Town of Cape Elizabeth

Seven Building Facility Study

Cape Elizabeth, Maine

HARRIMAN | Architects + Engineers

ARCHITECTURE • PLANNING • INTERIOR DESIGN • LANDSCAPE ARCHITECTURE • ENGINEERING

Table of Contents

Table of Contents

Introduction

Town of Cape Elizabeth Facilities Study

Facility Study Process

Harriman has conducted a Facility Study for seven town-owned facilities and also offered observations on the library and a possible future bus-port. As part of this study we were also asked to study the future potential of an all-day kindergarten program for the elementary school.

The town buildings included in the Facility Study was the high school, the Pond Cove Elementary/Middle School, police station, fire station, community services building, town hall and the transfer station. The process by which this study was documented consisted of data collection relative to existing construction documents defining when the buildings were constructed, renovated, or addition(s) made. This also provided us with information as to the mechanical and electrical infrastructure of the buildings and their age. A total of 15 sets of existing construction documents were discovered in your archives, all of which have been electronically scanned and will be provided to your Director of Facilities for future reference.

The second part of this study was to conduct a building walkthrough by an architect, mechanical and electrical engineers. During the walkthrough of each building, the team observed and documented any issues related to these buildings. IBC Building Code, Life Safety Code, and ADA issues were noted in the observations section of this report. The current status of the building envelope, interior building systems, mechanical systems, and electrical systems were documented relative to its current condition and its expected life span and the recommendation to upgrade or replace the system. This part of the study was quite extensive with numerous repeat site visits to the

Introduction

buildings to verify conditions which included over 1,500 photos. The photos will be downloaded to a CD and turned over to your Facilities Director for record.

The third section within the study is the assessment report of each building. Within this assessment, all the building systems were rated as to current status, potential future replacement costs and assigned a priority scale number. The priority scale is noted at the bottom of each assessment page.

The assessment report for each building is broken into two sections. The first part of the assessment denotes major system replacements that would be carried under a capital improvement project bond. The second part denotes items for maintenance or corrective action that will be performed through the town's operation and maintenance budget. Relative to the first section of the report, the far right column contains a number which correlates to the scale at the bottom of the page. The number provides the information for an action plan to be implemented recommending which item should be addressed based upon its life cycle status or need to correct due to ongoing maintenance issues. An example of this would be the primary electrical system for the high school.

The Town Hall assessment does not include any costs at this time for a current ongoing study to renovate the council chambers.

We also understand that a current bond question to replace the library is up for local voter approval in November. The Library and all of the connecting buildings were assessed as part of this report.

The Educational Program Study is to look at the future potential of conducting an all-day kindergarten class. The narrative provided in the Educational Program Tab will note these difficulties and recommend the next steps. During the study the discussion of the Middle School SPED program in the basement of the 1934 Building was brought forth as an issue. The location of this program in the basement with its Life Safety Code Issues along with current State Educational Program Guidelines for this type of program creates a major challenge for the administration. This program should be located with the general student population. The linear manner in which the middle school was constructed has created a layout that will inhibit the relocation of this program.

Town Of Cape Elizabeth
Facilities Study
Project No. 12580

HARRIMAN Architects + Engineers

Summary of CIP Probable Costs

		Probable Construction Costs
1. **Building #1 - Cape Elizabeth High School**		
	Architectural Systems	$2,972,000.00
	Mechanical Systems	$546,000.00
	Electrical Systems	$605,000.00
	Subtotal - Probable Construction Costs	**$4,123,000.00**
2. **Building #2 - Pond Cove Elementary / Middle School**		
	Architectural Systems	$3,780,000.00
	Mechanical Systems	$1,918,000.00
	Electrical Systems	$210,000.00
	Subtotal - Probable Construction Costs	**$5,908,000.00**
3. **Building #3 - Cape Elizabeth Fire Station**		
	Architectural Systems	$290,000.00
	Mechanical Systems	$0.00
	Electrical Systems	$30,000.00
	Subtotal - Probable Construction Costs	**$320,000.00**
4. **Building #4 - Cape Elizabeth Police Station**		
	Architectural Systems	$10,000.00
	Mechanical Systems	$0.00
	Electrical Systems	$0.00
	Subtotal - Probable Construction Costs	**$10,000.00**
5. **Building #5 - Cape Elizabeth - Community Services Building**		
	Architectural Systems	$143,000.00
	Mechanical Systems	$0.00
	Electrical Systems	$12,000.00
	Subtotal - Probable Construction Costs	**$155,000.00**
6. **Building #6 - Cape Elizabeth - Town Hall**		
	Architectural Systems	$350,000.00
	Mechanical Systems	$610,000.00
	Electrical Systems	$130,000.00
	Subtotal - Probable Construction Costs	**$1,090,000.00**
7. **Building #7 - Cape Elizabeth - Transfer Station**		
	Architectural Systems	$135,000.00
	Subtotal - Probable Construction Costs	**$135,000.00**
8. **Cape Elizabeth Bus-Port**		
	Architectural Systems	**$250,000.00**
9. **School Security Systems**		
	High School	$235,000.00
	Elementary / Middle	$265,000.00
	Subtotal - Probable Construction Costs	**$500,000.00**
10. **Total Probable CIP Construction Cost**		**$12,491,000.00**

Town Of Cape Elizabeth
Facility Survey - 6 Buildings
Total Square Footages
Project No. 12580

	High School		
1	First Floor -Gym, Café, Aud, Id., Art, Music	72,130	
2	Second Floor - Classrooms, Science Labs, Library	38,240	
3	Third Floor - Classrooms, Science Labs, Admin	39,140	
4	Pool	13,120	
	Total Square Footage - Existing	**162,630**	sf
	Elementary/Middle School		
1	Baesment	7,400	
2	First Floor - Gym/Café/Admin/Music/Lib/Classrooms	103,420	
3	Second Floor - Classrooms	52,290	
	Total Square Footage - Existing	**163,110**	sf
	Community Services Center		
1	Ground Floor	8,200	
2	First Floor	11,270	
	Total Square Footage - Existing	**19,470**	sf
	Fire Department		
1	First Floor	13,142	
	Total Square Footage - Existing	**13,142**	sf
	Police Station		
1	First Floor	9,319	
	Total Square Footage - Existing	**9,319**	sf
	Town Hall		
1	Basement	6,400	
2	First Floor	6,430	
3	Second Floor	6,430	
	Total Square Footage - Existing	**19,260**	sf

Cape Elizabeth High School/Donald Richards Pool

Building Description

Exterior - Interior	Constructed in 1969 Composite brick and block bearing walls Brick exterior faced Cast stone window infill panels with rigid insulation and drywall Exterior bearing walls Metal window systems Interior corridor and cross bearing walls Cast-in-Place concrete foundations Steel joist floor and roof framing on bearing walls Floor slabs – 2 ½" concrete on expanded metal lath Roof Deck – 2" wood fiber plank with T-bulb framing or concrete plank deck Roofing - asphalt built up roofing direct to decks Roof – re-roofed with tapered roof insulation and EPDM roofing
	Renovated in 2004 Main entrance addition Interior renovations – including walls, floors, ceilings, mechanical, electrical
Donald Richards Pool	Constructed in 1969 Composite brick and block walls Precast concrete T-roof beams Asphalt built up roof system Reroofed with roof insulation and EPDM roof membrane
	Addition constructed in 1999 Masonry bearing exterior CMU walls with brick veneer Cast-in-Place concrete foundation Steel joist framing with metal deck roof .060 EPDM roof membrane with mechanically fastened roof insulation Aluminum storefront windows

Cape Elizabeth High School/Donald Richards Pool

Mechanical

Heating hot water generation – oil-fired boilers (2011)
Heating hot water circulation – original pumps, upgraded to variable speed drives
Domestic hot water generation – solar (2011), indirect hot water
Direct Digital Control (DDC) – Invensys, Schneider Electric, throughout
Administration - heating, ventilation, air conditioning, baseboard radiation (2004)
Guidance – heating, ventilation, baseboard radiation (2004)
Classrooms – typical unit ventilation units, original exhaust fans (1968)
Music Practice Rooms – heating, ventilation (2004)
Lecture Room – typical unit ventilation units, original exhaust fans (1968)
Library – heating, ventilation, baseboard radiation (1968), split AC
Gymnasium – heating, ventilation units (1968), upgraded motors
Cafeteria – roof-top heating, ventilation, air conditioning (2004)
Kitchen – indoor heating, ventilation (1968), upgraded range hood.
Auditorium - indoor heating, ventilation, baseboard radiation (1968)
Pool Locker Rooms – roof-top heating, ventilation, heat recovery (2004)
Pool (space) – dedicated dehumidification, local gas-fired boilers (1999, 2011)
Woodworking Shop – unit heaters, general exhaust (1968), dust collection (2004),
Metal Shop – unit heaters, general exhaust, welding hood (1968)
Tech. Classroom – heating, ventilation (2004)

Electrical

Main switchboard – 2000A, 120/208V 3phase 4wire
Standby generator – 200kW diesel with day tank
Emergency Lighting – self-contained battery units
Fire Alarm System – Notifier AFP-400 w/ voice evacuation
Intrusion System – none
Security Surveillance System – minimal number of cameras
Door Lockdown System – none
Door Card Access System – main entrances
Voice/Phone/Intercom/Paging – modified VOIP

Cape Elizabeth High School / Donald Richards Pool

Architectural Systems Evaluation

Interior Systems Descriptions

Donald Richards Pool

Generally all the systems have been well maintained and are in very good shape for this age building. The interior of the building on all levels has been consistently cleaned; finishes, mechanical and electrical systems have been updated when required.

Survey Observations – Building Code Violations

Second and Third Floor Corridors

On the second and third floor corridors at the midpoint of the floor there is a set of cross corridor doors that swing in one direction. As they are constructed they constitute a dead corridor from one direction and violate the Life Safety Code for egress in a northerly direction. Recommend removal of the doors and leave frame to eliminate code violation.

Cross Corridor Doors

Main Lobby

Concessions serving window is not ADA compliant, existing is too high. Maximum height to counter line should be 34". Recommend lowering existing unit in place or install a new unit at a lower height.

Concession Serving Window

Cape Elizabeth High School / Donald Richards Pool

Third Floor Corridor

Transfer grilles through walls and doors. Transfer of make-up air for exhaust through this type of grille installation is no longer allowed by Life Safety Code from a means of egress corridor. The through wall grille has a fire damper with a fusible link on it. We would recommend the installation of a smoke damper tied to the fire alarm system as a correction method. The grille in the door would have to be blocked up and a new transfer installed overhead with a smoke damper.

The Life Safety Code puts a lot of emphasis on protecting the exit access corridors from smoke penetration.

Wall Transfer Grille

Door Transfer Grille

Cape Elizabeth High School / Donald Richards Pool

Doors – all Floors

Most of the existing glazed panels in the doors have a polished wire glass panel. This type of wire glass in doors and or borrowed lite panels is not allowed per current IBC Building Code. At the time of replacement, new glazing should be laminated glass tempered as required by current code.

Most of the rated door assemblies on stairwells and other locations had the Rated Fire Label painted over. IBC Building Code and fire departments require that these labels not be painted over for inspection purposes.

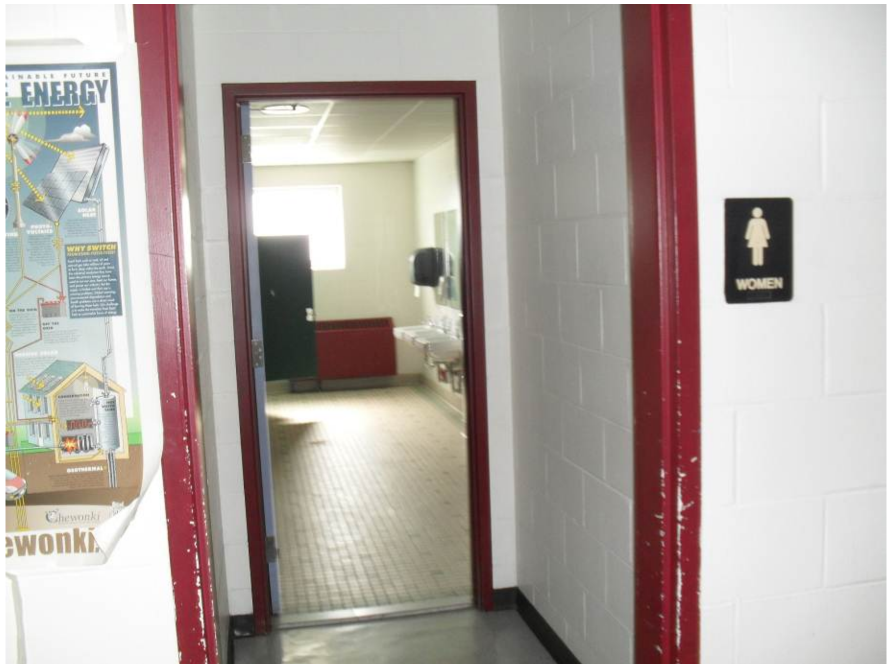
Doors – Glazed Panels of Wire Glass

Doors – Painted Fire Rating Label

Toilet Entry Doors

The students toilet door entrances are not ADA compliant for clearances on pull side of door. Recommend minimum renovation to make entrances compliant.

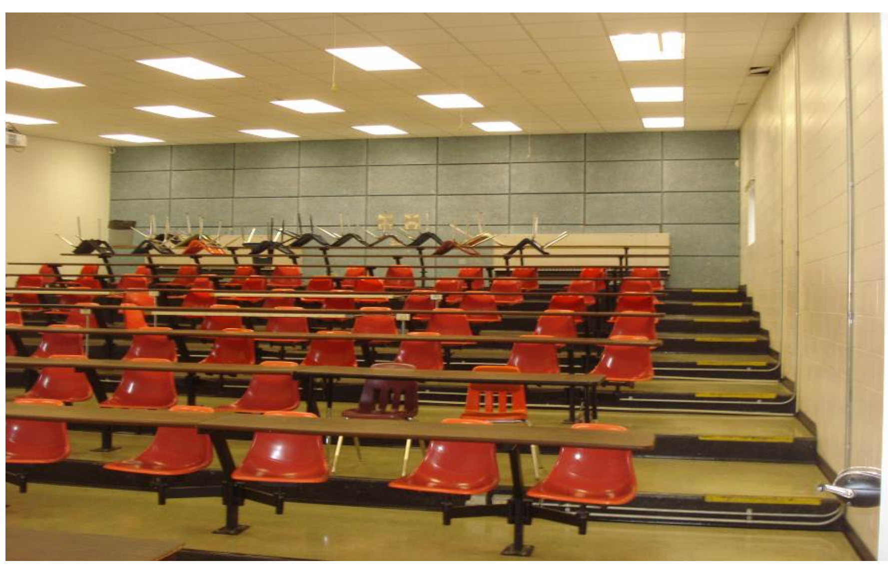
Doors to Student Toilets



Lecture Room

Third floor lecture room is not in compliance with ADA for wheelchair accessibility to raised seating areas. Recommend modification of low stepped seating area with ramp and platform accessibility by a wheelchair.

Lecture Room – Raised Seating Area



Stairs Across from Library

In means of egress stairwells – door openings from adjacent rooms are not allowed to exit into a stairwell. This opening was constructed in this manner and is a rated door assembly. Potential that local code may eventually require the school to block this opening.

Door to Room Exits Into Stairwell

Survey Observations – Potential Corrections

Interior Window Panels

Viewing the interior drywall panels around the windows it is apparent that water penetration around the windows and panels is the direct cause of the paint peeling and drywall failures and cracks you are witnessing. The window system is as originally constructed, a narrow-line non-thermally broken aluminum window frame and sash with a single glazed panel. Most of the window units have had the single pane glazing replaced with an insulated window glazing panel that appears to be around ¾" thick.

Even though there are benefits to replacing the glazing, the unit is installed in a non-thermally broken aluminum frame system. The sill frame of the unit does not have a sill flashing under the frame. The jambs are directly anchored to the precast panel with the frame mechanically attached to this anchor.

The precast concrete window panel system is anchored to the structure through a series of connection angles and weld plates. On the back of the precast panels a layer of insulation and drywall was installed directly to the precast panel. No information could be found on the drawings indicating how the drywall was attached to the precast panel or to any direct framing behind it.

Without a forensic demolition around the window to confirm its construction, at this point we would feel safe in stating that the issues you are experiencing at and around the window panels are due to thermal condensation.

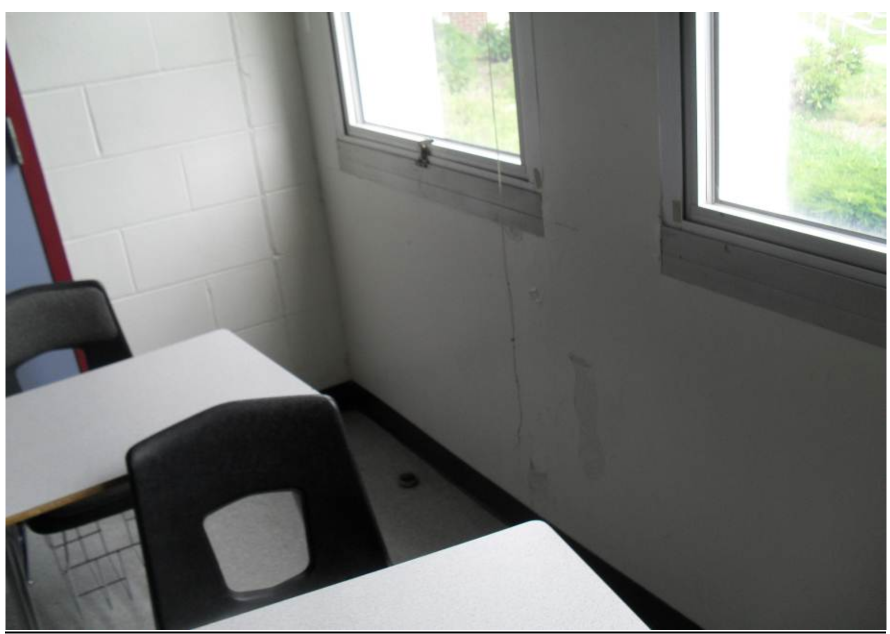
The manner in which the assembly is constructed with this large mass of concrete and the lack of any vapor barrier on the back of the panel, the dew point for condensation is somewhere inside the drywall surface thickness. A dew point analysis could quickly verify this but with a 3/8" drywall panel on the back it is a strong suspect.

There are areas above the suspended ceiling where the back of the panel is un-insulated or a layer of insulation is applied without a drywall layer. The manner in which this whole assembly is constructed provides an environment for condensation to build over time. Even though every room with this assembly was not observed, the rooms viewed shows signs of cracking and peeling or recent repair due to previous damage.

We would recommend to the Cape Elizabeth School Department that this becomes a very high priority on your Capital Improvement Project list. The potential for mold build-up behind the drywall is very high and in the present school environment of constantly minimizing health and safety risks the potential liability exposure could be become very serious.

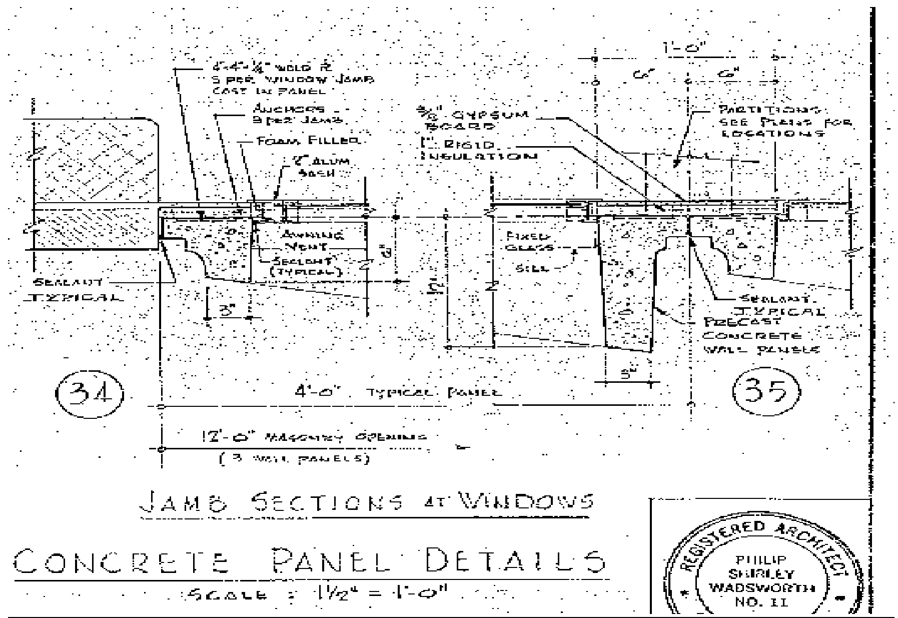
We would recommend a forensic analysis to verify and confirm our suspicions and an appropriate plan of action be put in place to repair this condition.

Peeling Paint on Drywall at Windows

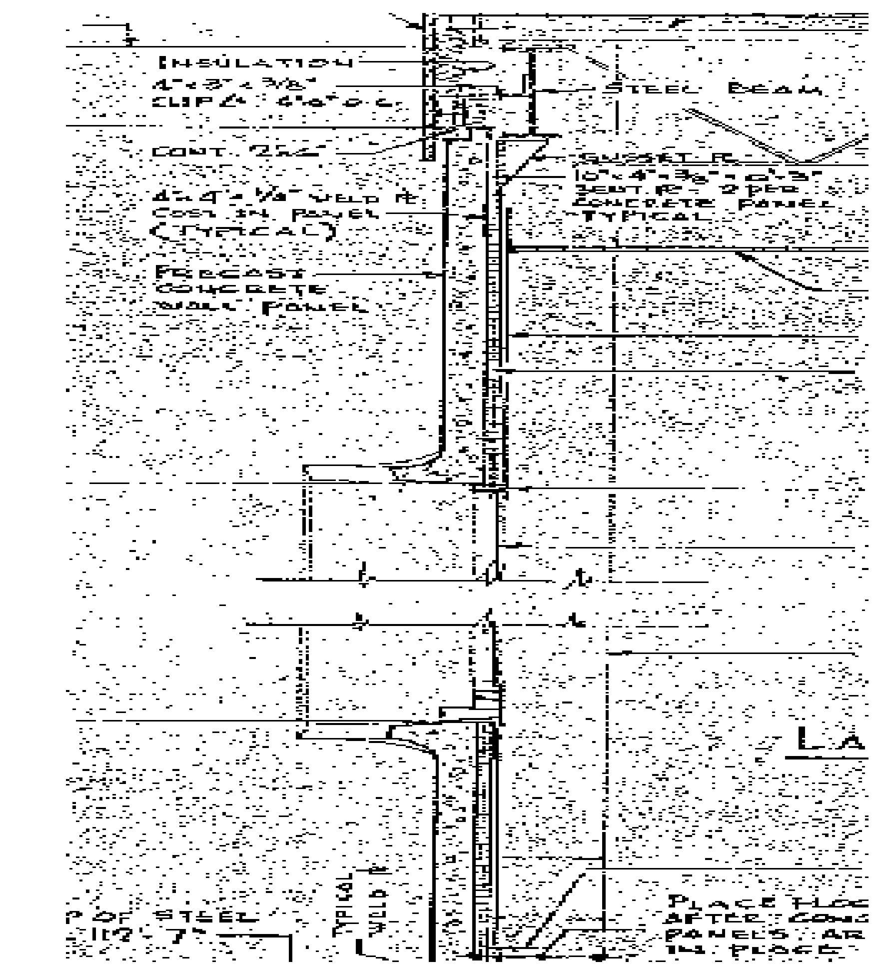


Cape Elizabeth High School / Donald Richards Pool

Detail 1 –
Plan of Existing Windows at Precast Panels



Detail 2 –
Section Through Window/Concrete Panel



Gymnasium

Roof drain body and covers were modified with new retro-fit drains as part of the 2004 renovation project when the roof was replaced. When the roof was constructed the drain boot and roof leader would have been cast iron. With the installation of the retro-fit drain we can see that a flexible boot and drain body was attached to the existing roof leader drain pipe. The concern lies with the lack of pipe hangers to support the roof leader especially when large volumes of water enter the line and the weight could cause a failure at this connection. It is unknown how they connected the drain and flexible boot together and we would consider this connection as a potential failure point during a heavy rainstorm.

We would recommend adding hangers at the elbow connection and along the horizontal leader to its vertical drop at the inside corner. At the time of roof replacement we would recommend replacement of these drains and connections.

The drain replacement will more than likely occur as part of the removal of the wood fiber roof panel and installation of a new metal deck.

This condition occurs at all roof drain locations in the gymnasium. There were four roof drains at the time of construction and two additional roof drains were added as part of the 2004 renovation project.

Gymnasium Roof Drain

Gymnasium

Existing concrete block wall – interior surface and block is cracked from water entry. Recommend block repair and painting to maintain wall.

Damaged Wall in Gymnasium

Interior Walls

Observed some locations where water entry in the concrete block back-up wall has ruined the finish on the face of the walls. In order for this level of damage to occur, it is reflective of a large amount of water having entered into the block cell. Tracing the damage up the wall it appears that the water entry point is somewhere near the roof line. The damaged wall in the first photo is from the third floor corridor. Damage to the wall on the second floor corridor directly below was also found.

The second photo shows a similar condition on the exterior wall of the art room. In this room the damage is relatively close to the precast concrete window panel system which suggests that the entry point may be related to a flashing or joint system failure.

If the source of water entry is unknown then we would recommend a forensic study to find and correct your water entry source before you repair the walls and repaint.

Exterior Wall – Corridor Water Damage

Exterior Wall – Art Room Wall Damage

Classroom Wings Third Floor

At the transition area of the second and third floor corridors there was a hump in the floor tile going wall to wall across the corridor. Research of the construction documents indicates that this hump is a location of a floor control joint system.

Recommended repair would be to cut out the existing control joint system and install a new metal floor expansion joint system with a VCT insert.

Floor Systems

The elevated concrete deck floor systems were constructed of wire mesh and concrete slab. When walking the corridors of the building there are highs and lows in the floor line visible through the floor tile. These valleys are a result of the way the system was installed. A wire mesh deck of this type is not rigid enough to maintain a straight level surface when wet concrete is applied. Sagging most likely occurred during the placement operation. The system is structurally sound and any attempt to correct would be of substantial cost.

Wire Mesh Floor Deck

Gymnasium Climbing Ropes and Net

During the course of our observations, installation of climbing ropes and nets suspended from the lower chord of the steel joist in the gymnasium was noted. As a minimum precaution, we would recommend that all of these rope systems be attached from the top chord. The bottom chord of a steel joist is not designed to take bottom load action as currently being applied with the suspension of these ropes. These connections should be relocated to a joist panel on the top chord and a minor structural review conducted to ensure that the loads of two to five students are not overstressing the joist bottom chord.

Gymnasium Climbing System

Swimming Pool, and Spa

During our site visit it was noted that the issue of ADA Accessibility to the pool and spa was noted, as the facility is non-compliant relative to access. There are products that can assist with accessibility issues. There is concern with adapting the spa pool. The spa pool has no physical room to mount these systems, and we would not recommend a wall mounted unit unless a structural upgrade to the wall is conducted.

The lack of ADA accessibility has become an issue for the town.

S.R.Smith

ADA COMPLIANCE

swimming pool COMPLIANCE GUIDE





accessibility **equipment**

MORE ACCESSIBLE POOLS

Access to aquatic environments is vitally important for both mobility challenged individuals and seniors. A pool provides the optimal setting for low impact exercise or therapy. As our society ages the mobility challenged population increases, as does the need for safe and accessible pools. Our line of powered lifts can help make pools more accessible starting today.

ADA COMPLIANT

POOLLIFTS.COM

new! **poollifts. com**

ADA Pool Accessibility requirements became law on September 15, 2010. This new legislation requires commercial swimming pools to provide means of access for their pools on or before March 15, 2012. Poollifts.com is an informational website dedicated to helping the swimming pool industry meet the new ADA Pool Accessibility requirements.

NEW! POOL LIFT CONFIGURATOR

Which pool lift is right for you? Pools vary greatly, so provide us with some basic information about your pool, and let us suggest the best lift for your application. Visit www.poollifts.com to try it today!

chairs

Mobile Aquatic Chair (MAC) NEW

Mobile Aquatic Chairs (MAC) are essential for facilities utilizing a ramp, zero-depth entry or movable floor. The MAC is built specifically for use in aquatic environments and with proper maintenance, will look great for years to come.

- Rear stabilizing wheels provide increased stability when the chair is in the water
- Arm rests flip up—enabling easy transfer on and off the chair
- 300 lb/136 kg weight capacity
- Powder coated stainless steel frame—looks beautiful and resists corrosion
- 18 inch/46 cm rotomolded plastic seat—rigid platform provides transfer support

SR Smith

ADA
(AMERICANS WITH DISABILITIES ACT)

The Americans with Disabilities Act requires public accommodations to provide goods and services to people with disabilities on an equal basis with the rest of the general public. The goal is to afford every individual the opportunity to benefit from our country's businesses and services, and to afford our businesses and services the opportunity to benefit from their patronage. In our case, the goal is to provide access to every swimming pool, so that people with disabilities will have a greater opportunity to enjoy the benefits of water-based activities.

ADA requires both **Title II (Public) and Title III (Private)** entities to provide **"accessible means of entry for swimming pools."**

PURPOSE OF THIS GUIDE

This guide will help you identify the accessibility requirements and solutions for swimming pools in order to meet your obligations under the ADA.

ada compliance = product + installation

ADA POOL LIFT REQUIREMENTS AS OUTLINED IN SECTION 1009.2 OF THE ADA ACCESSIBILITY GUIDELINES

REQUIREMENT*	POOL SPECIFIC	POOL LIFT SPECIFIC
Water depth at point of lift entry is no more than 48".	■	
When over the deck, the center line of seat is at least 16" from the edge of the pool.	■	
There is a 36" x 48" area of clear deck space on the side of the seat opposite the pool. Measurement starts at the rear edge of the seat. *(Figure 3, page 7)*	■**	■**
Seat is 16"-19" from the deck to the top of the seat surface.		■
In the loading area, the slope of the deck is no greater than 1:48.	■	
Seat is at least 16" wide.		■
There are footrests that move with the seat.		■
Armrests (optional) are removable or fold clear of the seat to allow the user to easily load the lift.		■
The lift is user operable from both the deck and water.		■
The seat submerges at least 18" into the water.	■***	■***
Lifting capacity is at least 300 pounds.		■

*For complete guidelines see Section 1009.2 of the ADA regulations at www.ada.gov
**Some requirements may impact both the site requirement and pool lift requirement.
***Deck to water height combined with the reach of the pool lift arm will determine if the 18" minimum can be reached.

SECTION 7
MAINTENANCE OF ACCESSIBLE FEATURES

Routine lift maintenance and cleaning are an important part of ensuring accessibility. Regular service helps prolong the life of your lift, supports daily operation and helps satisfy the ADA's Maintenance of Accessible Features* provision.

***MAINTENANCE OF ACCESSIBLE FEATURES**
The maintenance of accessible features provision of ADA states that "a public accommodation shall maintain in operable working condition those features of facilities and equipment that are required to be readily accessible to and usable by persons with disabilities."

ELECTRONIC LIFT MAINTENANCE

Electronic lifts are mechanical in nature and contain a motor & gears. Much like an automobile there is a basic level of maintenance required to ensure proper operation. By instituting the following maintenance practices you can ensure optimal lift performance.

ACTIVITY	DAILY	WEEKLY	MONTHLY
Check/Charge battery	■		
Test for normal operation	■		
Inspect lift for damage	■		
Clean lift and seat, rinse with fresh water	■		
Wipe down (dry) lift after cleaning	■		
Cover/Store after use	■		
Spray/Lubricate all gears		■	
Inspect all cable connections			■
Inspect frame, mast, arms, seat			■
Inspect counter weight stack (portable lifts only)			■
Clean battery connections with nylon scouring pad			■
Clean metallic surfaces with cleaner wax			■

ADD AN EXTRA LAYER OF PROTECTION

Swimming pool chemicals, water and direct sunlight, when mixed together create a potentially corrosive environment for metallic based mechanical systems. This situation is particularly harsh in poorly ventilated indoor environments. The best way to guard against this potent combination of elements is to follow all lift maintenance guidelines, avoid storing your lift near pool chemicals and use a lift cover. Lift covers provide an extra layer of protection against the random splash of chemical infused water and the fading effects of direct sunlight.

aXs COVER

PAL COVER

Splash! COVER

aXs

The aXs is a perfect low profile lift for simple pool designs.

- ADA-compliant
- 300 lb/136 kg lifting capacity
- Easily removable from stainless steel deck anchor
- Powered by a 24-volt rechargeable battery
- User operable via a waterproof hand control
- 360˚ rotation
- Powder coated stainless steel and aluminum construction
- Includes battery, charger, battery console cover, waterproof control, stainless steel anchor socket with cover, footrest and seat belt assembly

multiLift

multiLIFT™ is an adaptive pool lift platform that gives customers the flexibility to have either a fixed or removable lift in a single integrated design.

- 3rd party tested and verified ADA compliant
- 350 lb/159 kg lifting capacity
- Flange mounting
- Right seat mounting (facing pool), field convertible to left
- LiftOperator™ intelligent control system
- Easy portability via Wheel-A-Way mobility option
- Powder coated stainless steel and aluminum construction
- Includes battery, charger, battery console cover, waterproof control, footrest and seat belt assembly

PAL Series

Since its introduction in 1997, the PAL (Portable Aquatic Lift) has become the industry standard for portable swimming pool access. The completely portable PAL is the perfect accessory for any commercial aquatic facility.

- ADA-compliant
- 300 lb/136 kg lifting capacity
- Completely portable—easy to move by one person
- Conveniently stores away when not in use
- Powered by a 24-volt rechargeable battery
- User operable via waterproof hand control
- 240˚ rotation
- Powder coated stainless steel and aluminum construction
- Comes with battery, charger, battery console cover, waterproof control, footrest and seatbelt assembly

Splash! Series

This removable lifting system is designed for facilities seeking to provide user-friendly access to their swimming pools.

- ADA-compliant
- 400 lb/181.5 kg lifting capacity*
- Easily removable from stainless steel deck anchor
- Powered by a 24-volt rechargeable battery
- User operable via a waterproof hand control
- 359˚ rotation
- Powder coated stainless steel and aluminum construction
- Includes battery, charger, battery console cover, waterproof control, stainless steel anchor socket with cover, footrest and seat belt assembly

**Lifting capacity of the Extended Reach model is 300 lb/136 kg*

ada compliance

AmSan®

America's Leading Supplier of Janitorial, Cleaning and MRO Products

Your Source for ADA Compliant Products!

aXs (Removable)

PAL (Portable)

multiLift (Adaptive)

Splash! (Removable)

We offer a variety of Pool Lift units from S.R.Smith.
They vary from permanent installation to removable and portable units.

PERMITTED MEANS OF ACCESS

APPLICATION TYPE	Pool Lift	Sloped Entry	Transfer Wall	Transfer System	Stairs
Means of Access	**Primary** (Secondary)		**Secondary**		
Swimming Pool <300 linear Feet (1 means of access required)	■	■			
Swimming Pool >300 linear Feet (2 means of access required —1 must be a primary means)	■	■	■	■	■
Wave action, lazy river and other pools where user entry is limited to one area	■	■		■	
Wading Pools		■			
Spas	■		■	■	

Important Information

- Justice Department expects lifts at all pools and most spas to be in place by March 15, or when the pool/spa is opened.
- A lift is required for each body of water.
- A pool lift must be left poolside and operational when the pool is open.
- A pool lift cannot be shared amongst a pool and spa.
- All lifts must be fixed or attached to a deck at all times the pool is open to guests. A portable lift is not acceptable unless it can also be fixed to the deck with clamps, screws, or bolts.
- Portable lifts are approved if it's not readily achievable to purchase a fixed lift.
- Properties that have already purchased portable lifts will need to find a way to secure the lift to the deck or purchase a new lift that can be fixed.

For product quote, please contact: specialorder@AmSan.com
or call our customer service team 866-412-6726

Source; S.R. Smith

America's Leading Supplier of Janitorial, Cleaning and MRO Products

ADA Compliant Pool Lifts from SR Smith ensure your property complies with the new standards.

PORTABLE

Completely portable with 300 lbs. lifting capacity. Deck mounting anchor must be used to meet compliance.

PAL-PORTABLE AQUATIC POOL LIFT CHAIR
MFG. No. 200-0000
ITEM #757666

PAL HI/LO POOL LIFT CHAIR
MFG. No. 250-0000
ITEM #757667

PAL SPA POOL LIFT CHAIR
MFG. No. 275-0000
ITEM #757668

REMOVABLE

Semi-permanent installation via deck anchor with 400 lbs. lifting capacity

SPLASH AQUATIC POOL LIFT CHAIR
MFG. No. 300-0000
ITEM #757669

SPLASH HI/LO POOL LIFT CHAIR
MFG. No. 350-0000
ITEM #757670

SPLASH SPA POOL LIFT CHAIR
MFG. No. 375-0000
ITEM #757671

SPLASH POOL LIFT EXTENDED REACH
For pools with unusual gutter configurations requiring a longer reach.
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ITEM #757679

SPLASH POOL LIFT
MFG. No. 940-3000
ITEM #757680

AXS POOL LIFT
MFG. No. AX9000
ITEM #757681

ACCESSORIES

POOL LIFT DECK ANCHOR WITH CAP AND KEY
MFG. No. 300-6200
ITEM #757675

BATTERY FOR OLDER POOL LIFT MODELS
MFG. No. 100-2000
ITEM #757674

SPLASH POOL LIFT CADDY
MFG. No. 400-000
ITEM #757678

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Cape Elizabeth High School / Donald Richards Pool

Exterior Building Systems

High School Brick

The face brick on the composite wall of the high school is in very good shape since constructed 43 years ago. There were no visible signs of joint failure or brick cracks due to expansion or contraction. There are stains on the building in numerous locations due to re-coating and new sealant installations. The mildew at the bottom of the wall is due to constant moisture near the surface of the brick. All of the above can be cleaned with a mild brick washing detergent and a light pressure wash.

We would recommend that you do not apply transparent brick sealer of any type. Once applied it will become a maintenance issue every three to five years with a re-application. These sealers are known to keep moisture within the wall and cause earlier deterioration of these types of masonry wall systems.

High School Window Panels

The window units are generally set into a precast concrete wall panel system. It appears that some of panels have been re-coated and the sealant joints within and around the panels redone.

There are wall panels that need the same maintenance rework and we recommend continuance of this program until all the panels have been revamped. As noted earlier in this report the potential of cold and water infiltration thru these joints on these panels is a contributor to your condensation issue on the inside of the panels.

Window Panel Requiring Work

Cape Elizabeth High School / Donald Richards Pool

Window Panel Renovated

Lobby Entrance – Window Panels Renovated

High School Main Entrance

The bituminous asphalt ramp up to the front entrance is not in compliance with ADA requirements as a handicap ramp on an accessible route. The contract documents from the 2004 renovation project do not indicate this as an ADA ramp but it is implied by its location. There is an approximate 5' change in elevation between the bottom entry point and the front doors stoop elevation. There are a number of noncompliant issues connected with this ramp. The rise over the length is too steep; 68" in 105', change in direction widths, no handrails, and the total rise in one run exceeds 30". Per the contract documents, the entry slab at the doors is pitched too steep from the doors to the edge of the steps.

Cape Elizabeth High School / Donald Richards Pool

We would recommend construction of a new compliant ADA ramp to the doors and possible reconstruction of the front steps to work with the new ramp.

Front Entrance – Existing Stairs and Ramp

High School Exterior Stairs

Exterior concrete exit stairs are in bad shape and the cement based parging system used to patch the stairs has deteriorated and is falling off due to temperature and weather exposure. We would recommend replacement of these stairs with a new poured in place concrete stair and metal cast in nosing.

