

# 5.3 Kings Highway Elementary School

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## 5.0 Existing Facility Survey

### Master Plan Facility Study for Westport Public Schools

# KINGS HIGHWAY ELEMENTARY SCHOOL

## 5.3.1 Architectural Conditions Analysis

**Existing Building** The Kings Highway Elementary School is an E-shaped structure consisting of a central T-shaped original building (3 floors, plus a lower gymnasium level) with a rectangular addition to the west (2 floors) and a more recent L-shaped addition to the east.



Currently twenty-seven (27)\* classrooms serving approximately 455 students are spread across all floor levels in the original building and additions, generally grouped by grade (K-5). Four (4) of these classrooms are used for O.T./P.T., Music, Music & Gym Office, and a Resource Room with attached Work Room. In recent years, two (2) other classroom-sized spaces have been converted to administrative offices and a school nurse's suite (with accessible bathroom and exam room). Several Student Services rooms and teachers' work rooms/lounges are distributed throughout the facility.

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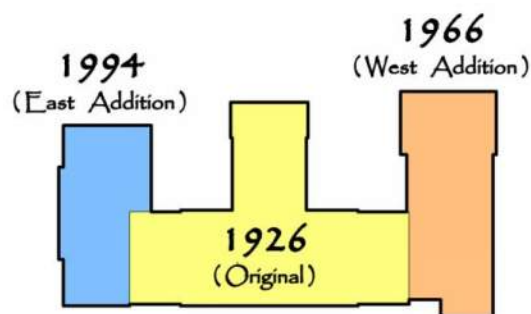
### KINGS HIGHWAY ELEMENTARY SCHOOL

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The Original Building contains the Gymnasium and the main Boiler Room, both (partially below grade). The Cafeteria/Kitchen, Science Lab, Art Room, Band Room, and Custodial Office are located on the Ground Floor. The First Floor hosts the main entrance to the facility, Main Office, Mail Room, Conference Room, Nurse's Suite, and historic Auditorium along with 2<sup>nd</sup> Grade classrooms. Mainly 3<sup>rd</sup> Grade classrooms occupy the Second Floor with a random 2<sup>nd</sup> and 5<sup>th</sup> Grade classroom also. This school opened in the Fall of 1926.

The 2-story West Addition is offset ½ story lower than the Original Building, connected by the mid-landings of one original 3-story stairwell. Therefore, there is no "Ground Floor"; the story at grade is designated as the First Floor. This floor primarily contains all the Kindergarten classrooms with egress doors directly to outside in each room. A second stairwell connects to the Second Floor (informally referred to by staff as the "Mezzanine Level"), which hosts 5<sup>th</sup> Grade classrooms, an ESOL office, and Teacher's Work Room. The West Addition was completed in 1966 and is not accessible. This wing also has no direct accessible connection to the primary functions located in the remainder of the school. Accessibility is not easily achievable and may be cost-prohibitive.



KINGS HIGHWAY ELEMENTARY  
FIRST LEVEL



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The 3-story East Addition, built in 1994, contains 1<sup>st</sup> Grade classrooms on the Ground Floor as well as large Mechanical and Electrical rooms. The Library / Media Center (with adjacent Computer Room) is located on the First Floor while the Second Floor is predominantly 4<sup>th</sup> Grade classrooms. These floors are directly connected to the corridors of the Original Building, with an additional 3-story stairwell at the south end.

The current contiguous facility consists of approximately 74,000 gross square feet:

Gymnasium Level:	6,630 GSF
Ground Floor:	16,370 GSF
First Floor:	28,870 GSF
Second Floor:	22,130 GSF



Used only for custodial and IT storage, the school currently has a stand-alone modular classroom building (two rooms with storage area below; approx. 1,275 GSF) to the west of the West Addition. This building is not included in the area calculations above. WPS Facilities reported this declining building is planned

for removal within two years. All of the proposed plans will include demolition of the portable classrooms, so their condition was not studied as part of this report.

