large. This is also evident at the basement window on the north elevation. Please refer to Photograph Exhibit GF-2 and Photograph Exhibit GF-3. This will require repairs to prevent water infiltration. The lintels should be removed and replaced.

At the north end of the Original Building on the east elevation, the concrete entry roof canopy to the Boiler Room is exhibiting signs of spalling concrete due to the corrosion of the reinforcing steel. Please refer to Photograph Exhibit GF-4, Photograph Exhibit GF-5 and Photograph Exhibit GF-6. The entry canopy should be repaired with a concrete repair mortar. This location must be repaired to prevent further corrosion and additional spalling of the concrete. The concrete should be chipped away behind and around the reinforcing for bonding purposes and the reinforcing cleaned of rust. A structural concrete repair product, such as those manufactured by “Sika Corporation” should be installed to reconstruct the foundation. Repair procedures and products should be submitted to the Architect for approval prior to performing any work. As an alternate, the canopy can be removed and replaced with a new canopy.

On the east elevation of the Original Building there is a diagonal crack in the brick masonry adjacent to the rain leader. Please refer to Photograph Exhibit GF-7. The brick should be repointed at this location to prevent water infiltration.

GREENS FARMS ELEMENTARY SCHOOL
5.2.3 Structural Conditions Analysis

On the east elevation of the Original Building there is a diagonal crack in the brick masonry propagating from the arched window head. Please refer to Photograph Exhibit GF-8. The damaged brick should be removed and replaced and the brick should be repointed at this location to prevent water infiltration.

Southwest Addition
Area 2

Building Envelope – Exterior Walls

On the west elevation of Area 2 the finished grade drops as you travel south. The exposed wall has a toothed concrete face. A diagonal crack was observed adjacent to the third window to the north of Door #22. Please refer to Photograph Exhibit GF-9.

The windows are typically wrapped with precast concrete on the east elevation and have a continuous precast concrete band spanning between the window sills. The face of the precast concrete was also observed to be spalling in some areas. Please refer to Photograph Exhibit GF-10 for a representative photograph of the spalling occurring at both locations.

On the west elevation steel lintels support the brick veneer. Minor corrosion of exposed steel was observed. The lintels should be stripped to bare metal and re-coated with an approved galvanizing coating.

East Addition
Areas 3 & 4

Building Envelope – Exterior Walls

On the north elevation at the entry doors there is a crack in the brick mortar joint below the arched soldier course of the second arch from the left. Please refer to Photograph Exhibit GF-11. The brick should be repointed at this location to prevent water infiltration.

On the west elevation at the entry doors there is a crack in the brick mortar joint below the arched soldier course of the second arch from the left. Please refer to Photograph Exhibit GF-11. The brick should be repointed at this location to prevent water infiltration.

General

Original Building

Building Envelope – Exterior Walls

In general, the brick masonry is in sound condition. Repointing of the brick mortar joints is required as well as the other specific areas of concern previously noted above.

GREENS FARMS ELEMENTARY SCHOOL
5.2.3 Structural Conditions Analysis

Building Interior – Floor Slabs

In general, the floor slabs observed to be in sound condition. The floors were not checked for levelness or flatness as part of this investigation. Due to the presence of in place finishes, the floor slabs could not be inspected.

The supported floor slabs throughout this building were generally observed to be in sound condition. However, some minor cracking of the floor slabs was observed in various areas slabs radiating thru the finish.

There are cracks in the north entry floor slab adjacent to the base of the stair. They appear to be shrinkage cracks and are not a structural concern. Please refer to Photograph Exhibit GF-12, Photograph Exhibit GF-13 and Photograph Exhibit GF-14.

Building Interior – Mechanical Room

There is a concrete masonry foundation (CMU) wall that abuts the original mortared stone foundation. There are signs of efflorescence on the CMU wall. Please refer to Photograph Exhibit GF-15. It is recommended to determine the source and cause of the water infiltration into the space. The exterior foundation wall may not be adequately damp proofed or water proofed.

The first-floor slab above is a cast-in-place concrete rib slab. Exposed reinforcing was observed in multiple locations. Please refer to Photograph Exhibit GF-16.

Building Interior – Classrooms

No issues to report.