Exterior Stairs

Cape Elizabeth High School / Donald Richards Pool

High School Exterior Doors and Frames

A quantity of the hollow metal exterior doors and frames on the building are showing signs of extensive rust at the bottom of the doors and frames as well as the hinge location. We understand as part of your yearly maintenance program these openings are being replaced. We also understand that the overhead doors at the IA shops are being replaced this year as part of that maintenance program.

We would recommend replacement of hollow metal doors and frame entrances be done as part of your yearly maintenance program. For long term durability we would recommend replacement doors and frames be ordered as galvanized units and primed with a good alkyd primer and alkyd enamel coatings.

Personnel and Overhead Doors

Cape Elizabeth High School / Donald Richards Pool

High School Exterior Walls

This picture shows that the brick and precast concrete walls panel system have been well maintained. We would recommend replacement of the fresh air-intake louvers at some point with a more durable louver system.

Exterior Wall with Intake Louvers

Cape Elizabeth High School / Donald Richards Pool

Architectural Systems Evaluation

Roof System Type Locations

- Fully adhered EPDM roofing membrane over two layers of 2 ½” roof insulation mechanically fastened.
- Existing 2” T-bulb and structural wood fiber plank with asphalt felt roofing direct to the plank.
- New roof insulation was mechanically fastened with molly bolts through the insulation.
- Roof system has very low slope to drain locations.
- Date of roof replacement unknown.
- EPDM membrane appears to be .060.

Industrial Arts Wing - Lower Industrial Arts Roof

- Fully adhered EPDM roofing membrane over hardboard underlayment with two layers of 2 ½” roof insulation adhered to existing roofing felts.
- Existing 2” T-bulb and structural wood fiber plank with asphalt felt roofing direct to the plank.
- Roof was replaced as part of the 2004 renovation project.
- Roof system has very low slope to drain locations.

Gymnasium Wing – Gymnasium Roof

Cape Elizabeth High School / Donald Richards Pool

- Fully adhered EPDM roofing membrane over hardboard underlayment with two layers of 2 ½" roof insulation adhered to existing roofing felts.
- Existing asphalt roofing felts remained on the existing concrete deck surface.
- Roof system has very low slope to drain locations.
- Roof was replaced as part of the 2004 renovation project.

Locker Room Wing – Locker Room Roof

- Fully adhered EPDM roofing membrane over two layers of 2 ½" roof insulation mechanically fastened.
- Existing 2" T-bulb and structural wood fiber plank with asphalt felt roofing direct to the plank.
- New roof insulation was mechanically fastened with molly bolts through the insulation.
- Roof system has very low slope to drain locations.
- Parts of the existing classroom roof were replaced as part of the 2004 renovation project.

Classroom Wing

Cape Elizabeth High School / Donald Richards Pool

- Fully adhered EPDM roofing membrane over two layers of 2 ½" roof insulation mechanically fastened.
- Existing 2" T-bulb and structural wood fiber plank with asphalt felt roofing direct to the plank.
- New roof insulation was mechanically fastened with molly bolts through the insulation.
- Roof system has very low slope to drain locations.
- Date of roof replacement unknown.
- EPDM membrane appears to be .060.
- Parts of the existing classroom roof were replaced as part of the 2004 renovation project. This area was not designated for replacement.

Classroom Wing

Cape Elizabeth High School / Donald Richards Pool

- Fully adhered EPDM roofing membrane over two layers of 2 ½” roof insulation mechanically fastened.
- Existing 2” T-bulb and structural wood fiber plank with asphalt felt roofing direct to the plank.
- New roof insulation was mechanically fastened with molly bolts through the insulation.
- Roof system has very low slope to drain locations.
- Date of roof replacement unknown.
- EPDM membrane appears to be .060.
- Parts of the existing classroom roof were replaced as part of the 2004 renovation project. This area was not designated for replacement.

Classroom Wing

Cape Elizabeth High School / Donald Richards Pool

- Fully adhered EPDM roofing membrane and roof insulation adhered to existing concrete T-beam.
- Lower roofs around pool are fully adhered .060 EPDM roofing membrane over two layers of 2 ½” roof insulation mechanically fastened to metal deck.
- Pool roof drains through scuppers to lower roof.

Donald Richards Pool – Pool and Locker Roofs

Pool Roof

- Fully adhered EPDM roofing membrane over two layers of 2 ½" roof insulation mechanically fastened.
- Existing 2" T-bulb and structural wood fiber plank with asphalt felt roofing direct to the plank.
- New roof insulation was mechanically fastened with molly bolts through the insulation.
- Roof system has very low slope to drain locations.
- Date of roof replacement unknown.
- EPDM membrane appears to be .060.
- Parts of the existing classroom roof were replaced as part of the 2004 renovation project. This area was not designated for replacement.

Classroom Wing – Classroom and Lecture Room Roofs

Condition of Roof Systems

The fully adhered roofing membrane is in overall good condition. As part of your yearly roof inspection and maintenance program the roof should be monitored on a continuous basis to maintain its condition which should allow the town to keep this roof out beyond its 20 to 25 year life span. It appears that corrective seam re-flashing and patching has been done as part of your roof inspection program. Generally an EPDM roof of this type requires a seam re-flashing as part of a normal maintenance program but the lap seams will become more problematic as the system grows older and the constant movement of the membrane under weather and temperature exposure will work the seams apart. The roof membrane did not show an abnormal amount of pitting at this time which is the sign that the UV exposure is breaking down the membrane. One of the installation issues that may reduce the life span of the system is the lack of pitch of the surface to the roof drain locations. There are locations where drain troughs have been cut into the roof insulation to remove water from the roof and also many locations where large ponding areas have dried up. Allowing large ponding areas on this roof to occur at seams is not recommended by roofing manufacturers as it will cause the bonding of the lap seams to deteriorate early. From the 2004 renovation documents it stated that the EPDM roof replacements on some of the roofs were pitched with a 1/8" per ft tapered roof insulation board. The roof drains are in the original locations from when the building was constructed and not laid out as required for minimum roof pitch and water ponding which is required by current code and manufacturers roof warranties. The current code requires minimum ¼" per ft roof pitch to drains and would be required as part of the next replacement. The flashing at walls and curbs is in good condition with the original copper flashing bent backed down from the roof replacement operation which gives the flashing the wavy bent appearance. The roof edge strip is showing 2 metal edge strips from which the only conclusion can be, without a forensic demolition, is that the installer of the replacement roof left the original metal edge and wood blocking and applied a new blocking and metal edge strip over the existing system. The roof insulation is showing a tapered board from this edge in some locations indicating the board was required to eliminate a high lip due to the new metal edge being applied over the top of the existing.

Roof Conditions – Minor issues to be Addressed

1. Provide drain cover at two drain locations – Industrial Arts roof.

Roof Drain - No Cage

Cape Elizabeth High School / Donald Richards Pool

2. Provide secondary membrane under all rooftop condenser curb locations. There are some curbs that need replacement. Weight of unit will allow curb to cut into membrane causing leak location.

Roof Curb - No Flashing Under

Roof Curb – No Flashing Under

3. Remove old metal cap and provide new permanent EPDM cap flashing. Potential roof leak location.

Replace Old Roof Curb Cap

4. Rework membrane flashing to some drains – membrane is stretched over insulation with gap under – not laying flat on insulation and following insulation profile – constant stretching will cause early seam failure at drain locations. Air space between membrane and insulation can easily be punctured with foot traffic.

Roof Flashing at Drain

Recommendation

Maintain a consistent yearly maintenance and inspection process with the entire roof system. Provide re-seaming of the seams, address roof leaks as they occur and provide long term maintenance to all roofs when recommended or required.

Installation of EPDM Replacement Roof – Long Term Concerns

Original High School

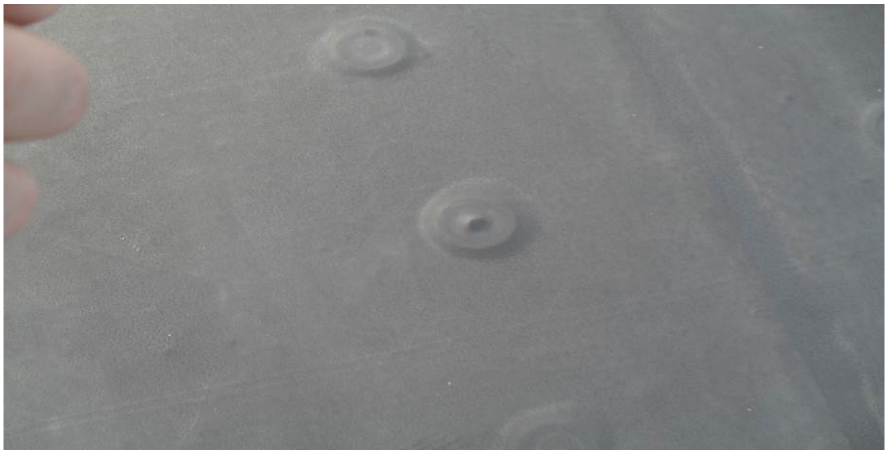
1. The roof insulation fastening pressure plates under the fully adhered membrane. The original building roof system was constructed of a 2" high T-bulb anchored to the steel joist with a 2" wood fiber roof plank set into the T-bulb and a built-up asphalt felt and gravel surface applied directly to the wood fiber plank system. The replacement roof insulation boards were mechanically fastened through this wood fiber roof plank deck with the use of a drilled pilot hole and metal molly bolts. The installation of these roof anchor bolts and pressure plates were inconsistently fastened through the plank with the wing drawn too far into the wood fiber plank. The pressure plates have loosened up or were drawn up causing a dimple in the membrane. The concern here lies with the fastener and the way they were installed through the wood fiber panel being raised up, stretching the membrane and causing a premature leak point. I would also question the amount of fasteners per board on some areas of the roofs and location in the boards and their capability to hold the roof system under wind uplift conditions. The lack of a third row of fasteners through the roof insulation boards along the perimeter of the roof through this wood fiber plank could be cause for a roof failure. The scenario of the boards lifting under wind pressure is related to specifications and the code requirements at the time of installation.

Since no record of the specifications or a copy of the written warranty were available, it would require some research and analysis to determine if in fact this condition will be problematic with this deck system. This condition is limited to those sections of roofs where the wood fiber roof plank deck was installed.

The molly bolts as shown through the deck in the lower picture have had the wings drawn up into the panel to various depths – visual inspections where the deck is exposed has shown that some wings are loose as a result of their attachment process. The result means that the amount of fasteners required to hold the roof board will be less than required by wind uplift codes thus adding to the observation about the amount of fasteners required to hold the roof system down properly.

The locker room roof which is attached to a concrete deck and those roofs at the Pool Facility which are attached to metal and concrete decks are not a subject of concern.

Pressure Plate Raised Up

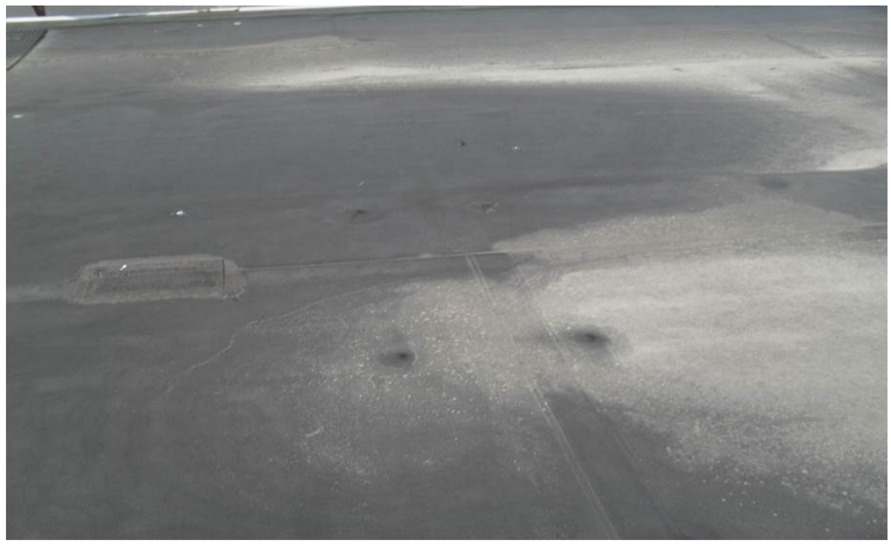


Roof Insulation Fasteners Through Plank

Cape Elizabeth High School / Donald Richards Pool

2. Lower locker room roof membrane has a number of locations where foreign material under the roof membrane is causing large dimples in the surface. Foot traffic over these locations can cause holes in the roof membrane and leaks.

Material Under Membrane



3. Low slope pitch of roof system – Existing 1/8" per ft and roof drain locations.

   There is no available information as to the date the replacement roof was installed. Areas of the High School Roofs were replaced as part of the 2004 renovation project. Both those that were replaced as part of the 2004 project and the remaining areas have 1/8" per foot slope to existing drain locations.

   Per the IBC Code 2003 it is required as part of that code that single membrane roofs be installed at ¼" per ft slope. There is an exception in the code that replacement roof systems do not need to meet this requirement. There is a state statue through the Bureau of General Services on public school buildings that supersedes the code requirement saying replacement roofs will meet the ¼" per ft single membrane low slope pitch without exception. In regards to this statue the state also requires that an analysis of the roof structure be conducted and that the roof structure and roof system be brought up to current live and drift loads. We can offer no explanation as to why the replacement roofs were not installed according to the state statue.

Cape Elizabeth High School / Donald Richards Pool

The current 1/8" per ft slope and the inconsistent drain locations is creating large ponding areas on all roofs that will have a long term effect on the membrane and lap seams. The large ponding areas where they occur could also present an issue if a roof drain were to plug, the pond could increase in depth and cause the wood fiber deck to be over stressed from the load and fail.

Low Slope to Roof Drains

Recommendation

As part of a future roof replacement project the wood fiber plank deck should be removed and a new metal roof deck installed. With this existing combustible material in your ceiling cavities and with the replacement of this material with a new metal deck it should raise the classification of the building to a Type II B rating per IBC Code.

We would recommend the replacement roof system be specified with a Class A rating and a ¼" per ft tapered board system and new roof drains to meet current code requirements.

As part of this replacement it will be required by state statute that an analysis of the existing roof structure be conducted to establish the designed live loads, and if required, to provide a structural frame upgrade of those roof sections to bring them up to current live loads code.

Based upon the configuration of the current building wings it will be highly probable that certain low roof areas will not meet the current code requirements for drift loads and would require a structural frame upgrade. These upgrades may also have an impact on your insurance premium cost for the building and should be discussed with your carrier.

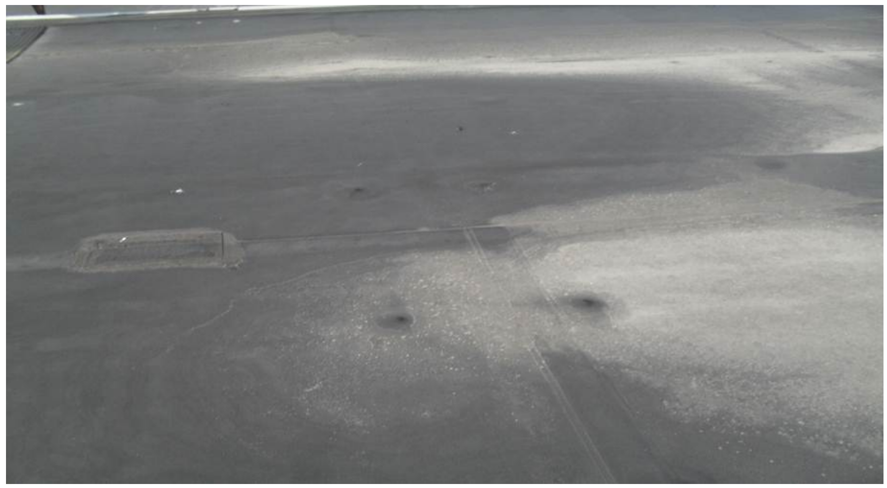
Cape Elizabeth High School / Donald Richards Pool

Roof Survey Observations

Locker Room Roof

1. Numerous locations with foreign material under the roof membrane causing large dimples on the surface. Roof areas with these light colored or collection areas are indicators of ponding on the roof and the inability of surface water to be properly sloped to a roof drain. These ponding areas have a long term effect on your lap seams.

Dimples and Light Colored Areas of Ponding



High Classroom Roof

2. Parapet CMU walls above classroom wing roof are showing signs of block joint cracking and overall deterioration due to weather exposure. Water entry has entered into the block system and has caused some spalling of the grout joints and the potential issue of water entry through these joints below the roof line to the rooms below is occurring.

   Recommend temporary waterproof system application over surface and full height flashing installation and cap at the time of replacement.

Parapet Wall - CMU Failing and Cracking

Lower Roof Flashing

3. Through wall flashing was bent up at the time new flashing was installed and bent back down and anchored to the wall and mastic over the anchor heads.

   This through wall flashing is consistent around the perimeter where a lower roof adjoins a high exterior wall. The flashing used appears to be a lead coated copper flashing which is consistent with the type of flashing used for this age period. It may require special removal at the time of roof replacement and we would recommend installation of a new metal flashing that is more compatible with a new EPDM roof system.

Metal Flashing at Base of Wall

High Classroom Roof

4. Under the 2004 project this area of roof was replaced. We recommend removal of leftover roofing product, weights, and pallets.

Materials Left on Roof

Cape Elizabeth High School / Donald Richards Pool

High Classroom Roof

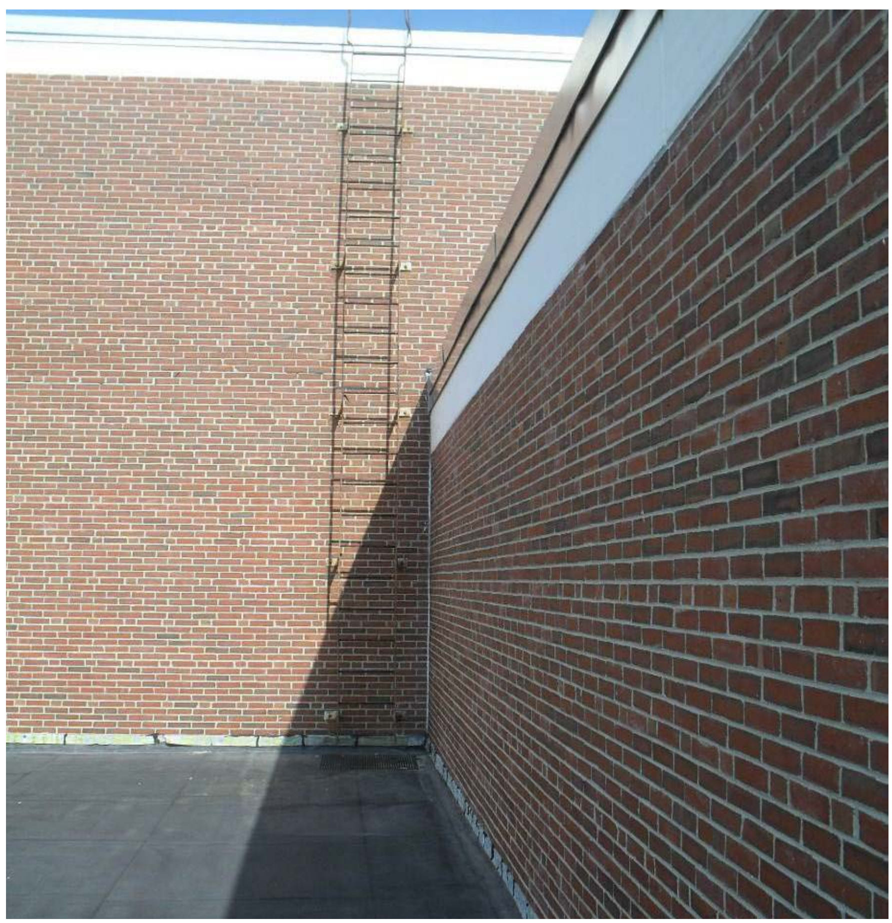
5. Existing roof hatch does not meet current OSHA Standards. Recommend installation of new scuttle hatch, ladder and safety railings.

Existing Roof Hatch

High Classroom Roof

6. Existing exterior access ladder does not meet OSHA standards. Recommend installation of a new OSHA compliant vertical ladder and cage.

Non-Compliant Ladder



Cape Elizabeth High School / Donald Richards Pool

High Classroom Roof

7. As part of the 2004 roof replacement we observed some sheets installed with the product label up. This type of roof membrane product is manufactured with the membrane surface on each side having two different functions. The surface applied to the insulation provides better bonding with the adhesive. The exposed surface is provided with a coating to help protect it from UV exposure. The label up indicates to us that the sheet was installed with the wrong surface up which may cause premature failure of the sheets in this area.

Product Label Facing Up

Kitchen Roof

8. Base flashing for AHU unit not at recommended height.

AHU Unit Base Flashing

Cape Elizabeth High School / Donald Richards Pool

Mechanical Systems Evaluation

Boiler Room

The heating hot water is generated from three new Buderus boilers installed during the Summer of 2011. Each boiler is outfitted with fully modulating Riello oil-fire burner, factory-provided controls and communicates directly with the building Direct Digital Control (DDC) system. The #2 fuel oil is provided to the boilers through the existing pump set. The gauges and hand valves were upgraded as of the boiler replacement project. Based on the oil delivery data for the years FY06-07 to FY10-11, the average fuel oil consumption was 71,556 gallons. The fuel consumption for FY11-12 was 46,908 gallons indicating a significant savings with the new boilers.

New Boderus Boilers

The heating hot water is circulated through the building by the Weinman base-mounted circulating pumps located adjacent to the boilers. One pair of pumps (left two) provides the hot water through the majority of the building. The other set of pumps circulate heating hot water through to the pool section of the building. The insulation on the hot water piping contained asbestos and was abated as part of the boiler project.

We would recommend insulating all of the heating hot water piping and accessories in the boiler room.

Existing Heating Hot Water Pumps

Piping is Not Insulated

The propane gas piping is installed along the exterior wall of the Boiler Room. The gas valve is protected. The piping from the parking lot level to the gas valve appears to be exposed to potential damage.

We would recommend the installation of protective barrier devices in front of the gas piping.

Propane Gas Piping on Exterior Wall of Boiler Room

The gas piping is exposed to potential damage.

The LP propane gas tanks serving the Kitchen Equipment are located outside of the Kitchen and do not meet code. The tanks are location of the tanks in non-code compliant.

We would recommend relocation of the LP propane tanks in accordance with codes.

LP Gas Tanks Serving the Kitchen Equipment

Cape Elizabeth High School / Donald Richards Pool

Rooftop Ventilation Systems

Ventilation and air conditioning for the cafeteria is provided from the Trane packaged rooftop air conditioning unit located directly above the cafeteria. The unit was installed as part of the 2004 renovation project and identified on the drawing as AC-1.

Trane Rooftop Air Handling Unit Serving the Cafeteria and Kitchen Areas

At the time of review, the unit was operating with the intake dampers 100% open, the relief fan was off, and the mechanical cooling running. At such warm ambient conditions, one would expect the intake dampers to be closed down to the minimum position. The unit-mounted intake filters are damaged.

We would recommend replacement of the filters and verification of system operations.

Damaged Packaged AC Rooftop Unit Outside Air Intake Filter

Rooftop Condensing Units

In general, the rooftop condensing units appear to be in good condition with the exception of some of the refrigerant piping and associated insulation. At many of the units, the insulation on the suction lines is showing signs of age and breaking down.

Rooftop Condensing Unit Refrigerant Piping

Rooftop Condensing Unit Refrigerant Piping

Cape Elizabeth High School / Donald Richards Pool

Rooftop Exhaust Fans

Many of the rooftop exhaust fans are showing signs of age. At the time of review, many of the exhaust fans were not operating. It is unknown which units were supposed to be running and which ones were in the off mode.

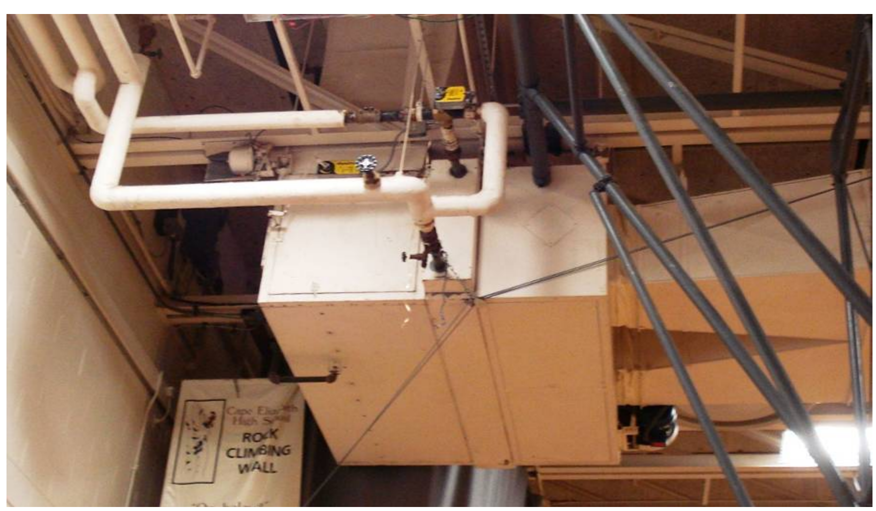
Rooftop Exhaust Fan

Indoor Ventilation Systems

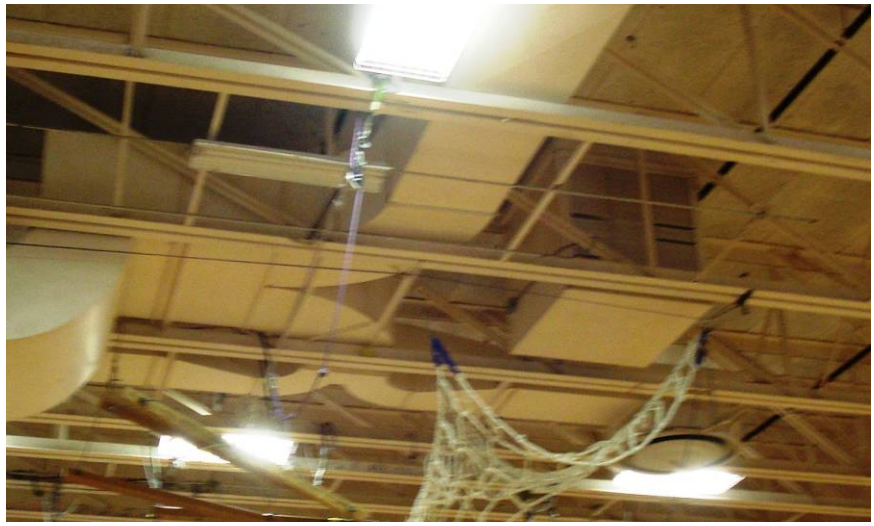
The gymnasium ventilation is provided through four air handing units suspended from the roof structure. The units appear to be original to the 1968 construction project. According to the 2004 renovations construction documents, the four existing units were scheduled to be removed and replaced with two new units. The units were not removed or replaced. During this review the units were not operating. The automatic controls and fan motors have been upgraded and variable frequency drives have been installed.

We would recommend replacement of the 4 units.

Gymnasium Ventilation Units (Typical of Four Units)



Gymnasium Relief Roof Vent (Typical One for Each Unit)



The ventilation unit HV-3 was installed during the 1968 construction project and appears to be in operation. The original pneumatic automatic temperature controls have been replaced and upgraded with DDC controls with electronic actuation. The unit originally provided conditioned ventilation air to two areas on the second floor and one area on the third floor. During the 2004 renovations project, minor changes were made to the system distribution.

The current 3-way valve actuator replaced the original pneumatic valve actuator and was retrofitted to the original 3-way control valve. The insulation on the piping appears to be original and may contain asbestos.

American Air Filter, Inc. Ventilation Unit HV-3 Located in "The Attic"

3-Way Control Valve and Pipe Insulation of HV-3 Multi-Zone Unit

The reheat heat coils and associated piping may be original to the 1968 project. The 3-way valves have been upgraded to ball-style valves.

Typical Reheat Coil with 3-Way Control Ball Valve

Cape Elizabeth High School / Donald Richards Pool

The original pneumatic automatic temperature controls for HV-3, and other units in the attic, have been replaced with current style electronic controls.

HV-3 Mixed Air Damper Actuator

The ventilation unit HV-4 was installed during the 1968 construction project and appears to be in operation. The original pneumatic automatic temperature controls have been replaced and upgraded with DDC controls with electronic actuation. The unit originally provided conditioned ventilation air to two areas of the current library or media center. Since 1968, changes have been made to the distribution system of HV-4. Changes do not appear in the 2004 renovations project. The note above the junction box indicates the fan bearings were changed in October 2000.

American Air Filter Co. HV-4 Mixed Air Damper Actuator

According to the hand-written note on the fan motor, the 7.5 HP motor was replaced in November 2010.

HV-4 Fan Motor

The return air for HV-3 and HV-4 is provided to each unit through a respective return fan as shown above. The return fans were installed during the 1968 project; upgrades are unknown.

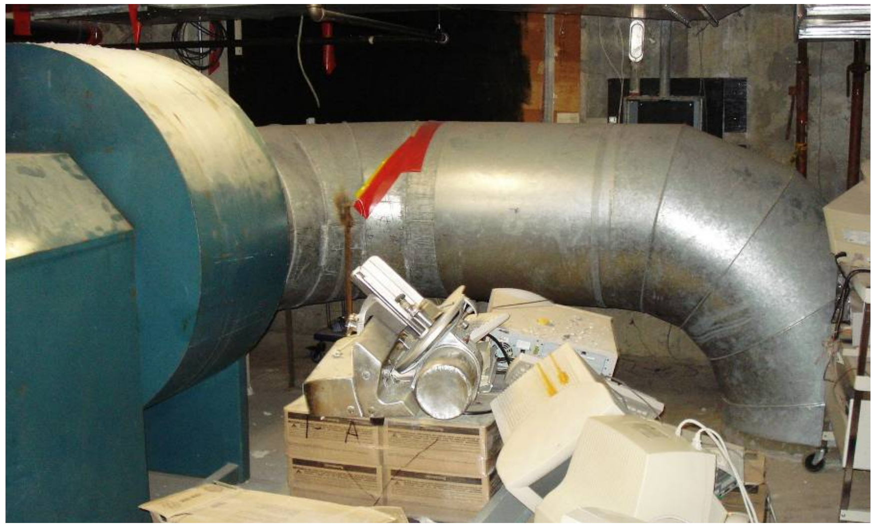
The 36" return air duct for HV-4 is installed in a floor trench. Operation of the fan is unknown. According to the 1968 drawings, the trench follows the outside perimeter of the library and provided the return air through floor-mounted return grilles located above the trench.

Return Air Fan Serving HV-3

Cape Elizabeth High School / Donald Richards Pool

Return Air Fan Serving HV-4

36" Duct Installed in Floor



The ventilation for the storage room or attic is provided through a wall-mounted propeller type exhaust fan. Recommend sealing the fan enclosure.

Storage Room (Attic) Ventilation Fan

Classroom Heating and Ventilation Systems

Many classrooms are served through individual classroom unit ventilators (UV). The UVs appear to be in relatively good condition for their age. The unit ventilator system may no longer meet the state requirements for Classroom Ventilation.

It appears attention has been paid to the maintenance and filter changes in the unit. It also appears efforts have been made to reduce the infiltration of outside air through the unit ventilators.

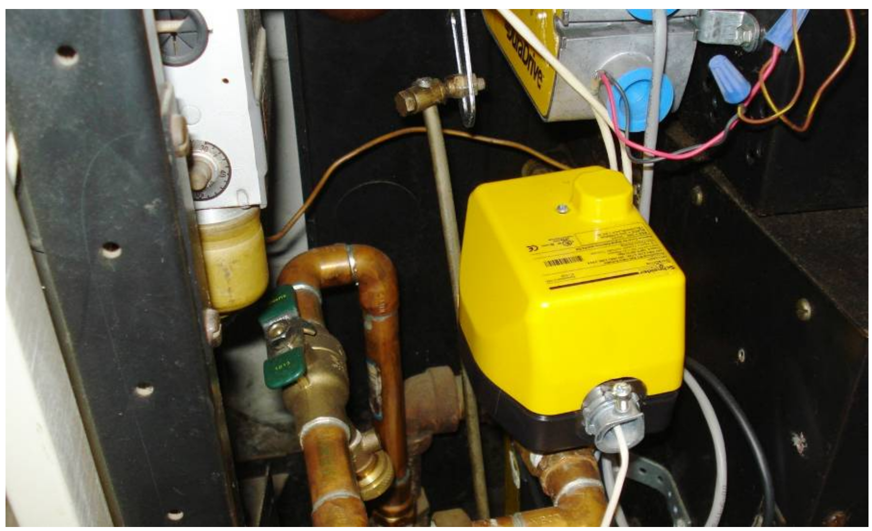
Trane Unit Ventilator Located in the Music Classroom (Typical of Many Classrooms)

Photo to Show Insulation Installed Near the Outside Air Duct Connection

Unit Ventilator Located in Classroom 214 (Typical of Many Classrooms)

The original pneumatic automatic temperature controls have been upgraded to current DDC with electronic control components.

Upgraded UV Electronic Components



Relief for the classroom systems is provided through the individual relief louver located near the ceiling of each classroom. According to the 1968 plans, relief for the second and third floor classrooms is provided through a roof-mounted exhaust fan shown as Fan #20. Operation of the fan is unknown.

Typical Classroom Unit Ventilator System Relief Louver

In Classroom 208, the unit ventilator has moved away from the wall creating an air gap between the unit insulation and the opening in the wall allowing for infiltration of outside air into the classroom.

Unit Ventilator in Classroom 208. Photo on Right Shows the Gap Between the Unit and the Wall

Cape Elizabeth High School / Donald Richards Pool

Heating and ventilation for the Lecture Hall is provided through two typical classroom unit ventilation units. The units are located along the back wall and are controlled through the building DDC system. The units may be original to the 1968 construction project and are noted on the 2004 renovations project as to remain.

Natural ventilation relief is provided through grills located near the floor and ceiling. Based on the 1968 drawings, the relief is ducted to a roof-mounted vent.

Lecture Hall Ventilation Unit (Typical of Two)

Front of Lecture Hall Showing Relief Grilles Near Floor and Ceiling

Industrial Technology Classroom Heating and Ventilation Systems

Heating of the Industrial Technology Wood Shop is provided by one horizontal and two ceiling-hung vertical hot water unit heaters.

Horizontal and Vertical Unit Heaters Located in the Industrial Technology Wood Shop

A dust collection system is provided for the Wood Shop. Operation of the dust collection system is unknown. According to construction documents, the dust collection system was provided during the 2004 renovations project.

Exterior and Interior Views of Dust Collection Exhaust System in the Wood Shop

It appears general exhaust is provided to each of the Wood Shop spaces. The make-up air for the exhaust systems is unknown and may be insufficient.

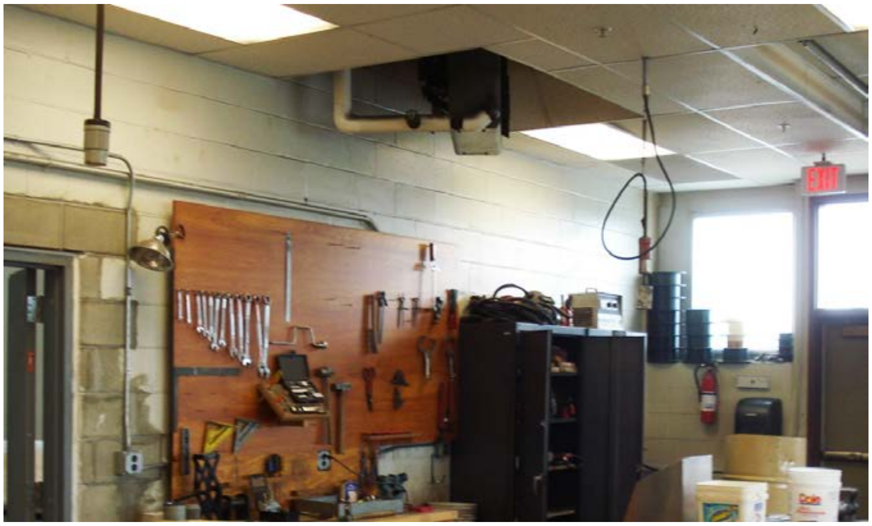
Roof-Mounted Exhaust Fan Louvers

Classroom Unit Ventilator in the Finish Room

Cape Elizabeth High School / Donald Richards Pool

It appears the room between the Wood Shop and the Metal Shop may have been a classroom served by the unit ventilator. The Herman-Nelson UV is showing signs of age. The original automatic temperature controls have been upgraded similar to other classroom UVs.

Horizontal Unit Heater Serving the Metal Shop



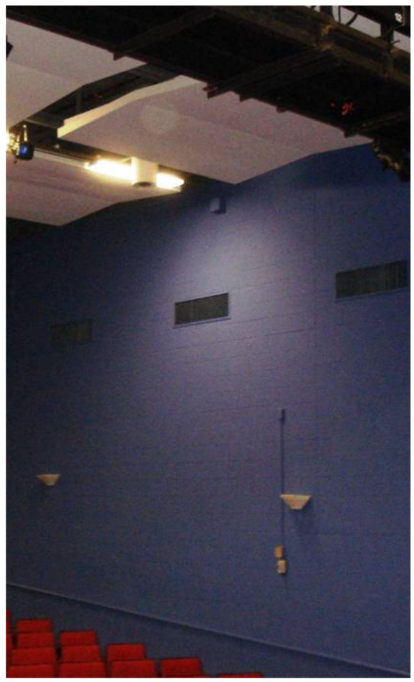
Heating for the Metal Shop is provided by a ceiling-hung unit heater facing the overhead door area.

Exhaust Hood Serving the Welding and Metal Working Area

Auditorium, Stage and Theatrical Arts Heating and Ventilation Systems

The ventilation air serving the auditorium and stage areas is supplied through the wall-mounted diffusers located up high in both areas.

Ventilation Supply Diffusers Serving the Auditorium and Stage Areas



Return from the stage is provided thought two return grilles located at the floor level. The return may be susceptible to excess dust and dirt as evident by the location of the dust mop. The return grilles serving the Auditorium are located along the back wall. The return grille, located adjacent to the door, is not obscured.

Ventilation Return Grille Serving the Stage Areas

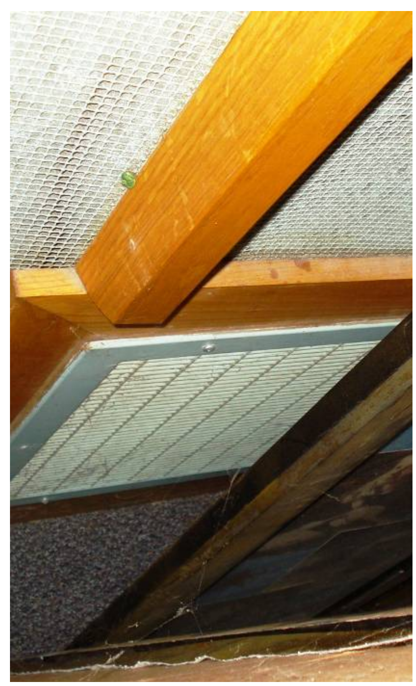
Cape Elizabeth High School / Donald Richards Pool

Return Grilles for the Auditorium. Photo Shows the Grille at the Back Right Side Near the Entrance From the Corridor

The return grilles serving the Auditorium are located along the back wall. The return grille, located adjacent to the door, is not obscured. The return grille located on the left side (shown in above photo) is completely blocked by tables and show posters lining the back wall. The photo on the left shows the exterior door and the tables and posters blocking the grille. The photo on the right shows the blocked grille behind the posters.

We would recommend maintaining.