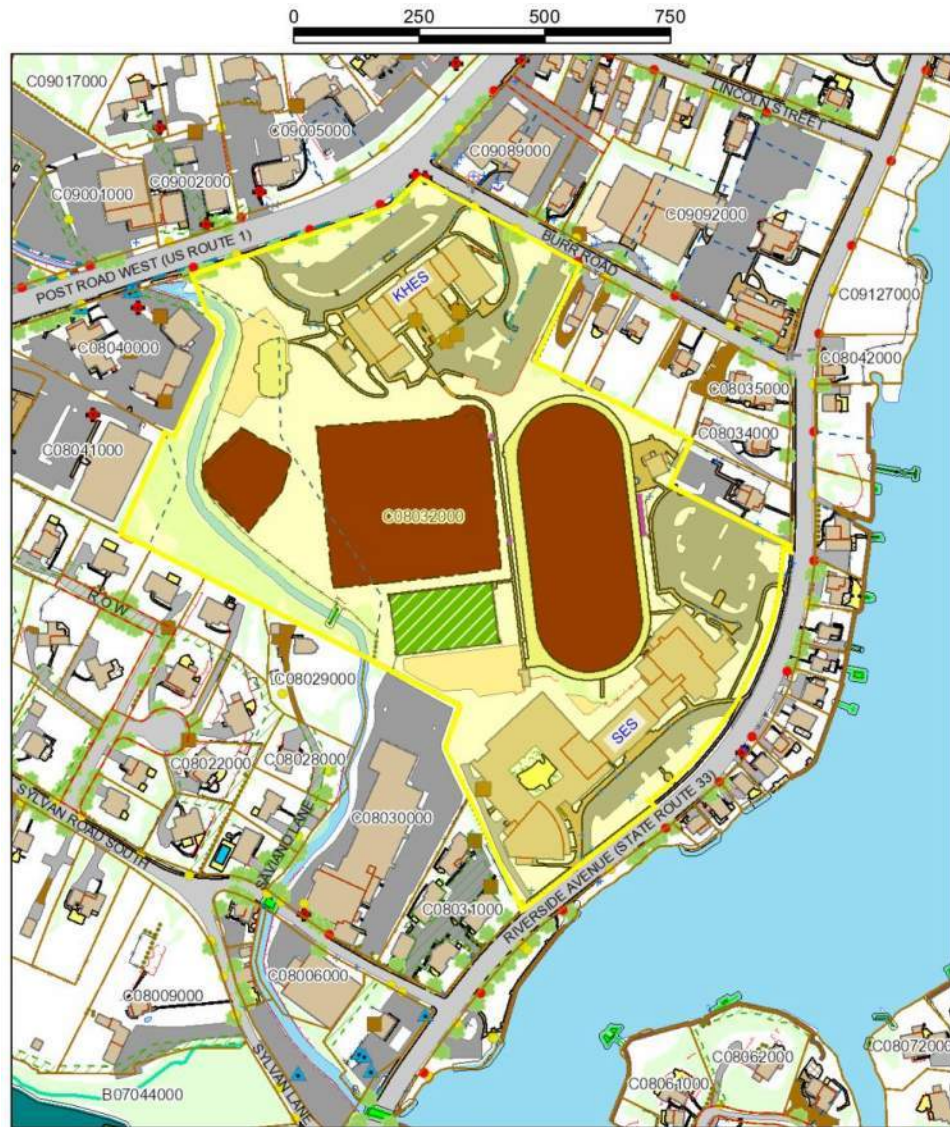
The Kings Highway Elementary School is located on the same site as the Saugatuck Elementary School and a Police Athletic League (PAL) building operated by the Parks and Recreation Commission. The property location address is 170 Riverside Avenue, running parallel to the Saugatuck River on the southeastern boundary. The two schools are separated by athletic fields consisting of a softball field, baseball field, artificial turf football / lacrosse field with track, and tennis courts.

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On the north side of the School, a dedicated bus drop-off/pick-up lane and adjacent faculty/visitor parking lot provide access from Post Road to the main entrance. All visitors (and students that walk to school) must use this main entrance, but note that this entrance is not accessible (monumental stone steps). A dedicated parent drop-off/pick-up loop, faculty parking, and accessible parking are provided at the south (rear) of the school off of Burr Road. South Door 4 (East Addition) is the main accessible entrance, but only with administrator assistance. There is no

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loading dock or formal receiving area, so food service deliveries occur at north Door 21 and all other deliveries where convenient.

The School has dedicated play equipment areas and a hard surface play area (basketball court). See site/Civil facility survey for more information.