Building Interior – Cafeteria / Kitchen

No issues to report.

Building Interior – Auditorium

Building Interior – Music Room

Minor water staining of the ceiling in the northeast corner. It is recommended to determine the cause of the leak.

Building Interior – Receiving Area

No issues to report.

GREENS FARMS ELEMENTARY SCHOOL
5.2.3 Structural Conditions Analysis

East Addition

Building Envelope – Exterior Walls

In general, the brick masonry is in sound condition.

Building Interior – Floor Slabs

In general, the floor slabs observed to be in sound condition. The floors were not checked for levelness or flatness as part of this investigation. Due to the presence of in place finishes, the floor slabs could not be inspected.

The supported floor slabs throughout this building were generally observed to be in sound condition. However, some minor cracking of the floor slabs was observed in various areas slabs radiating thru the finish.

Building Interior – Classrooms

Computer Room 120C, there is a water stain in the ceiling tile indicating a water leak above the ceiling. Please refer to Photograph Exhibit GF-17. It is recommended to determine the cause of the leak. It may be due to above ceiling piping.

Room 114, there is a water stain in the ceiling tile indicating a water leak above the ceiling. The adjacent ceiling tiles are a different style and may be an indication this has been an ongoing issue. Please refer to Photograph Exhibit GF-18. It is recommended to determine the cause of the leak. It may be due to above ceiling piping.

Building Interior – Gymnasium

No issues to report.

Building Interior – Stairs

The stair tower located in the southeast corner of Area 4. Opening of the masonry control joint was observed. Please refer to Photograph Exhibit GF-19. The mortar joints at the window head and jambs are failing and in need of repair. Please refer to Photograph Exhibits GF-20 and GF-21.

Water has also infiltrated the wall and is evident in the window jamb. Please refer to Photograph Exhibit GF-22.

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5.2.3 Structural Conditions Analysis

Building Interior – Library / Media Center

There is some water staining on the ceiling tiles along the west wall. Please refer to Photograph Exhibit GF-23. There is some water staining in the northeast corner. Please refer to Photograph Exhibit GF-24. This indicates water infiltration above the ceiling. It is recommended to determine the cause of the leak. It may be due to leaks at the roof or possibly above ceiling piping.

There are some minor cracks in the CMU walls. One is a vertical crack located at the northeast corner. The crack is at the intersection of the north and east walls. Please refer to Photograph Exhibit GF-25. One is a vertical crack located at the northwest corner. The crack is at the intersection of the north and west walls. Please refer to Photograph Exhibit GF-26. The cracks should be routed out and filled with a backer rod and sealant.

At the south interior wall of the Media Center there is a crack at the west jamb of the window. This appears to be due to shrinkage of the CMU wall. Please refer to Photograph Exhibit GF-27. The cracked CMU mortar should be routed out and repointed at this location. The damaged CMU blocks should be removed and replaced.

Building Interior – Mechanical Penthouse

The steel base of the mechanical unit located within the penthouse is corroding and should be stripped and recoated. Please refer to Photograph Exhibit GF-28.

RECOMMENDATIONS

1. Full masonry analysis to determine extent of mortar/masonry problems and appropriate remediation methods.
2. Full analysis of stage curtains, equipment, catwalks, lighting, etc. by a theater consultant to determine functionality, service life, etc.
3. Engage an appropriate service company to provide a full analysis of the operable partition system in the Gymnasium, including proper and safe operation, switch locations, and the condition of the panels, seals, motors, equipment, etc.

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5.2.4 Mechanical, Electrical, Plumbing, and Fire Protection

Plumbing

Plumbing Utilities

1. Domestic Water:
 - a. Existing Domestic Water Service: The building is currently served by a 3" domestic water main fed from the Aquarion Water Company. This water service currently serves all of the school's domestic water needs.
2. Natural Gas:
 - a. Existing Natural Gas Service: The building is equipped with two natural gas service lines from Southern Connecticut Gas, one service appears to be an interruptible gas supply and the second an uninterruptible gas service.