Location of Return Grille at the Left Side of the Auditorium Back Area



Kitchen Ventilation Systems

The kitchen hood system appears to be in good condition. Overall, the condition of the hood appeared to be good. Fire suppression system is provided. At the time of review, all of the hood light bulbs and globes were missing.

View Under Hood and Fire Suppression System Panel

According to the 1968 drawings, the ventilation for the kitchen is provided through a heating and ventilation unit located in a machine room above the adjacent corridor.

We would recommend further review of the kitchen exhaust and ventilation systems to verify proper interlocks between the exhaust systems and the heating and ventilation systems to ensure proper pressure and airflow control.

Kitchen Ventilation Vents

The dishwashing unit and laundry equipment share a space off the kitchen. The dryer vent is not installed in accordance with current codes. Exhaust is not provided for the dishwasher

We would recommend the installation of proper dryer exhaust ducting and the installation of proper exhaust for the dishwasher equipment.

Kitchen Laundry and Dishwashing Area

Dishwasher Area

In the corner of the dry storage room, it appears some of the original heating pipes have been cut and abandoned open-ended. The piping insulation material is unknown due to the inaccessibility to the piping.

We would recommend a review of the existing pipe insulation and determine proper action for pipe removal.

Piping in Corner of Dry Storage Room

Main Office and Nurse's Office Ventilation Systems

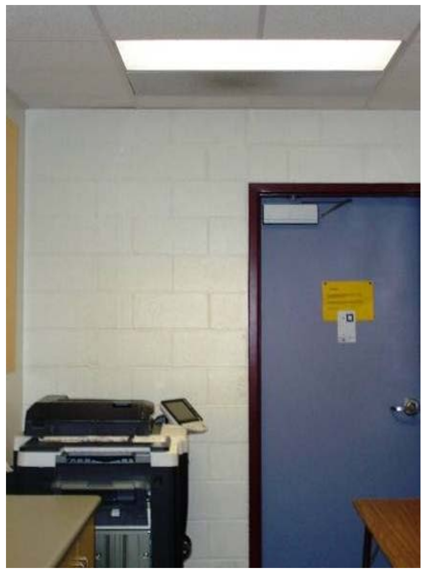
Heating, ventilation, and air conditioning is provided for the office areas through the air handling unit AHU-15 installed as part of the 2004 renovations project. During our review, the spaces felt very cool. Perhaps the setpoint is set too low. Perimeter heating is provided through baseboard radiation.

Main Office

Cape Elizabeth High School / Donald Richards Pool

Ventilation in the print room is provided through a return air connection to AHU-15 and a separate exhaust air grille connection to the ceiling-mounted exhaust fan EF-10. The return grille is shown in the photo below. The exhaust fan/grille is located directly above the door opening. If the ventilation in this space is an issue, perhaps the return grille and exhaust fan could be relocated.

Print / Copy Room Off Main Office. Copier and Return Grille Shown at Left. Exhaust Fan Shown at Right



Cape Elizabeth High School / Donald Richards Pool

Electrical Systems Evaluation

Primary Service and Service Transformer

Primary service is supplied by a radial 15kV underground primary service feed. Primary conductors originate at a CMP riser pole located on the Scott Dyer Road near the Cape Elizabeth Middle School. The conductors travel to the middle school pad mount transformer in PVC conduit where they are tapped to supply the Middle School and High School transformers. From the Middle School transformer, conductors continue in PVC conduit to a splicebox at the edge of the middle school parking area. Cables then run direct buried under the ball field and tennis courts to a manhole at the edge of the high school parking area. The cable transitions to PVC conduit for the remainder of the distance to the high school 500kVA 3 phase pad mount transformer. Secondary service voltage is supplied at 120/208 volts.

There have been multiple problems with the direct buried cable resulting in lost phases and multiple outages.

Primary Service Riser Pole and Meter at Scott Dyer Road

Cape Elizabeth High School / Donald Richards Pool

There is no peak demand data for this service as there is one primary meter for the High School and Middle / Pond Cove Elementary Schools; however, the 500kVA transformer appears undersized for the square footage of the building. 500,000VA ÷ 162,630 sq ft = 3.1VA/sq ft (typical design VA/sq ft ≈ 8VA/sq ft). As technology requirements increase it is likely that energy usage will increase also.

Primary Service Transformer

It is recommended the existing primary service be disconnected from the middle school and a new service be installed originating at Ocean Street and terminating in a new higher capacity pad mount transformer.

Cape Elizabeth High School / Donald Richards Pool

Service Entrance and Distribution

There are two main service entrances to the building. One feeds the main school areas, the other feeds the pool area.

The main school service consists of secondary conductors from the exterior pad mounted transformer feeding a 2000A 120/208V 3phase 4wire Square D main switchboard located in the boiler room. The main switchboard then serves three distribution panels and multiple lighting/power panelboards throughout the school facility. Distribution equipment appears to be in serviceable condition; however, much of it appears to be original equipment (1969 - 43 years old). The distribution section of the switchboard has several spaces for future breakers.
Based on per square foot loads (see above) the main switchboard appears to be undersized for a building of this size. The switchboard has capacity for up to 3.5 watts per square foot.
It was noted that the electrical feed to Hannaford Field is overloaded. It is recommended that this be replaced with a larger capacity service.

Main School Switchboard

Cape Elizabeth High School / Donald Richards Pool

Switchboard Distribution Section

Switchboard Main Breaker

Cape Elizabeth High School / Donald Richards Pool

The service in the Donald Richards Pool area consists of secondary conductors from the exterior pad mounted transformer feeding an 800A Cutler-Hammer distribution panel located in the pool mechanical room. Distribution equipment was installed during the 1999 pool addition and appears to be in excellent condition. There is no space for future breakers, requiring alterations to the system for future expansion. Consideration should be given to the high humidity and corrosive environment this equipment is installed in.

Pool Area Distribution Panel

Cape Elizabeth High School / Donald Richards Pool

Standby Power System

The high school is served by a standby power system. This consists of a 1000A Onan automatic transfer switch located in the boiler room. The normal side of the transfer switch is connected to a breaker in the main switchboard and the standby side is connected to an exterior self-contained Cummins-Onan diesel standby generator set rated 204kW and configured (configurable for multiple voltages) for 120/208 volts, 3 phase, 4 wire. Standby power is provided to a 1000A distribution board DP1 located in the boiler room. It was observed that the distribution board DP1 did not have code required clearances.

It appears that only mechanical loads are fed from the standby system, but the system does not incorporate the mechanical system controls. This condition renders the mechanical system inoperable during a power outage.
The generator and transfer switch have ample capacity to feed many more loads in the building than are currently connected. Consideration should be given to using this system to its full capacity. This could include mechanical loads and controls, standby lighting, computer system and other non-life safety loads. With the addition of a separate transfer switch and panel, the system could be expanded as a life safety system as well.

Automatic Transfer Switch and Standby Distribution Board

Automatic Transfer Switch

Standby Generator

Lighting and Power Panelboards

Lighting and power panelboards are located throughout the facility. Many panels located in classroom areas are filled to capacity with breakers. In areas needing additional circuit capacity, additional panels or panel replacement may be required. Panels located in the corridors and accessible to the students were not locked but should be provided with lockable hardware to prevent unauthorized access.

Typical Lighting/Power Panelboard

Lighting

Most classroom lighting is achieved with 2'x4' 3 and 4-lamp T8 recessed troffers with electronic ballasts. Two level switching arrangements are inconsistent from classroom to classroom, but most have two levels of lighting. Lighting levels look acceptable.

Typical Classroom Lighting

Gym lights consist of five rows of six, 6-lamp T5 high bay fixtures. Some fixtures are damaged and many need replacement wireguards. Lighting levels are fair to average.

Gym Lighting

Cape Elizabeth High School / Donald Richards Pool

Cafeteria Lighting

The cafeteria is served by a combination of 2'x4' 2-lamp T8 recessed troffers and incandescent downlights. Lighting is in fair condition with some fixtures needing lens replacement. Lighting levels are fair.

Theatre Lighting

Theatre lighting is a combination of 2'x4' T8 recessed troffers, 4' 2-lamp T8 surface wraps, compact fluorescent wall sconces, and HID pendant downlights. Lighting is in poor to average condition with many fixtures being damaged and/or dirty.

Kitchen Lighting

Kitchen lights are 4' surface wrap T8 fluorescent fixtures. Fixtures are in poor condition with some lenses damaged or missing. Hood lights have been removed. Lighting levels are poor.

Library Lighting

Library is served by 2'x4' 3-lamp T8 recessed fixtures with parabolic louvers. Lighting levels are good.

Corridor Lighting

Most corridors are served by 2'x4' 3-lamp T8 troffers on 12' centers. Lighting levels are reasonably good.

Office Lighting

Most office lights are 2'x4' 3-lamp T8 troffers with electronic ballasts. Most offices have only one level of switching and no automatic lighting controls were observed. Lighting levels are good.

Cape Elizabeth High School / Donald Richards Pool

Pool area lighting is a combination of surface mounted vapor-tight fluorescent fixtures, fluorescent wall mounted linear fluorescent up-lights and pendant mounted linear fluorescent up-lights. Fixtures appear to be in good condition and lighting levels are good.

Pool Lighting

Lighting Controls

Current energy codes require multiple levels of switching and some form of automatic off function for lights in areas such as classrooms and offices. While most classrooms were observed to have at least 2 levels of switching the code required automatic functionality was not observed.

Emergency Lighting

The High School emergency lighting is primarily served by self-contained emergency battery units with remote heads (EBUs). Some fluorescent strip fixtures with battery backup ballasts were evident in the gym. EBUs were generally in serviceable condition. A few new replacement units were observed to be of the LED type. Gym fluorescent strip fixtures with battery backup ballasts are damaged and/or disassembled and need to be replaced. Many areas including corridors, gym, cafeteria, and library did not appear to have adequate coverage per NFPA 101. In several instances, corridor EBU spacing exceeded 65'.

Cape Elizabeth High School / Donald Richards Pool

Exit signs observed are internally illuminated units with integral battery. Most signs are in good condition; however the cafeteria has damaged units and the library needs more signage to meet NFPA 101 requirements.

Classroom Power Outlets

There are wall mounted grounded outlets located throughout the building. Older classroom areas have a minimal number of duplex receptacles serving power requirements. This may be of some concern as technology requirements, and resultantly, power demands increase. The 2004 addition area classrooms have better outlet coverage and some areas have added two channel surface raceway system to supplement the receptacle coverage.

Fire Alarm System

Fire alarm system is an older Notifier AFP-400 addressable system, with an associated voice evacuation system. In the event of an alarm, the system reports directly to Portland monitoring / dispatch facility. This system has had numerous device failures markedly in the pool area most likely due to moisture infiltration and corrosion.

Fire Alarm System

Cape Elizabeth High School / Donald Richards Pool

Typical Pull Station and notification appliance

Security Surveillance System

The High School is served by a video surveillance system with cameras at various locations throughout the building, mainly at building entrances. The system is an Integral Technologies system with a mixture of legacy and upgraded video platforms. The main server is based in the High School but also serves the Middle School, Pond Cove Elementary School, Police Department and Fire Department. Advance Technology is responsible for maintaining the system, and reports multiple failures of the system, with frequent database corruption and loss of camera function.

Typical Camera

Building #1
Cape Elizabeth High School / Donald Richards Pool - Architectural

***Priority Scale:** #1 = 1 year
#2 = 2 years
#3 = 5 years
#4 = Future

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost	* Priority
A1.1	Admin / Library Carpet	Carpet in Admin and library is showing wear patterns	Carpet will need to be replaced at a future Date.	Replace carpet as part of the yearly maintenance budget	$42,000.00	4
A1.2	Elevator	3 stop Elevator - original to the building construction - Updated interior finished in 2004 renovation	Elevator is not ADA Code Compliant - Control panel, hall signals and cab signals and size of interior cab do not meet code.	Replace Elevator Car and shaft with New Ada Compliant Elevator - Some schools are sizing car for maintenance equipment and local fire departments are requesting car size for stretchers in case of a medical event.	$150,000.00	4
A1.3	Classroom Interior Drywall at Precast Concrete Window Panels	Interior drywall surfaces are water stained and plaster joints are cracking due to moisture condensation.	Drywall panels inserted on back of precast window panels are damaged due to moisture migration in most classrooms where detail occurs.	Replace drywall and insulation system with new system of A/V, increased insulation and new drywall.	$375,000.00	2|3
A1.4	Abate - Flooring and Pipe Insulation	Flooring System Damage Potential	Building Hazard Assessment Report - Dated Oct 25, 2011 denoted location and status as worn.	Remove ACM flooring and pipe Insulation	$175,000.00	4
A1.5	Exterior Doors and Frames	Exterior doors at pool building are rusted including hardware attachment locations. The doors and frames on the school are showing a lot of wear with exception of aluminum door and frame system.	Pool building doors should be replaced. The school 's hollow metal doors and frames should be replaced.	Replace door and frame system through yearly maintenance budget.	$75,000.00	1|2
A1.6	Donald Richards Pool - Exterior Exposed Concrete Surfaces	Cast in place concrete beams and columns supports precast concrete double T's roof beams	Exposed face of concrete beams and columns - finish and concrete chips are spalling off structure - Concern is exposure internal reinforcing to weather thus weakening the structure.	Exposed concrete should be sandblasted to remove finish - high strength grout to patch surface and then high quality concrete stain to surface.	$25,000.00	3
A1.7	Exterior Concrete Exit Stairs	Cast in place concrete stairs at corridor exit doors	Stairs are badly deteriorated from salt and rain - landings, treads and risers have been patched. Over time the concrete system will crack and spall due to weather and expose the reinforcing.	Complete remove and replace landings, treads and risers with new cast in place concrete and metal nosing	$40,000.00	2
A1.8	Main Entrance	Cast in place concrete stairs, paved side walk, canopy and entrance slab	The stairs, sidewalk and paved side entry are in good shape. The layout does not meet ADA for accessibility. Stairs are not very well lighted.	Reconstruct front with new ADA accessible ramp.	$75,000.00	1|2
A1.9	Roof System Replacement #1	Adhered EPDM roof system over IA, Kitchen, Stage / AUD, High Classroom, Pool Roof, Library Roof - Wood fiber roof deck panels	Information denotes system installed in 1988 and roof system is close to its 25 year lifespan and seams, flashing and membrane surface are showing indications of deterioration due to age.	Replace existing EPDM roof membrane, insulation and existing wood fiber roof panels. Install new metal deck and R30 EPDM roof membrane system. Conduct Structural study of roof structure, especially in drift areas. Total of 72,100 SF	$1,350,000.00	1|2|3

High School - Architectural

A1.10	Roof System Replacement #2	Adhered EPDM roof System over Lockers, Gymnasium, Partial High Classroom Roof	The roof system is 8 years old. Its has approximately 15 to 20 years left in its lifespan.	Replace existing EPDM roof membrane, insulation and existing wood fiber roof panels. Install new metal deck and R30 EPDM roof membrane system. Conduct Structural study of roof structure, especially in drift areas. Total of 34,200 SF	$665,000.00	4

Total Potential CIP Costs **$2,972,000.00**

***Priority Scale:** #1 = 1 year
#2 = 2 years
#3 = 5 years
#4 = Future

Building #1
Cape Elizabeth High School / Donald Richards Pool - Mechanical

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost	* Priority
M1.1	Duct Cleaning of Ventilation System	Ventilation systems have been in use since 1968 and 2004.	The overall condition of the inside of the ducts is unknown and may require extensive cleaning	Clean the supply and return duct systems of 14 ventilation systems	$105,000.00	1|2
M1.2	Gymnasium Ventilation	The (4) air handling units in the Gym were installed as part of the 1968 project.	The units were slated to be replaced as part of the 1994 project but economic restraints prevented the replacement. Upgrades have included Direct Digital Controls, variable frequency drives and more efficient fan motors.	Replace the 4 units with two rooftop units. Replacement of the unit may require structural, architectural, mechanical and electrical analysis and may require upgrades.	$90,000.00	3|4
M1.3	Classroom Unit Ventilators	The overall condition of the Classroom unit ventilators varies.	Based on the construction documentation, the unit ventilators were installed during the 1968 and 2004 projects. Approximately 38 UV's may be 44 years old and approximately 11 UV's may be 8 years old. All UV's are controlled through the Direct Digital Control system.	Review the operation and overall condition of all unit ventilators. Option 1: Go through each UV and make necessary repairs: $500/unit(38)=$19,000 Option 2: Replace the (38) 44 year old units in kind: $7000/unit (38)=$266,000	$266,000.00	2
M1.4	Exhaust Fans	The overall condition of the exhaust fans varies	Based on the construction documentation, most of the 28 rooftop exhaust fans were installed during the 1968 project.	Inspect each fan. Repair of replacement as needed: Repair Estimate $500/fan. Replacement Estimate: (25) General exhaust fan: $2500/fan; (3) Utility type fan: $4000/fan	$75,000.00	4
M1.5	Dishwasher	Exhaust Fan	Exhaust is not provided for the Dishwasher	Install Dishwasher exhaust in accordance with codes.	$10,000.00	1

Total Potential CIP Costs **$546,000.00**

*Priority Scale: #1 = 1 year
#2 = 2 years
#3 = 5 years
#4 = Future

Building #1
Cape Elizabeth High School / Donald Richards Pool - Electrical

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost	* Priority
E1.1	Primary Service	Primary underground is largely direct buried and has had multiple failures. Pad mount transformer is 500kVA.	Poor reliability in direct buried cable. Transformer is undersized for building load.	Replace existing primary underground service with new primary underground service from Ocean Street.	$250,000.00	1
E1.2	Service entrance and Distribution	2000A 120/208V 3phase 4 wire main switchboard serves main High School Building, 800A 120/208V 3phase 4 wire main distribution panel serves Pool addition.	2000A switchboard appears undersized for building load. Panels in some areas have no space / capacity for additional loads.	Install new higher capacity main switchboard and re-feed existing switchboard / loads. Where necessary, replace existing panels with new panels with space for additional loads.	$80,000.00	1
E1.3	Generator / ATS	204kW generator and 1000A 120/208V 3phase 4 wire transfer switch feeds 1000A distribution panel.	Standby power only feeds mechanical loads and not the controls for mechanical systems rendering the mechanical system inoperable during outages. System has capacity for much more load which could include life-safety equipment, additional lighting etc.	Rework standby system to include additional load to better utilize generator / standby system.	$50,000.00	3
E1.4	Hannaford Field Electrical	Hannaford Field service breaker / feeder undersized for load.	System is overloaded and magnetic trip setting field adjusted to its maximum setting.	Rework service to field to increase capacity.	$50,000.00	2
E1.5	Lighting	Most lights are T8 fluorescent fixtures with electronic ballasts. Switching arrangements are inconsistent from room to room, but most classrooms have two levels of lighting.	Most fixtures are in good condition but some areas including kitchen, gym, and theatre need replacement / maintenance. No automatic lighting controls are in use for interior fixtures.	Lighting levels and switching arrangements should be evaluated and fixture layouts should be adjusted accordingly. Automatic controls should be added to provide manual ON and automatic OFF functions.	$100,000.00	4
E1.6	Emergency Lighting	Emergency lighting is achieved with Self-Contained Emergency Battery Units with remote heads. Exit signs are internally illuminated. Emergency battery units and exit signs appear to be in serviceable condition.	Some areas appear to have emergency light spacing such that a minimum of 1fc will not be achieved in the means of egress. Also some areas need additional exit signs.	Evaluate coverage areas and provide additional emergency lighting and exit signs to meet NFPA 101 requirements.	$10,000.00	1
E1.7	Classroom Power Outlets	Power outlets distribution in older classroom areas is minimal with some classrooms only being served by 2-3 outlets. 2004 addition classrooms have better outlet coverage.	With technology requirements on the increase it is likely that classroom receptacle coverage will need to increase.	Evaluate all spaces in detail to determine exactly where additional receptacles are required.	$25,000.00	3
E1.8	Fire Alarm System	Older Notifier AFP-400 system with voice evacuation. Notification appliances and initiating devices throughout the building. Many trouble notifications, and failures mostly with pool area devices.	System is older but functional. Some areas need additional notification appliance coverage to meet NFPA 101. Annual inspections are performed by Eastern Fire Protection Co.	Perform study of and provide additional notification appliance coverage in all areas to meet NFPA 101. Replace devices in pool area to minimize system faults / trouble alarms.	$40,000.00	1

Total Potential CIP Costs **$605,000.00**

Building #1 - Cape Elizabeth High School / Donald Richards Pool - Architectural - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
A10.1	Flooring Systems	VCT floors are well maintained	The VAT flooring is original to the building and the AHERA reports that the flooring is at Class 5	Replace VAT floors with new VCT floors. See Item A1.11	$0.00
A10.2	Interior - Suspended Ceilings	Suspended ceilings are in reasonably good shape. Some panels throughout the facility have water stains and are damaged from maintenance access to space above	Suspended ceiling for the most part is comprised of 2 x 2 panels. Change out stained and damage panel on a yearly basis.	Replace existing suspended ceiling panels with new panels. This will become more difficult as panels get dirty and aged. Surface will not match - older panels will become darker. Recommend consider changing out entire rooms at same time.	$0.00
A10.3	Interior Walls	Most of the walls are masonry walls in corridors, stairs and locker rooms and high abuse spaces.	Paint surface on walls in some locations especially corridor areas needs to be repainted.	Repaint walls as part of the schools yearly summer maintenance program	$0.00
A10.4	Door Hardware	Door Hardware has been replaced with new lever hardware	New ADA Lever Cylindrical hardware are on some doors - Old round cylindrical type door hardware exists on some doors.	Replace with New ADA Lever type Door Hardware. Recommend classroom security function hardware at all classroom doors as part of a new security plan	$0.00
A10.5	Student Toilet Rooms	Toilet fixtures have been upgraded to hands free type devices fro energy efficiency relative to water use. Toilet stalls at water closets are plastic type and have been recently replaced. ADA clearances for fixture access and accessory locations are in compliance with ADA	Fixtures and toilet stalls partitions are in good shape - well maintained - interior finishes have been well maintained and are in good shape and should serve the school for a number of years.	Maintain fixtures, stalls and finishes as part of the schools maintenance program.	$0.00
A10.6	Lockers	Metal lockers have been replaced at some date. Not original - Single tier 12" x 72"	Lockers are in good condition. No damaged units were observed.	Recommend adding ADA designated lockers units as required.	$0.00
A10.7	Gymnasium Bleachers	New Comfort Curve Plastic Bleachers installed in 2011	New Bleachers will give school use for at least 25 years	Maintain bleachers as part of a yearly inspection program.	$0.00
A10.8	Exterior Walls	Composite brick face with concrete block backup. Precast concrete panels with single window unit punch out.	Brick and block walls are in good shape and ongoing maintenance to precast concrete panels.	Maintain program of resurfacing and re-caulking precast concrete panels.	$0.00
A10.9	Donald Richards Pool Exterior Doors and Frames	The 1994 Addition / Renovation project installed hollow metal doors and frames at exterior locations.	Due to the corrosive environment of pools all the exterior door and frame setups are experiencing significant rust at all edges and hardware locations.	Some Rusted doors and frames are being replaced - See above for cost line item	$0.00

Total Potential CIP Costs **$0.00**

Building #1 - Cape Elizabeth High School / Donald Richards Pool - Mechanical - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
M10.1	Boiler Plant - Pipe Insulation	Heating hot water and domestic hot water piping is not insulated	Prior to the 2011 upgrade the pipes were covered with insulation containing asbestos. During the boiler upgrade project, the insulation was abated.	Install new fiberglass insulation with a PVC-type protective barrier	$2,000.00
M10.2	Propane Gas - Barrier for Exterior Piping	The propane supply piping at the entrance to the boiler room	Where the piping rises up along the wall from under the pavement, the piping is exposed to possible damage. Protection is provided for the pressure regulator.	Install protective barriers for the gas piping.	$1,500.00
M10.3	AC-1: Cafeteria Rooftop Unit	Outside air intake filters, economizer operation, relief fan operation, relief fan backdraft damper	Outside air intake filters damaged. The outside air dampers were open 100% during operation of cooling. Relief fan not operating while outside air dampers are at 100%.	Replace the damaged filter. Check operation of relief fan and associated damper. Verify proper operation of economizer cooling.	$500.00
M10.4	Rooftop Condensing Units (General)	Refrigerant pipe insulation failure	At all condensing unit, the insulation on the refrigerant lines is showing signs of age.	Install new pipe insulation and UV rated protective barrier as needed.	$1,200.00
M10.5	Mechanical and Storage Room Ventilation (Attic)	There are numerous gaps around the exhaust fan housing	Gaps around the fan housing have been stuffed with various materials in an attempt to reduce infiltration of cold air.	Properly seal around the exhaust fan housing	$200.00
M10.6	Kitchen area Clothes Drier	Drier exhaust duct is not installed in accordance with codes		Install Drier exhaust in accordance with codes	$600.00

Total Potential CIP Costs **$6,000.00**

Building #1 - Cape Elizabeth High School / Donald Richards Pool - Electrical - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
E10.1	Security Surveillance System	Older Integral Technologies system. Mixture of legacy and upgraded video platforms.	The camera system has encountered multiple camera failures and data corruption.	Install new surveillance system cameras and cabling as part of an overall security / door lockdown system. See architectural.	$0.00

Total Potential CIP Costs **$0.00**

Pond Cove Elementary / Middle School

Building Description

Buildings

Original School	Constructed in 1934 Composite walls with wood framed floors and pitched roof
Original Primary School	Constructed in 1948 Composite walls with wood framed roof
Addition to Primary	Constructed in 1955 Composite walls with wood framed roof
Lunt Building (Primary)	Constructed in 1962 Composite walls with wood framed roof
Gymnasium/Classroom *Addition to High School* *Allied Arts Wing*	Constructed in 1962 Composite walls/steel framed/masonry bearing Wood framed roof with masonry bearing walls
Cafeteria/Library/ *Offices/Classrooms* *Major Renovations*	Constructed in 1994 Stud/brick veneered/steel framed
Kindergarten Wing	Constructed in 2004 Stud/brick veneered/steel framed

Pond Cove Elementary / Middle School

Mechanical	Heating hot water generation – (2) Oil-fired boilers Heating hot water circulation – Split-case pumps, constant volume Domestic hot water generation – Solar, Instantaneous gas-fired heaters Controls – Invensys, Schneider Electric, DDC throughout Classrooms – Rooftop air handlers, reheat, radiation Libraries – Rooftop air handlers, VAV, radiation Computer Lab – Split air conditioning Server Room – Split air conditioning Administration, Middle School – Rooftop air handler, VAV, radiation Administration, Elementary School – Indoor air handler, VAV, radiation Gymnasium Heating, Ventilation – Indoor air handlers Cafetorium – Indoor air handler Kitchen – Hood exhaust, indoor air handler Music and Technology – Indoor air handler, unit heaters
Electrical	Main switchboard – 1600A, 277/480V 3-phase, 4-wire Standby generator – None Emergency Lighting – Self-contained battery units Fire Alarm System – Siemens FireFinder XLS w/voice evac Intrusion System – None Security Surveillance System – Minimal number of cameras Door Lockdown System – None Door Card Access System – Main Entrances Voice/Phone/Intercom/Paging – Modified VOIP

Pond Cove Elementary / Middle School

Architectural Systems Evaluation

Interior Systems Descriptions

Pond Cove Elementary / Middle School Buildings

The original building was constructed with composite brick exterior walls and interior bearing walls. The building frame is of wood construction with plaster surfaces. The plaster surfaces were repaired and repainted during the renovation project and will require ongoing maintenance. The gymnasium and locker room addition construction in 1962 as well as the new additions of 1994 have masonry walls for durability in corridor, stairs and other high abuse spaces which should service the district for a number of years. The flooring system is in good shape as well as the ceilings.

There are a number of life safety code issues and long term infrastructure items that will be highlighted in this report for the town to address at some date.

Survey Observations – Building Code Violations

Pond Cove Elementary / Middle School Buildings

The existing courtyard is grassed and includes tables and other items that one may assume is for student use. There is only one means of egress out of the courtyard. The Life Safety Code requires minimum two means of egress diagonally across from each other. This area should be reviewed with your local fire department for approval of use as the authority having jurisdiction. Per the code, this area cannot be occupied with a single means of egress. The exit doors should have an exit sign over the top and the doors should have a proper panic device for exiting a potential of 50 people or more.

Courtyard with One Means of Egress

Middle School Building

In the middle school building when the 1994 addition was added to the original 1934 building the floor plan oriented the new corridors in line with the 3-story stairwells of the original building. Per plan, the east stairwell exits into a protected corridor which exits to the exterior. The west end allows all three levels of the original building access into a new exit access corridor. Per life safety code, a person cannot exit into a stairwell as a second means egress and then into an unprotected corridor. The stairwell acts as a second means of egress for all three levels and must exit to the outside. Secondly, doors were removed at the new 2nd and 3rd corridor levels thus exposing the stairwell to multiple levels of the building which, by code, each level needs to be independent, especially in schools. Thirdly, the travel distance from the point of entry to an exit exceeds the allowable limit from each level of the original building.

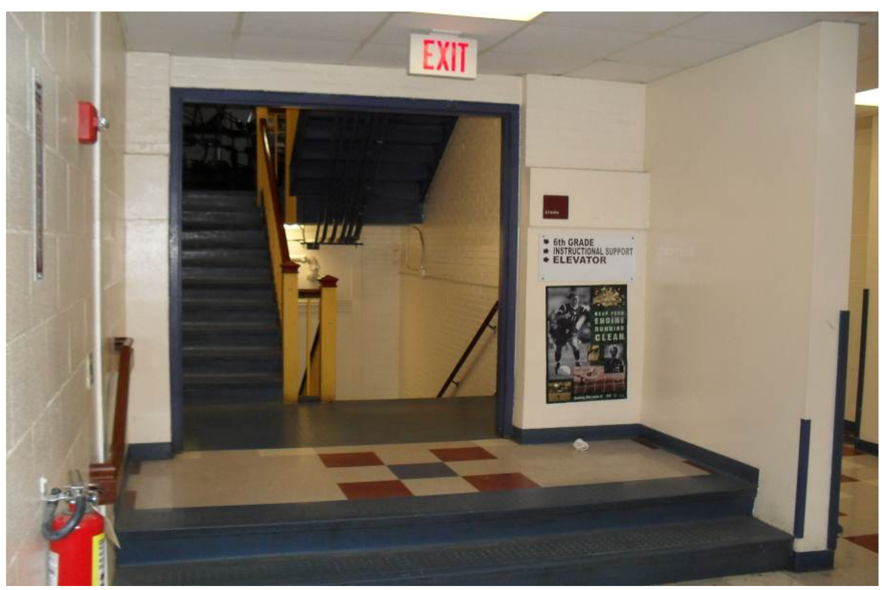
This current exiting setup is in violation of the current life safety codes and will expose the school to liability exposure in the event of an emergency.

West End Stairwell
2nd Floor

Stairwell – Exits to an Unprotected Corridor

West End Stairwell
First Floor

Stairwell Opening to Corridor – Illegal Exit Sign



Pond Cove Elementary / Middle School

Middle School Building

The east and west stairwells in the original building have a number of obstructions that remained after the renovation project. These items should be removed to provide the clearances as required by the life safety code. The handrails in both stairwells should be replaced and brought up to current life safety codes.

Original 1934 Building

In the lower level of the original building there is a space that is integrated with the corridor. This type of assembly space and the stove and cabinets implies a usage that is in violation of the life safety code.

The space must be separated from the exit access corridor by a wall constructed of UL type components. The other end of this assembly space exits into the west end illegal stairwell.

Assembly Space Integrated with Exit Corridor

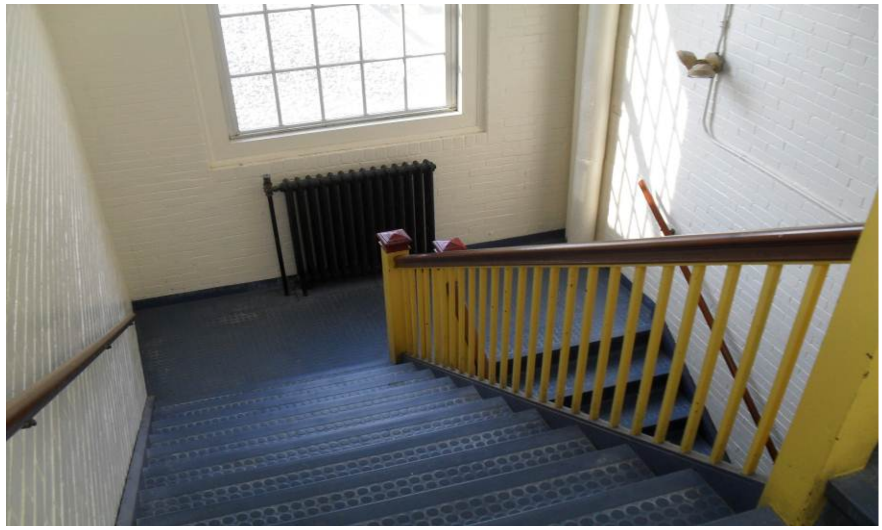
Original 1934 Stairwell

Drinking Fountain and Ladder – Needs to be Removed

Pond Cove Elementary / Middle School

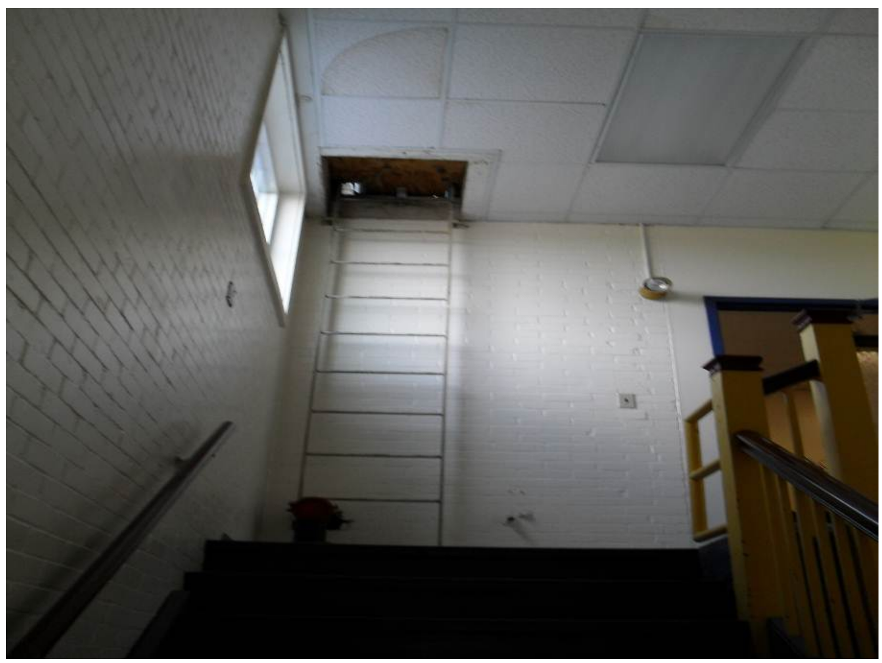
Original 1934 Stairwell

Radiator Unit – Remove or Raise



Original 1934 Stairwell

Ladder – Relocate or Remove

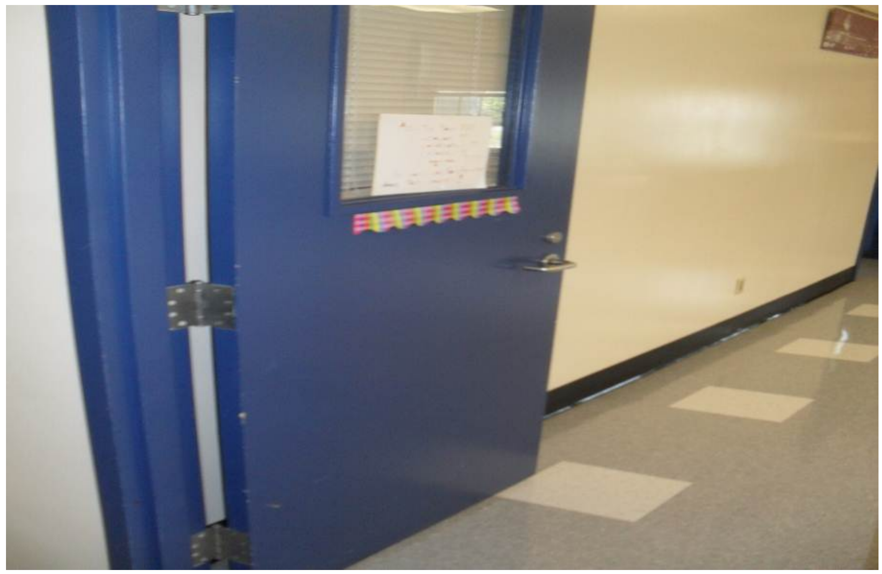


Pond Cove Elementary / Middle School

Original 1934 Building

Doors to the classroom have glazed panels with the bottom exceeding the allowable 42" height to the bottom per ADA.

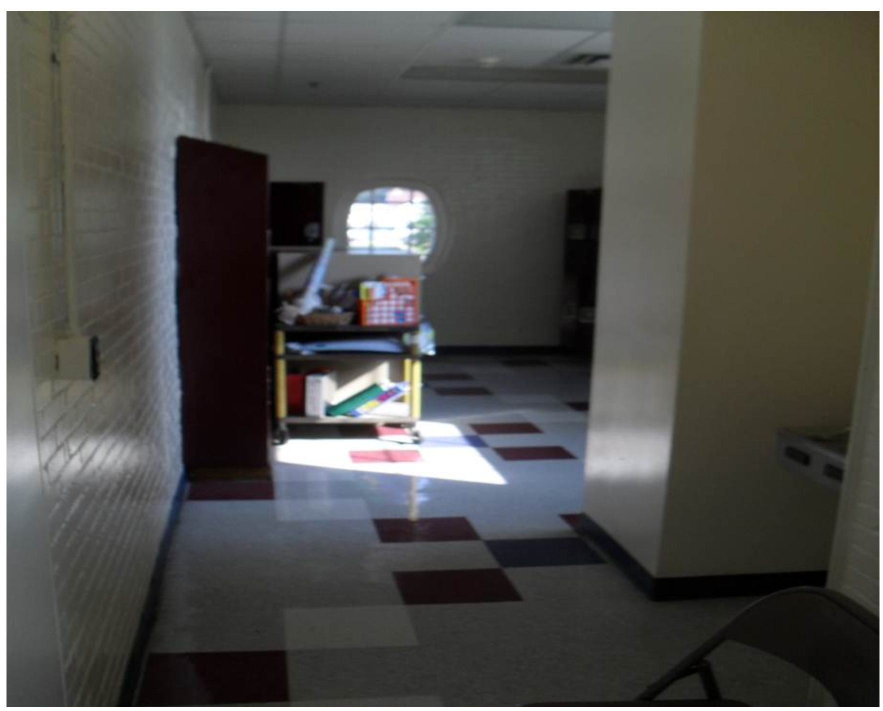
Bottom of Glazed Panel Exceeds 42" Maximum Height to Bottom



Original 1934 Building

In the second floor exit corridor to the stairwell there is an alcove off the east end of the corridor. This space constitutes a dead end corridor and must be separated by partition from the corridor.

Dead End Space Off Second Floor Corridor



Pond Cove Elementary / Middle School

Middle School Lobby / Corridor

The lobby next to the library has a corridor continuing up past the library to the exit doors by the original building.

These cross corridor doors swing in the wrong direction. The exit access corridor from the library must have two means of egress out of the building. The doors swing into the exit corridor and should swing towards the lobby. The exit sign should be removed; this is a non-compliant means of egress.