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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**Building Profile**

Kings Highway Elementary School  
 125 Post Road West  
 Westport Connecticut 06880

Grades:	Kindergarten – 5th Grade
Original Construction:	Opened Nov. 2, 1926; 45,000 GSF
Former Name(s):	Bedford Junior High School
West Addition:	1966; 10,092 GSF
East Addition:	1994; 17,670 GSF
Modular Classroom Building:	Undetermined**
Lot Size:	23.15 acres* (combined with SES)
Zoning:	Zone A*
Number of Parking Spaces:	See site/Civil facility survey
Building Facade:	Brick and stone veneer
Roof Construction:	Gabled Roofs – Asphalt Shingles Flat Roofs – EPDM
Occupancy Classification:	E, Educational A-3, Assembly B, Business
Construction Type:	Varies (multiple additions)
Fire Protection System:	Sprinkler system throughout. Water service and FD connection in Mechanical Room of East Addition.
Emergency Generator:	No
Handicap Accessible:	Partial (elevator in East Addition provides access to main areas)
Number of floors:	3, + Lower Level (Gymnasium) + Walk-up Attic
Existing Total Floor Area:	Approx. 74,000 Gross Square Feet (not including modular classroom)

\* Data from Town of Westport Assessor's Office – Online Assessment Database.  
 \*\* Database indicates modular classroom construction in 1936, which is improbably given its contemporary construction.

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**Building Envelope Original Building (1926)**

Building Envelope – Exterior Walls



The exterior walls of this portion of the facility are constructed of rough stone/granite veneer on the Gymnasium Level and Ground Floor and brick veneer above, separated by stone belt courses. The brick has a Flemish bond pattern with raked joints. Walls are solid masonry with plaster interior finish typical of this period for a total wall thickness of approximately 15”.



The brick veneer and mortar joints are in good condition given their age. Mortar at rough stone veneer is cracked in multiple locations (predominantly at window heads; see structural facility survey) and requires repointing. Multiple joints in the stone belt courses are missing mortar. Minimal brick repointing required.



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When the brick at the upper portion of the west wall was repointed, the joints were tooled as typical concave/flush and not raked as would match this building and the 1960's addition. Proper repointing recommended.



Windows and openings have various stone elements, including sills, lintels, arches, panels, and accents. Elements are in good condition given their age.



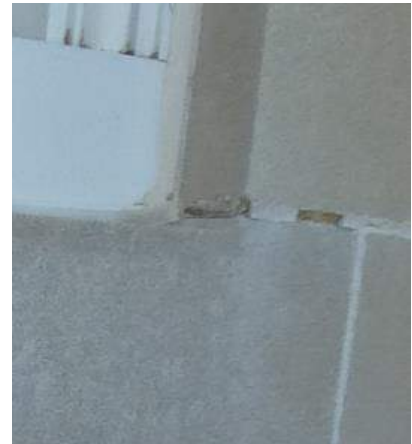
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**5.3.1 Architectural Conditions Analysis**



There are numerous areas where mortar or caulking is deteriorated at vertical joints between stone elements and brick. Joints should be raked clean and a soft sealant joint provided. Steel lintels above many window and door openings are showing signs of rust and should be scraped, primed, and repainted.

Some areas of smooth stone veneer need mortar repointing, primarily adjacent to window sills.



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Exterior vents and louvers remain in place from removed old HVAC units at the Main Office (interior infill not directly observed). If vents are to remain, need to remove hard, crumbling mortar joints and provide soft joints/sealant between vent and masonry. Alternatively, infill with recessed masonry or stone panels.



Evidence of rust staining on brick from vents and louvers that remain (primarily on south elevation). Paint or seal rusting components; clean brick.



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The main entrance stone columns and pediment are in good condition given their age but have staining, some of which could be from copper flashing. Cleaning recommended. Metal bird deterrent spikes were noted on top of exposed column capital ledges in good condition.



Soffits, brackets, and cornice trim appear to be painted wood in fair condition, but many areas have peeling paint. There are a few missing brackets, and at least one soffit requiring repair at downspout. Missing brackets should be fabricated to match existing, soffits repaired, then all surfaces scraped, primed, and painted.



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Some existing pipe penetrations require proper sealing.



The paint on some of the architectural louvers on this building is wearing off or scraped/damaged. Touch up to prevent rusting. Exhaust louvers from Boiler Room's upper level are poorly installed into what appear to be old window locations. Rotting wood and cracked concrete/lathe panels should be replaced and made water tight.