Plumbing Fixtures and Specialties

1. Plumbing fixtures:
 - a. Water closets are primarily vitreous china with manual flush valves. An upgrade to consider is the use of sensor activated flush valves.
 - b. Lavatories are primarily wall hung vitreous china with faucets which are manual, lever handle type. An upgrade to consider is the use of infrared activated faucets.
2. Specialties:
 - a. There is a sewage ejector pump in Mechanical Room 3B which was labeled "For Bathroom".

Domestic Hot Water Systems

1. Domestic hot water is generated by an AO Smith BT-120 gas fired water heater which was installed in 2017 and is in excellent condition. The system also includes a 119 Gallon AO Smith Storage Tank to accommodate a higher domestic hot water usage. One Lawler 802 domestic hot water tempering valve was observed in fair condition.
2. Domestic hot water was previously generated utilizing a water to water heat exchanger which was interconnected to the boiler system. This heat exchanger and associated accessories are no longer in use and are abandoned in place.



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5.2.4 Mechanical, Electrical, Plumbing, and Fire Protection

Fire Protection

Fire Protection Service

1. The building is served by a 6” fire protection service and is sprinklered throughout.
2. The system utilizes a Sterling Peerless Fire Pump with a Webtrol Econo-flo jockey pump. This arrangement was observed to be in fair to good condition.
3. Controllers for the pumps are TornaTech installed in 1999.
4. Five (5) zone control valves were observed in good condition.



GREENS FARMS ELEMENTARY SCHOOL

5.2.4 Mechanical, Electrical, Plumbing, and Fire Protection

Mechanical

Boiler Plants / Chiller Plants

I. Boiler Plant:

- a. The boiler plant is located in Mechanical 3B and is comprised of eight (8) dual fuel, hot water boilers. Boilers are all Triad Boilers model G0PS 900 SH. At the time of field observation, all boilers were under maintenance for cleaning and appeared in fair condition. Upon observation it was noted that Boiler B-4 had been replaced in 2018 and appeared in excellent condition.



GREENS FARMS ELEMENTARY SCHOOL

5.2.4 Mechanical, Electrical, Plumbing, and Fire Protection

3. There is a variety of burners utilized for the boiler plant. About half of the original Gordon Piatt Burners have been replaced with PowerFlame burners.
4. The primary circulating pump located at each boiler is an in-line Bell & Gossett pump. These pumps varied in age. Some appeared original while some were noted as replaced in 2014 and 2015.
5. Bell & Gossett HWS Series 1510 Centrifugal pumps (P-1 & P-1A) circulate hot water to the building. They are each in poor condition.
6. The Webster duplex fuel oil transfer pumps appear to be in poor condition.
7. Boiler Plant:
 - a. As an option to replacing the 7 remaining modular boiler sections, an option would be to replace the entire boiler plant with two or three high efficiency boilers (possibly gas fired condensing). This arrangement minimize maintenance of burners and pumps. Rigging of equipment is a consideration.
8. Chiller Plant:
 - a. The chiller plant is located in Mechanical 2B. A single (1) McQuay chiller was observed in fair condition.
 - b. The pumps for the primary chilled water (P-2), condenser water (P-3), and secondary chilled water (P-4) are each Bell & Gossett and appeared in fair condition.