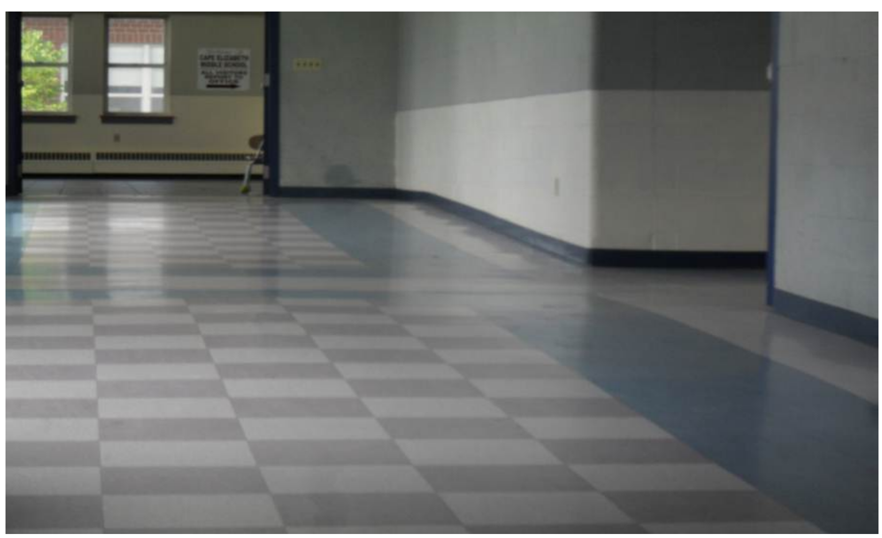
Illegal Means of Egress Door Setup at Lobby

Middle School Corridor

The corridor next to the cafeteria entrance has been constructed with a ramp to provide access to different levels of the cafeteria. The ramp transition from the upper floor level to the mid-level was not constructed to meet ADA. The ramp run was not extended long enough. The level requirements at each end and the bottom of the concrete ramp have been manually dished toward the entrance doors causing a cross slope that is non-compliant with ADA.

Ramp at Cafeteria Corridor

Non-Compliant Ramp Entrance



Pond Cove Elementary / Middle School

Main Entrance Corridor With Ramps – Farther One is Non-Compliant

Pond Cove Elementary / Middle School

Middle School Cafeteria

The middle school cafeteria is segregated by a series of three platform levels. Access to two serving areas is dependent upon which level the individual chooses to sit. The intent of ADA is to provide an accessible route to either serving line. The current arrangement is non-compliant with ADA relative to an accessible route. The split levels also present a life safety egress issue. Depending on the direction of egress to any set of doors a person would choose, the step is non-compliant with the life safety code. The 8" rise is non-compliant in the direction of travel even though marked with yellow edge and a step aisle up to the next level. There must be two means egress out of an assembly space and any steps in that direction must be a minimum of three risers.

These two steps between levels are not guarded off in any manner and also present a strong tripping hazard potential and the liability that goes with these levels.

Recommend a design study to propose a solution to this space that would meet ADA and the life safety code. As part of this study it should involve the serving area to see if there is a solution to steps and a more efficient use to your kitchen staff.

ADA Accessible Routes to Serving Line – Change in Level – Life Safety Code Issue

Pond Cove Elementary / Middle School

Middle School Cafeteria

For this type of assembly space the State Code for educational facilities has a stringent code for light levels. This space appears to be short of that light level.

Would recommend a study and possible re-lighting to bring up light levels.

Middle School Cafeteria

Low Level Lighting

Pond Cove Elementary / Middle School

Middle School Locker Rooms

The shower areas of both the boys and girls locker rooms are non-compliant with ADA. Size, clearances, shower faucets, and seats are all non-compliant with ADA.

As a method to upgrade shower areas and bring them up to ADA code we would recommend a complete renovation of both the boys and girls locker rooms.

The lockers within both spaces do not have any units denoted as ADA accessible.

We recommend adding the correct amount of ADA compliant lockers to each locker room. The number is a percentage of the schools population.

Middle School

Non-Compliant Shower – Girls Locker

Pond Cove Elementary / Middle School

Middle School

Non-Compliant Boys Shower

Middle School Lockers

Provide ADA Compliant Lockers

Kitchen Serving

The cafeteria is serviced by two serving areas and a dishwashing space. The floors within these areas and the kitchen have been constructed with an epoxy resin floor and grit surface.

The system is showing many repair areas and cracks due to the concrete slab substrate shrinking.

The system should be replaced as the cracks will allow floor washing water to enter and will only cause the system to fail further.

When the decision is made to replace the floors we would recommend removal of the steps to the serving lines.

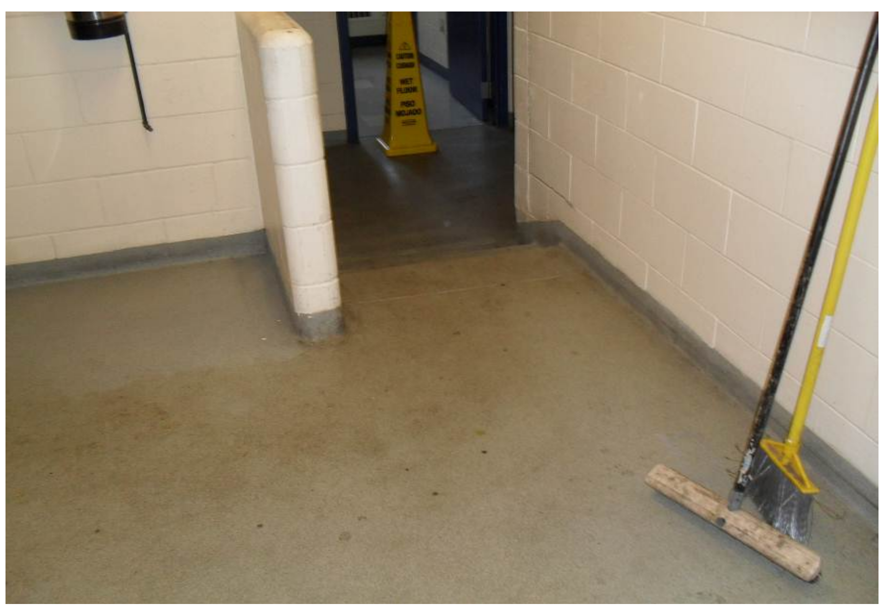
These steps offer liability exposure to your kitchen staff as a trip hazard.

Kitchen Floor

Patched Kitchen Floor Showing New Cracks

Serving Line Area

Steps to Serving Line



Middle School Lockers

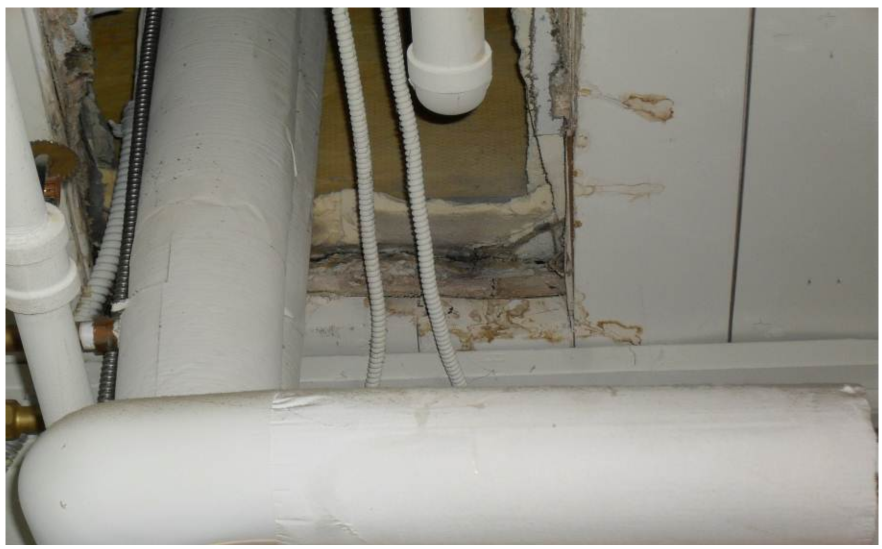
The middle school locker area was constructed in 1962 with a steel frame bearing and wood deck bearing system. Information that we have been able to find stated that the wood was originally constructed with a built-up tar and gravel roof system direct to the wood deck.

As part of a roof replacement project the new insulation was directly screwed to the wood deck over the old insulation, tar, and gravel. The picture below indicates that the roof cutout was done.

As part of any new roof replacement, and if a long warranty for the new roof is desired, the wood deck will have to be removed. It is highly probable that the existing wood deck and the bearing steel frame will not meet the new IBC roof load and drift load capacities required.

This area should be considered and budgeted for a major structural upgrade as part of that roof replacement.

Cutout in Existing Wood Deck



Pond Cove Elementary / Middle School

Middle School Lockers

The locker room ceiling is an exposed structure space. The picture indicates support hot water supply and return and ventilation ductwork.

The exposed structure is as it was constructed. The sprinkler system was installed as part of the 1994 construction project and does not appear to meet the head spread and layout requirements of NFPA 13.

Would recommend cutting in new heads to meet current code.

Exposed Structure – Sprinkler Heads Layout

Pond Cove Elementary / Middle School

Middle School Gymnasium

The gymnasium exposed structure shows a wood deck over a steel joist girder and steel bar joist frame and wood decking. Information that we have been able to find stated that the wood was originally constructed with a built-up tar and gravel roof system direct to the wood deck.

As part of a roof replacement project the new insulation was directly screwed to the wood deck over the old insulation, tar, and gravel. As part of any new roof replacement, and if a long warranty for the new roof is desired, the wood deck will have to be removed. It is highly probable that the existing wood deck and the bearing steel frame will not meet the new IBC roof load and drift load capacities required.

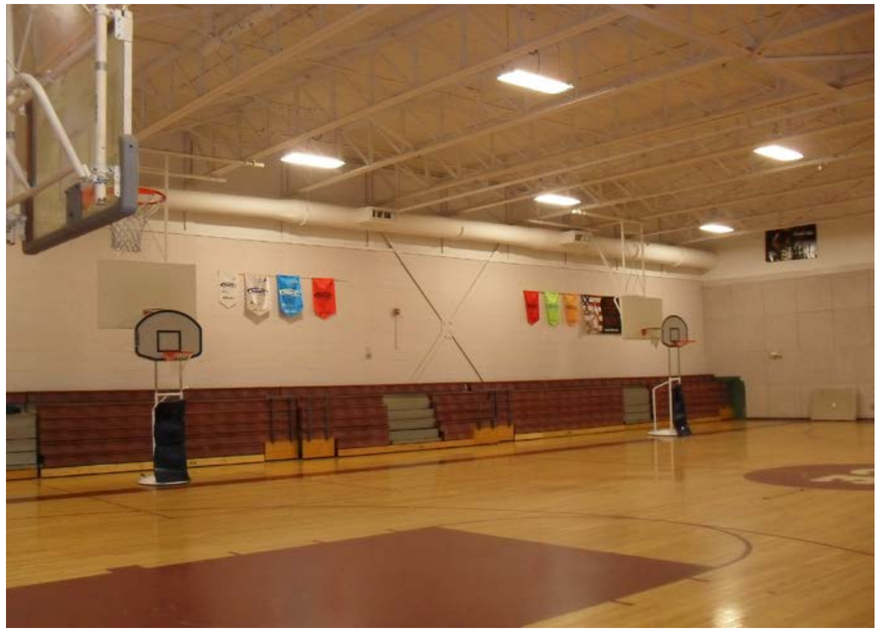
Gymnasium Wood Decking

Gymnasium Floor

The gymnasium floor has been sanded as part of refinishing floor operations. There has been a substantial amount of wood surface removed during these sanding operations. The wood floor has been measured as low as 5/8” on the ends down from a 7/8” to 1” board when installed. Close inspection of the floor and one can see the tongue of the adjacent board thru the joint between. The wood floor is a direct nailed system and cannot be sanded again for a surface refinish system.
We would recommend a floor replacement be considered – the floor has been in place for almost 50 years.

Pond Cove Elementary / Middle School

Middle School Gym



Original Building
1934 Original Building

The 1934 original building was constructed with a second gymnasium space. To achieve the height for this space on a second level the roof was constructed with a series of steel angle truss girders spanning from wall to wall and steel beam cross purlins attached to the truss. On top of the cross purlins a large wooden beam was attached at each cross beam and a tongue and groove deck spanning from roof edge up the slope to the ridge is the surface for the roof shingle attachment.

From the exterior the gable ends appears to have been repaired at some point, possibly when the roof was replaced. On the interior side of the gable ends a structural reinforcement of the walls has been installed. The picture indicates a series of structural shapes through bolted to the masonry from these new structural components and the components were welded back to the existing structure.

It would be safe to assume that added structural members were installed to brace the end wall. No design information was found to show what level of bracing was installed.

The ceiling system currently in place was installed using a grid of cold angles hung from the trusses or cross beams. Some parts of the existing wood decking and attic remained in place on the ends of the building.

The new suspended ceiling system is hung below the grid with the insulation placed on top of the panels. The lights are set on the grid and the new ductwork placed throughout the attic is laid directly on top of the suspended ceiling. By code the lights, piping and ductwork should hang independently from the ceiling.

The new ductwork and some of the heat piping is insulated. The manner in which the whole attic is constructed with all these components provides the potential for a ceiling collapse based upon how the system is hung. The intent of the insulation at the ceiling is for maintaining room temperature due to heat loss thru the ceiling. The unit heaters within the space keep the space warm. The hangers for this system are too widely spaced and the gage and angle of suspension reduce the capacity of the wire hangers to carry the proper load, in fact the load capacity has been reduced by installing them at an angle.

Recommend removal of the entire ceiling system and construction of a new insulated drywall ceiling and air barrier at an extended height. New system should have capabilities to hang all the relocated ductwork to a cavity between the insulation barrier and a new suspended ceiling. The attic space would then be turned into a cold space and properly vented. This repair should offer an energy savings by reducing the amount of volume the school is currently heating.

Steel Truss Girders

Steel Truss Girder
Old Wood Platform and
Partial Wall

Pond Cove Elementary / Middle School

Gable End Wall Brace Brick Pier off Existing Chimney

Bolts Through Exterior Wall

Beam Shapes Welded and Bolted to Bottom Chord Cross Beam Extension

Bracing Gable End Wall

Pond Cove Elementary / Middle School

Insulation Pulled Back From Ceiling

Drywall Ceiling Framing Sprinkler Piping Hangers to Cold Roll Channel Grid

Ductwork Through Existing Wood Platform

Pond Cove Elementary / Middle School

Light Not Suspended Independently From Suspended Ceiling Grid

Elevator Shaft Cap Existing Wood Deck and Wall

Pond Cove Elementary / Middle School

Recent Window Replacement

Window Extends Into Attic Space

Pond Cove Elementary and Middle Schools

Exterior Building Systems

Original School Building

The face brick as part of the composite wall system is in good shape and shows the work of a well maintained surface. The areas requiring work are located around the window openings, the frames and the sills of the openings and the painted concrete surfaces.

Original School Building

The aluminum windows in the building are replacement units set into the existing wood frame system. With these old wood units the wood sash came with a large counterweight located within a boxed out area at each side the frame. The old window frames in general are badly deteriorated on the exterior. Some replacement units came with a preformed sill that extended over the cast stone sill and other units were just simply placed on the bottom sill frame.

We would recommend the installation of a prefinished metal panning system on all sides of the opening to extend the life of the wood frame. Currently a sanding, patching and repainting effort is underway to refinish these old frames. The frames are deteriorated to the point where this effort will be counterproductive. As a second option to this issue we would recommend removal of the existing aluminum sash unit, old wood frames, and window boxes. Provide new wood blocking and interior moulding to replicate a window of this type and install a new metal system on the exterior side as noted in option above.

Some of the cast stone sills at the windows have deteriorated and broken due to weather exposure. To maintain the traditional look of the building we would recommend a patching of these sills with a high strength concrete and an application of a high quality concrete stain over the surface.

Original School Building

Existing Wood Window Frame Badly Deteriorated

Pond Cove Elementary and Middle Schools

Original School Building

Prefinished Metal Sill Over Cast Stone Sill

Original School Building

Broken Window Sills – Concrete Requiring Repainting

Pond Cove Elementary and Middle Schools

Broken Cast Stone Window Sill

Original School Building

Exiting Window Completed With Metal Pan System

Pond Cove Elementary and Middle Schools

Original School Building

The white base of the building is the original exposed concrete foundation with a painted surface. Some exposures of the building have been repaired and refinished. Other exposures need work to the concrete surface with proper prepping and painting as well as window frames

Original School Building

Concrete and Windows Requiring Repair and Refinish

Concrete and Windows Requiring Repair and Refinish

Pond Cove Elementary and Middle Schools

Original School Building

The wood cornices on the building have been repainted a number of times and the wood has rotted out. At this point in time sanding and repainting would not give you the desire results of no maintenance over the long term.

We would recommend the complete removal of all the wood trim and soffit boards and any rotted blocking system behind. Provide a new pressure treated wood frame system with a prefinished white metal bent cornice with a profile to match what was removed. By replacing this old wood cornice with a metal system it would preserve the appearance of the building as originally installed with low maintenance long term.

Original School Building

Wood Cornice

The 1934 Building Exterior Columns at Front Entry

The bases of the large exterior wood columns at the 1934 building have rotted out due to age. The columns are constructed of wood. Columns of this type and size will have to be custom made and we would recommend they be constructed of fiberglass. When the decision is made to repair the columns, at that time when the work commences it could be determined, depending on the condition, to do a partial replacement or if the condition is too deteriorated then complete replacement would be warranted.

Pond Cove Elementary and Middle Schools

Elementary / Middle School – Addition Renovation - 1994

The new brick veneer installed on the elementary/middle school as part of the 1994 project has an issue with an improperly installed flashing system at the window sills. The brick module is an economy brick unit which is 4" x 8" extruded, with core holes in the brick center, it is not solid. In the contract documents a flashing system was indicated on the window details locating the flashing under the window sill and extending down to under the precast concrete sill. The constructed detail shows the flashing was extended down one course below the precast sill through the mortar joint. This flashing installation is trapping water and a freeze/thaw action has destroyed the mortar joints at the precast sill and the brick course below.

Recommend a corrective repair to all existing windows that were built with this condition. It would involve removal of the precast concrete sill, brick and flashing down to the course where the flashing extends through the brick veneer. Though BIA recommends flashing under window sills we have, through our experience in this weather climate, not installed this flashing system. The issue with flashing not installed correctly thus forming a sag and trapping water at that level along with rapid changes in temperature during winter conditions leads to this type of damage. The brick should be re-installed with the same size unit and blend to match, and then reset the precast sill with a proper anchor and soft sealant joints at the butt and end joints. No anchorage of the sill was indicated on the contract documents but is required currently by IBC in conjunction with Siesmic Codes.

This type of damage should be corrected ASAP due to water entry causing more damage to the veneer and a more extensive repair cost.

Damaged Butt and Sill Joints

Window Sill Damage

Pond Cove Elementary and Middle Schools

Second Floor Window Sill Damage

Butt Joints and Mortar Joint Damage

Grout Joint Damage

Consistent Window Sill Damage

Pond Cove Elementary and Middle Schools

Flashing at Location Different From Contract Documents

Fabric Flashing Extended Through Joint – Joint Spalled Off

Elementary/Middle School – Addition Renovation - 1994

The new brick veneer installed on the elementary/middle school as part of the 1994 project has not been properly weeped at the window head. The contract documents indicate a location for the flashing on top of the lintel angle which has been verified. The weep hole was not installed as part of the construction process. The 2-story classroom wing appears to be the area with the most amounts of windows without weeps.

We would recommend a corrective action of cutting in new holes at the proper location at a maximum spacing of 2'-0" o.c. at all window heads that have no weep holes. We also recommend at those window heads with a few weep holes that additional weep holes be cut in to provide the proper water drainage out from behind the veneer.

The flashing over the windows that was installed was not extended to the end of the steel lintel. A properly installed metal flashing at this location would extend a minimum 8" into the jam with an end dam turn up to keep water from migrating off the end and under the lintel.

Window With No Weep Holes

Pond Cove Elementary and Middle Schools

Flashing at Window Head

Flashing – Not Extended Properly – Weep Hole on End Only

No Butt Joint, Flashing Not Extended – Weep Drains Down Edge

Improper Window Head Installation

At locations where the precast concrete lintel is shown as an element over the top of windows, the flashing as indicated on the contract documents was installed. Most of the vertical butt grout joints between the pieces has broken and fallen out. The grout was broken either due to the expansion/contracting of the precast units or the fact that no weep hole was installed and freeze/thaw action has broken the mortar and allowed it to fall out.

Precast Concrete Lintel Head

Broken Joint Between Units

Broken Joint Between Units

Pond Cove Elementary and Middle Schools

On two wings of the existing elementary school the 1994 construction documents called for installing a new brick veneer out beyond the face of the existing foundation. The detail shows a support angle bolted to the existing foundation with a new through wall flashing and weep holes. Field observation showed that no flashing was installed and no weep holes were observed at that point. Some locations showed weep holes at the same height as the bottom of the windows but no flashing was installed under the windows.

Potentially they may have filled the bottom two courses with grout and pulled the flashing up to a higher course. No flashing extension was seen at that brick course to indicate it was installed in that manner.

Since it was not constructed as detailed, we would recommend a forensic removal to find out how it was constructed. A corrective repair action could then be put in place. If left long term in its current state it would potentially have a long term impact on the life of this wall, especially on the support angle.

Brick on Support Angle

No Flashing Pulled Through at Support Angle

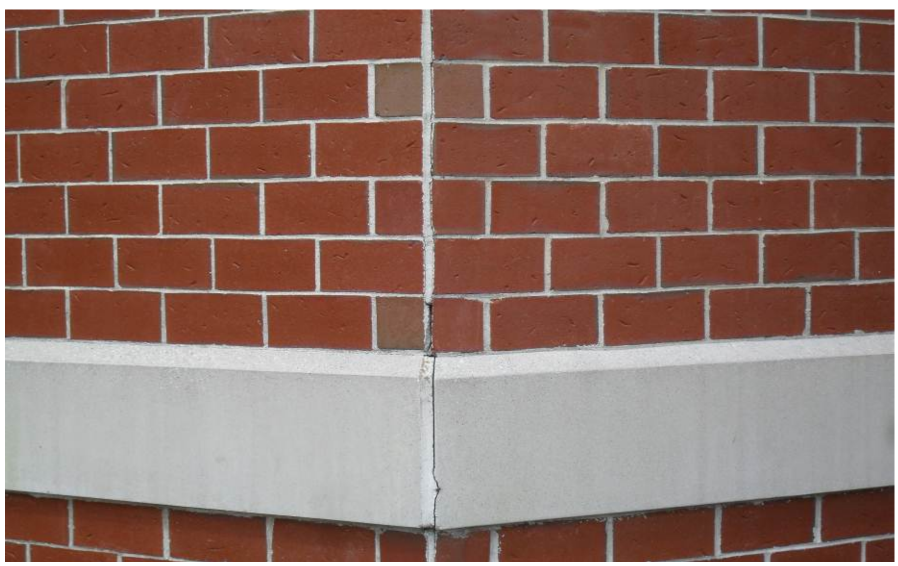
Weep Holes Installed at Unexplained Location

Precast Concrete Bands

The precast concrete bands that horizontally course the new veneer were head jointed with mortar. Most of them have cracked from thermal expansion and some mortar has fallen out leaving an open joint. The open joint creates a water entry point that will only allow for more damage to the veneer in the future.

Recommend that all head joints in this condition be routed out and then filled with a backer rod and sealant joint. Some joints have had an attempted repair but the improper installation has failed.

Joint Failure



Pond Cove Elementary and Middle Schools

Repair Failed

Mortar Joint Failure

Pond Cove Elementary and Middle Schools

Original 1948 Primary School Building

As part of the 1994 construction project the old window-wall system was removed and replaced with a new stud backup and brick veneer infill. The old window system was removed down to the bottom of the old window-wall sill and the old brick was left to the top of the knee foundation wall. The remaining face brick needs a major corrective repointing and brick patching. Some joints have been caulked up to stop water entry and patch mortar has been applied elsewhere. The original mortar is over 60 years old and needs work.

The exposed steel columns exposed as part of the old window wall should be ground down and painted with a galvanizing primer and enamel coat.

The Unit Ventilators are not operational and the intake louvers should be removed and the opening bricked up.

Face Brick in Bad Condition

Elementary School - Wall

Original 1948 Primary School Building

Plywood Panels Needs Painting

Pond Cove Elementary and Middle Schools

Original 1948 Primary School Building

Opposite Side Exposure – Brick Condition

Original 1948 Primary School Building

Unit Ventilator louver in Bad Shape

Wood Siding

The clapboard siding system on the buildings is peeling off on certain exposures of the building. We observed sides of the building being scraped sanded and repainted. We recommend continuing with this repair as part of your regular maintenance program.

For future consideration you may want to replace with a no maintenance siding system.

Wood Clapboard Siding Needs Repainting

Wood Panel Siding

On the library addition and other locations there is a wood panel MDO panel attached to a wood backup framing system. The panel has become completely deteriorated due to weather exposure and should be completely replaced. Would recommend a maintenance free coated metal skin panel for long term durability.

MDO Panel Has Failed

Pond Cove Elementary and Middle Schools

1962 Classroom Addition

In the 1994 addition renovation project the window-wall was removed as part of the renovation. The original steel columns and overhang as well as the wood decking were left in place and a new stud back-up and brick veneer was installed. The exposed wood deck should be repainted or a new metal panel applied over it.

As a potential roof replacement project for this area, the wood decking would have to be removed for a new metal deck to meet current loads.

Exposed Wood Decking

Pond Cove Elementary and Middle Schools

1994 Windows

The caulking system that was applied around the windows as part of the 1994 additions is showing signs of imminent failure and discoloration. The head joint at the top was installed as an extremely large joint and on an average the installation was not very good. The joints at the jambs were done as an overlapping joint and traditionally this type of sealant joints are the first to fail in this type of application.

The sealant system around all your openings will have to be replaced in the near future.

Window Sealant System

Window Head Sealant Joint

Pond Cove Elementary and Middle Schools

Main Entrance

The main entrance doors have a brick course directly over the doors. It would appear that the door frame was installed a few inches short and when the space discrepancy was discovered and was infilled with brick. The brick appears to be sitting directly on the door frame below the lintel.

Main Entrance

Close-Up of Brick on Door Frame

Pond Cove Elementary and Middle Schools

Main Entrance

Over the main entrance there are weep holes in the brick that were inserted for an unknown reason. No through wall flashing indicated on details.

Weep Holes Over Arch Masonry

Precast Entrance Sign

Weep holes have been installed in the brick course above the precast concrete sign, but there is no evidence that flashing was installed. Metal through wall flashing edge should be exposed.

Flashing Not Evident

Weep Holes Without Flashing

Pond Cove Elementary and Middle Schools

Base of Wall Flashing and Weep Hole System

Around the perimeter base of the new brick the weep holes were installed at an odd spacing. The spacing is inconsistent from wall to wall with some locations exceeding 5'-4" o.c and others as short as 16" o.c. The weep holes are recommended by BIA to be inserted at a maximum spacing of 2'-8" o.c.. The spacing in the picture is at 3'-4".

The through wall flashing shown is a fabric flashing and was installed in a poor quality manner. Would recommend cutting in new weep holes on all walls.

Weep Hole Spacing too Far Apart

Support Angles

On existing buildings where the existing window-wall was removed a new support angle was bolted to the existing foundation to support the brick. There is no indication on the contract documents that these angles were galvanized.

They should be closely monitored and maintained to keep the angle from rusting.

Pond Cove Elementary and Middle Schools

Exposed Support Angle

Support Angle

Exposed angle for brick support.

Brick Detail

Pond Cove Elementary and Middle Schools

Exit and Entrance Doors

The hollow metal doors and frames around the building will require replacement at some locations. Some are showing rust through the bottom of the frame or door edge. Most need to be repainted.

Recommend replacement as part of your annual maintenance budget. Install new galvanized doors and frames for long term durability.

Hollow Metal Entrance Doors and Frames

Pond Cove Elementary / Middle School

Architectural Systems Evaluation

Roof System Type Locations

- Architectural shingle – moderate weight.
- Galvanized metal edge strip – flat seamed.
- Metal parapet cap – painted.
- EPDM flashing and metal termination bar.
- Shingles installed over existing wood decking.
- No record found as to when replacement roof shingles where installed.

Original High School
Built in 1934

- Fully adhered .060 EPDM roofing membrane with two layers roof insulation mechanically fastened to wood decking.
- Denoted on the 1994 addition/renovation project as a replacement roof system.
- Roof is in good condition. Roof has been maintained as part of a regular maintenance program.
- Roof membrane is 18 years into its potential 20 to 25 year life span.
- Would consider this roof for replacement in the near future.

Original Primary School
Built in 1948

Pond Cove Elementary / Middle School

- Fully adhered .060 EPDM roofing membrane over roof insulation boards mechanically fastened to the existing wood deck.
- Denoted on the 1994 addition/renovation project as existing EPDM roofing to remain.
- Based on the note and no record of replacement we suspect this roof is already beyond its 20 year life span.
- This roof would be on a higher priority schedule for replacement due to its age since installation.

Addition to Primary
Constructed in 1955

- Fully adhered EPDM roofing membrane over two layers of 2 ½" roof insulation mechanically fastened to the existing wood deck. Lunt roof is shown beyond the ballasted roof in the foreground.
- Denoted on the 1994 addition/renovation project as existing EPDM roofing to remain.
- Based on the note and no record of replacement we suspect this roof is already beyond its 20 year life span.
- This roof would be on a higher priority schedule for replacement due to its age since installation.

Lunt Building –
Addition to Primary
Built in 1962

Pond Cove Elementary / Middle School

- Fully adhered .060 EPDM roofing membrane over roof insulation boards mechanically fastened to the existing wood deck.
- Denoted on the 1994 addition/renovation project as existing EPDM roofing to remain.
- Based on the note and no record of replacement we suspect this roof is already beyond its 20 year life span.
- This roof would be on a higher priority schedule for replacement due to its age since installation.

Gymnasium / Classroom Addition to High School Built in 1962

Lower Roof Beside Gym

Gymnasium Roof

Pond Cove Elementary / Middle School

- Loose laid .060 EPDM roofing membrane over two layers of roof insulation with stone ballast on metal roof deck.
- These ballasted roof systems were installed with the 1994 addition/ renovation project.
- Roof is in good condition. Roof has been maintained as part of a regular maintenance program.
- Roof membrane is 18 years into its potential 20 to 25 year life span.
- Would consider this roof for replacement in the near future.
- Date of roof replacement unknown.

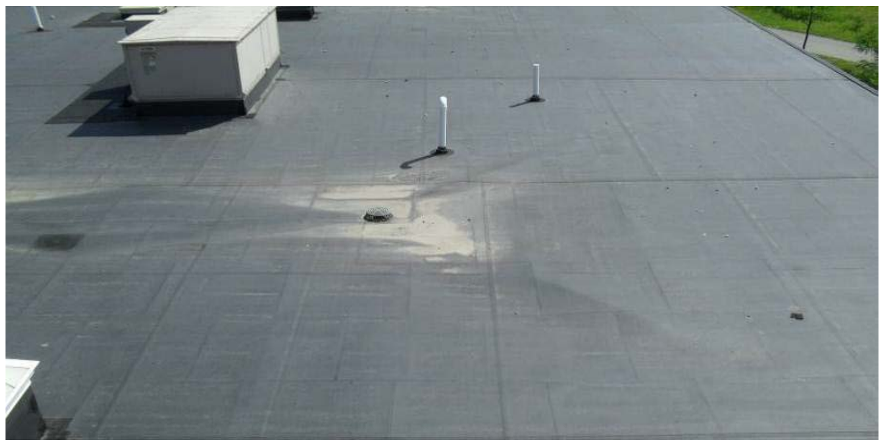
Cafeteria / Library / Offices / Classrooms Built in 1994

Pond Cove Elementary / Middle School

Pond Cove Elementary / Middle School

- Fully adhered .060 EPDM membrane on tapered roof insulation adhered to the concrete roof deck.
- The roof structure was designed with a concrete deck on metal as a composite system for a future second floor addition.
- The roof system is only eight years into its lifespan and should service the school for 15 to 20 years with a good maintenance program.

Kindergarten Wing
Built in 2004



- Fully adhered EPDM roofing membrane and roof insulation adhered to the existing wood deck.
- Existing wood beam and wood deck is visible from rooms below. Appears a wood truss pitched system was installed directly over the wood beam and deck system and an adhered membrane installed to the deck.
- Denoted on the 1994 addition/renovation project as existing EPDM roofing to remain.
- Based on the note and no record of replacement we suspect this roof is already beyond its 20 year life span.
- This roof would be on a higher priority schedule for replacement due to its age since installation.

Vocational Arts Wing

Pond Cove Elementary / Middle School

- Standing seam painted metal roof panels roofing.
- Metal roof panels are installed over a plywood deck on structural steel studs spanning from lower to upper structural support steel.
- These roof panels were installed with the 1994 addition/renovation.
- The roof system is only 18 years into its lifespan and should service the school for 10 to 15 more years depending on the paint system on the surface that the panel was manufactured with.
- No information was found regarding the metal panel roof system specifications.
- The installation appears to be according to recommended manufacturer installations.

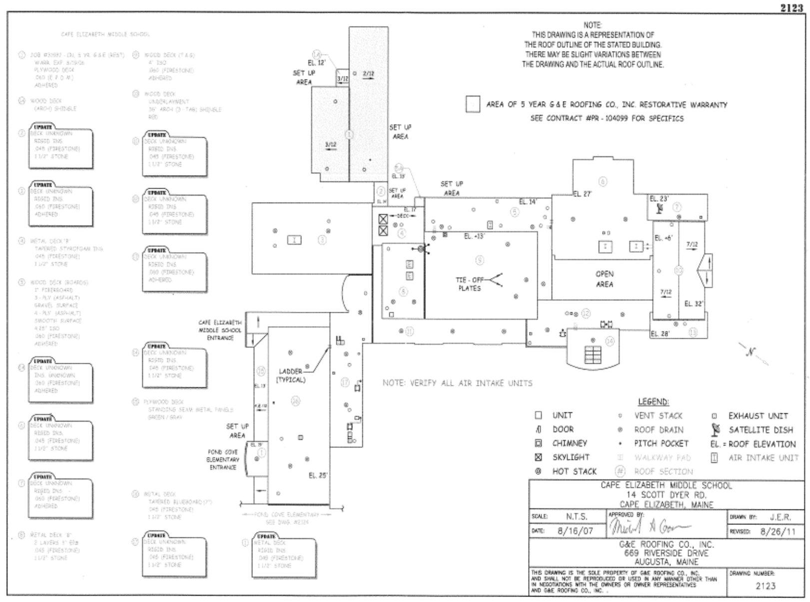
Cafeteria / Library / Offices / Classrooms Built in 1994

Metal Standing Seam Roof on Middle School

Pond Cove Elementary / Middle School

Roof Systems – Condition Concerns

Pond Cove Elementary / Middle School Roof Plan



Elementary School Concern No. 1

1. The roof areas on the plan above plan designated No's 3, 5, 9, 18, 20, 22 should be considered high priority for replacement. These roofs have been down the longest and have been exposed to UV. The seams are showing signs of deterioration and may require closer attention from a maintenance perspective. The picture below shows repair work to membrane and seams.

EPDM Roof with Seam and Membrane Repair

Pond Cove Elementary / Middle School

Elementary School Concern No. 1

Elementary School Roof with Repair Membrane

Middle School Concern No. 2

2. The ballasted roof areas denoted on the plan above as areas 6, 8, 11, 12, 14, 16, 17, 19 should be considered for replacement based on the age. Though these types of roof systems would be considered to offer a longer life to the membrane there are a number of issues connected with this installation that we will highlight further on in this report.

Ballasted Roof System – Stone Directly Over the Membrane

Pond Cove Elementary / Middle School

Middle School
Concern No. 2

The picture below shows an area where the ballasted stone has been pulled back to reveal possible water leak locations. Patches were installed as a corrective action. The stone was never spread out back over the area. It is difficult to review the condition of the roof membranes with the stone ballast over. There were a number of locations on the roof where the membrane was exposed due to corrective action and this exposure is revealing that the membrane has prematurely started to wear out. Normally with a stone ballast roof there is a nylon protective mat that is laid down over the membrane to protect the membrane surface from the type of wear revealed at the locations where the stone was pulled back. At other locations where the stone was pulled back the membrane was showing similar wear. Based upon the visual observation at these locations I think you can assume the entire ballasted membrane is in similar condition.

Middle School
Concern No. 2

Roof Membrane Badly Worn

Middle School
Concern No.2

Roof Membrane Badly Worn

Pond Cove Elementary / Middle School

3. On the kindergarten roof addition there are two large major buckles with the roof membrane. Per the contract documents, the system was installed as an adhered membrane to adhered insulation direct to a concrete deck and our observation indicates that there has been a separation of the membrane from the insulation.

   This condition requires immediate correction because of the potential of a high wind condition lifting and causing the entire roof to separate from the insulation and causing a total roof failure.

Roof with Major Membrane Buckle

Elementary and Middle School Roofs

1. Most of the skylights on the school are showing signs of paint peeling off the frames. This is a sign of low quality paint finish on the frames.

Skylight Frame – Paint Finish Flaking Off

Elementary and Middle School Roofs

2. A couple of skylights have an EPDM flashing tape applied over the frame and the skylight panel as a corrective measure to stop what we assume was leaking through the skylight frame. This is not a recommended manufacturer correction to these units and could be detrimental to the life of the panel with an adhesive applied to the panel.

   We would recommend as part of a maintenance item, to procure a Glass and Glazing company which services this particular skylight and have them clean and patch all the paint finish flaking locations, dismantle the frame and panel and apply new seals between the frame and panels to bring the units back to the originally installed condition. If for some reason the clamping frame was removed from the panel, the original seal on both sides would have had to be replaced – this is a manufacturer's requirement. The units may not have been installed correctly and thus the leak issues.

Skylight Frame With Tape Flashing Over Frame

Pond Cove Elementary / Middle School

Middle School

3. The metal ladders from the roof over the locker rooms that accesses the classroom addition and the gymnasium roof are not in compliance with OSHA.

   We would recommend replacement with new compliant ladder and cage.