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**West Addition (1966)**

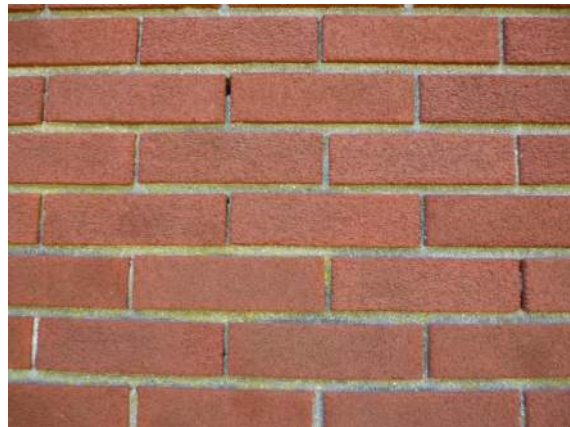
Building Envelope – Exterior Walls

The exterior walls of this portion of the facility are constructed of brick



vener with stucco panels along the top of the building and between the first and second story windows. The brick has a standard running bond pattern with raked joints and concrete masonry unit (CMU) backup walls for a total wall thickness of approximately 13” (likely no insulation).

The brick veneer and mortar joints are in good condition with some mortar repointing required (notably on the east side). The Head Custodian conveyed that the brick of the entire south wall above the roof of the 1-story portion of the Addition was recently repointed. The sealant in most brick movement joints is aged and stiff (and missing in some areas). Rake joints completely and provide appropriate backer rod and sealant to complement mortar color.



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Two temporary plywood ramps were fabricated by custodial staff to provide access to (or egress from) Music Room 6 and O.T./P.T. Room 5 when the school had an injured, wheelchair-bound student. These ramps are not securely fastened (floating on the asphalt) and are cannot be considered accessible (do not provide accessible maneuvering areas or clearances, do not have handrails and edge protection, no landing at door, etc.). If permanent accessibility is required at these doors, stable Code-compliant ramps should be built. All First Floor doors exiting the West Addition have a step except for the flush north main entrance doors.



Rust is occurring at the First Floor unit ventilator grilles (and possibly Second Floor ones) which may no longer be active. If grilles are to remain, paint or seal rusting components and clean plaster. Alternatively, infill with recessed plaster panels.

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Branches of nearby large tree at southwest corner of building should be trimmed back to prevent damage to building and minimize leaves collecting on the roof.



A portable classroom building was removed from the courtyard outside Door 13 but sealant, mastic, paint, etc. from the connecting corridor were never removed from the remaining building. The masonry should be cleaned and restored.



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**East Addition (1994)**

Building Envelope – Exterior Walls

A split face concrete block ground floor is separated from two stories of brick veneer by a cast stone belt course. The same belt course defines the window sill line at the Second Floor windows. First Floor windows have cast stone lintels with keystones and sills with panels below. The design is intended to replicate the elements of the Original Building.



The brick is laid in standard running bond with standard, tooled mortar joints. Brick and mortar are in good condition, with only a few locations noticed for repointing. The walls are cavity-type construction with an airspace, 2” rigid insulation, and concrete block backup walls for a total wall thickness of 19”. Some interior walls, such as at the Library, are furred out with metal studs and finished with gypsum board.

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Mortar repointing appears to have occurred on either side of the CMU movement joints on the west wall. Mortar color does not match remainder of CMU area. Along this same wall, a crack runs through the vertical mortar joints and faces of the split-face CMU veneer but no evidence of cracking on the interior (in Girls Toilet Room).



Unit ventilator grilles are no longer active (blanked off on the interior). Long vertical areas of yellow staining were observed on brick and CMU in multiple locations around the Addition that may be related to ventilator grilles from the Second Floor. Investigate cause of staining, then clean masonry once corrected.



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###### Building Envelope – Roofs & Chimneys

Only general roof conditions were observed; see the Preventative Maintenance Inspection report prepared by Offshore Construction Inc. for additional information. Facility consists of varying areas of low-slope and steeply-pitched, high-slope roofs. **There were no reported roof leaks at the time of the inspection.**



Flat roofs are typically 060 EPDM single-ply membrane in good condition. Per Offshore Construction, the Carlisle (manufacturer) warranty expires in 2021 and therefore should be replaced in perhaps 5 to 7 years. Roof drainage varies from traditional interior roof and overflow drains to perimeter parapet drains (piped to exposed downspouts) with thru-wall overflow scuppers. No major ponding was observed, and walkway pads are provided to and around major rooftop equipment.



Metal copings and roof edges appear to be generally in good condition. At ground-level roof areas, the mortar underneath the stone copings requires repair in some locations.

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High-slope roofs are architectural asphalt shingles in hip and gable configurations with snow guards. Shingles and flashings are in good condition. The system warranty on the East Addition has expired per Offshore Construction (unsure of date) while the shingled roof areas of the Original Building appear to have been replaced in 2011 per data from the Westport Public Schools Facility Summary dated 5-6-2019.