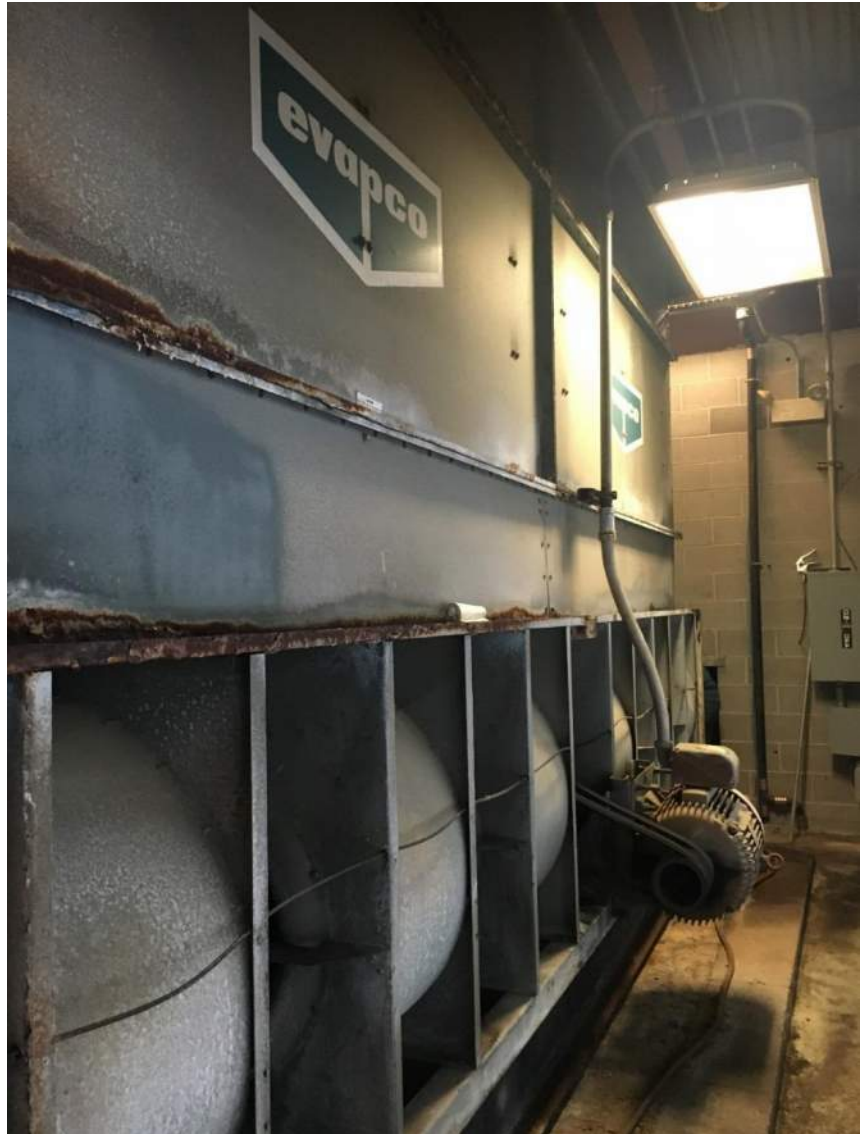
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5.2.4 Mechanical, Electrical, Plumbing, and Fire Protection

- c. The Evapco cooling tower is located in a mechanical room on the roof and is in poor condition.



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5.2.4 Mechanical, Electrical, Plumbing, and Fire Protection

Air Systems

1. There are twelve (12) indoor air handling units conditioning in the building. Most of these units are manufactured by McQuay and are in fair condition at the time of observation.
2. There are numerous fan powered VAV boxes throughout which have older fans that are failing. In addition the vibration isolators do not perform well and the controls need updating.



GREENS FARMS ELEMENTARY SCHOOL

5.2.4 Mechanical, Electrical, Plumbing, and Fire Protection

Electrical

Existing Systems

1. The building is served by a Siemens switchgear at the service entrance which is rated at 3000 amperes, 208Y/120 volts, 3-phase, 4 wire. There is a separate Siemens switchgear dedicated to the Fire Pump CT/Disconnect which is rated at 600 amperes, 208Y/120 volts, 3-phase, 4 wire. Each service were observed to be in good condition.



2. There are a number of Siemens electrical panels located throughout the building. Most panelboards are fed from overhead conduits and are in good condition.
3. Lighting at classrooms and offices is primarily LED fixtures as replaced as part of NORESKO's energy improvement programs. Overall, light fixtures are in good condition. There are still some fixtures will need to be updated and we recommend these be scheduled for replacement with LED fixtures
4. Lighting controls at classrooms and offices is typically line voltage toggle switches. Some rooms have ceiling mounted occupancy/vacancy sensors.

GREENS FARMS ELEMENTARY SCHOOL

5.2.4 Mechanical, Electrical, Plumbing, and Fire Protection

5. Emergency lighting is handled by 1-head and 2-head emergency lighting fixtures with battery packs (integral and remote mounted) and are in fair condition.
6. The fire alarm system is a Notifier zoned system and is in excellent condition.
7. The PA system is a Telecor II system. The head end equipment and speakers are in good condition.
8. The clock system is an Intermatic Model ET70115CR and is in excellent condition.
9. The security system is a Sonitrol system and is in excellent condition.
10. Exit signs are battery backed LED and are in good condition.