Vertical Ladder – Noncompliant

Vertical Ladder – Noncompliant

Pond Cove Elementary / Middle School

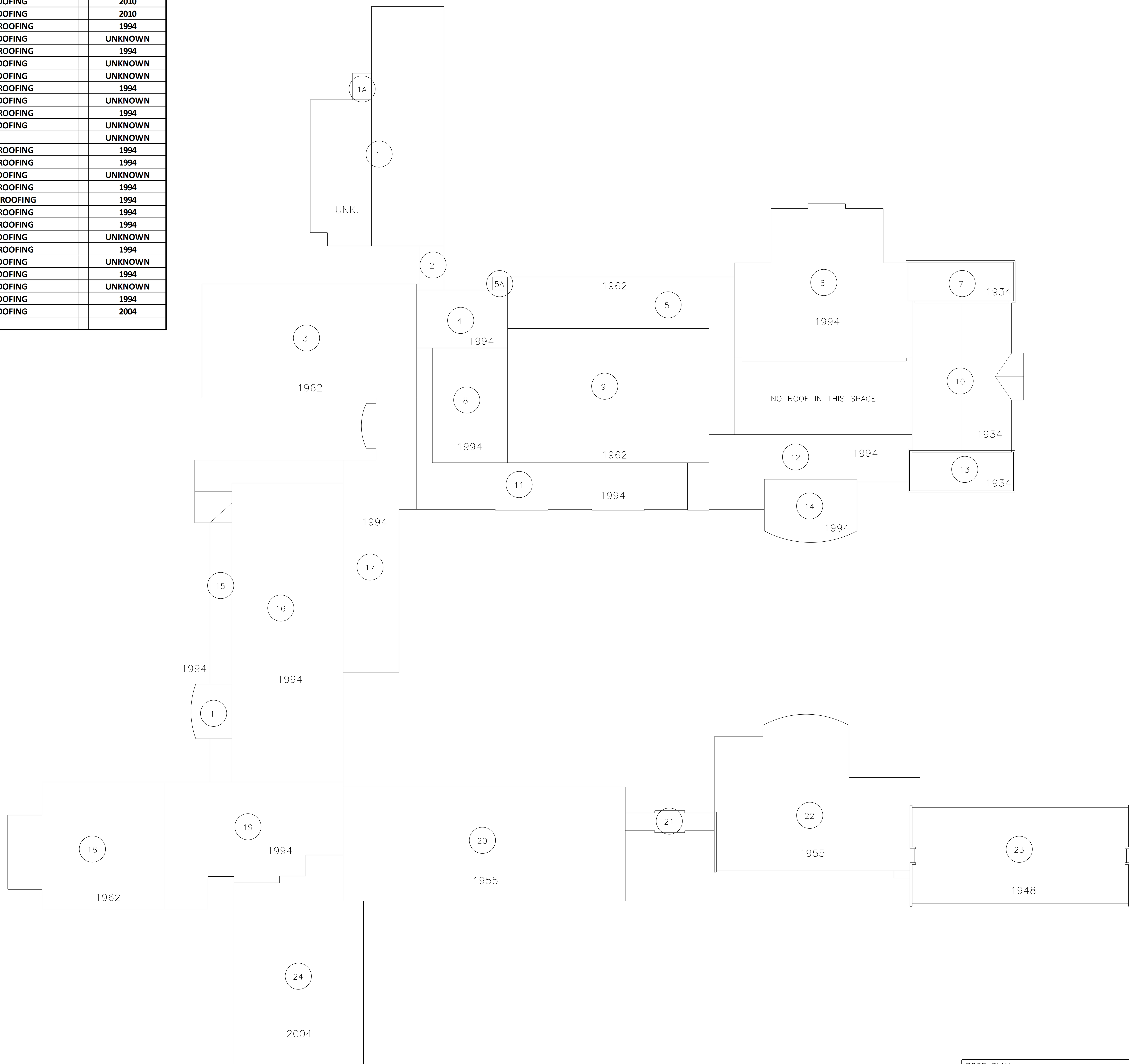
Original High School Built in 1934

In the 1994 addition/renovation project it was denoted as the existing shingled roof to remain with bottom metal galvanized drip edge denoted as being replaced. No record found of when the shingled roof was installed.

Shingled Roof on the Original Building

ROOF #:	ROOF DESCRIPTION:	REPLACED:
1	ADHERED MEMBRANE ROOFING	2010
1A	ADHERED MEMBRANE ROOFING	2010
2	BALLASTED MEMBRANE ROOFING	1994
3	ADHERED MEMBRANE ROOFING	UNKNOWN
4	BALLASTED MEMBRANE ROOFING	1994
5	ADHERED MEMBRANE ROOFING	UNKNOWN
5A	ADHERED MEMBRANE ROOFING	UNKNOWN
6	BALLASTED MEMBRANE ROOFING	1994
7	ADHERED MEMBRANE ROOFING	UNKNOWN
8	BALLASTED MEMBRANE ROOFING	1994
9	ADHERED MEMBRANE ROOFING	UNKNOWN
10	SHINGLED ROOF	UNKNOWN
11	BALLASTED MEMBRANE ROOFING	1994
12	BALLASTED MEMBRANE ROOFING	1994
13	ADHERED MEMBRANE ROOFING	UNKNOWN
14	BALLASTED MEMBRANE ROOFING	1994
15	STANDING SEAM METAL ROOFING	1994
16	BALLASTED MEMBRANE ROOFING	1994
17	BALLASTED MEMBRANE ROOFING	1994
18	ADHERED MEMBRANE ROOFING	UNKNOWN
19	BALLASTED MEMBRANE ROOFING	1994
20	ADHERED MEMBRANE ROOFING	UNKNOWN
21	ADHERED MEMBRANE ROOFING	1994
22	ADHERED MEMBRANE ROOFING	UNKNOWN
23	ADHERED MEMBRANE ROOFING	1994
24	ADHERED MEMBRANE ROOFING	2004

NOTE:
DATES SHOWN ON ROOF PLAN REFLECT DATE PORTION OF BUILDING WAS BUILT



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Project Title
CAPE ELIZABETH MIDDLE/ELEMENTARY SCHOOL
CAPE ELIZABETH, MAINE

HA Project No. 12580

Key Plan

Mark | Date | Description

Issue Dates

Drawing Status

Drawing Title
ROOF PLAN EXISTING CONDITIONS

PA / PC: DER   Drawn By: JDD

Drawing Number
A15.1

ROOF PLAN
NTS   REF: –
A1

Pond Cove Elementary and Middle Schools

Mechanical Systems Evaluation

Boiler Room

In general, the Boiler Room does not meet current code requirements. The room is being used as an office, work room and storage facility for flammable and combustible materials. Air handling units AHU-5, 6, and AHU-7 are located in the Boiler Room.

We would recommend replacement of the boilers and a redesign of the entire Boiler Room, including the air handling systems, to increase system efficiency and meet code requirements.

Boiler Plant – Code Violations

General Condition

Boiler Plant – General Conditions

The heating hot water is generated from two 28 year old Weil-McLain model 1888 18-section cast iron boilers installed during the 1994 addition and renovations project. Each boiler is outfitted with the original, fully-modulating Webster Cyclonetic burner and Autoflame combustion management control system. The burner controls are interfaced with the building Direct Digital Control (DDC) system. The net output of each boiler is rated at 4,035 Mbh for water. Based on the following calculated heat loss of the facility, the boiler plant appears to offer nearly 100% redundancy. Based on oil delivery data for the years FY06-07 to FY10-11, the average fuel oil consumption is 54,316 gallons. Based on the average fuel consumption, we would estimate the heat loss of the facility to be in the range of 4255 – 4495 Mbh and would estimate the per square foot consumption to be 0.33 gal/SF. The fuel consumption numbers of new schools, of similar size, that utilize oil typically see numbers ranging from 0.23 to 0.28 gallons per square foot per year depending on systems being implemented in the school design and the operational profile of the facility.

The #2 fuel oil is provided to each individual burner through the respective oil pump. At the time of review, the boilers were down for the season.

Boiler Plant - Existing Boilers

Fuel Oil Pump – Boiler 1

The enclosures of the boilers are showing signs of their age. The side of Boiler 1 shows signs of combustion and gas leakage between the cast iron sections of the boiler. With proper maintenance and repair, this type of boiler can provide many years of service.

Left Side of Boiler 1 (left-hand) Showing Signs Burned Surface

The linkage of the draft control damper at the rear of Boiler 1 is loose at the shaft of the damper. The position of the damper is unknown. Recommend the damper linkage be properly adjusted and tightened.

Breeching Damper at Back of Boiler 1 Was Loose

Each boiler is outfitted with an individual injection pump. The pump at Boiler 1 appears to be original and showing signs of leakage. The pump at Boiler 2 appears to be a recent replacement.

Boiler 1 Injection Pump and Oil Pressure Gauge and Transmitter

The heating hot water is circulated through the building by Taco 30 HP, 800 gpm constant volume split-case base-mounted pumps. The pumps were provided as part of the 1994 renovation project and are showing their age.

We would recommend upgrading the heating system hot water pump motors to high efficiency type and thee installation of variable frequency drives for control and vary the speed of the pump to maintain a temperature differential across the heating hot water system.

Heating Hot Water Pump

Pond Cove Elementary and Middle Schools

Combustion air to the boiler room is provided through the 54" x 60" insulated duct dropping down in the middle of the Boiler Room. The opening at the floor has been partially blocked off. It was reported the combustion air duct was partially blocked to help reduce the possibility of freezing the boiler(s).

The damper actuator appears to be original and shows signs of oil leakage. At the time of review, the damper was open.

Combustion Air Duct Partially Blocked

Combustion Air Damper Actuator

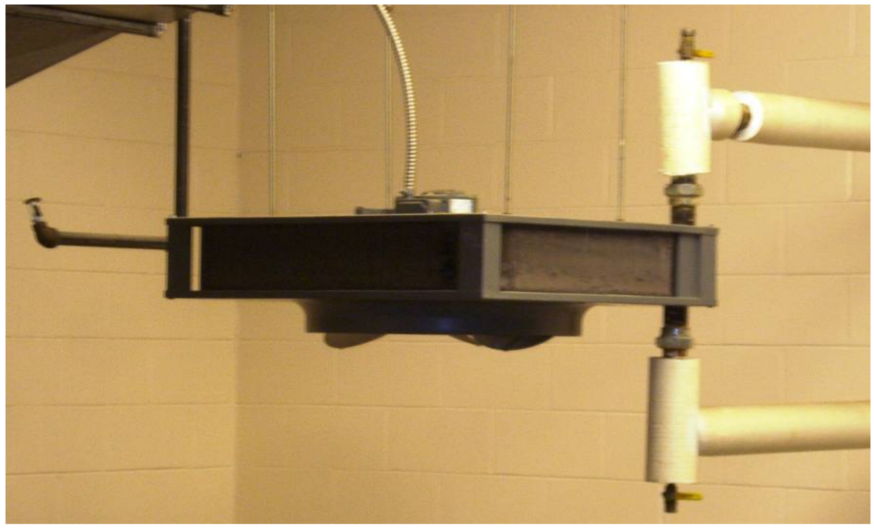
Pond Cove Elementary and Middle Schools

Heating in the Boiler Room is provided through two vertical hot water unit heaters. The coil of one of the heaters appears to be plugged.

Recommend cleaning of the coils.

Vertical Unit Heater in Boiler Room

Coil is Plugged



The domestic hot water system was upgraded during the Summer 2011. A part of the upgrade, the existing oil-fired hot water was abandoned in place. At the time of review, the oil-fired heater was turned off at the local disconnect.

We would recommend removal of the abandoned heater.

Domestic Hot Water Boiler

Pond Cove Elementary and Middle Schools

Part of the upgrade project was installation of a set of solar arrays located on the roof of the boiler room and two hot water storage tanks and two and instantaneous gas-fired hot water heaters located in the Boiler Room

Solar Hot Water Array

Solar Domestic Hot Water System Tanks and Gas-Fired Instantaneous Hot Water Heaters

Pond Cove Elementary and Middle Schools

The Network 8000 Direct Digital Control (DDC) system components in the Boiler Room were provided and installed during the 1994 renovation project. The I/A Series Micronet components, pictured at the left of the panel, were provided and installed during the 2011 Boiler Room Upgrade project. The Network 8000 components are monitored through the original Signal graphics software package and the upgraded I/A Series components are accessed through the web-based Enterprise Server software package. We recommend upgrading the Network 8000 components to the I/A Series system components.

Direct Digital Control System in Boiler Room

The #2 fuel oil is store in the underground tank. Liquid propane gas is stored in the fenced in area. The International Fire Code provides a minimum distance between an LP gas container and fuel oil tank. As a noted exception, horizontal separation is not required between above-ground L-gas containers and underground flammable and combustible tanks. It would appear the tanks at the school are in compliance.

Underground Fuel Oil Storage Tank and Above Ground Propane Storage Tanks

Fuel oil is provided to the boiler room through a duplex pump set located in the "E" wing janitor's closet. The pump set is showing signs of leakage.

We would recommend the pump set be replaced in accordance with NFPA 31 code requirements.

Fuel Oil Pump Set

Rooftop Heat Recovery and Air Handling Units

The rooftop air handling units and heat recovery units were provided and installed as part of the 1994 Additions and Renovations project making them approximately 18 years old and nearing the end of their expected service. Many of the units are showing signs of their age. At the time of review, the heat recovery units were not operating. Possibly down for the summer.

We would recommend replacement of the rooftop units.

Typical Des Champs Rooftop Heat Recovery Unit (HRU-5)

The outside air intake and bypass damper actuators, located within the outside air intake plenum, are original to the unit and are showing signs of oil leakage.

The condition of the interior surfaces of the rooftop units supports our recommend to replace the units. We would recommend replacement of the damper actuators as a short term correction.

HRU-5 Intake and Bypass Damper Actuators

On a number of the units, additional sections of sheet metal were added to a number of the heat recovery units to help reduce the infiltration of snow into the unit. The filters in HRU-4 are noted as replaced in March 2012. On the filter it is also noted the plenum was very warm and the there was no snow.

HRU-4 with Additional Intake Hood Section (right side of photo)

Pond Cove Elementary and Middle Schools

On HRU-4, the heating coil valve actuator appears to be original to the unit and is showing signs of oil leakage. The pointer on the front of the actuator indicates the valve is partially open possibly indicating the actuator has failed partially open.

We would recommend replacement of the valve actuator as a short term correction.

HRU-4 Heating Coil Valve Gear-Train Actuator

The HRU-4 supply fan motor appears to be a recent replacement. The heating coil low limit thermostat capillary has been partially removed from the heating coil fins and the fins have been bent over. The return air side of the heat recovery coil is very dirty.

We would recommend reinstallation of the capillary, combing out of the heating coil fins and cleaning all rooftop heat recovery and heating coils.

HRU-4 Supply Fan Motor, Heating Coil, and Low Limit Coil Capillary

Pond Cove Elementary and Middle Schools

The return air side of the heat recovery coil is very dirty.

We would recommend cleaning of all rooftop heat recovery and heating coils

HRU-4 Dirty Heat Recovery Coil (Return Air Side)

The acoustically lined return air plenum of HRU-4 is very dirty. This is typical of all units.

We would recommend cleaning of all return and supply duct systems.

HRU-4 Dirty Return Air Plenum Duct Connection

Pond Cove Elementary and Middle Schools

The bypass damper in HRU-3 is partially open indicating the linkage requires adjustment of the damper, original damper actuator has failed.

We would recommend checking and repairing the damper as needed.

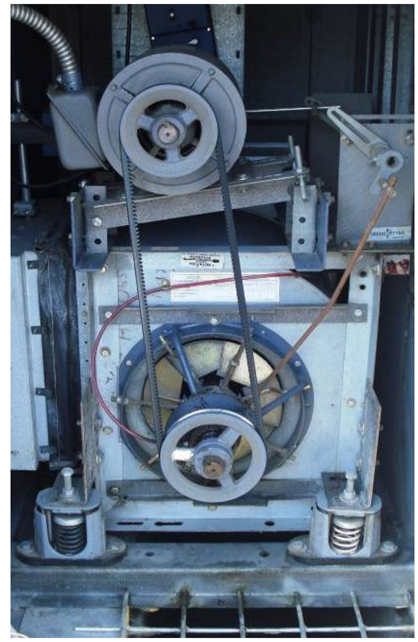
HRU-3 Partially Open Bypass Damper

The Trane rooftop air handling unit AHU-1 serves the Variable Air Volume (VAV) system in Elementary School Media Center and adjacent Office Areas. The unit was installed as part of the 1994 Addition and Renovations project. The unit will vary the amount of air provided for the variable air volume system by opening and closing the inlet vanes at the constant speed fans. A more efficient method of varying the airflow would be to vary the speed of the fans through the use of variable speed drives (VFD).

We would recommend removing the inlet vanes, verify the motors are suitable for use with variable speed drives, and provide and install new VFDs.

AHU-1 Trane Air Handling Unit

AHU-1 Supply (Photo Left) and Relief Air Fans with Inlet Vanes



The outside air portion of the mixed air dampers (shown to the left of the photo above) were not completely closed allowing for a small amount of infiltration of outside air when the unit is off. Recommend adjustment of the damper linkage to allow the dampers to close fully.

AHU-1 Mixed Air Dampers

Pond Cove Elementary and Middle Schools

The upper portion of the coil section is not connected. The photo below on the right shows a piece of cardboard covering the cooling coil. According to the design documents, the upper coil was provided for future chilled water cooling. As a temporary measure, the upper coil was blocked off to prevent airflow from bypassing the heating coil.

AHU-1 Coil Connections and Cardboard Covering Portion of Coil

On HRU-1, additional sheet metal has been added to the outside air intake hood to help prevent snow from entering the intake. In many of the rooftop units, there are signs a corrosion between the sections of the HRU. Note the rusty areas shown in the photo below.

HRU-1

HRU-1 Rusty Areas Within Unit

Additional sheet metal has been added to HRU-8 intake hood.

At the time of review, the unit was not operating but the intake closure damper was open possibly indicating the damper actuator has failed in the open position or the damper linkage is disconnected.

As an immediate action, we would recommend servicing the intake damper. As a future action, we would recommend replacement of the unit.

HRU-8 Intake Hood

HRU-8 Intake Closure Damper

HRU-9 serves the 1930s "G" Building. The unit supply is provided out of the unit and through the exterior of the building. The wall penetration appears to be in good condition. The supply duct is not insulated on the outside but may internally lined. The return to the unit is installed up through the roof curb from the ceiling space below.

We would recommend replacement of the unit and insulating the supply duct to reduce heat loss.

HRU-9 Supply Duct

The newer York Solution AHU-1 (duplicate numbering) was provided and installed as part of the 2004 Pond Cove Elementary Addition project. The unit appears to be in good condition.

Newer York Solution AHU-1

Indoor Ventilation Systems

Three air handling units (AHU-5, 6, 7) are located in the Boiler Room/Mechanical Room. This is a code violation. The units serve the Cafetorium, Middle School Gym, and Middle School offices respectfully. These air handling units were installed during the 1994 addition and renovations project.

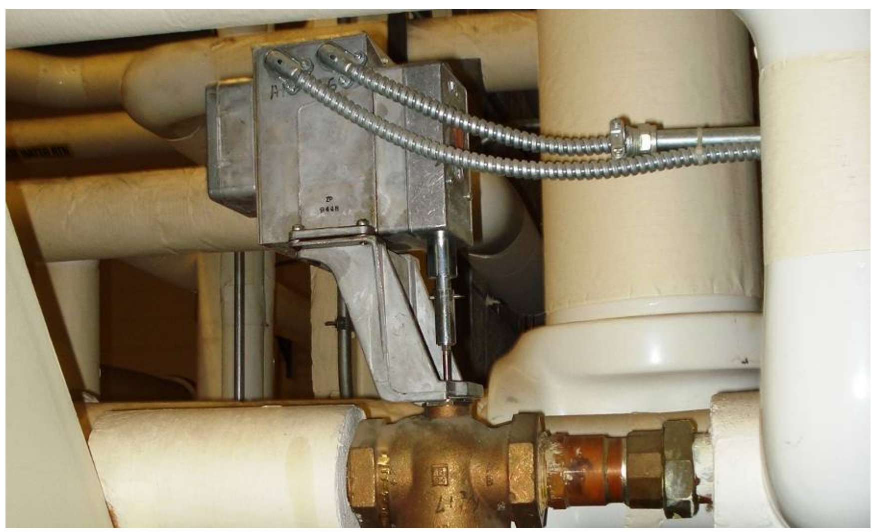
AHU-5 fan speed is controlled through the DDC system and the Toshiba VFD. The system monitors the return air carbon dioxide (CO2).

AHU-5 Variable Frequency Drive

AHU-5 Return Air Carbon Dioxide Sensor

AHU-6 heating coil valve actuator is the original gear train actuator and is showing signs of oil leakage. At the time of review, the unit was off. The mixed air dampers partially open and showing signs of their age. One of the filters has been pulled of the frame.

View of AHU-6 Heating Coil Valve



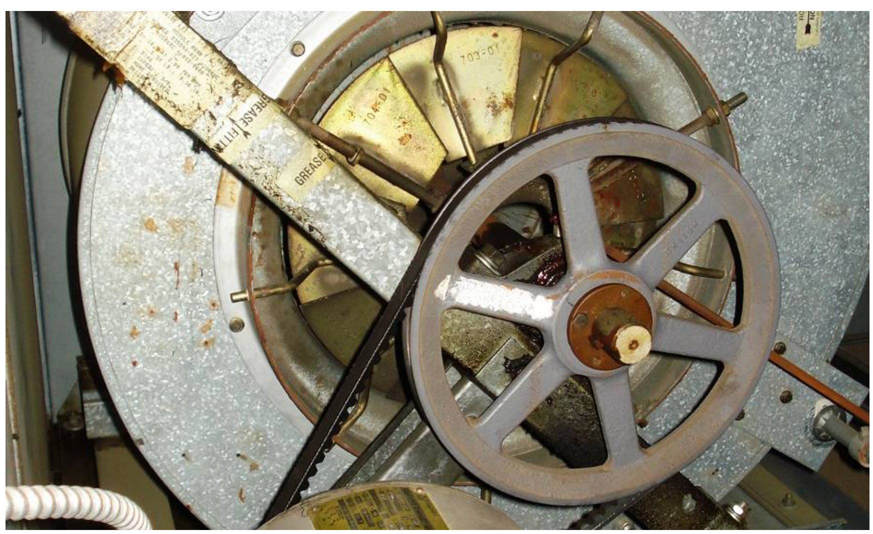
AHU-6 Mixed Air Dampers and Filter

AHU-7 supply air is controlled by opening and closing the fan inlet vanes. This was a common practice before the introduction of variable frequency drives to control the speed of the fans.

The damper at the end of the unit was blanked off during the construction. The unit was provided with mixed air dampers. Due to room constraints, changes were made to mix the return (return fan RF-4) and outside air in the ductwork above the unit and provide the mixed air to the unit through the top damper. The top damper was locked open and the damper at the end of the unit was blocked off.

We would recommend the removal of the inlet vanes, verification of motor and VFD compatibility and the installation of a variable frequency drive.

AHU-7 Adjustable Inlet Vanes in Supply Fan



Pond Cove Elementary and Middle Schools

AHU-7 Blanked-off Damper at the End of Unit

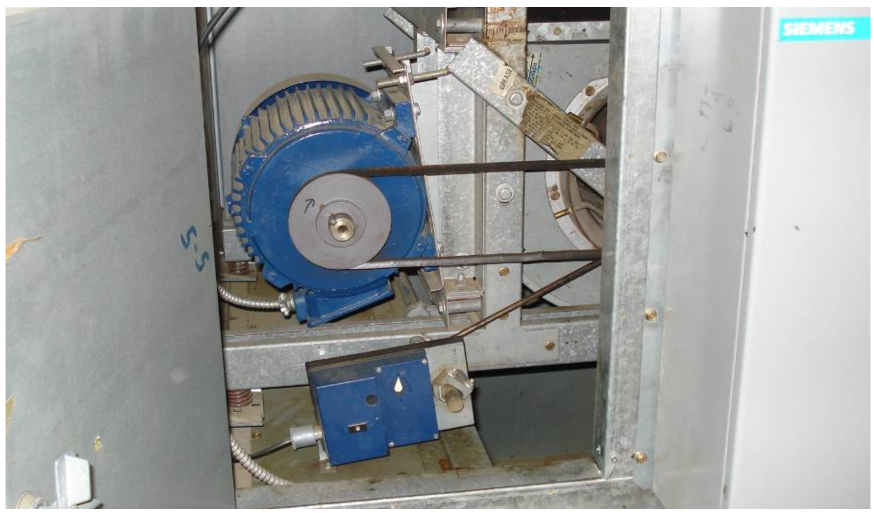
Air handling units AHU-2 and AHU-3 are located in the Mechanical Room by the 2nd and 3rd grade wings and were installed as part of the 1994 addition and renovation project and appear to be in good condition.

AHU-2 is a variable air volume unit and serves the Administration Offices on the ground floor (Area "C") of the Elementary School. At the time of review, the return fan (RF-3) associated with AHU-2 was operating but the AHU-2 supply fan was off on reset. Depressing the reset button caused the fan to operate.

AHU-2 Side View

Air handling units AHU-2 and AHU-3 are located in the Mechanical Room by the 2nd and 3rd grade wings and were installed as part of the 1994 addition and renovation project and appear to be in good condition. AHU-2 is a variable air volume unit and serves the Administration Offices on the ground floor (Area "C") of the Elementary School. At the time of review, the return fan (RF-3) associated with AHU-2 was operating but the AHU-2 supply fan was off on reset.

The air volume of AHU-2 is controlled through the fan inlet vanes. We would recommend removing the vanes, verifying the motor is compatible with a variable frequency drive (VFD), and installing a VFD to control the fan speed.



AHU-2 Supply Fan and Inlet Vane Actuator

Sometime after December 2005 (date code 0551), the hydraulic actuator on the 3-way valve had been replaced. The valve appears to be original.

AHU-2 3-way Control Valve Actuator

AHU-3 is a constant volume unit and serves the Pond Cove Gymnasium (Area "D"). At the time of review the unit was not operating.

The smoke detector is installed in the return duct without an access door to allow access to clean the intake tube.

We would recommend the installation of access doors at all duct smoke detectors and cleaning of all smoke detector inlet tubes.

View of AHU-3and the Respective Duct Smoke Detector

The inside of the mixed air/filter section is very dirty and the top filters have been pulled into the de-stratification device.

AHU-3 Mixed Air and Filter Section.

Pond Cove Elementary and Middle Schools

The actuator on the 3-way valve has been recently replaced. Based on the signs of leakage, it would appear the valve body may be original to the 1994 installation.

AHU-3 3-way Control Valve

A variable frequency drive is mounted to the side of the unit. The sequence of operation for the fan is unknown.

Pond Cove Elementary and Middle Schools

Fire dampers and access doors have been installed in the supply and return ducts at the wall between the gym and the Mechanical Room. The access doors may not be sufficient to exercise or reset the fire damper if necessary. Some of the wall penetrations have not been properly sealed. The inside of the supply and return ducts are very dirty.

We would recommend exercising of the fire dampers annually in accordance with NFPA providing additional access doors as necessary and sealing all wall penetrations and cleaning of all duct systems.

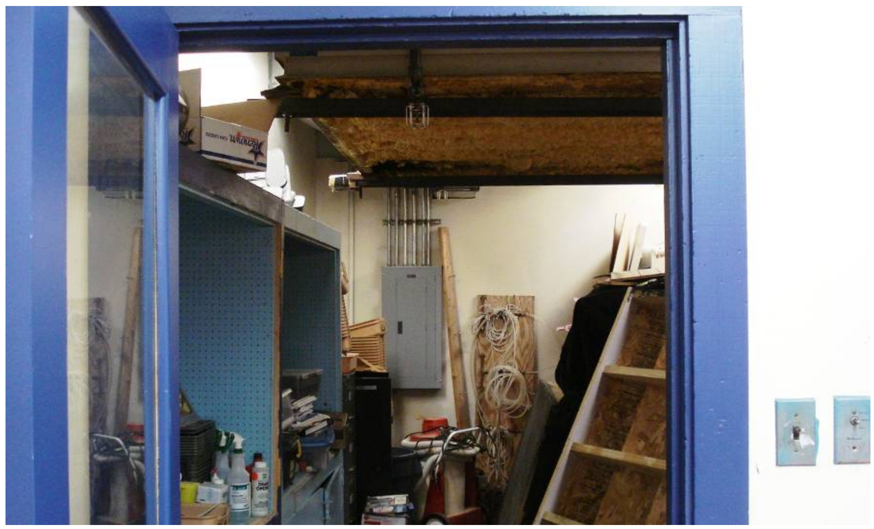
View of Access Door at Return Fire Damper and Dirty Duct

Sample of Unsealed Wall Penetrations

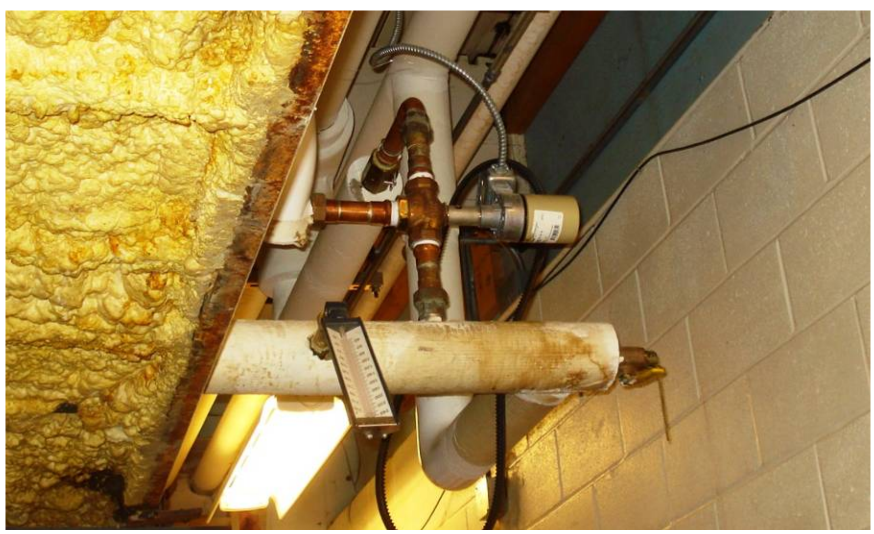
Pond Cove Elementary and Middle Schools

Heat Recovery Unit HRU-7 serves the "F" wing including the Band Room, Piano/Music Room, Technical and Applied Arts area and Teacher Workroom. At the time of review, the unit was turned off at the disconnect. The unit is rigidly supported directly from structure in the Storage Room F112. Spray foam has been applied to the bottom of the unit for an unknown reason. The 3-way valve hydraulic actuator is showing signs of leakage.

View of Underside of HRU-7



HRU-7 3-Way Control Valve and Hydraulic Actuator



Pond Cove Elementary and Middle Schools

It would appear access to the HRU-7 is very limited. The hinges on the filter door appear to have been dismantled to gain access to the filters likely due to the location of the threaded rod supporting the unit.

The DDC system components are located behind the Storage Room door and access is restricted by the shelving unit.

The unit-mounted electrical power disconnect and control panel are located in a very inaccessible location.

HRU-7 Filter Access Door

HRU-7 DDC system Components and Unit-mounted Disconnect and Control Panel

The ductwork running along the ceiling of the Shop Area is the HRU-7 outside air intake (through the further wall) and the unit exhaust (through the roof). The ductwork is un-insulated and there are no isolation dampers at the wall or ceiling. This is a tremendous heat loss.

We would recommend the installation of isolation motorized low-leak dampers at the wall and roof line and insulating the intake and exhaust duct.

HRU-7 Outside Air Intake and Exhaust Ductwork

Additional heating in the technical and Applied Arts Shop area is provided through two horizontal unit heaters controlled by a local thermostat. Operation of the unit heaters is unknown. The thermostat cover is off and electrical tape is wrapped around the thermostat.

We would recommend replacing the thermostat with a DDC system space sensor and adding control of the unit heaters to the DDC system if points are available.

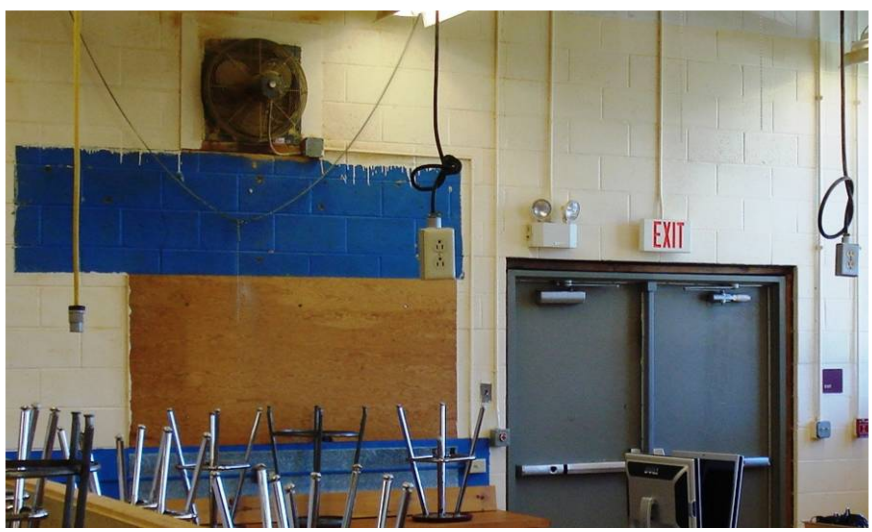
Unit Heater in the Shop Area

Pond Cove Elementary and Middle Schools

The wall-mounted exhaust fan at the back wall is controlled by the local wall switch near the door. The fan does not appear on the 1994 Addition and Renovations documents. Operation was confirmed. When the fan was turned off, the backdraft damper remained partially open after the fan stopped. After a few minutes it dropped closed.

The old dust collection system has been abandoned, the ductwork removed, and the wall opening blocked.

Wall-mounted Exhaust Fan



Abandoned Dust Collection System Wall Penetration and Switch

In the Teachers Workroom, a kitchen area was provided as part of the 1994 Addition and Renovations project without an exhaust hood or automatic fire suppression system above the stove.

We would recommend the installation of a hood and fire suppression system in accordance with current codes and the requirements of Fire Marshall and the Jurisdiction Having Authority.

Electrical or Mechanical Room Ventilation

The exhaust fan (EF-14) serving the Main Switchgear Electrical Room F103 responded to the call for cooling at the local thermostat. Cycling the thermostat caused the fan to respond properly. Daylight is visible through the backdraft damper.

Exhaust Fan in Main Switchgear Electrical Room F103

The IT Server and associated gear, is located on the old stage off the old gym. The Server is located in the Storage Room E170. An exhaust fan and a wall-mounted split air conditioning unit have been installed to ventilate and cool the Server Room. The exhaust fan responds to the local thermostat. The split unit responds to the remote packaged controller.

Server Gear, Piping and Electrical Panel in Storage Room E170

View of Exhaust Fan and Split AC Unit in Server Room E170

The exhaust fan (EF-17) serves the Mechanical Room C210 (near AHU-2), and, based on the contract documents, was to be interlocked with the motorized damper at the intake hood. The low-leak airfoil type damper is installed but, based on the wires hanging by the damper and the lack of screw holes in the duct, it appears the damper actuator was not installed. It is unknown whether the actuator was left off intentionally or not.

If proper ventilation of the space has been an issue, we would recommend installation of the damper actuator and proper interlock with the exhaust fan.

Intake Damper Associated with Exhaust Fan EF-17

Other Systems

HRU-6 3-way heating control valve is located under the unit in the Laundry or Sports Storage Room E126. The MPR-5413 hydraulic valve actuator is showing signs of hydraulic fluid leakage.

We would recommend replacement of the control valve actuator.

HRU-6 3-way Heating Control Valve

The horizontal portion of the drier vent duct, located in the janitor's closet E127 was installed as part of the 1994 addition and renovation project. The drier was installed by the school at a later date. The horizontal section is installed with screws at the joints. The duct near the drier appears to be assembled with duct tape; screws are unknown. Lint traps are not installed.

We would recommend reinstalling the duct with lint traps as required in accordance with current codes.

Drier Vent Duct n the Janitor's Closet.

1930s "G" Wing Ventilation Systems

The ventilation of the 1930s Building is provided from the roof-mounted heat recovery unit HRU-9 (rooftop unit shown above). The attic space is heated by two horizontal unit heaters located at each end of the attic. Operation of the unit heaters is unknown and the fins are mostly closed.

The supply and return from HRU-9 is ducted through out the building. The ventilation system appears to be well insulated but the piping and duct components do not appear to properly suspended.

Unit Heater Located In Attic Space of 1930s Building

Pond Cove Elementary and Middle Schools

Supply (far duct) and Return Ducts located in the Attic Space of the 1930s Building

Ducted Supply System with Reheat Coils

Note Exposed Ceiling Tiles

Pond Cove Elementary and Middle Schools

The heating control valves appear to be as installed during the 1994 Addition and Renovation project, nearing the end of their life expectancy, and may require replacement.

We would recommend a complete review and verification of proper operation of all reheat control valves.

Reheat Control Valve

Where the branch flex duct is located in the line of traffic, some of the insulation has been damaged and the thin inner liner is exposed. Many of the metal branch tees are not insulated.

Failed Insulation on Branch Flex Duct

Branch Tee is Not Insulated

Pond Cove Elementary and Middle Schools

In the ground level of the 1930s building, a kitchen area has been installed without an exhaust hood or fire suppression system above the stove.

We would recommend the installation of a hood and fire suppression system in accordance with current codes and the requirements of Fire Marshall and the Jurisdiction Having Authority. Another option may be to remove the stove.

Ventilation for the ground floor has been provided. Based on the large grille installed in a door, it would appear the ventilation unit may be located within the room. The room would be used as the return air plenum. At the time of review, we did not have access to the room.

View of Large Grille Installed in Door

Pond Cove Elementary and Middle Schools

Kitchen Ventilation Systems

Ventilation for the kitchen areas is provided through AHU-4 located above the cooler/freezer. At time of review, we did not access the unit.

View of Range Hood located at East End of Kitchen EF-1/SF-1

A fire suppression system has been provided and installed. It was reported the automatic gas shut-off valve is located above the ceiling.

Fire Suppression System and Gas Piping Behind Grilles

An exhaust hood has been provided for the dishwasher.

Dishwasher Exhaust Hood

Elementary School Cafetorium

Ventilation for the Cafetorium is provided from AHU-5 located in the Boiler Room. The supply is installed along the north wall (kitchen side) and supplies air to the full length of the Cafetorium, including the stage, and both sides of the moveable wall. The return is installed along the south wall (corridor side) but does not provide for return from the west end of the café when the moveable wall is closed.

We would recommend the return air system be revised to allow for return air from the west end of the café.

View of North Side of Cafetorium Wall showing Supply Outlets

Pond Cove Elementary and Middle Schools

View of South Side Wall

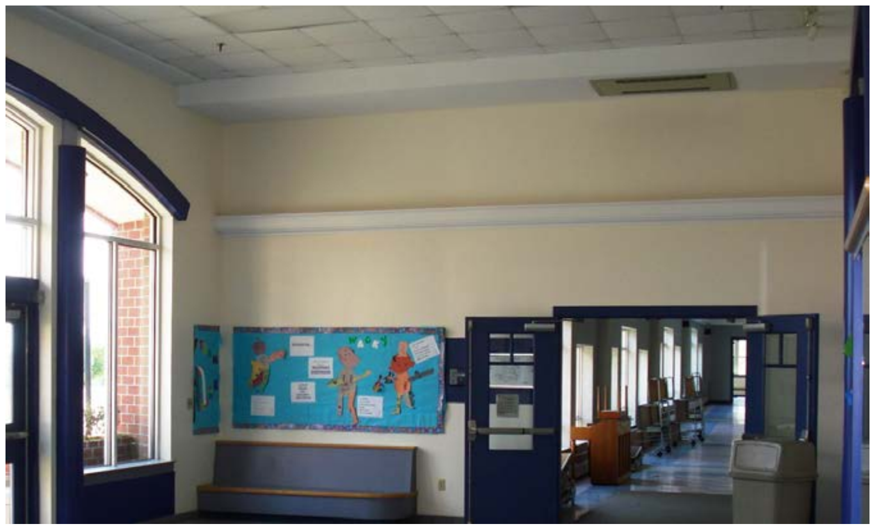
Pond Cove Gymnasium, Lobby and Corridor Heating and Ventilation

Heating and ventilation for the Pond Cove Gymnasium is provided through AHU-3 located in the adjacent mechanical room. The return to the unit is provided through the wall openings and relief is provided up through the roof.

Pond Cove Elementary and Middle Schools

Heating is provided in the Pond Cove Lobby area through the ceiling-mounted cabinet unit heaters. Heating in the adjacent Corridors is provided through the perimeter finned tube radiation.

Ventilation is not provided for the Lobby or adjacent Corridors.



Pond Cove Elementary and Middle Schools

Electrical Systems Evaluation

Primary Service and Service Transformer

Primary service is supplied by a radial 15kV underground primary service feed. Primary conductors originate at a CMP riser pole located on the Scott Dyer Road. The conductors travel to the Middle School pad mount transformer in PVC conduit where they are tapped to supply the Middle School and High School transformers. From the Middle School transformer, primary service conductors continue to the High School. See high school report for primary underground assessment

Primary Service Riser Pole and Meter at Scott Dyer Road

Pond Cove Elementary and Middle Schools

The Middle School pad mounted transformer is a 500kVA three phase transformer. Secondary service voltage is supplied at 277/480 volts. There is no peak demand data for this service as there is one primary meter for the High School and Middle / Pond Cove Elementary Schools; however, the 500kVA transformer appears undersized for the square footage of the building. 500,000VA ÷ 163,110 sq ft = 3.1VA/sq ft (typical design VA/sq ft ≈ 8VA/sq ft). As technology requirements increase it is likely that energy usage will increase also.