Roof drainage consists of box gutters (copper at Original Building; aluminum and rubber membrane at East Addition) attached to various downspouts (painted round metal pipe at Original Building; galvanized square at East Addition) which empty to grade, onto other roof surfaces, or piped underground. Gutters and downspouts appear to be in good condition except that paint on downspouts is scratched in some areas.



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The steep roof structure in the Original Building is 3x8 wood rafters that create an open attic space for roof access, mechanical equipment, etc. There are four (4) old metal skylights on the south, east, and west-facing roofs. The skylights are significantly rusted, causing staining on the roof shingles. The glass appears to have been replaced at some point with translucent wired glazing which is in reasonable condition. Original manual hardware is most likely no longer operational.



Roof access is generally provided by roof hatches that are in good condition except for some rusting and scraped flashing around exposed fasteners. Traversing from the hatch to the lower flat roof is wearing the asphalt shingles and damaging unsupported shingles at the roof edge. An access ladder and platform are recommended to safely traverse the sloped roof and roof height difference and to prevent shingle damage.



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Relatively new caged metal roof ladders were installed on the West Addition to provide an alternative from the interior ladder in the Kindergarten classrooms below. The lower caged ladder already has signs of rusting.



The Original Building has copper flashing and roofing on top of all cornices, which appears to be in good condition.



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Both flat and sloped roofs are dotted with vent pipes, exhaust fans, and major mechanical equipment units. See the mechanical facility survey.



The various chimneys of the Original Building are constructed of mass brick with stone copings or caps and appear to be in good condition given their age. The two large main chimneys are used for ventilation and have rubber membrane roofs in good condition. Louvers are in fair condition but repointing

of brick and stone cornice is needed, especially at lintels.

At least one chimney on the west side of the Original Building has a deteriorating clay flue liner under the stone coping. Condensation resulting from combustion can deteriorate the flue liner further. Flue should be cleaned and inspected for additional deterioration. WPS Facilities reported this chimney may be the seasonal nesting place for chimney swallows. Verify in field and coordinate accordingly.



The tall brick boiler chimney is still in use and was only observed from afar and through photographs. It appears to be in satisfactory condition, given its age, but see structural facility survey for crack repair required.

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##### 5.3.1 Architectural Conditions Analysis

###### Building Envelope – Windows

The windows are primarily double-hung type with an occasional fixed half-round transom window above. They appear to be a consistent type throughout the facility (except as noted below), but information was not available as to when these were replaced. Windows are white aluminum with insulated double glazing, exterior applied muntins, and full-height insect screens at operable windows. Pole hooks are provided for operation of upper sash as needed. Windows appear to be in good, operational condition.

Most of the facility now has ducted air conditioning, so operable windows are typically no longer opened. Many insect screens are missing throughout the facility. According to the Head Custodian, most of these locations were former window air conditioners and the whereabouts of the missing screens is unknown. Missing screens are particularly unsightly on the north and east facades (facing the main roads) and should be installed.



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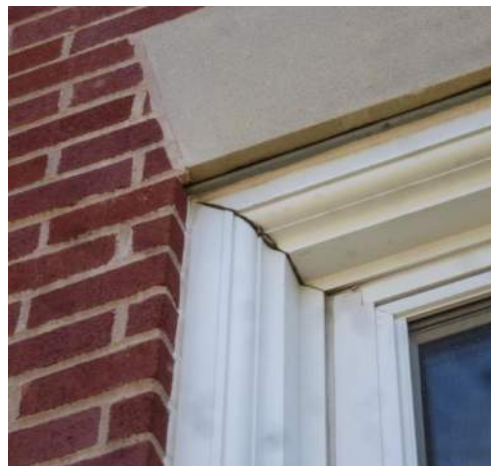
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##### 5.3.1 Architectural Conditions Analysis



Several rooms (including Custodial Office, Mail Room, and Office adjacent to the stage in the Auditorium) still utilize window air conditioners. These commonly are maintenance and weather-tightness problems and they put strain on the window assembly. The Mail Room is particularly unsightly, being located at the main entrance to the school.

Exterior window trim typically consists of white aluminum; flat stock at sills, prefabricated scotia profile at jambs and head. Although trim appears to be in moderate condition, some joints have opened up and require sealing. The sealant in general is in fair condition, but has signs of drying/cracking, mildew on north and west exposures, and missing in spots. Resealing all windows and exterior trim is recommended.



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Interior window casing is typically painted wood mouldings or flat stock with painted wood stool and apron. Interior casing is generally in good condition, but could use some touch-up.

Windows typically have metal horizontal blinds with string pull cords for shade control, except in the gymnasium. Conditions range from good to fair as would be expected. The cords may pose a safety concern with smaller children. Consider replacing with an alternate solution that's more durable and requires less maintenance, dusting, etc.



At the main entrance doors of the Original Building, the half-round transom is still single-pane glass even though the aluminum storefront transom / door system below was replaced with insulated units. Replacing this transom would provide better energy efficiency.

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5.3.3 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**

**Original Building**

Building Envelope – Exterior Walls

The typical exterior walls consist of a multi-wythe brick supported on a mortared stone foundation wall. Decorative wood trim with dentil work is present above the brick at the perimeter of the building, just below the eave of the roof, as well as above the windows and doors. The main entry doors have four full height stone columns are along the front elevation, with decorative caps and bases.

Previous repair work has been performed on the brick mortar joints and at the stone columns, however, additional areas were observed, where repointing of the brick mortar joints is required.

On the front elevation of the building, one location was observed, where the wood cornice beam beneath the eave of the roof, has removed or fallen. Please refer to Photograph Exhibit KH-1. This detail would require replacement. The Architect would provide a detail for this work.

On the front elevation of the building at the intersection of the entry roof and the main roof there is a separation of the main roof and the entry roof. Please refer to Photograph Exhibit KH-2. This will require repairs to prevent water infiltration.

Steel lintels are present above the typical window openings. Minor surface corrosion of the steel is occurring in some locations. One lintel on the east elevation of the Gymnasium wing at the north end is exhibiting heavy rusting. Please refer to Photograph Exhibit KH-3. These lintels should be stripped to bare metal where exposed and recoated with a galvanizing compound and painted approved by the Architect. This lintel may require replacement if there is a significant loss of section.

The south wall of the boiler room is exhibiting through-wall cracking adjacent to a pipe penetration in the wall. Please refer to Photograph Exhibit KH-4 for the exterior view and please refer to Photograph

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Exhibit KH-5 for the interior view. The stone should be repointed to prevent water infiltration.

The west wall of the Gymnasium there is a crack in the stone foundation adjacent to the window by the stair and platform. Please refer to Photograph Exhibit KH-6. The stone should be repointed to prevent water infiltration.

On the east side of the Gymnasium there is a stair to the below grade gymnasium floor. The stair risers have some rock pockets that are deteriorating. In this exposed condition the concrete is subjected to freeze/thaw cycles that will further deteriorate these stairs. Please refer to Photograph Exhibit KH-7. The stairs should be repaired or replaced.

The existing stone retaining wall at the front of the building has a crack through the concrete cap and the stone wall below. This may be due to shrinkage or possible settlement of the wall. Please refer to Photograph Exhibit KH-8.

The dumpster wood shed at the south side and rear of the Gymnasium is exhibiting wood rot at the at the door sill. Please refer to Photograph Exhibit KH-9. The repair of the sill would require replacement of the sill with pressure treated lumber.

The brick chimney at the south west corner of the Auditorium has a crack in the brick on the east face of the chimney. Please refer to Photograph Exhibit KH-10. The crack should be routed out and repointed to prevent water infiltration.

### **East Addition**

#### Building Envelope – Exterior Walls

The exterior walls consist of a masonry cavity wall system with a split face CMU veneer below and brick above supported on a cast-in-place concrete foundation wall.

There is a concrete site retaining wall that has a parge coat on the concrete. There is some cracking in the wall and parge coat. This is likely due to shrinkage and is not a structural concern. Please refer to Photograph Exhibit KH-11 and Exhibit KH-12.

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On the ground floor on the east side there is a crack at the CMU window jamb at the head of the third window from the south. It is a shrinkage crack and it is the only window that did not have a control joint at the jamb. Please refer to Photograph Exhibit KH-13. Recommend that a control joint be sawcut to allow movement.

On the ground floor on the south side at the first window from the east there is a crack in the CMU window jamb at the head on both the left and right sides. It is a shrinkage crack and the window did not have a control joint at either jamb. Please refer to Photograph Exhibit KH-14 and Exhibit KH-15. Recommend that a control joint be sawcut to allow movement

### **West Addition**

#### Building Envelope – Exterior Walls

The exterior walls consist of a brick veneer supported on a cast-in-place concrete foundation wall. On the west elevation there are brick piers at the window jambs and an exterior insulated finish system (EIFS) below and above the windows. There is some minor corrosion at the window heads below the roof. Please refer to Photograph Exhibit KH-16. These steel edges at the window heads should be stripped to bare metal where exposed and coated with new paint approved by the Architect.