Primary Service Transformer

It is recommended that as building loads increase special attention be given to the primary service transformer and ultimately be replaced for a more appropriately sized unit.

Pond Cove Elementary and Middle Schools

Service Entrance and Distribution

Main service consists of secondary conductors from the exterior pad mount transformer feeding a 1600A 277/480V 3phase 4wire Siemens main switchboard located in the Area F Main Electrical Room. The main switchboard serves two distribution panels, a motor control center, and multiple lighting/power panelboards throughout the facility. There is one spare breaker and one space provided in the main switchboard for future expansion. There are multiple transformers located throughout the building to provide 120/208V power. Distribution equipment appears to be in good condition. Most equipment was upgraded in the 1994 renovation project.
Based on per square foot loads (see above) the main switchboard appears to be appropriately sized for this building. The switchboard has capacity for just over 6.5 watts per square foot.

Main Switchboard

Pond Cove Elementary and Middle Schools

Lighting and Power Panelboards

Lighting and power panelboards are located throughout the facility. Most panels located in classroom areas have additional space for breakers making future additions possible. There are few panels located where students have access.

There appears to be some older cloth covered and Romex wiring either in use or abandoned in place in Area G. This should be replaced or removed where possible.

Typical Lighting / Power Panelboard

Pond Cove Elementary and Middle Schools

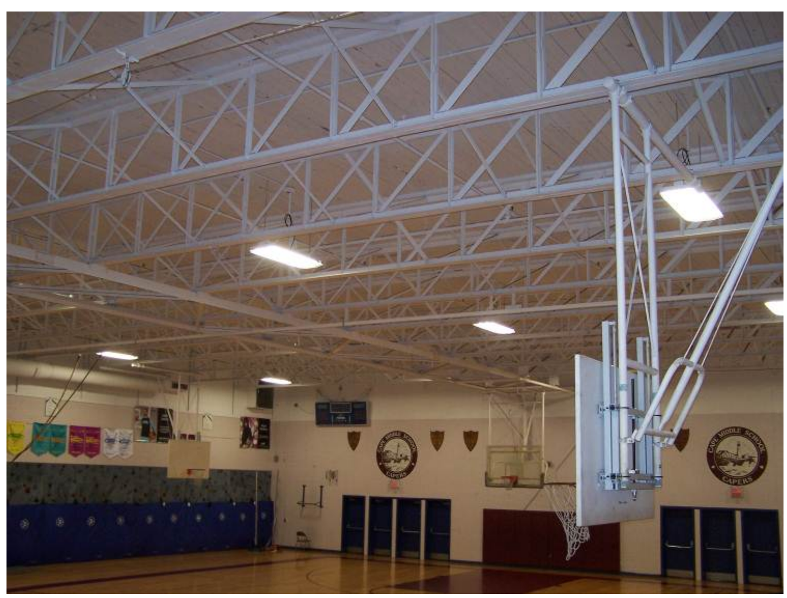
Lighting

Most classroom lighting is achieved with 2'x4' three and four lamp T8 recessed troffers. There are a variety of switching arrangements including one level, two level, and three level switching. Generally switched rows are parallel with the windows allowing the outer rows of lights to be switched off on a brighter day. Lighting levels appear to be acceptable.

Typical Classroom Lighting

Middle School Gym lights consist of four rows of four, 6-lamp T5 high bay fixtures. Fixtures are in good condition. Lighting levels are average.

Middle School Gym Lighting



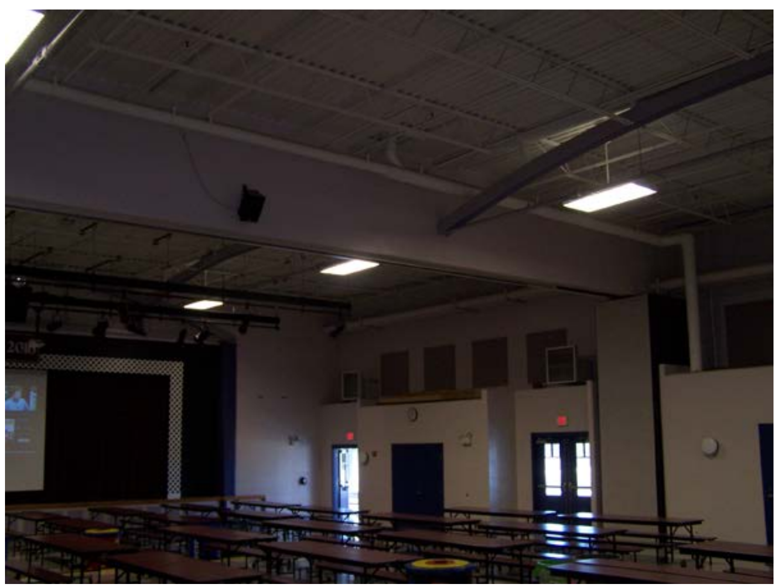
Pond Cove Elementary and Middle Schools

Pond Cove School Gym lights consist of two rows of three, 6-lamp T5 high bay fixtures. Fixtures are in good condition. Lighting levels are fair. Further investigation into the use of this space and its required lighting levels is recommended

Pond Cove School Gym Lighting

Combination of two rows of four, 6-lamp T5 high bay fixtures, and incandescent wall mounted fixtures. Lighting is in good condition. Lighting levels are low for a multi-use space. Further investigation into the use of this space and its required lighting levels is recommended

Cafetorium Lighting



Pond Cove Elementary and Middle Schools

Kitchen Lighting

4' surface wrap fluorescent fixtures with 4' T8 surface vapor-tight fluorescent fixtures in the wash area. Fixtures are in good condition. Lighting levels are good.

Library Lighting

2' x 2' 3-lamp recessed fixtures with 4' T8 strip fixtures in the skylight area. There are four levels of switching. Lighting levels are good.

Office Lighting

Generally office lighting is either 2 'x 2' or 2' x 4' T8 recessed fixtures. Switching is single level. Lighting levels are good.

Corridor Lighting

Corridors fixtures are either 2' x 2' or 2' x 4' T8 recessed fixtures on 10' centers. Lighting levels are good.

Lighting Controls

Current energy codes require multiple levels of switching and some form of automatic off function for lights in areas such as classrooms and offices. While most classrooms were observed to have at least 2 levels of switching the code required automatic functionality was not observed.

Emergency Lighting

Most emergency lights are surface wall mounted or ceiling recessed self-contained battery units with remote heads (EBUs). EBUs were generally in serviceable condition. Middle School Gym units were damaged and should be replaced. Generally emergency lighting coverage is good.

Exit signs observed are internally illuminated units with integral battery. Most signs are in good condition; however several areas including the Health/Tech Lab need supplemental exit signage to meet NFPA 101 requirements.

Typical Emergency Lighting and Exit Signs

Pond Cove Elementary and Middle Schools

Classroom Power Outlets

There are wall mounted grounded outlets located throughout the building. Most classrooms have adequate power outlet coverage. Many classrooms include two channel surface raceway systems.

Typical surface raceway system

Fire Alarm System

Fire alarm system is a Siemens FireFinder XLS. The system was recently upgraded from an older Notifier installed during the 1994 renovation. The system is in good condition and no trouble was reported. In the event of an alarm, the system reports directly to Portland monitoring / dispatch facility. Several areas need additional notification appliances including the classrooms on the second floor of Area G.

Fire Alarm System

Pond Cove Elementary and Middle Schools

Typical Pull Station and notification appliance

Security Surveillance System

The School is served by a video surveillance system with cameras at various locations throughout the building, mainly at building entrances. The system is an Integral Technologies system with a mixture of legacy and upgraded video platforms. The main server is based in the High School but also serves the Middle School, Pond Cove Elementary School, Police Department and Fire Department. Advance Technology is responsible for maintaining the system, and reports multiple failures of the system, with frequent database corruption and loss of camera function.

Typical Camera

***Priority Scale:** #1 = 1 year
#2 = 2 years
#3 = 5 years
#4 = Future

Building #2
Cape Elizabeth Pond Cove Elementary / Middle Schools - Architectural

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost	* Priority
A2.1	Flooring Systems	VCT floors, Ceramic tile at toilet rooms and showers, Epoxy resin floor at kitchen, wood flooring at gymnasium	VCT flooring are well maintained and in good shape. The epoxy resin flooring in the kitchen and serving has been patched due to previous cracking and has cracked in same location.	Replace kitchen epoxy flooring with new quarry tile system. Patch and maintain all VCT floors	$50,000.00	2
A2.2	Flooring Systems	Gymnasium Flooring is a maple direct wood 2 1/2" wide system	The wood flooring has been re-sanded as part of the refinishing process such that the thickness of the floor has been greatly reduced. Floor cannot be sanded for any future refinishing.	Replace gymnasium wood floor with new floating din rated maple wood floor.	$145,000.00	3
A2.3	Student Toilet Rooms	Toilet fixtures have hands free type devices for energy efficiency relative to water use. Toilet stalls at water closets are plastic type. Walls are masonry with exception of area A, B Elementary School	Masonry walls, fixtures and flooring in very good shape. Student Toilet Rooms in Area' A,B elementary school should be rebuilt. Some toilet spaces have direct views from corridor.	Renovate 2 student toilet for accessibility, finish upgrades. Add privacy screen In toilet spaces with direct views	$80,000.00	3|4
A2.4	Elevator	3 stop Elevator in middle school wing - 2 stop elevator in elementary school wing	Elevator are ADA Code Compliant and located for accessibility. Control panel and audible signals should be updated to current codes.	Update both elevator cars with current audible signals and panels	$20,000.00	1
A2.5	West End Stairwell 1934 Building	The survey noted this stairwell as non-compliant with the Life Safety Code for exiting. Doors missing on door openings. Signage incorrect and handrails not code compliant	Stairwell were not renovated to current code requirements at the time of construction. Proper exit to the exterior needs to be provided and all components relative to this stair should be corrected.	Renovate the stairwell and provide a code compliant means of egress to the exterior. Remove obstructions in stairs, install new doors and handrails	$175,000.00	1
A2.6	Cafeteria - Split Level Floor	Floor split into 3 levels - ADA Access, Life Safety egress, Serving line at 2 levels, dishwashing at one level. Corridor Ramp from upper level to mid level not sloped correctly with doors.	The space has a number of Code issues related to the space and the efficiency of the current layout brings into question the manner and efficiency of the staff to serve lunch.	Renovate space to bring up to code - 5,500 sf Provide study to design solution to all code related issues and with kitchen staff.	$225,000.00	1
				Study -	$25,000.00	
A2.7	Boys and Girls Locker Rooms	Shower areas have ADA accessibility issue. Shower stalls are old - finishes are worn. Wood roof decking exposed - high moisture space. Lockers are in good shape - no ADA Lockers	Both locker spaces should be completely renovated. Bring shower areas up to code and more durable finishes- relay out spaces for more efficiency and privacy. Improve ventilation, exhaust	Renovate Boys and Girls Locker Rooms	$125,000.00	2
A2.8	1934 Building	Cold roll channel ceiling support system, suspended ceiling below hung from grid, lights set on grid, ducts set onto grid, structure is truss girder with purlins and wood deck. End walls have been structurally upgraded - end gable walls on exterior shows signs of repair.	The ceiling system as a whole is non-compliant on a number IBC related code issues. The insulation provides no value for energy, the cold roll grid is supported by enough cables, the lights and ducts sit on this grid and the attic space is heated with a unit heater. Any work to the structure of this roof will require a full study including the added wall bracing which is highly suspect.	Renovate ceiling cavity to include new insulated drywall ceiling at one elevation with suspended ceiling below that. Move all ductwork down to below the insulated envelope. Change sprinkler to dry system and make space a cold attic.	$175,000.00	2

Pond Cove Elementary / Middle School - Architectural

A2.9	Exterior Walls 1934 Building	Composite Brick walls, replacement windows in existing wood frames, exposed concrete sills and structure painted, wood cornices and asphalt shingled roof. Painted front wood columns and stucco façade.	Brick walls are holding up - major repointing is in near future for those walls. Exposed concrete needs repair and repainting, wood cornices need to be replaced. Existing wood window frames if not deteriorated beyond point of use should be metal pan covered.	Renovate exterior painted concrete, cornices and window frame system.	$110,000.00	2
A2.10	Exterior Walls 1994 Additions	Econo Brick Veneer with precast concrete bands, sills and headers.	The sill at all the new windows had a fabric flashing installed thru a brick course. The water entrapment has broken most of the mortar joints in the brick and all the mortar joints at the sill have broken and fallen off. A number of openings did not have weep holes installed at the head to relieve water.	All window sills should be rebuilt and properly flashed - Reuse and reset precast concrete sills with new anchors and backer rod and sealant all butt joints. Cut in new weep holes at all locations where none occur.	$200,000.00	2
A2.11	Exterior Walls Primary School 1948 & 1955	Composite brick and concrete foundation. Wood window wall removed and new stud infill and econo brick added. Some walls brick was installed external of foundation face.	Brick mortar is in a very deteriorated state. UV louvers are no longer in use and show be removed. Potential brick wall above sitting on existing composite wall with no flashing.	All window sills should be rebuilt and properly flashed - Reuse and reset precast concrete sills with new anchors and backer rod and sealant at all butt joints. Cut in new weep holes at all locations where none occur.	$200,000.00	2
A2.12	Exterior Sealant System	Exterior Sealant system at windows, masonry control joints, door and louver openings.	Sealant joints have failed or are badly discolored at a number of locations. Control joints in masonry , grouted joints and perimeter sealant systems at windows are of a poor quality installation. Some locations have failed and some others are too large and shows signs of failure in the near future.	Remove and replace all sealant systems on the entire complex.	$70,000.00	2
A2.13	Window Frame Pan System and Cornice	Wood frames with aluminum replacement window insert. Wood cornice with copper cap flashing.	Exposed woof frames at windows in 1934 wings paint is peeling and surface is showing signs of rotting. Wood cornice has been repainted numerous times, paint is peeling and wood is badly deteriorated.	Install metal pan system around new replacement windows and install new pressure treated framing and metal cornice - profile to match existing.	$90,000.00	2
A2.14	Lower Existing Brick Face - 1948 & 1955 Primary wings	The 1994 renovation project left the existing brick face below the wood window-wall system.	The brick joints are cracked and chipped, mortar is falling out of the joints. Existing UV louver not being used - dented and rusted. Exposed metal column flange rusted.	Repoint and replace lower brick face - re-paint or cover exposed metal column flange - remove UV louver and brick up opening. Correct flashing issue at level where brick type changes.	$40,000.00	2
A2.15	Roof System Replacement #1	Adhered EPDM roof system over 1955 Primary Wing, 1962 Lunt Building, 1962 Classroom Wing, 1962 Gymnasium / Locker Rooms	Adhered EPDM roofs installed in 1988 +/-. Entire sheet patching and seam flashing rework has been done to roofs.	Replace EPDM roof System with new 060 EPDM membrane and tapered board roofing insulation. Structural study of existing roof structure - Total - 52,270 SF	$925,000.00	1|2
A2.16	Roof System Replacement #2	Ballasted Roof system over all 1994 Additions - Cafeteria, Classrooms, Elementary Gym, Library, Science	Ballasted roof membrane - where stone is pulled back - membrane is in tough shape. Stone is piled up causing extensive load issues in some locations. Roof slope is 1/8" ft most locations.	Replace Ballasted roof system with new tapered board roof insulation and .060 EPDM adhered roofing membrane. Structural Study of existing roof frame. Total of 45,530 SF	$650,000.00	2

Pond Cove Elementary / Middle School - Architectural

A2.17	Roof System Replacement #3	Adhered EPDM roof system over 1948 Primary Wing, Additions to 1934 Original Building, Allied Arts Wing	Adhered EPDM roofs installed in 1988 +/-. Entire sheet patching and seam flashing rework has been done to roofs.	Replace EPDM roof System with new 060 EPDM membrane and tapered board roofing insulation. Structural study of existing roof structure. Total- 18,860 SF	$325,000.00	2
A2.18	Roof System Replacement #4	Asphalt shingled roof over wood decking at 1934 Original Building	Asphalt Shingles have been replaced in recent years. Relatively good shape. EPDM flashing at parapets not compatible with this type of roof system. Product is not self sealing for nail penetration.	Replace asphalt shingled roof with new Architectural 3 tab heavy duty shingles - waterproof membrane entire surface. Structural study of existing steel girders and brace frames. Total of 5,650 SF	$150,000.00	3

Total Potential CIP Costs **$3,780,000.00**

Building #2
Cape Elizabeth Pond Cove Elementary / Middle Schools - Mechanical

***Priority Scale:** #1 = 1 year
#2 = 2 years
#3 = 5 years
#4 = Future

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost	* Priority
M2.1	Boiler Plant	Boiler room does not meet code. Boilers are 18 years old. Air handling units are located in the same room as the boilers. Boiler room is used as storage for combustible and flammable materials.	Based on fuel consumption and heat loss calculations, the boiler plant offers nearly 100% redundancy.	Upgrade boilers and boiler plant. Install an engineered combustion air system. Relocate the air handlers	$650,000.00	2
M2.2	Heating Hot Water Pumps	The constant volume heating pumps are original to the 1994 Renovation project.	The pumps appear to be operational and are showing signs of their age.	Install new energy efficient motors and variable frequency drives	$25,000.00	4
M2.3	Rooftop Heat Recovery Units HRU-1-6, 8,9	The rooftop heat recovery units (8) were installed during the 1994 project. At the time of review, most of the units were not operating likely due to summer scheduling.	The rooftop units are 18 years old, nearing their life expectancy and are showing signs of their age. It appears filter changes and repairs have been done as needed.	Replace the rooftop units. Replacement of the units may require structural, architectural, mechanical and electrical analysis and may require upgrades.	$790,000.00	3
M2.4	Indoor Heat Recovery Unit HRU-7	The indoor heat recovery unit serving the Applied Tech wing was installed during the 1994 project. At the time of review, the unit was not operating likely due to summer scheduling.	The unit is 18 years old, nearing the end of their life expectancy and are showing signs of their age. It appears filter changes and repairs have been done as needed.	Replace the rooftop units over a 5 year period. Replacement of the units may require structural, architectural, mechanical and electrical analysis and may require upgrades.	$75,000.00	3
M2.5	Rooftop Air Handling Units AHU-1	The rooftop air handling unit serves the Elementary School Media Center and was installed during the 1994 project. At the time of review, the unit was not operating likely due to summer scheduling.	The rooftop unit is 18 years old, nearing the end of its life expectancy and is showing signs of its age. It appears repairs have been done as needed.	Option 1: Remove the fan inlet vanes, replace the fan motors with energy efficient models, install variable frequency drives (VFD). Option 2: Replace the unit and install VFD's. Replacement of the unit may require structural, architectural, mechanical and electrical analysis and may require upgrades. ($125,000)	$125,000.00	3
M2.6	Rooftop Air Handling Unit AHU-4	The rooftop air handling unit serves the Kitchen Areas and was installed during the 1994 project. At the time of review, the unit was not operating likely due to summer scheduling.	The rooftop unit is 18 years old, nearing the end of its life expectancy and is showing signs of its age. It appears repairs have been done as needed.	Replace the unit. Replacement of the unit may require structural, architectural, mechanical and electrical analysis and may require upgrades.	$85,000.00	3

Pond Cove Elementary / Middle School - Mechanical

M2.7	Duct Cleaning of Ventilation System	With the exception of the Kindergarten Wing ventilation system, the ventilation systems in the rest of the school have been in use since 1994.	The overall condition of the inside of the ducts is unknown and may require extensive cleaning	Clean the supply and return duct systems of 16 ventilation systems	$120,000.00	1|2
M2.8	Rooftop Exhaust Systems	The rooftop exhaust fans were installed during the 1994 project. At the time of review, most of the units were not operating likely due to summer scheduling.	With the exception of upgrades and repairs that have been done to fans, all fans are 18 years old and are nearing the end of their life expectancy.	Repair or replace exhaust fans as needed. (Replacement shown)	$48,000.00	3

Total Potential CIP Costs **$1,918,000.00**

Building #2
Cape Elizabeth Pond Cove Elementary / Middle Schools - Electrical and Technology Systems

***Priority Scale:** #1 = 1 year
#2 = 2 years
#3 = 5 years
#4 = Future

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost	* Priority
E2.1	Primary Service	Primary underground from Scott Dyer Rd. (see High School Assessment). Pad mount transformer is 500kVA.	500kVA transformer is undersized for a building of this size.	Replace existing 500kVA pad mount transformer with new 1000kVA.	$35,000.00	1
E2.2	Service entrance and Distribution	1600A 277/480V 3phase 4 wire main switchboard serves multiple distribution panels throughout building and a motor control center in the mechanical room.	Main switchboard appears adequately sized for building load.	Maintain switchboard and distribution boards per manufacturer's recommendations. Provide infrared scan of existing system to identify trouble spots.	$10,000.00	1
E2.3	Lighting	Most lights are T8 fluorescent fixtures with electronic ballasts. Switching arrangements are inconsistent from room to room, but most classrooms have at least two levels of lighting.	Most fixtures are in good condition. No automatic lighting controls are in use for interior fixtures. Several areas of concern exist for low lighting levels including Cafetorium, Pond Cove Gym.	Lighting levels and switching arrangements should be evaluated and fixture layouts should be adjusted accordingly. Automatic controls should be added to provide manual ON and automatic OFF functions.	$100,000.00	4
E2.4	Emergency Lighting	Emergency lighting is achieved with Self-Contained Emergency Battery Units with remote heads. Exit signs are internally illuminated. Emergency battery units and exit signs appear to be in serviceable condition.	Some areas need additional exit signs.	Evaluate coverage areas and provide additional emergency lighting and exit signs to meet NFPA 101 requirements.	$10,000.00	1
E2.5	Classroom Power Outlets	The building is served by wall mounted grounded outlets and some areas have two channel surface raceway / outlet systems.	Outlet coverage is good in most areas.	Evaluate all spaces in detail to determine exactly where additional receptacles are required.	$15,000.00	3
E2.6	Fire Alarm System	System was recently upgraded to Siemens FireFinder XLS. Notification appliances and initiating devices throughout the building.	System is in good condition. Some areas need additional notification appliance coverage to meet NFPA 101. Annual inspections are performed by Eastern Fire Protection Co.	Perform study of and provide additional notification appliance coverage in all areas to meet NFPA 101.	$40,000.00	2

Total Potential CIP Costs **$210,000.00**

Building #2 - Cape Elizabeth Pond Cove Elementary / Middle Schools - Architectural - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
A20.1	Interior - Suspended Ceilings	Suspended ceilings are in reasonably good shape. Some panels throughout the facility have water stains and are damaged from maintenance access to space above	Suspended ceiling for the most part is comprised of 2 x 2 panels. Change out stained and damage panel on a yearly basis.	Replace existing suspended ceiling panels with new panels. This will become more difficult as panels get dirty and aged. Surface will not match - older panels will become darker. Recommend consider changing out entire rooms at same time.	$0.00
A20.2	Interior Walls	Most of the walls are masonry walls in corridors, stairs and locker rooms and high abuse spaces. Plaster surface in the 1934 wing.	Paint surface on walls in some locations especially corridor areas needs to be repainted.	Repaint walls as part of the schools yearly summer maintenance program	$0.00
A20.3	Door Hardware	Door Hardware for is ADA compliant lever handled units. Panic devices are on rated assemblies, cross corridor, exit assemblies and major assembly spaces. System is keyed	Door hardware is current with codes	Maintain hardware and replace units as needed	$0.00
A20.4	Lockers	Metal student and Athletic lockers were installed with 1994 project - Double Tier 12" x 72"	Lockers are in good condition. No damaged units were observed.	Recommend adding ADA designated lockers units as required.	$0.00
A20.5	Gymnasium Bleachers	Comfort Curve Plastic Bleachers	Bleachers will give school use for at least 25 years	Maintain bleachers as part of a yearly inspection program.	$0.00
A20.6	Kitchen Floor	Epoxy resin floor with grit surface installed directly onto concrete slab	The floor will continue to deteriorate in the high abuse type space. Floor has been patched soon after construction, it has cracked in same location over joint in concrete slab. Peeling and worn in locations.	Replace epoxy resin floor with new more durable floor system. Recommend possible replacement with solution to cafeteria / serving areas.	$0.00
A20.7	Exterior Walls Lunt Building 1962	Composite brick and concrete foundation. Wood window wall removed and new stud infill and econo brick added. Some walls brick was installed external of foundation face.	New econo brick veneer system was installed on support angle and face mounted to the existing foundation. Flashing is evident on edge - support angle is extended out farther than the brick on the ends	The installation of this support angle this close to the ground presents a high potential of rusting from water, snow etc. The bolted connection to the existing foundation and the location of the flashing at the angle height will definitely impact the life of the angle and connection. Monitor the condition on a yearly basis and when condition warrants a repair plan should be enacted.	$0.00
A20.8	Exterior Doors and Frames	The exterior doors and frame system are at various levels of wear. Some openings need painting, other have had doors replaced, frames have remained in most locations.	The exterior doors and frame system are at various levels of wear. Some openings need painting, other have had doors replaced, frames are generally rusting out. Recommend replace entire door and frame system at openings as needed and budget allows.	Recommend replace entire door and frame system at openings as needed and budget allows.	$0.00

Total Potential CIP Costs **$0.00**

Building #2 - Cape Elizabeth Pond Cove Elementary / Middle Schools - Mechanical - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
M20.1	Boiler Room Unit Heaters	The hot water coils of the unit heaters appear to be blocked or plugged.	Heat transfer is substantially reduced with blocked coils.	Clean the coils of the unit heaters	$200.00
M20.2	Domestic Hot Water Heater	The domestic heater installed during the 1994 project appears to be abandoned in place.		Removed the abandoned domestic hot water heater.	$500.00
M20.3	Fuel Oil Pump Set in Storage Room	The operation of the pump set is unknown. At the time of review, the left pump was valve off	The pump set is located in the Storage Room. Fuel oil pump set is showing signs of leakage and does not meet current code	Replace the pump set in accordance with current codes	$15,000.00
M20.4	Indoor Air handling Units AHU-2,3	The indoor air handling units were installed during the 1994 project. At the time of review, most of the units were not operating likely due to summer scheduling.	These indoor units are 18 years old, nearing their life expectancy and appear to be in condition for their age It appears regular maintenance has been performed as needed.	Clean the units and associated duct systems	$2,400.00
M20.5	Wall Exhaust Fan in Technical Allied Arts Shop	The fan is installed through the wall with a backdraft damper.	At the time of review, the fan was operational. Use of the fan is unknown. The damper does not function properly and is a source of heat loss	Remove the fan if it is not being used. Repair exterior CMU wall as needed.	$2,500.00
M20.6	Dust Collection System in Allied Arts Shop	The duct collection system is o longer being used.	The outdoor unit has been electrically disconnected and abandoned in place. The duct connection through the wall has been poorly plugged.	Remove the dust collection system and electrical connections. Repair exterior CMU wall as needed.	$500.00
M20.7	Teachers Work Room Range Hood and Fire Suppression	There is no exhaust hood or fire suppression system installed at the electric range		Install exhaust hood and fire suppression system in accordance with codes.	$2,500.00

Total Potential CIP Costs **$23,600.00**

Building #2 - Cape Elizabeth Pond Cove Elementary / Middle Schools - Electrical - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
E20.1	Security Surveillance System	Older Integral Technologies system. Mixture of legacy and upgraded video platforms.	The camera system has encountered multiple camera failures and data corruption.	Install new surveillance system cameras and cabling as part of an overall security / door lockdown system. See architectural.	$0.00

Total Potential CIP Costs **$0.00**

Cape Elizabeth Central Fire Station

Building Description

Exterior - Interior

Was constructed as the Public Works Building for the Town
Date of construction – no records found
Addition/Renovated in 2001 for Central Fire Department/Rescue use
Truck Garage – long span steel joist on bearing masonry walls
Remainder of existing and new addition – steel frame with steel stud infill
Regular block with painted finish on high truck garage
Pre-colored 4" CMU veneer on remainder of the building
Mezzanine – steel joist and concrete slab on masonry bearing walls
EIFS band around top of Garage
Fully adhered EPDM roof installed in 2001
Building is fully sprinklered
Steel stud interior partitions with HM frames and wood doors
VCT floors, suspended acoustical tile ceilings

Mechanical

Heating hot water generation – one oil-fired boiler
Heating hot water circulation – seven individual zone circulating pumps
Domestic hot water generation – boiler tankless coil
Controls – Invensys or Schneider Electric DDC, local electric thermostats
Offices – ventilation and AC unit, split air conditioning, baseboard radiation
Training Room – rooftop packaged gas-fired AC unit, baseboard radiation
Kitchen – hood exhaust
IT Room – split air conditioning, exhaust
Apparatus Bay – infrared heaters, exhaust fans, gas-fire make-up air unit
Bedrooms – fresh air, baseboard radiation

Cape Elizabeth Central Fire Station

Electrical	Main Distribution Panel – 600A, 120/208V 3-phase, 4-wire Standby Generator – 230kW-diesel with day tank - shared with Police Department Emergency Lighting – Self-contained battery units. All lights on standby generator. Fire Alarm System – Notifier DR-500 Intrusion System – none Security Surveillance System – Minimal number of cameras connected to High School system Voice/Phone/Intercom/Paging – modified VOIP

Cape Elizabeth Central Fire Station

Architectural Systems Evaluation

Interior Systems Descriptions

Central Fire Station

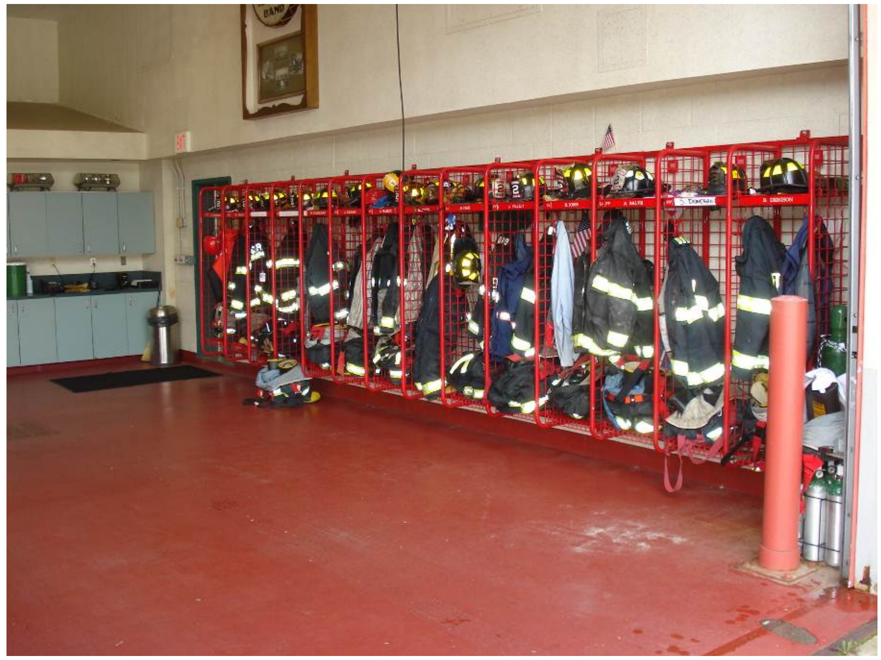
As part of the 2001 construction project the interior partitions, flooring and suspended ceilings were installed to match previously installed systems in the office/reception areas. All the finishes within the office area are in good shape and should service the town for a number of years with a good maintenance program. Walls should be repainted on a regular basis, flooring cleaned and waxed and ceilings replaced when deemed dirty and sagging.

Squad Room

Meeting Room

Cape Elizabeth Central Fire Station

Turn Out Lockers



Exterior Systems Evaluation

Central Fire Station

The exterior wall system is a combination of pre-colored concrete masonry units, EIFS on steel studs and a durable paint system on regular block. The building was surveyed the day after a rain event. The pre-colored cmu veneer system had a surface wetness common with this type of masonry unit. Even though the system is cavity back with the proper flashing and drainage the presence of the moisture remaining in the block will be problematic over a very short term and will lead to a premature failure of the block system.

Front Entrance

The front entrance shows the block surface with a lot of moisture permeating the block from inside. These types of masonry units should be specified with a Dry Block ingredient so as to not allow moisture to permeate into the cell of the block through a rain event. The moisture is being drawn back through the block surface and joints causing this wet appearance. The moisture is also being drawn through the mortar joints and has caused an efflorescence to all sides of the block veneer. The white blotchy surface is a sign that the moisture being drawn from inside the block through the mortar is allowing the alkalines within the mortar to bleed out. This chemical reaction will lead to premature cracking and spalling of the mortar joints.

Cape Elizabeth Central Fire Station

Wet Masonry Surface

Wet Masonry Surface

Cape Elizabeth Central Fire Station

Rear Wall – Moisture in Wall Has Discolored Pre-Colored Masonry Units

Rear Wall - Efflorescence

Exterior EIFS Panel

The EIFS panels on the office and meeting room areas are showing mold and mildew on the surface and the bottom edge is showing that parts of the finish has chipped off due to moisture.

Recommend cleaning of these panels with a strong bleach component building wash product to remove the mold and maintain the surface finish.

Mold and Mildew on Panel Surface

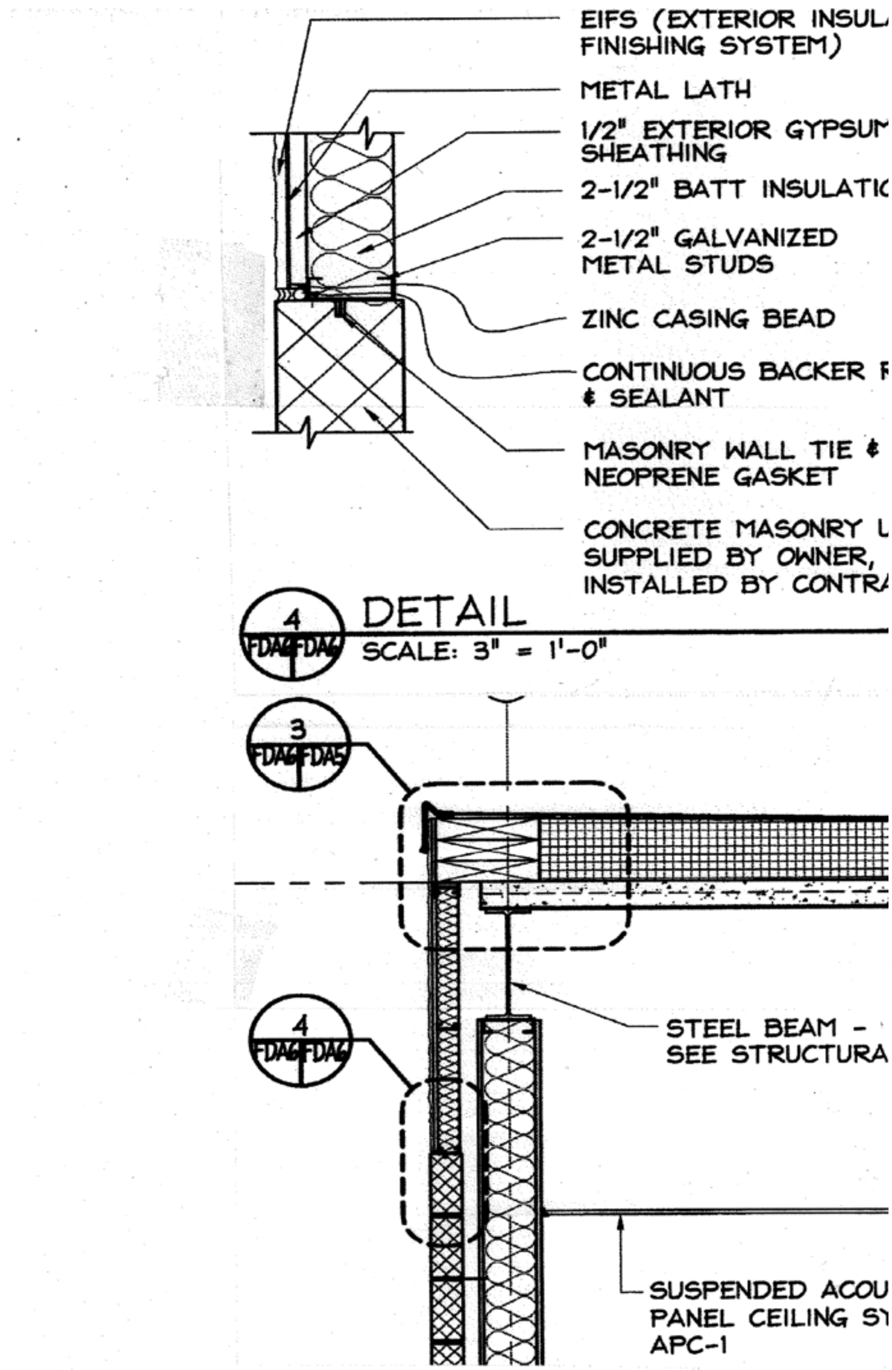
Exterior EIFS Panel

The detail for the exterior panel, per the construction documents, is a very poor installation method. The detail shows a steel stud sitting directly on top of the block veneer and attached directly to the wood blocking at the roof line. The detail is showing a caulk joint between the panel and the top of the block. At a number of locations no caulking was installed which provides a location for water entry.

Cape Elizabeth Central Fire Station

The detail of this installation should be checked to verify if indeed it was constructed in this manner. The lack of sheathing and moisture protection to the roof line from inside the cavity will cause long term issues with steel and stud connection as well as a non-insulated barrier to the inside.

Fire Station – Top of Wall



Cape Elizabeth Central Fire Station

Exterior Wall Control Joints

The new pre-colored block veneer has a number of cracks in the mortar joints due to contracting and expansion of the veneer. Because of the earlier issue described relative to the amount of moisture that the block is retaining this is more than likely the cause of the numerous joint cracks found around the building. These types of systems will expand and contract more due to moisture and temperature changes and the proper location of control joints is key to maintaining the wall appearance and not lead to water entry issues.

Control Joint Failed

Corner Joint Failed

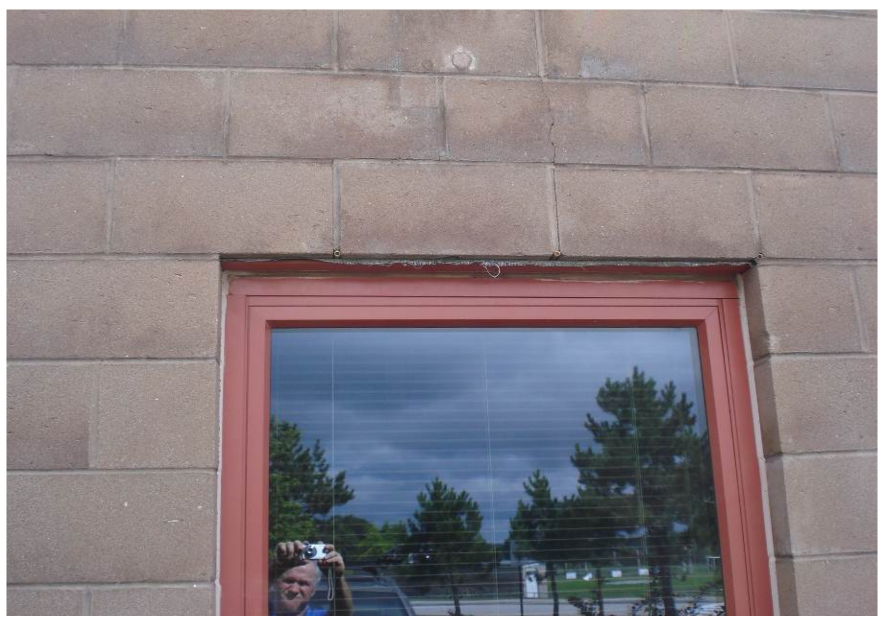
Cape Elizabeth Central Fire Station

This Stepped Cracking Occurs at All Windows and Both Sides

Stepped Cracked Joint

Crack Extends to Bottom of EIFS Panel Above

Window Head – Crack Through Joints and Block



Cape Elizabeth Central Fire Station

Crack in Existing Block and Foundation

Control Joint Failure

Cape Elizabeth Central Fire Station

Exterior Wall Crack Currently Being Repaired

Cracked Wall Being Repaired and Sealed

Sill at Overhead Door to Garage Bay

The concrete sill at one of the overhead doors to the garage bay is showing an area that has completely cracked and chipped off exposing the reinforcing bars to the weather. One very noticeable issue with this broken area is that the rebar within the concrete sill has been placed too close to the exterior surface. The metal angle edge is partially broken for an unknown reason. The detail, per the construction drawings, shows a thickened reinforced slab edge sitting on the foundation wall. The reinforcing from the foundation wall is dowel into the slab and it is not recommended to leave this rebar exposed to weather where, long term, this could lead to a failure of the foundation.