The foundation wall on the east side is exposed and the concrete foundation has a parged coating. At the southeast corner the foundation wall is cracked. Please refer to Photograph Exhibit KH-17. This location must be repaired by routing out the crack and providing an appropriate sealant and the wall parged to match the existing finish. Repair procedures and products should be submitted to the Architect for approval prior to performing any work.

### **Portable Classrooms (West Side)**

There is a temporary modular classroom on the west side of the site adjacent to the west addition. We did not have access to the interior of the building, but we did observe the exterior of the building. The exposed vertical plywood wood sheathing is rotting at the base of the panels on the east side. Please refer to Photograph Exhibit KH-18.

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**5.3.3 Structural Conditions Analysis**

On the west side there is a drop in the grade from the east side of about 8 feet. The wood rim at the plywood joint is deteriorating and in some places is missing. Please refer to Photograph Exhibit KH-19 and Photograph Exhibit KH-20. Also, a portion of the siding is failing and bowing out and is not properly fastened to the structure. Please refer to Photograph Exhibit KH-21. If the portable classroom is to remain we recommend the structure be inspected to propose repairs for continued use.

**General**

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.

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 – Boiler Room

The foundation walls are mortared stone masonry walls in fairly good condition. The south wall has a crack in the wall adjacent to a pipe penetration. This is reported above under the Original Building comments. Please refer to Photograph Exhibit KH-4 for the exterior view and please refer to Photograph Exhibit KH-5 for the interior view. The stone should be repointed to prevent water infiltration.

The stone foundation has cracking through the parge coat at the southeast corner of the Boiler Room. We could not determine if the cracking is also in the stone wall. Please refer to Photograph Exhibit KH-22. This wall should be observed to determine extent of cracking. If it is determined to be in the stone foundation, the stone should be repointed to prevent water infiltration.

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**Plumbing**

Plumbing Utilities

- I. Domestic Water:
  - a. Existing Domestic Water Service: The building is currently served by a 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 natural gas service (Southern Connecticut Gas) serves the boilers, water heater and miscellaneous loads such as kitchen equipment.

Plumbing Fixtures and Specialties

- I. Plumbing fixtures:
  - a. Water closets are vitreous china with manual flush valves though sensor activated flush valves were observed in a few locations. An upgrade to consider is the use of sensor activated flush valves.
  - b. Lavatories are wall hung vitreous china with varying faucets which are manual, lever handle or twist type. An upgrade to consider is the use of infrared activated faucets.
  - c. Urinals are vitreous china with manual flush valves. An upgrade to consider is the use of sensor activated flush valves.
  - d. Electric water coolers varied within the building. Some are simple manual activated units, some are more updated Elkay units, and some are more updated Elkay units with a sensor activated bottle filling station.
  - e. In general, many of the fixtures are old and need to be replaced.



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2. Specialties:

- a. An air compressor with filter dryers is located in Mechanical Room G-10. They appear to be in good condition.
- b. A second air compressor with filter dryer is located in the Main Mechanical Room. These are in poor condition.

Domestic Hot Water Systems

1. Domestic hot water is generated by an AO Smith BTR-120 which was installed in 2016 and in excellent condition. A Bell & Gossett hot water circulating pump labeled “Kitchen” was observed in fair condition. A domestic hot water tempering valve for the 110°F building loop was observed in poor condition.

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**Fire Protection**

A 6” fire protection service is supplied to the building and is located in Mechanical G-10. Control valves were observed for three separate zones; Zone 1: Wet System Zone, Zone 2: Dry System Zone, Zone 3: Pre Action System. Air compressors for the fire protection valves are manufactured by Gast.

**Mechanical**

Boiler Plants / Chiller Plants

- I. Boiler Plant: The building is heated by (2) dual fuel, steam boilers. The boilers are each HB Smith Model M450A with Power Flame C3-G0-25 Burners.

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2. The boilers and accessories including but not limited to the burners, boiler feed pumps, condensate pumps and fuel oil transfer pumps are in poor condition.