Cracked and Chipped Sill at Overhead Door

Cape Elizabeth Central Fire Station

Roof System Evaluation

Central Fire Station

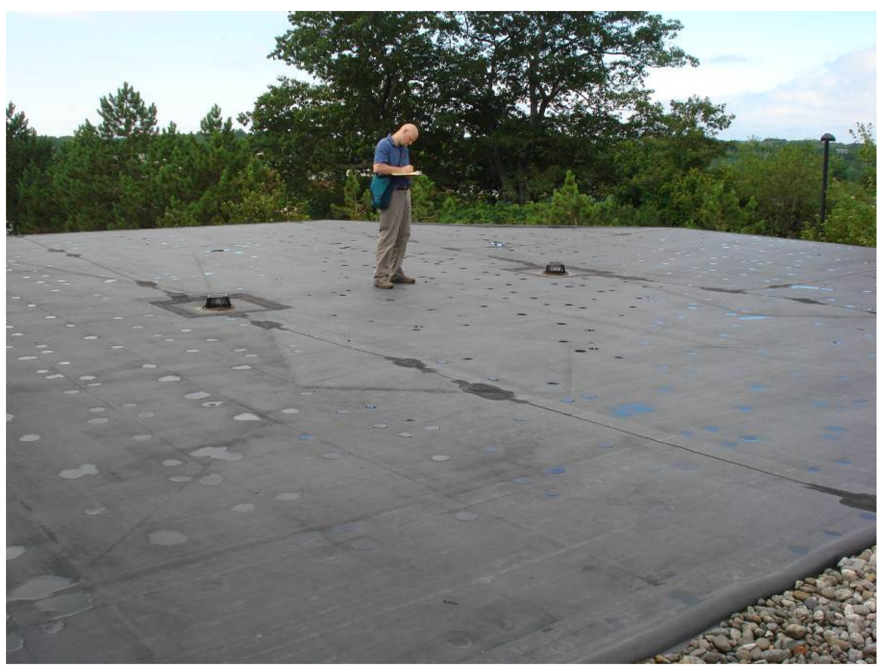
The addition/renovation project of 2004 did not replace the existing roof system on the garage bays and the existing office area. The new addition that was added to the back of the original building was constructed with a concrete roof deck and ballasted stone EPDM roof membrane.

No record was found as to when the fully adhered membrane roofing was installed over the garage and office areas. These roof membranes were installed with a lap sealant system as evident in the pictures. There is also a number of patch / repairs that have been done to the seams. These roofs also have a mechanically fastened insulation board and fully adhered membrane fastened to the board. The high garage roof has a few roof drains off to one side and a couple of drainage slots created into the roof insulation for drainage as part of an overflow issue.

The main concern with the garage roof is the amount of ponding on the roof and the little or no slope to drainage locations. Since no record was found as to its replacement it is difficult to put a time period on the life of the roof. It showed no significant pitting due to UV and the seams on the low roof were in good condition. The ponding on the upper roof will be problematic to the overlap seams and will cause maintenance issues on a continuous basis over a period of time.

At the time of replacement we would recommend additional roof drains and a code compliant tapered board system be installed. Unknown if this roof is part of the town's yearly inspection and repair program.

Low Roof – Over Front Office – Ballasted Roof in Foreground



Cape Elizabeth Central Fire Station

High Garage Roof

Ponding on Roof – Drain in Background

High Garage Roof

Roof Drainage Cut Into Insulation with Ponding Nearby

Cape Elizabeth Central Fire Station

High Garage Roof

Ponding Over Large Expanse of Roof

Cape Elizabeth Central Fire Station

Mechanical Systems Evaluation

Boiler Room

The heating hot water is generated from a propane gas-fired H.B. Smith boiler located in the boiler room. The boiler room is centrally located within the building. The boiler was upgraded as part of the 2002 renovation and addition project.

According to the contract documents, the existing HB Smith model BB14-A-W-4 boiler was to remain and the original oil-fired burner was replaced with the Riello model 40-P200L burner shown in photos below. According to documents, the boiler net heat output was 145 MBH. It would appear the boiler may be interlocked with the Direct Digital Control (DDC) system; a relay appears to be interlocked with the burner service switch and a temperature sensor is installed in the domestic hot water coil.

Boiler room ventilation and burner combustion air is provided through the roof-mounted supply fan SF-2. At the time of review, the fan was operating with the associated damper open. The fan was installed prior to the 2000 addition and renovation project. The actual airflow of the fan is unknown.

We would recommend a more thorough review of the combustion air system to verify it meets current code requirements.

Boiler Plant

Boiler

Cape Elizabeth Central Fire Station

The Ampco prefabricated double-wall chimney appears to be in good condition. The section of the chimney above the roof was supported off the upper roof flashing and is loose.

We would recommend the chimney be properly secured as needed.

Chimney

Heating hot water is circulated through the building by individual zone constant volume circulator pumps located in the boiler room. The pumps shown below right were existing at the time of the 2002 addition and renovations project and are controlled from the local electric (non-DDC) zone thermostats. The pumps shown below left (Taco 005) were added as part of the 2002 addition and are controlled through the DDC system.

Heating Hot Water Zone Pumps

Left Photo Shows Pumps Added During the 2004 Renovations Project

Right Photo Shows Original Pumps That Remained During the Renovations Project

Cape Elizabeth Central Fire Station

Domestic hot water is generated through the tankless coil in the boiler and respective hot water mixing valve.

Domestic Hot Water Tankless Coil

The Boiler Room Invensys LON-based Direct Digital Control (DDC) panel is stand-alone and does not communicate with other DDC system components.

Direct Digital Control System and Newer Zone Pump Relays

Cape Elizabeth Central Fire Station

Liquid Propane is stored in four tanks located across the back rear parking lot. The enclosure is not secured. The gas regulator and associated pipe is free standing in the middle of the tanks.

We would recommend the installation of additional support for the gas piping as needed.

Liquid Propane Storage Tanks

Cape Elizabeth Central Fire Station

Apparatus Bay Heating and Ventilation Systems

Heating and ventilation for the Apparatus Bay is provided through the 2-speed gas-fired make-up air unit (MAU-1) located in the Mezzanine and the roof-mounted exhaust fans (EF-2, 3 & 4). The make-up air unit and exhaust fans were installed as part of the 2000 addition and renovation project and appear as installed. According to the dates on the air filters, they were replaced February 10, 2011 and appear to be in good condition.

The make-up air system is controlled through the unit-mounted panel and is designed to either operate in the manual mode or automatically ventilate the Truck Bay in the event the levels of Nitrogen Dioxide (byproduct of a diesel engine running), or Carbon Monoxide (byproduct of a gasoline engine running), or gas exceed preset levels of concentrations as determined by one more of the four Brasch NO2/CO gas detectors located in the Truck Bay. Based on information provided by the gas detector manufacturer, regular recalibration of the NO2/CO detectors is recommended as part of normal maintenance. Recalibration would require the replacement of the main circuit board with a new board containing calibrated sensor.

We would recommend recalibration of the four NO2/CO gas detectors.

Apparatus Bay Ventilation MAU-1

Cape Elizabeth Central Fire Station

MAU-1 Control Panel

Brasch Combination Nitrogen Dioxide and Carbon Monoxide Detector

Cape Elizabeth Central Fire Station

Primary heating for the Apparatus Bay is provided through three gas-fired infrared heaters located above the suspended ceiling and directly vented through the roof. Each heater is controlled by a respective wall-mounted thermostat.

Apparatus Bay Heating

Training Room Heating and Ventilation

Heating and ventilation for the Training Room is provided through the packaged gas-fired rooftop air conditioning unit RTU-1. RTU-1 is equipped with an economizer and a powered relief fan. According to the Chief, occupants have a limited level of control to enable the occupants to determine when the unit operates. Control of the RTU is provided through the DDC system.

Packaged Rooftop Unit RTU-1

The hood at the left of the unit is the fresh air intake for AC-8.

Cape Elizabeth Central Fire Station

Primary heating of the space is provided through finned tube radiation based on the local wall-mounted low-voltage thermostat. On a call for heat the respective pump operates.

Training Room

Training Room DDC System Space Sensor (Left) and Local Low-Voltage Thermostat

Cape Elizabeth Central Fire Station

Dispatch and Office Area Heating, Ventilation and Air Conditioning System

The heating for the Dispatch, Office, and Lunch/Break Room areas is provided by finned tube radiation controlled by the respective local thermostat.

Ventilation for these areas is provided through the air conditioning unit (AC-8) and associated reheat coil located above the ceiling of the locker area.

Additional cooling is provided by numerous local split unit air conditioning systems. Each system can be individually controlled by the occupants. Some of the units were installed during the 2004 additions and renovations project and some existed before the 2004 project.

Typical Split System Indoor Evaporator Unit

Typical Split System Rooftop Condensing Unit

Views of CU-2, EF-3 and CU-1(left to right) on Upper Roof

Cape Elizabeth Central Fire Station

The ceiling supply diffuser in the Conference Room is installed in a location that may be detrimental to proper ventilation and cooling of the space.

We would recommend relocating the diffuser to a location closer to the center or other end of the room.

Typical Split System Indoor Evaporator Unit

Kitchen Hood and Dishwasher Exhaust Systems

A commercial kitchen hood exhaust system (EF-5) is provided above the gas stove. An Ansul automatic fire suppression system is installed. It appears the fire suppression system is interlocked with the gas shut-off valves located behind the range.

A commercial dishwasher hood exhaust system (EF-6) is provided and controlled by the wall-mounted switch located to the left of the dishwasher.

Make-up air for the hood exhaust is provided through louvers installed in the door to the Training Room and an opening in the Training Room wall.

Kitchen Commercial Range Hood

Cape Elizabeth Central Fire Station

Close-up View of Fire Suppression Heads

Dishwasher Machine Exhaust Hood

Cape Elizabeth Central Fire Station

General Exhaust Fans

The exhaust fan serving the men's toilet, janitor closet and women's toilet (Existing EF-1) was installed prior to the 2004 renovations project. It would appear one of the exhaust grills serving the men's toilet has not been installed in accordance with the 2000 renovations project design documents. The duct opening may be open above the suspended ceiling.

The exhaust grille in the janitor closet is showing signs of corrosion.

We would recommend further review of the missing men's toilet exhaust grille.

Men's Toilet Ceiling Exhaust Grille

Janitor Closet Exhaust Grille

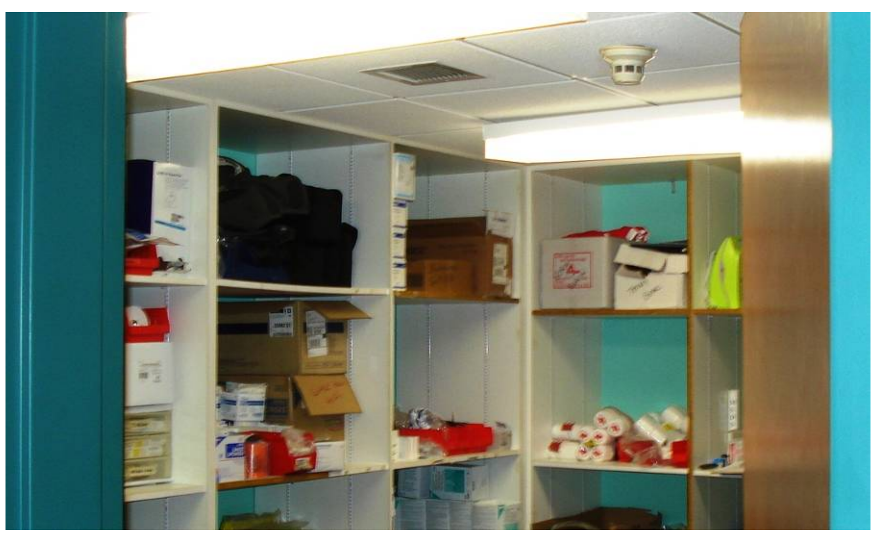
The toilet and janitor closet exhaust fan is controlled by a local lighted wall switch located outside of the janitor's closet and does not meet the current code requirements. Operation of the fan was confirmed.

We would recommend interlocking the fan with the lights in each room served to operate when the lights are on and remain on for a time delay after the lights are turned off.

Janitor Closet Light/Fan Switch

Exhaust for the Electric/Storage Room and Equipment Storage Room is provided by exhaust fan EF-7 located on the high roof above the mezzanine. The wall-mounted fan switch is located in the Storage Room. Operation of the fan was confirmed. The exhaust ducts for each space penetrate the mezzanine floor.

Storage Room next to Mezzanine Stairs



Cape Elizabeth Central Fire Station

Fire dampers have been installed at the floor level. Adjacent to one of the fire dampers (left photo below), a section of electrical pipe has penetrated the sheet metal near the fire damper. Access doors have not been installed above each fire damper. Access doors are required for annual inspection and testing of fire dampers. It would appear the mounting screws may have penetrated the damper channel.

We would recommend properly sealing the floor penetration, installing access doors, verifying proper operation of the dampers, and annually testing fire dampers in accordance with requirements outlined in NFPA 90A.

EF-7 Duct Penetrations Through Mezzanine Floor

Based on the 2000 addition and renovations design documents, the two rooms across the hall from the mezzanine stairwell were designed to be bedrooms and are currently being used as storage rooms. The heating for these rooms is provided by a single wall-mounted low-voltage thermostat, pump P-7, and individual sections of finned tube radiation in each room. Fresh air ventilation is provided through a ceiling hung variable speed supply fan located above the corridor ceiling, drawing air from the same roof vent as AC-8. At the time of review, the wall-mounted variable speed switch did not appear to have an effect.

We would recommend verification of proper supply fan operation.

Cape Elizabeth Fire Station

Electrical Systems Evaluation

Primary Service and Service Transformer

The Cape Elizabeth Fire Department is served by a 208V 3 phase 4 wire, 150kVA pad mounted transformer that is fed by underground conductors originating at a CMP riser pole located on Jordan Way. This transformer and meter are shared with the Cape Elizabeth Police Department, the two being connected by an underground duct bank.

Central Maine Power Company reports a peak demand of 46kW for the two facilities. The pad mount transformer has ample capacity for the building loads.

Primary Service Transformer

Cape Elizabeth Fire Station

Service Entrance and Distribution

The main service consists of secondary conductors from the exterior pad mount transformer that feed a 600A self-contained circuit breaker which in turn feeds the normal power side of a 600A automatic transfer switch. The standby portion of the automatic transfer switch is connected to an exterior 230kW 120/208V 3 phase 4 wire self-contained Cummins Onan diesel generator with day tank. The standby generator is also shared with the police department and provides backup power for both facilities.

Main Service Breakers and Transfer Switch

Standby Generator

Cape Elizabeth Fire Station

The main distribution panel is a 600A 120/208V 3 phase 4 wire GE Spectra distribution panelboard located in the Apparatus Bay. The main distribution panel is fed by the automatic transfer switch and in turn feeds multiple panels throughout the Fire Station. Distribution equipment appears to be in good condition and is adequately sized for the building loads. There are several spaces for future breakers. Most equipment was upgraded in the 2000 renovation project.

Main Distribution Panel

It was observed that there was no bonding jumper across the water meter in the boiler room.

Water Meter missing bonding jumper

Cape Elizabeth Fire Station

Lighting and power panelboards are located throughout the fire station. Most panels have additional space for breakers making future additions possible.

Typical Lighting / Power Panelboard

Cape Elizabeth Fire Station

Lighting

The Cape Elizabeth Fire Department is served by a variety of lighting fixtures (lens troffers, parabolic troffers, compact fluorescent downlights, surface wraps). Fixtures in the apparatus bay are 2'x4' T5 lensed troffers; all other troffers contain T8 and bent tube T8 lamps. No automatic controls for interior lighting fixtures were observed.

Lens Troffers

Surface Wraps

Cape Elizabeth Fire Station

Compact Fluorescent Downlights

Emergency Lighting

Only a few emergency lights were observed in the corridors and restrooms. These units are surface wall mounted self-contained battery units with remote heads (EBUs). The units have been recently upgraded to an LED type. Generally EBUs are in excellent condition but coverage is limited to the restrooms and central corridor. If the occupancy of this building exceeds 50 the building is required to have full life safety lighting for all paths of egress per NFPA 101 standards.

Exit signs are internally illuminated. Signs are in good condition; coverage is good.

Life Safety Lighting and Exit Signs

Cape Elizabeth Fire Station

Fire Alarm System

The fire station is served by a fire alarm system. The fire alarm system is a Notifier DR-500. It appears that this system was installed during the 2000 renovation. Notification appliance, smoke detectors and pull stations are located throughout the building. In the event of an alarm, the system reports directly to Portland monitoring / dispatch facility. The fire department reports no trouble with the system.

Fire Alarm System

Security Surveillance System

The system is an Integral Technologies system with a mixture of legacy and upgraded video platforms. Server is based in the High School but also serves the Middle School, Pond Cove Elementary School, Police Department and Fire Department. Advance Technology is responsible for maintaining the system, and reports multiple failures of the system, with frequent database corruption and loss of camera function.

Building #3
Cape Elizabeth Fire Station - Architectural

***Priority Scale:** #1 = 1 year; #2 = 2 years; #3 = 5 years; #4 = Future

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost	* Priority
A3.1	Exterior Walls	Masonry Bearing single wythe walls at the garage - Exterior steel stud infill with a precolored block veneer at the meeting room and office spaces.	The block walls at the garage are being repaired and the paint finish corrected. The precolored masonry veneer at the office walls has cracked in numerous locations	The Block veneer system and EIFS panels should be replaced with a new masonry veneer system of a more durable product	$90,000.00	2
A3.2	Roof System Replacement	Adhered EPDM roof system over garage and meeting room - stone ballasted roof over original office area	Roof system installed in 2001 - has approximately 10 to 15 years left in lifespan cycle. Due to the flat pitch of roof system may fail at an earlier date.	Replace existing EPDM roof membrane, insulation and existing wood fiber roof panels. Install new metal deck and R30 EPDM roof membrane system. Conduct Structural study of roof structure, especially in drift areas.	$200,000.00	4

Total Potential CIP Costs **$290,000.00**

Building #3
Cape Elizabeth Fire Station - Electrical and Technology Systems

***Priority Scale:** #1 = 1 year; #2 = 2 years; #3 = 5 years; #4 = Future

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost	* Priority
E3.1	Lighting	Most lights are T8 fluorescent fixtures with electronic ballasts.	Most fixtures are in good condition. Apparatus bay lighting recently upgraded to T5.	Automatic controls should be added to provide manual ON and automatic OFF functions.	$10,000.00	3
E3.2	Security Surveillance System	Older Integral Technologies system. Mixture of legacy and upgraded video platforms.	The camera system has encountered multiple camera failures and data corruption.	Install new surveillance system cameras and cabling, integrate with the new system in use in other town buildings.	$20,000.00	4

Total Potential CIP Costs **$30,000.00**

Building #3 - Cape Elizabeth Fire Station - Architectural - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
A30.1	Flooring Systems	VCT Floors at Office/ Reception Rooms - Quarry Tile Floor at Meeting Room - Ceramic Tile at Toilet Rooms - Exposed Concrete painted at Garage	All floor system are in very good condition - Should serve this building for a minimum of 20 years with a good maintenance program	Maintain maintenance program	$0.00
A30.2	Interior - Suspended Ceilings	Suspended ceilings are in reasonably good shape. Some panels throughout the facility have water stains and are damaged from maintenance access to space above	Suspended ceiling for the most part is comprised of 2 x 2 panels. Change out stained and damage panel on a yearly basis.	Replace existing suspended ceiling panels with new panels. This will become more difficult as panels get dirty and aged. Surface will not match - older panels will become darker. Recommend consider changing out entire rooms at same time.	$0.00
A30.3	Interior Walls	Drywall systems at office and meeting room areas. Masonry walls at the garage / mezzanine areas	Interior drywall system should be considered for repainting. Exterior masonry wall at the garage is in the process of being repair and the paint will be patched up to match.	Repaint interior walls as part of a maintenance of a maintenance program.	$0.00
A30.4	Door Hardware	Door Hardware has lever style door handles with the appropriate exit devices at all exits.	The door hardware system meets all current ADA and Life Safety code requirements.	No action required	$0.00
A30.5	Interior Door and Frames	A mix of hollow metal doors and frames and hollow metal frames with wood doors	Doors and frames are in very good shape. Should service this building for the next 15 to 20 years	Maintain paint and wood finishes on all doors and frames.	$0.00
A30.6	Exterior Doors and Frames	Main Garage door bay doors are insulated metal with an overhead door operator. Exterior personnel doors are hollow metal doors and frames.	Garage are in good condition considering the type of cycle use they go thru. The personnel doors and frames are in relatively good shape. All these doors needs some form of maintenance with either new weather-stripping, painting or hardware adjustments	Repair and maintain doors and frames thru annual maintenance budget.	$0.00

Total Potential CIP Costs **$0.00**

Building #3 - Cape Elizabeth Fire Station - Mechanical - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
M30.1	Boiler Flue	The flue vent pipe is installed through the roof and along the adjacent wall	The flue vent pipe support at the top of the adjacent roof is loose.	Re-secure the flue vent pipe near the roof line of the Apparatus Bay	$250.00
M30.2	LP Gas Tank Storage and Piping		The gas piping in the storage area does not appear to be well supported	Install supports for the gas piping within the tank enclosure	$250.00
M30.3	Apparatus Bay Ventilation	The ventilation system is controlled through the (4) Nitrogen Dioxide/Carbon Monoxide Detectors located in the Bay.	The detectors were installed during the 2001 project. The calibration of the detectors may not have been done.	Calibrate the detectors in accordance with manufacturer's recommendations (replace the detector printed circuit board).	$4,000.00

Fire Station - Mechanical

M30.4	Exhaust for Toilets and Janitor Closet	An exhaust fan is common to the Men's and Women's Toilets and the adjacent Janitor Closet	The fan is controlled by a wall switch located near the Janitor Closet. Operation of the fan does not meet code.	Revise the control of the fan. Interlock the fan with the lights in each Toilet and the Janitor Closet. Install a delay-off time delay relay at the fan to maintain operation for a period of time after the lights are turned off.	$2,500.00
M30.5	Exhaust Duct Fire Dampers at Mezzanine Floor	Fire dampers are installed at the Mezzanine Floor for the exhaust fan serving the Storage Rooms below the Mezzanine. Access doors are not installed. Electrical pipe is installed along side of one damper.	The dampers were installed during the 2001 project. Access doors are not installed. Access doors would be necessary to properly test the fire dampers on an annual basis and reset the dampers in the event they release.	Install access doors at fire dampers. Inspect and test the dampers on an annual basis in accordance with NFPA code requirements. Seal floor penetration at fire damper in accordance with code	$1,500.00

Total Potential CIP Costs **$8,500.00**

Building #3 - Cape Elizabeth Fire Station - Electrical and Technology Systems - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
E30.1	Primary Service	Service is shared with Police Department. 150kVA pad mount transformer.120/208V 3 phase 4 wire	Service is in good condition and sized appropriately for the building loads.	Maintain existing system. Periodically perform infrared scan of system	$5,000.00
E30.2	Standby System	230kW generator and 600A 120/208V 3 phase 4 wire automatic transfer switch feed main distribution board.	Generator and transfer switch are in good condition. Generator is shared with police department. Generator is adequately sized for both building loads.	Maintain existing system. Contract with vendor to maintain generator.	$5,000.00
E30.3	Distribution System	600A 120/208V 3 phase 4 wire main distribution board feeds downstream panelboards	Distribution system is in good condition and sized appropriately for the building loads.	Maintain existing system. Periodically perform infrared scan of system (see above)	$0.00
E30.4	Emergency Lighting	Emergency lighting is achieved with Self-Contained Emergency Battery Units with remote heads. Exit signs are internally illuminated. Emergency battery units and exit signs appear to be in serviceable condition.	If the occupancy of this building exceeds 50 the building is required to have full life safety lighting for all paths of egress per NFPA 101 standards.	Evaluate occupancy of building and provide additional life safety lighting per NFPA standards	$15,000.00
E30.5	Fire Alarm System	Notifier DR-00 system installed during 2000 renovation.	System is in serviceable condition with no trouble reported.	Maintain existing system.	$0.00

Total Potential CIP Costs **$25,000.00**

Cape Elizabeth Police Station

Building Description

Police Station

Exterior - Interior

Constructed in 2001
Steel framed – wood trussed pitched roof with small flat sections
Steel stud exterior wall with batt insulation between studs
Batt insulation at wood truss bottom chord with poly stapled to bottom
Aluminum metal window system
Heavy weight three-tab asphalt roof shingle
Fully adhered EPDM roof system at flat areas
Steel stud and drywall interior partitions with HM frames and wood doors
Some concrete block walls at high abuse areas
VCT floors, suspended acoustical tile ceilings

Mechanical

Heating hot water generation – one oil-fired Weil-McLain boiler
Combustion Air – natural ventilation, motorized damper
Oil Storage – two 275 gal. tanks, located in Sallyport
Heating hot water circulation – inline circulator pumps, constant volume
Domestic hot water generation – tankless, 50 gal. electric water heater
Controls – Invensys, Schneider Electric, DDC throughout
Sally Port – indoor air handling unit
Offices, Conference – indoor air unit, return fan, DX cooling, VAV, FTR
Dispatch – dedicated indoor air unit, DX cooling
Booking, Evidence – dedicated indoor air unit, DX cooling
Toilet Exhaust – rooftop exhaust fan
Shower Exhaust – inline exhaust fan

Cape Elizabeth Police Station

Electrical	Main Distribution Panel – 400A, 120/208V 3-phase, 4-wire Standby Generator – 230kW-diesel with day tank - shared with Fire Department Emergency Lighting – No emergency lighting. All lights on standby generator. Fire Alarm System – Notifier AFP-200 Intrusion System – none Security Surveillance System – minimal number of cameras connected to High School system Voice/Phone/Intercom/Paging – modified VOIP

Cape Elizabeth Police Station

Architectural Systems Evaluation

Interior Systems Descriptions

Police Station

The police station was constructed at the same time as the fire station project as a joint project.

The building as a whole was well constructed and the interior finishes are holding up well after 10 years of use. The interior public and dispatch area has seen its use function reduced with the dispatch being moved to another location outside the town. The floor in that space has a raised floor system in the entire room which provided a space for all the communication wiring required for the equipment. If the police department functions require renovations for new spaces there is enough space within the footprint of the building to accommodate future changes. The infrastructural systems within the building are easily adaptable to any future needs. The exterior brick veneer of the building is well constructed and the building should service the Town for the next 40 years.

Front View Towards Route 77

Cape Elizabeth Police Station

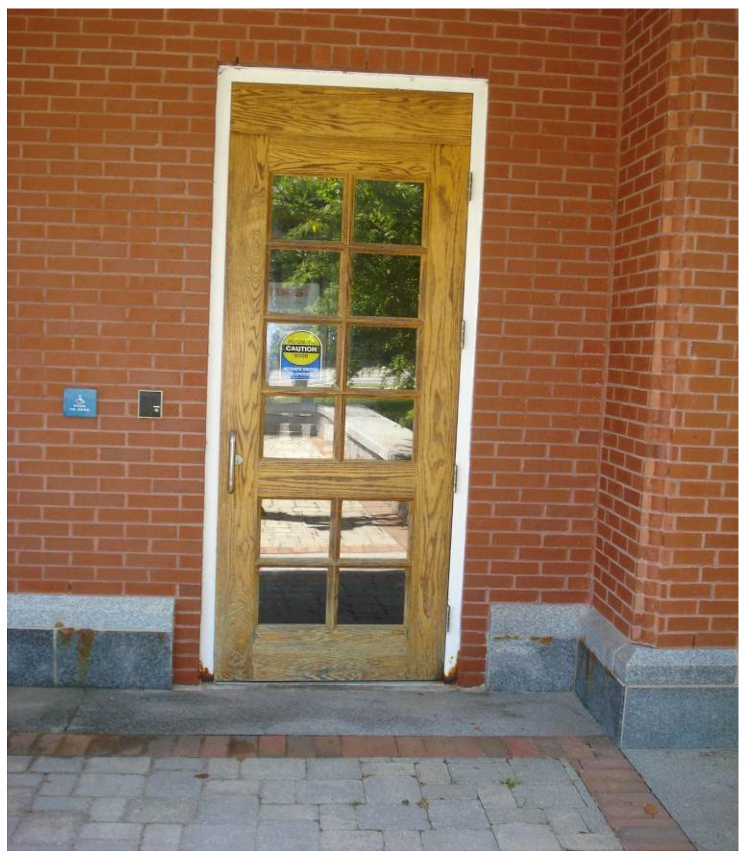
Exterior Systems Evaluation

Police Station

The exterior brick system has no flashing, control joints or mortar issues requiring attention at this time. The siding should be repainted on an as needed basis to maintain its appearance and the caulking system may require attention after another 15 years.

The items requiring maintenance or replacement would be the exterior doors and frames. The front entry wood door needs replacement – the door is sticking to the jamb and the frame is showing rust through the bottom of the hollow metal frame.
The exterior painted white doors and frames will need replacement soon as the bottom edge of the doors and frames are rusted out to the point where sanding and painting will be ineffective.

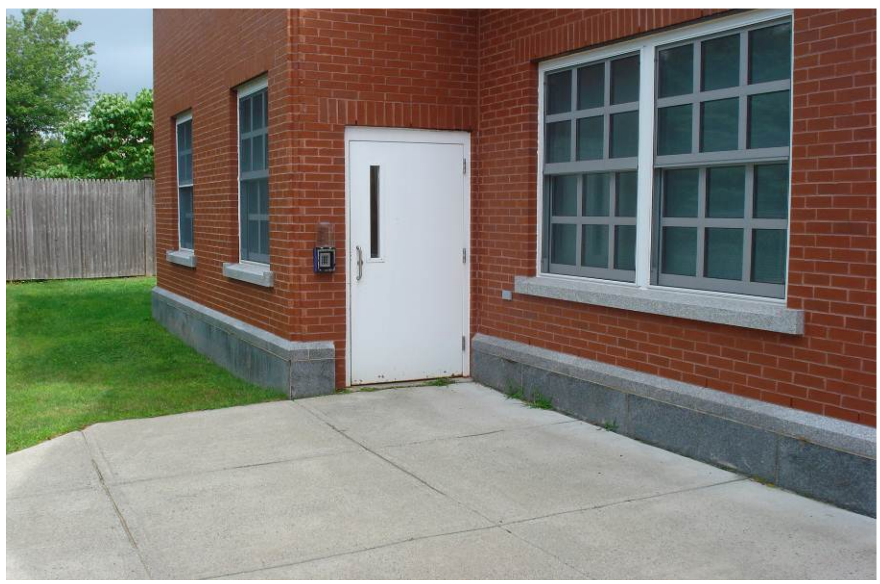
Front Entrance – Wood Door



Cape Elizabeth Police Station

Painted Doors Bottom Edge Rusted

Rusted Bottom Edge Door



Cape Elizabeth Police Station

Exterior

The asphalt roof shingles are a good 2-tab shingle. Based on its age since installation the roof shingles should have a 15 to 20 year life span before replacement should be considered. The pitched roof is a cold attic space and utilizes a series of gable end vents to relieve the heat from the attic.

Shingled Roof

Exterior Wall – Pitched Roof with Parapet Wall

Cape Elizabeth Police Station

Interior
Bottom of Trussed Rafters

On our walk through the building we noticed in the electric room a hole through the insulation system on the bottom of the rafters. The system of batt insulation and poly stapled to the bottom chord of the rafters is not a good system to stop cold air infiltration into the spaces below.

It appears that a hole was made for access to a damper on the side of the exhaust duct. As a minimum, holes of this nature provide a large amount of heat loss in the winter and cooling loss in the summer months. Holes of this nature through to a cold attic space should be periodically checked as they can be a complaint item when trying to keep an occupied space below at minimum heat levels.

All hangers, conduits and other penetrations through the system should be taped and sealed tight as all these un-sealed penetrations are locations for air infiltration.

We would recommend a review above all suspended ceilings within the building to verify if there are any more such holes and insulate, poly and seal all locations.

Major Hole in Insulation Barrier

Cape Elizabeth Police Station

Mechanical Systems Evaluation

Boiler Room

The heating hot water is generated from two oil-fired Weil-McLain boilers installed during the construction of the new building in 2002. According to the contract documents, each burner was size for 175 MBH. Each boiler is outfitted with factory-provided controls, interlocked with the building Direct Digital Control (DDC) system and appears to be in good condition.

Boiler Plant

Boilers

The #2 fuel oil is provided to the boilers from the two 275 gallon oil storage tanks located in the sally port through the individual burner-mounted oil pumps.

Fuel Oil Tanks

Cape Elizabeth Police Station

Combustion air is provided by natural ventilation into the boiler room through two openings. The opening shown below is a dual-duct opening configuration with a combustion air damper on the lower portion. According to the original plans, each opening is 24" x 6". At the time of review, the damper was open as expected in accordance with the sequence of operations.

The second combustion air opening is a louver cut into the boiler room door. Based on the duct tape around the inside of the opening, it would appear efforts have been made to reduce the infiltration through the door-mounted louver.

Ducted Combustion Air

Door-Mounted Combustion Air Louver

Cape Elizabeth Police Station

Heating hot water is circulated through the building by constant volume vertical in-line pumps located in the boiler room. It appears one of the pump motors has been recently replaced. According to the specification, the lead pump operates continuously.

Heating Hot Water Pumps

Domestic hot water is generated in the 50 gallon electric hot water heater located in the boiler room and provided to the building through a mixing valve by a circulator pump located in the boiler room.

The boilers are outfitted with tankless hot water connections. Based on the contract drawings and apparent piping modifications, the electric hot water heater may have been added since the time of construction.

Domestic Hot Water Heater

Cape Elizabeth Police Station

Tankless Domestic Hot Water Boiler Connection

The Invensys LON-based Direct Digital Control (DDC) system was installed during the construction.

Direct Digital Control System and Pump Starters

Cape Elizabeth Police Station

Indoor Ventilation Systems

Direct Digital Controls for HV-1

Heating and ventilation for the sally port is provided through the 1100 cfm Trane HV-1 unit suspended from the structure in the sally port. The unit appears to be in good condition. When manually commanded on, the duct-mounted intake and return dampers opened. However, the duct-mounted relief damper failed to open. As a result, the space may be improperly ventilated.

Trane Heating and Ventilation Unit HV-1

Cape Elizabeth Police Station

Ventilation for majority of the building is provided through the 4250 cfm air handling unit (AHU-1) located above the Electrical Room ceiling. The air handler serves a variable air volume (VAV) ventilation system throughout the building. The fans in AHU-1 and RAF-1 are controlled through the VFDs located in the Electrical Room. At the time of review, the system was operating. The rooftop condensing unit (CU-1) for the air handling unit AHU-1 is located on the roof above the sally port.

The duct-mounted return air fan (RAF-1), located above the conference room (former employee break room) in the center of the building, operates continuously when the AHU fan is operating. At the time of review, comments were made concerning the noises produced by the return fan.

We would recommend review of the installation of the return fan verifying the fan is properly suspended from structure with vibration isolation devices.

Variable Frequency Drives (VFD) for the AHU-1 and RAF-1 Fans

The occupied/unoccupied periods or modes are determined through the electronic time clock located in the Dispatch Center. Based on the time of review, the clock appears to be maintaining proper time and function.

Building Occupied/ Unoccupied Mode Time Clock

Air conditioning is provided to the Dispatch Center through 1480 cfm split air conditioning unit (AC-1) located above the main lobby ceiling. Heating is provided through the duct-mounted reheat coil shown to be located above the lobby ceiling. Fresh air (scheduled 100 cfm) is ducted directly into the return air steam through a 6" diameter duct. The rooftop condensing unit (CU-2) associated with the air conditioning unit (AC-1), is located on the roof above the Dispatch Center.

Air conditioning is provided to the Booking, Evidence Lab, and the adjacent secure passageway through the 735 cfm split air conditioning unit (AC-2) located above the passageway ceiling. Heating is provided through the duct-mounted reheat coil shown to be located above the Storage Room ceiling. Fresh air (scheduled 50 cfm) is ducted directly into the return air steam through a 6" diameter duct. The rooftop condensing unit (CU-3) associated with the air conditioning unit AC-2 is located on the roof above the Storage Room off the secure passageway.

Exhaust Fans

Exhaust air is provided for the women's locker shower area, the men's restroom and showers and the Evidence Storage Room through exhaust fan EF-1. It is located in the attic space above the open area outside of the Chief's office. According to the sequence of operations shown on the contract documents, the fan is interlocked to operate when the lights in either the men's restroom or the women's locker room are on.

Cape Elizabeth Police Station

Exhaust air is provided for the Dispatch Center toilets, adjacent janitor closet and the Booking toilet through exhaust fan EF-2. It is located in the attic space above the main lobby ceiling. According to the sequence of operations shown on the contract documents, the fan operates continuously. At the time of review, it appeared to be operating.

Exhaust air is provided directly for the Evidence Lab through the exhaust fan EF-3 located on the roof above the Evidence Lab. According to the sequence of operations shown on the contract documents, EF-3 is controlled from a local wall switch. When the switch is turned o, the fan operates and the return air from the Evidence Lab is diverted to be drawn from the secure passageway.

Cape Elizabeth Police Station

Electrical Systems Evaluation

Primary Service and Service Transformer

The Cape Elizabeth Police Department is served by a 208V 3 phase 4 wire, 150kVA pad mounted transformer that is fed by underground conductors originating at a CMP riser pole located on Jordan Way. This transformer and meter are shared with the Cape Elizabeth Fire Department, the two being connected by an underground duct bank.

Central Maine Power Company reports a peak demand of 46kW for the two facilities. The pad mount transformer has ample capacity for the building loads.

Primary Service Transformer

Cape Elizabeth Police Station

Service Entrance and Distribution

The main service consists of secondary conductors from the exterior pad mount transformer that feed a 400A GE Spectra 120/208V 3 phase 4 wire main distribution board with 400A main breaker. The main distribution panel feeds several mechanical loads as well as a self-contained circuit breaker which in turn feeds the normal power side of a 260A automatic transfer switch. The standby portion of the automatic transfer switch is connected to an exterior 230kW 120/208V 3 phase 4 wire self-contained Cummins Onan diesel generator with day tank. The standby generator is also shared with the fire department and provides backup power for both facilities.

Distribution equipment was installed during the 2000 construction, appears to be in good condition, and is adequately sized for the building loads. The main panel has several spaces for future breakers.

Main Distribution Panel

Cape Elizabeth Police Station

Standby Generator

Transfer Switch and Breaker

Cape Elizabeth Police Station

Lighting and power panelboards are located in the boiler room of the police station. Generally, panels have additional space for breakers making future additions possible.