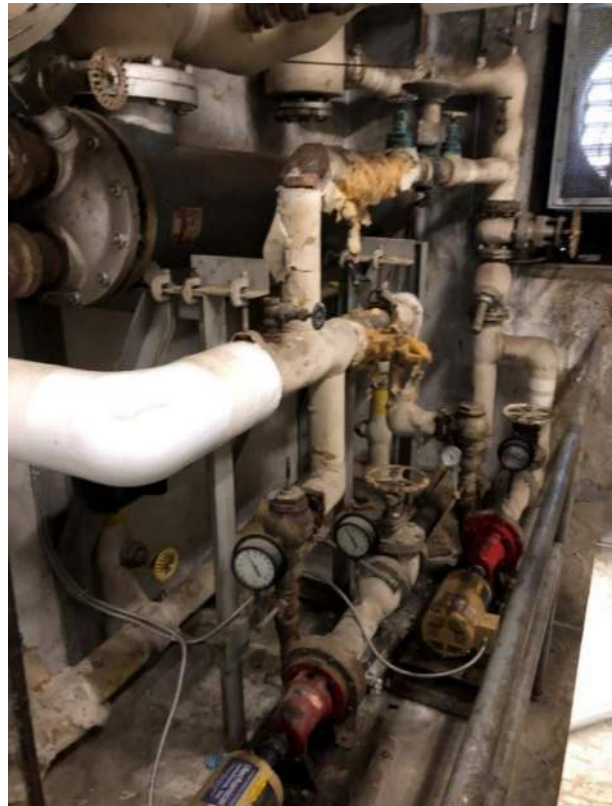
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3. Boiler Room accessories:

- a. There are two steam to hot water heat exchangers.
- b. Heat exchanger: HX-1: This shell and tube heat exchanger is served by two Bell & Gossett Series 1510 pumps located below the unit
- c. Heat exchanger: HX-2: This heat exchanger was installed in 1965 and is located in the upper level of the mechanical room. The shell and tube heat exchanger is a Bell & Gossett heat exchanger and is also served by two Bell & Gossett pumps.
- d. In general, much of the equipment and accessories in the boiler room are old and in poor condition.
- e. The glycol make-up unit is one piece of equipment that is in good condition.

- f. Miscellaneous related spaces: There are rooms where the enclosure for the fin tube does not completely enclose the steam piping (bottom of the enclosure is up to 10" above the floor). For safety reasons, consider replacing the enclosures with ones that are closer to the floor (2" to 4" off the floor).



4. Chiller Plant:

- a. There is a Trane Model CGAM100F packaged air cooled chiller located on site which was observed to be in good condition.
- b. The chiller is located at the exterior of the building at grade.
- c. The chiller's enclosure houses two chilled water pumps

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##### Air Systems

- I. Heating, ventilating and air conditioning is accomplished with a central dedicated outdoor air unit (DOA-I) and a number of air handling units and fan coil units. The units listed below are connected to the chiller plant.
  - a. DOA-I: This TRANE TCCB030 dedicated outside air unit was observed to be in good condition.
  - b. Large AHU's: There is one Trane Model BCV 090 unit serving the gym which is in good condition.
  - c. Small AHU's (AHU's / FCU's mostly located in the attic of ceiling space): There are 38 small Trane AHU's which were generally observed to be in good condition.



2. At the Auditorium there are concerns with the aesthetic of the supply air diffusers serving this historical space. Refer to the architectural survey.

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3. In addition to air handling equipment served by the chiller, there are also a few units as listed below which are DX and are served by a dedicated condensing units located outside the building:
  - a. There are three ceiling mounted units at the Main Office, Conference Room and Nurse's Office. These units were installed in 2004 and were observed to be in fair condition. They are served by outdoor units shown below.



- b. AHU-DX1: This Trane MCCA012 air handling unit supplies heating and cooling. Cooling is accomplished utilizing R-410A refrigerant. The unit was installed in 2004 and was observed to be in good condition.

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### Electrical

#### Existing Systems

1. The building is served by GE Spectra switchgear at the service entrance which is rated at 1200 amperes, 208Y/120 volts, 3-phase, 4 wire. This is a three section switchboard. The service equipment is in good condition.



2. Electrical panels are typically Siemens and GE type. Most panelboards are fed from overhead conduits and all 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 that will need to be updated and we recommend these be scheduled for replacement with LED fixtures. In particular, consider replacing the older style, surface-mounted fixtures at the entrances.
4. Lighting at some rooms have ceiling-mounted occupancy/vacancy sensors.
5. Emergency lighting consists of 1-head and 2-head incandescent lights. Some have integral battery packs, others have battery packs on walls nearby. All emergency lighting is battery backed. All lights are in fair to good condition and appeared dated upon observation.
6. The fire alarm system is a Notifier zoned system and is in excellent condition.

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7. The PA system is a Telecor system. The head end and most of the end devices are in good condition. Classroom speakers appeared dated and damaged and were observed to be in fair condition.
8. The clock system is a Master Clock System 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, some with dual head emergency lights. Signs were in good condition.