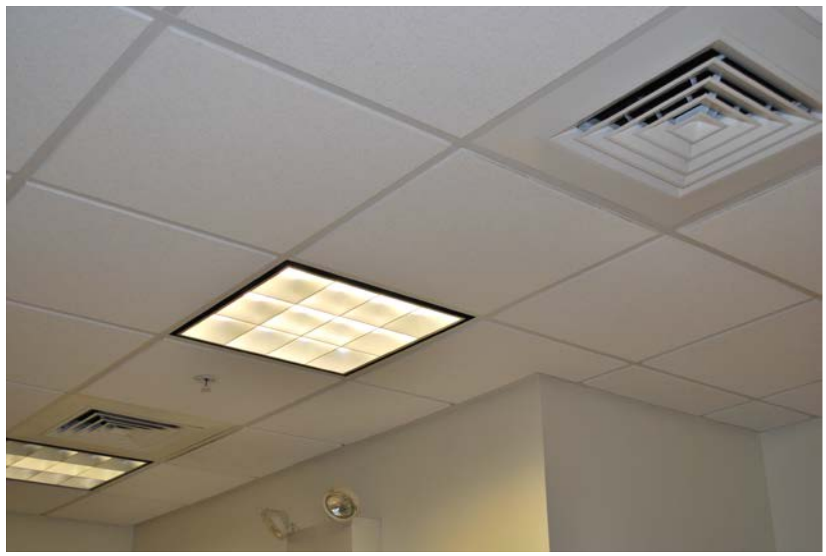
Typical Lighting / Power Panelboard

Cape Elizabeth Police Station

Lighting

The Cape Elizabeth Police Department is served by a variety of lighting fixtures (lens troffers, parabolic troffers, compact fluorescent downlights, incandescent downlights, surface wraps, vapor-tight). Most fixtures are T8 or bent tube T8 lamps. Many spaces are switched for two levels of lighting. Occupancy sensing lighting controls were observed in some spaces. Rear exterior soffit lighting showed signs of dirt and insect infiltration.

Typical 2'x2' Parabolic Troffer



Vapor-Tight Fixtures in the Sally Port

Cape Elizabeth Police Station

HID Downlights in Canopy

Rear Soffit Lights

Cape Elizabeth Police Station

Emergency Lighting

No emergency lights were observed in the police station. NFPA 101 only requires emergency lighting where occupancy exceeds 50. Lighting for the facility is on standby power.

Exit signs are internally illuminated. Signs are in good condition; coverage is good.

Exit Signs

Cape Elizabeth Police Station

Fire Alarm System

The police station is served by a fire alarm system. The system is a Notifier AFP-200. It appears that this system is original to the 2000 construction. Notification appliance, smoke detectors and pull stations are located throughout the building. In the event of an alarm, the system reports directly to Portland monitoring / dispatch facility. The police department reports no trouble with the control panel but has experienced some trouble with the dialer.

Fire Alarm System

Security Surveillance System

The system is an Integral Technologies system with a mixture of legacy and upgraded video platforms. Server is based in the High School but also serves the Middle School, Pond Cove Elementary School, Police Department and Fire Department. Advance Technology is responsible for maintaining the system, and reports multiple failures of the system, with frequent database corruption and loss of camera function.

Building #4
Cape Elizabeth Police Station - Architectural

***Priority Scale:** #1 = 1 year
#2 = 2 years
#3 = 5 years
#4 = Future

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost	* Priority
A4.1	Exterior Doors and Frames	Main entrance door is wood in a hollow metal frame. Exterior personnel or room access doors are hollow metal doors and frames. Garage door is insulated metal.	Main entrance door needs to be replaced - door is sticking to frame and door is showing signs of delamination. Exterior hollow metal systems are showing significant rust around the perimeters and should be replaced. Garage door is in good servable condition	Replace the main entrance and other personnel doors and frames.	$10,000.00	2

Total Potential CIP Costs **$10,000.00**

Building #4 - Cape Elizabeth Police Station - Architectural - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
A40.1	Flooring Systems	VCT Floors at Office/ Reception Rooms - Squad Rooms, Conference and other associated spaces - Ceramic Tile at Toilet Rooms - Exposed Concrete painted at Garage	All floor system are in very good condition - Should serve this building for a minimum of 20 years with a good maintenance program	Maintain maintenance program	$0.00
A40.2	Interior - Suspended Ceilings	Suspended ceilings are in reasonably good shape. Some panels throughout the facility have water stains and are damaged from maintenance access to space above	Suspended ceiling for the most part is comprised of 2 x 2 panels. Change out stained and damage panel on a yearly basis.	Replace existing suspended ceiling panels with new panels. This will become more difficult as panels get dirty and aged. Surface will not match - older panels will become darker. Recommend consider changing out entire rooms at same time.	$0.00
A40.3	Interior Walls	Drywall systems at offices, conference rooms, interrogation spaces	Interior drywall system should be considered for repainting. Exterior masonry wall at the garage is in the process of being repair and the paint will be patched up to match.	Repaint interior walls as part of a maintenance of a maintenance program.	$0.00
A40.4	Door Hardware	Door Hardware has lever style door handles with the appropriate exit devices at all exits.	The door hardware system meets all current ADA and Life Safety code requirements.	No action required	$0.00
A40.5	Interior Door and Frames	A mix of hollow metal doors and frames and hollow metal frames with wood doors	Doors and frames are in very good shape. Should service this building for the next 15 to 20 years	Maintain paint and wood finishes on all doors and frames.	$0.00
A40.6	Exterior Walls	Brick veneer on exterior steel studs	The veneer is in very good condition and we did observe any remedial action for the building envelope	No action required	$0.00
A40.7	Roof System Replacement	Architectural shingle - heavy weight type with adhered EPDM roof in flat sections at each side.	Roof system installed in 2001 and is in good serviceable condition for its life span of the next 15 to 20 years	No action required	$0.00

Total Potential CIP Costs **$0.00**

Building #4 - Cape Elizabeth Police Station - Mechanical - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
M40.1	Return Fan RAF-1	RAF-1 serves the VAV ventilation system. During the review, the fan was operating	The Owner noted objectionable and excessive noise is present above the ceiling in the Conference Room. The fan may be developing excessive vibrations that may be transmitted as noises.	Review operation of the fan and verify the fan is properly supported from the structure with vibration isolation.	$1,000.00

Total Potential CIP Costs **$1,000.00**

Building #4 - Cape Elizabeth Police Station - Electrical and Technology Systems - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
E40.1	Primary Service	Service is shared with Fire Department. 150kVA pad mount transformer.120/208V 3phase 4 wire	Service is in good condition and sized appropriately for the building loads.	Maintain existing system. Periodically perform infrared scan of system	$5,000.00
E40.2	Standby System	230kW generator and 400A 120/208V 3phase 4 wire automatic transfer switch feeds panelboard.	Generator and transfer switch are in good condition. Generator is shared with Fire department. Generator is adequately sized for both building loads.	Maintain existing system. Contract with vendor to maintain generator.	$0.00
E40.3	Distribution System	400A 120/208V 3phase 4 wire main distribution board feeds downstream panelboards	Distribution system is in good condition and sized appropriately for the building loads.	Maintain existing system. Periodically perform infrared scan of system (See above)	$0.00
E40.4	Lighting	Most lights are T8 fluorescent fixtures with electronic ballasts.	Most fixtures are in good condition.	Automatic controls should be added to provide manual ON and automatic OFF functions.	$10,000.00
E40.5	Emergency Lighting	No Emergency lighting. Exit signs are internally illuminated. Emergency battery units and exit signs appear to be in serviceable condition.	Exit signs are in good condition.	No action required	$0.00
E40.6	Fire Alarm System	Notifier AFP-200 system installed during 2000 construction.	System is in serviceable condition. Trouble with dialer reported.	Maintain existing system, contract with vendor to repair dialer.	$7,500.00
E40.7	Security Surveillance System	Older Integral Technologies system. Mixture of legacy and upgraded video platforms.	The camera system has encountered multiple camera failures and data corruption.	Install new surveillance system cameras and cabling, integrate with the new system in use in other town buildings.	$10,000.00

Total Potential CIP Costs **$32,500.00**

Community Services Building

Building Description

Community Services Building

Exterior - Interior

No information when original building was constructed
Renovated in 2002
Combination of wood stud bearing walls and wood trusses - Existing
Renovated with structural steel stud bearing walls and wood framed stick built entry gale roofs and barn roof structural upgrade.
Cedar Clapboard Siding
Vinyl Clad Wood Windows
Wood Framed floor framing
Asphalt roof shingles – 2 tab
Steel stud and drywall interior partitions with HM frames and wood doors
VCT floors, Suspended Acoustical Tile Ceilings
Building is Fully Sprinklered

Mechanical

Heating hot water generation – (2) H.B. Smith cast iron oil-fired boilers
Combustion Air – Natural ventilation, motorized damper
Oil Storage – (3) 330 gal tanks, located in Boiler Room
Heating hot water circulation - Inline circulator pumps, constant volume
Domestic hot water generation – (2) Electric water heater s
Controls - Invensys, Schneider Electric, DDC throughout
Open Office – Unit ventilators, DX cooling, wall-mounted relief
General spaces, Classrooms - Unit ventilators, wall-mounted relief
Conference, Office – Dedicated ducted spilt heat pumps, DX cooling
Computer Lab – Unit ventilator, DX cooling, wall-mounted relief
Elevator Machine Room – Thermostatically controlled exhaust
Toilet Exhaust – Individual ceiling-mounted fans, interlock with lights

Community Services Building

Mechanical (continued)	Toilet Heating – Radiant ceiling panels Kitchen Range – Commercial hood, fire suppression system, gas lock-out Lower Areas – Heating, hot water unit heaters
Electrical	Main Distribution Panel – 800A, 120/208V 3-phase, 4-wire Standby Generator – none Emergency Lighting – self-contained battery units. Fire Alarm System – Notifier AFP-200 Intrusion System – none Security Surveillance System – minimal number of cameras connected to High School system Voice/Phone/Intercom/Paging – modified VOIP

Community Services Building

Architectural Systems Evaluation

Interior Systems Descriptions

Community Services

The interior finishes are in good shape relative to the age of 10 years of use. The floors and walls have been well maintained and with a good maintenance program should service the community for the next 20 to 30 years without a major update. The interior of the building as a whole is a reflection of a well maintained community building.

Main Entrance Lobby

Interior Systems Evaluation – Code Items

Cross Corridor Doors

The cross corridor doors and frames along the main corridor including those that exit to the exterior and to the main lobby entrance carry a one hour fire label on the door and frame. In order for the doors to be code compliant there are some hardware issues connected with these fire rated setups that should be added to bring the doors into full compliance with the code.

The cross corridor doors have full vertical rod panic devices which are required to latch at the top and bottom to meet code. The floor strike plate is missing at all fire rated door assemblies viewed, and should be replaced. Pairs of doors used in a fire rated assembly are required to have smoke seals at the frame and smoke resistant astragal. These items are also missing and should be corrected. The doors have glass lites with wire glass. Fire doors with wire glass are no longer allowed per code. IBC requires glazing in these doors to be of tempered fire lite.

Community Services Building

One Hour Rated Cross Corridor Door

Floor Strike Plate Missing

Community Services Building

Wire Glass in Rated Doors – Not Allowed Per Code

Floor Strike Plate Missing – Doors to Main Entrance

Community Services Building

Interior Exit Door

On the ground floor there is a space being utilized with exercise bikes. Both means of egress doors out of this space are non-compliant with the Life Safety Code. The space is being utilized as an occupied space with a large amount of combustible material stored in the space. The local fire department should be consulted on the use of this space and the exit requirements as to further use by the occupants.

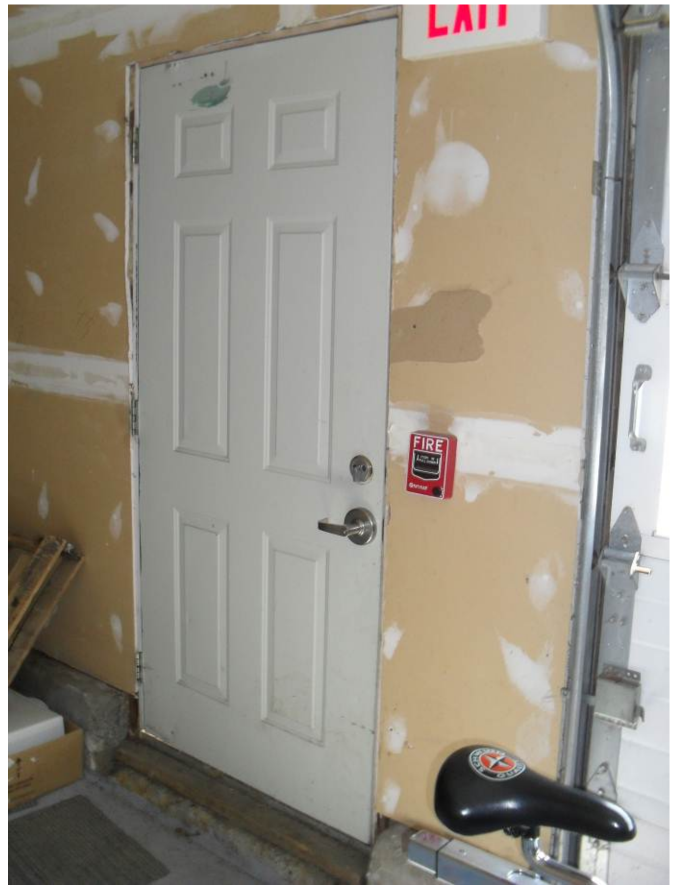
Exit Door Enters Into a Storage Room – Code Does Not Allow Exiting Into a Higher Hazard Space

Means of Egress Door to Storage Room

Community Services Building

Life Safety Code Requires Floor to be at Same Level at Each Side of an Exit Door

The levels on each side of the door are not the same height as threshold.



Occupied Space with Combustible Materials

Combustible Material Storage

Community Services Building

Lobby Floor

The porcelain tile lobby floor is having continuing issues with the grout joints cracking, loosening, and breaking the tile bond with the substrate below. It has been reported that a number of repairs have already been conducted to the floor system. There are a number of items connected with this floor that can produce this condition. The framing may be flexing under live load conditions or the bond or type of grout used is not bonding properly to the substrate.

The method of correction for this floor is to remove the tile and plywood substrate and replace the underlayment with a product designed for this application.

Lobby Tile Floor

Community Services Building

Interior Cabinets

Laminate edges are falling off. The adhesive for the laminate edge has dried up allowing the laminate edge to fall off.

Recommend minor repair.

Laminate Edge - Repair

Elevator

Elevator is sized to meet current code requirements.

Elevator Entrance

Community Services Building

Exterior

The building was re-roofed and re-sided with the renovation project of 2002. The asphalt roof shingles are medium weight shingle and should provide the Town with up to 20 years additional life span before replacement should be considered.

The cedar clapboard siding installed with its painted surface is in very good shape. No information was found but a normal procedure with this type of siding is to prime all sides before installation and then surface coat to the color desired. The paint surface is not showing signs of chipping or fading but will require a normal repainting every 10 to 15 years as part of a normal maintenance program.

Main Entrance

Community Services Building

Exterior Base Detail at Barn

The base of the barn has a construction detail that will require attention. As part of the renovation project a series of materials was added over the existing framing system to protect it from grade. The sills were replaced with new pressure treated framing and insulated to help keep the crawl space warm. The materials used in series as sketched are not designed for this application in this particular location. Ground water and moisture in the grade will break the system down and allow moisture to get at the wood frame components and rot out even though they are noted as pressure treated products.

A forensic investigation of the system should be done to confirm that it has been constructed as shown and to verify if the system is starting to break down. It appears that the details were constructed per the sketch detail that was issued during construction. Though an under-drain is shown in the detail we could not find any cleanout covers that should have been extended up to grade for cleaning maintenance.
We would also be suspect as to where the downspout of the roof dumps into a subsurface drain with no outlet location for it visible. If this dumps into an under-drain then it has the potential of plugging it with the material collected in the gutter.

We would recommend a correction of this detail with a waterproofing product designed for this application and a new underdrain system on all sides where this detail occurs.

Base of Siding

Base Detail – Ice and Water Shield Exposed

Community Services Building

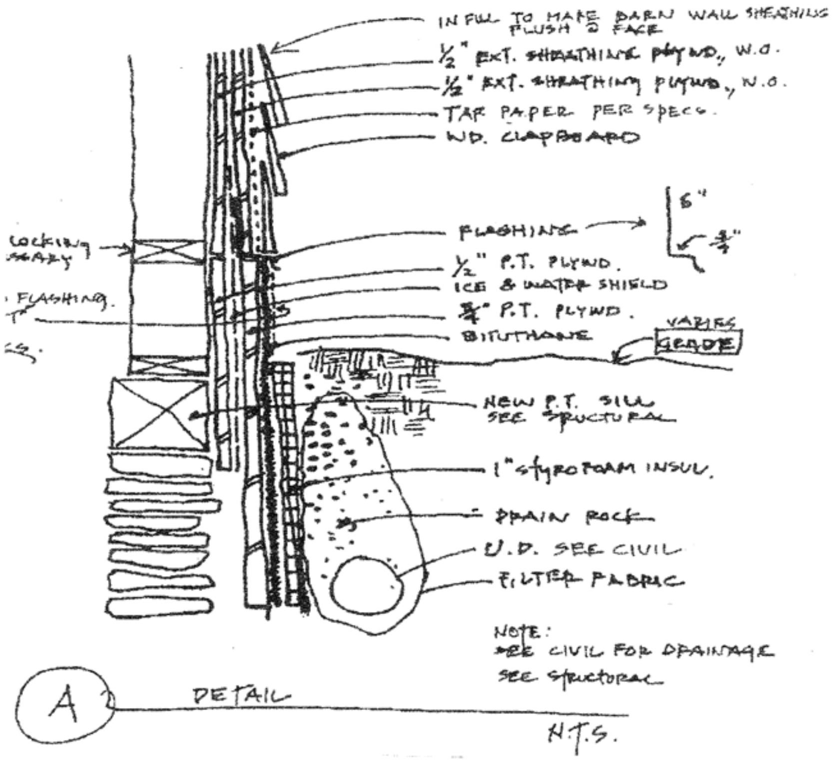
Base Detail on These Walls

Barn

Base Detail – Front of Barn

Community Services Building

Sketch Base Detail per Contract Drawings



Community Services Building

Side Entrance

Exit doors at the side entrance cannot be fully open for exiting under freeze conditions. It has been reported that the leading edge of the door becomes stuck in a partially opened position after contacting the concrete entry slab. The entry slab is not a structural slab and is subject to ground freeze when moisture from the roof is introduced into the ground under and heaves the slab upward.

This is a Life Safety code issue that should be repaired immediately. The recommended repair is to remove the canopy and slab and replace with a structural slab and foundation and replace the canopy.

Community Services Building

Main Entrance

For ease of accessibility for elderly citizens who use this building we would recommend an ADA Automatic Door Opener at this entrance.

Main Entrance Doors

Community Services Building

Gable Ends

All of the gable ends have wood louvers on the end to add to venting capacity of the attic space. The contract documents showed the appropriate eave vent as well as the roll vent system at the ridge.

The documents did show two louvers on this gable end stacked and per the picture one has been removed and blocked up with a plywood panel. This type of gable end louvers of this size can be problematic by allowing wind-blown snow to enter the attic and pile up on top of your ceiling insulation. When the temperature rises enough to allow melting of the snow then water damage will appear on the ceilings below and may give the appearance of a roof leak.

The removal of one louver and the plywood panel indicates that scenario may have already occurred.

Exterior – Gable End

Blocked up Gable End Vent Louver

Community Services Building

Mechanical Systems Evaluation

Boiler Room

The heating hot water is generated from two H.B. Smith series 19 cast iron boilers with Becket oil-fired burners and individual in-line injection pumps. According to the boiler nameplate, the net heat output for each boiler is 500 Mbh and it would appear each boiler and respective injection pump are interlocked with the Direct Digital Control (DDC) system. The injection pumps are suspended from structure without vibration isolation similar to heating hot water pumps noted below. The Amco breeching appears to be in good condition.

At the time of review, the injection pump at Boiler 2 was operating but appeared to be commended off at the relay.

The boiler room is being used as a storage room. This is in violation of code. Combustible materials are not to be stored within the boiler room.

We would recommend check out of the boilers, injection pumps, and review of the boiler operating system and DDC interlocks.

We would recommend removal of all flammable and combustible materials stored in the boiler room.

Boiler Plant

View of Boiler 1

View of Combustible Materials Stored in the Boiler Room

Community Services Building

At Boiler 1, the return pipe insulation is burnt indicating a possible leak from the combustion chamber.

We recommend repair of the combustion leak.

Burnt Pipe Insulation at the Rear of Boiler 1

Fuel oil is stored in three tanks located in the boiler room. The fuel line is covered with insulation indicating there may have been a problem due to the location of the fuel line in relation to the combustion air opening. The fuel line installation does not meet code. The fuel line could be damaged and creates a tripping hazard.

We recommend reinstallation of the fuel line in accordance with code.

Oil Tanks

Community Services Building

Heating hot water is circulated through the building by one of two Bell & Gossett in-line constant volume pumps and is controlled through the DDC system. The pumps are installed with threaded rods directly attached to the structure with rubber in-shear vibration isolators as specified. This may cause structural borne vibration noises to be transmitted through the building.

We would recommend the installation of vibration isolation at the pump and associated supports.

Heating Hot Water Pumps

Some of the piping connections around the pumps are showing signs of excessive leakage and corrosion.

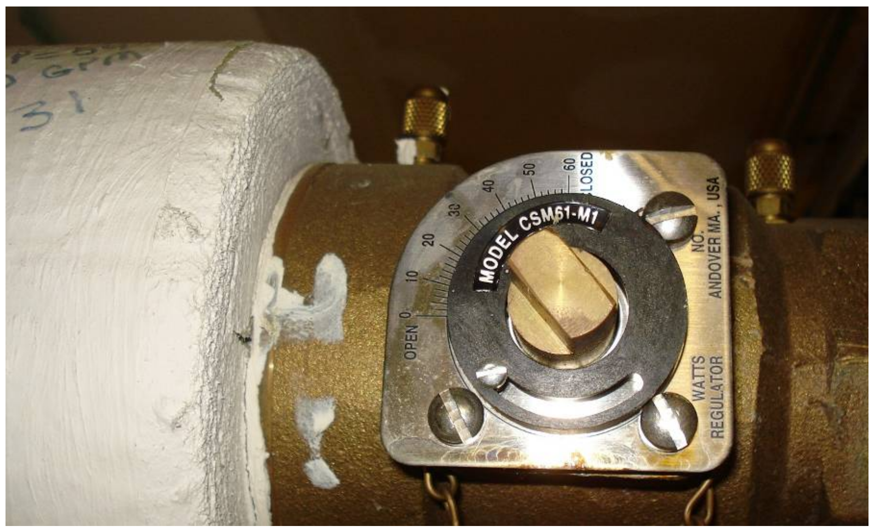
Pipe Fittings Around Pump P-3 Showing Leakage, Corrosion

Community Services Building

The circuit setters at each pump discharge have been set to approximately 50% open indicating the circuit setters required adjustment to restrict the flow to provide 80 gpm flow through the system (connected load is 75 gpm). According to design documents, the pumps were scheduled to provide 75 gpm. The circuit setters were not installed as noted on the design documents (length of straight pipe before and after the CS).

We would recommend opening the circuit setters to 100% open and the installation of variable frequency drives to reduce the speed of the pumps to accomplish the design water flow while reducing the energy consumption of the pumps.

Hot Water Pump Circuit Setter



Community Services Building

Combustion air is provided through two ducted openings; one is approximately 12” above the floor and the other is approximately 6” below the ceiling. The lower duct opening is partly blocked with insulation and plywood. It would appear the lower opening was blocked due to the location of the fuel oil piping directly under the opening. As installed, the combustion air duct system does not meet current code requirements.

We would recommend revision of the combustion air system to meet current code requirements.

Combustion Air Ducts

Combustion Air Duct Blocked Off at Floor

Community Services Building

Boiler room ventilation is provided by the wall-mounted paddle exhaust fan and motor operated damper based on the local electric thermostat. At the time of review, the damper was closed and the fan off. On a call for cooling, the damper opened but the fan remained off.

We would recommend the installation of vibration isolation devices and full review of the supply fan operation.

Boiler Room Ventilation Fan

The Boiler Room Invensys LON-based Direct Digital Control (DDC) panel controls the boiler room equipment and is accessible through web-based graphics.

Direct Digital Control System Components and Heating Hot Water Pump Starters

Community Services Building

Domestic hot water is generated from two 30 gallon electric hot water heaters (EWH). EWH-2 is located in the boiler room and EWH-1 is located in the Custodial Closet on the First Floor.

The heater in the boiler room appears to showing signs of leakage based on the floor stains around the heater. Both heaters appear to be resting directly on the floor without any means of leak retention.

Electric Domestic Hot Water Heater

Community Services Building

Community Service Offices and Conference Room
Heating, Ventilation and Air Conditioning

Heating, ventilation and air conditioning is provided to the Community Services open office area through two unit ventilators (UV), provided with mechanical (DX) cooling coils, located at the outside wall. At the time of review, the left-hand unit was operating and the right-hand unit was not. According to the occupants, air flow of the left-hand unit was being defected by the portable blind to help reduce cold drafts. It was noted that during the cooling season it is typically too cold and during the heating season it is typically cold also.

The unit ventilators in the office area are controlled through the DDC system. The space temperature sensor is located near the left-hand entry door. The temperature setpoint is unknown. At the time of review the door was open.

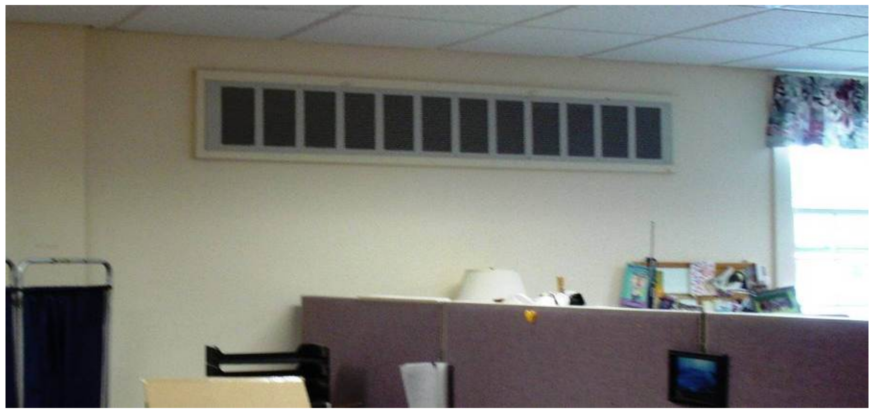
Unit Ventilator in the Open Office Area

Portable Blind Deflector

Community Services Building

Relief for the office area is provided through two wall-mounted vented louvers located directly above each unit ventilator. According to the contract documents, the designed was based on the Ventimatic through-wall shutter assemblies manufactured by AFF. Actual vent model is unknown. According to the occupants, during the cold weather, cold air typically drops down from these relief vents.

Unit Ventilator Relief Vent



Between the office and the lobby area is a large open window. Cooling is not provided in the lobby and adjacent corridors; heating and ventilation are provided through a ceiling-mounted unit ventilator (UV). It is unknown if the was UV was operating at full economizer ventilation or if the dampers were commanded to the minimum position.

At the time of review the spaces felt moist and cool. The outside air was warm and humid. The single UV in the office was operating at full mechanical cooling and the condensing unit was short cycling. The lobby UV was operating at perhaps full ventilation or economizer. As a result, unconditioned air from the lobby may have been adversely affecting the air conditioned air in the office.

We would recommend further in-depth review of the office and lobby ventilation systems.

Lobby Window

Community Services Building

Conference Room and Office Heating, Ventilation and Cooling

Heating, ventilation and air conditioning are provided to the conference room and the office (at the left of the open office) through individual split-system heat pumps located above each space. Outside air and return air are ducted to a common return plenum above the ceiling at the unit. The contract documents do not indicate a closure damper at the outside air duct.

At the time of review, the conference room felt very cold and moisture was evident on the surface of the conference table and other furniture. The conference room door had been left closed. The cooling setpoint, indicated at the local low-voltage thermostat, was set at 69°F and the space temperature showed the same. It appeared the unit was operating to maintain the space temperature below the dewpoint. The setpoint was adjusted and left at 71°F to help reduce the moisture issue.

Community Room/Kitchen Heating, Ventilation and Cooling

Heating and ventilation for the community room is provided through a single unit ventilator and respective relief vent louver. Mechanical cooling is not provided. At the time of review, the UV was not operating. The window was open and a large fan was circulating air in the room.

Community Room Unit Ventilator and Vent

Community Services Building

A Kees range hood is provided above the gas stove. The lights and fan of the hood are controlled through the wall-mounted switch located to the left of the range. The unit mounted switches are left in the on position. The wall-mounted switch is not labeled. An Ansul automatic fire suppression system is installed. It appears the fire suppression system is interlocked with the gas shut-off valves located behind the range.

Range Hood

Hood Light and Fan Switches

Fan switch is in the on position.

Community Services Building

Event Room Heating, Ventilation and Cooling

The heating and ventilation for the event room is provided by two McQuay unit ventilators and respective relief vents located on the west wall. At the time of review, the left-hand unit was operating. The UVs are controlled through the DDC system. Cooling for the space is provided by two window type air conditioning units located in the windows of the north and south walls. At the time of review, the AC units were not operating.

Event Room

View of (1) AC Unit and (1) Unit Ventilator.

The unit ventilators are controlled through the DDC system. Based on review of the right-hand UV, it would appear it is in need of repair.

The black box at the upper left corner of the photo below appears to be a gas detector; perhaps carbon dioxide. With the tubes installed as shown in the photo, it is likely the sensor does not properly monitor the level of gases in the room or the return air from the room.

We would recommend further in-depth review of both unit ventilators and the respective DDC controls.

View of Right-Hand Unit Ventilator End Panel

Community Services Building

Extended School Care, Meeting, Living and Game Rooms
Heating and Ventilation

Heating and ventilation of the extended school care (ESC), meeting, living and game rooms is provided by typical unit ventilators and respective relief vents. At the time of review, the majority of the units were not operating. The displays at many of the DDC system wall sensors were blank possibly indicating the unit ventilators have been turned off. By turning the unit off, power for the unit DDC system controller may have been disconnected as well.

A single window type air conditioner is installed in the living room.

ESC Room "B"

Living Room Air Conditioning Unit and Unit Ventilator

Community Services Building

Computer Lab Heating, Ventilation and Cooling

Heating, ventilation and cooling of the computer lab is provided by a unit ventilator, provided with a mechanical (DX) cooling coil, and the respective relief vents. At the time of review, the unit was not operating and the sensor display was blank.

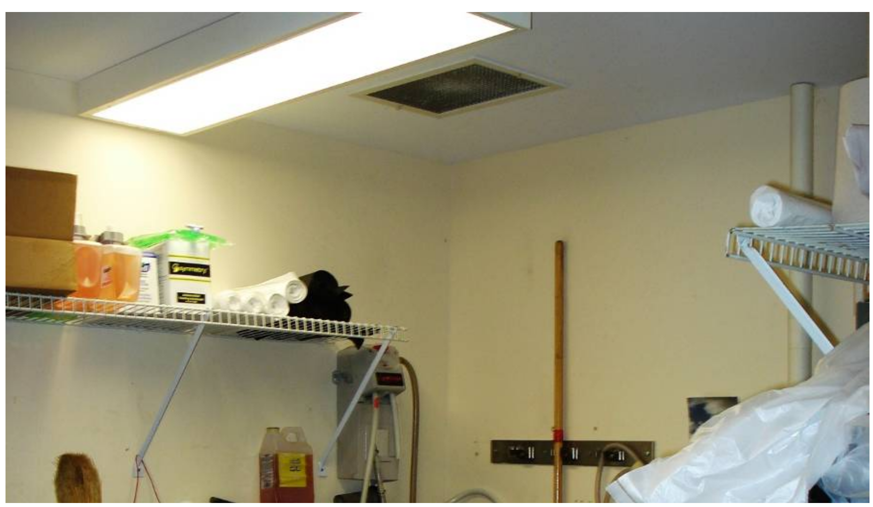
Computer Lab

General Toilet and Janitor Closet Heating and Exhaust

Heating is provided in the toilets and janitor closet by ceiling-mounted radiant panels controlled by individual wall-mounted thermostats. Exhaust is provided in the toilets through individual ceiling-mounted exhaust fans interlocked to operate when the lights are on.

We would recommend the installation of time delay relays at each exhaust fan to allow the fan to remain operating for a delay period after the lights are turned off.

Janitor Closet Ceiling Exhaust Fan



Community Services Building

Elevator Machine Room Exhaust

Exhaust is provided for the elevator machine room by a ceiling-mounted exhaust fan controlled by the local wall-mounted thermostat. The current setpoint is 80°F. Operation was confirmed.

Elevator Machine Room

Exhaust Fan Thermostat

Heating of Lower Spaces

Heating is provided in the lower level spaces by a number of horizontal hot water unit heaters controlled by the respective local wall-mounted thermostats. In many locations, the piping in the lower level is not properly supported.

Typical Horizontal Hot Water Unit Heater

Note clevis hanger upside down on pipe.

Community Services Building

Condensing Units

The condensing units for the Community Service office and computer lab unit ventilators and the conference room and office split-system heat pumps are located on the north side of the building. At each of the condensing units, the refrigerant and power piping is installed on grade and is showing signs of possible damage due to lawn care.

Condensing Units for the Conference Room and Office Heat Pumps

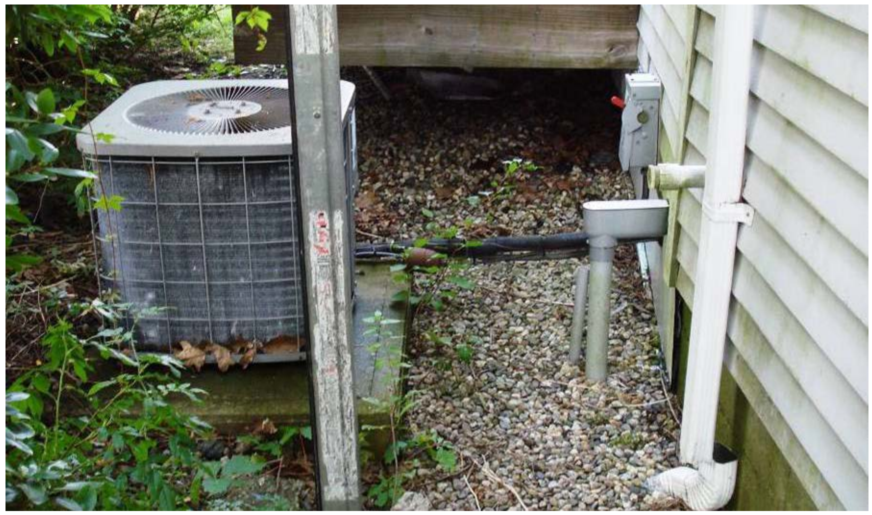
Condensing Units for the Community Service Office Unit Ventilators

Note unit at left has been moved.

Community Services Building

The condensing unit serving the computer lab UV is installed behind the trees near the corner of the building and is showing signs of deterioration and neglect. The fins of the coil are corroding and there is debris on the fan blade.

Condensing Unit for the Computer Lab Unit Ventilator



Liquid Propane Storage Tank

The propane storage tank for the gas range is located next to the building and within 10 feet of the adjacent window and fresh air intake louver. The tank is resting on concrete blocks below the level of the grass. The installation does not meet code.

We would recommend the relocation and installation of the propane tank in accordance with code.

Propane Storage Tank

Community Services Building

Electrical Systems Evaluation

Primary Service and Service Transformer

The Cape Elizabeth Community Services Building is served by a bank of three 120/208V 1 phase 3 wire, 50kVA pole mounted transformers at a CMP riser pole. Metering is via a CT cabinet at the exterior building wall. The meter enclosure was observed to be partially detached from the building.

Central Maine Power Company reports a peak demand of 23kW for the facility. The primary service has ample capacity for the building loads.

The meter enclosure was observed to have partially detached from the building wall.

Primary Service Transformer

Community Services Building

Service Metering

Meter Enclosure Partially Detached

Community Services Building

Service Entrance and Distribution

The main service consists of secondary conductors from the exterior pole mounted transformer bank, which are routed through an exterior CT metering cabinet, as indicted above, feeding an 800A main distribution panel. The main distribution panel is an 800A 120/208V 3 phase 4 wire GE Spectra distribution panelboard with 800A main breaker located in the basement Electrical Room. The main distribution panel feeds multiple panels throughout the Community Center. Distribution equipment appears to be in good condition. Most equipment was upgraded in the 2002 renovation project.

Main Distribution Panel

Community Services Building

Lighting and power panelboards are located throughout the building. Generally, panels have additional spare breakers or space for breakers making future additions possible.

Typical Lighting / Power Panelboard

Community Services Building

Lighting

The Cape Elizabeth Community Services Building is served by a variety of lighting fixtures (lens troffers, parabolic troffers, compact fluorescent downlights, surface wraps). The majority are fluorescent T8 lamps with electronic ballasts. No automatic controls for interior lighting fixtures were observed.

There was yellowing of the lenses observed in the Event space indicating deterioration in the acrylic lenses. There were lenses missing on several fixtures and several fixtures require lens re-adjustment.

Surface Wraps

Lens Troffers

Community Services Building

Compact Fluorescent Downlights

Parabolic Troffer

Community Services Building

Emergency Lighting

Emergency lights and exit signs were observed throughout the building. Emergency lights are surface wall mounted self-contained battery units with remote heads (EBUs). Generally the EBUs are in good condition and coverage is good throughout the building.

Exit signs are internally illuminated. Signs are in good condition; coverage is good throughout the building. One exit sign was observed in the basement area directing emergency exit through a storage space. This is a code violation.

Life Safety Lighting and Exit Signs

Fire Alarm System

The fire alarm system is a Notifier AFP-200. It appears that this system was installed during the 2002 renovation. Notification appliance, smoke detectors and pull stations are located throughout the building. In the event of an alarm, the system reports directly to Portland monitoring / dispatch facility. There was no reported trouble with this system.

Fire Alarm System

Community Services Building

Security Surveillance System

The system is an Integral Technologies system with a mixture of legacy and upgraded video platforms. Server is based in the High School but also serves the Middle School, Pond Cove Elementary School, Police Department and Fire Department. Advance Technology is responsible for maintaining the system, and reports multiple failures of the system, with frequent database corruption and loss of camera function.

Typical Camera

Building #5
Cape Elizabeth Community Services - Architectural

*Priority Scale: #1 = 1 year; #2 = 2 years; #3 = 5 years; #4 = Future

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost	* Priority
A5.1	Flooring Systems	Rubber Flooring at Entrances and stairways. Porcelain tile at main lobby and access corridors. Carpeting and VCT floors in adjoining rooms.	Porcelain tile floor system is constantly being repaired on yearly basis. Grout and tile are cracking and loosening up. All other floor systems are well maintained and in good serviceable condition.	Replace Main Lobby Porcelain Tile Floor and underlayment with new system that will service the building without constant repair.	$25,000.00	3
A5.2	Interior Door and Frames - Hardware	Combination of wood door and metal doors in hollow metal frames. Cross corridor doors are fire rated with magnetic hold backs.	The cross corridor fire rated doors and meeting room pairs all need additional fire rated hardware to be code compliant and replace polish wire glass with fire rated glazing panels. All other doors and frames are in good serviceable condition and the hardware meets current ADA requirements.	Upgrade all fire rated door systems.	$8,000.00	3
A5.3	Exterior Doors and Frames	Hollow metal doors and frames at entrances and personnel doors. Residential size meta garage doors.	Entrance doors and frames are in good serviceable condition. Garage doors are manual operated and are in good condition. First floor entrance to community rooms from under canopy - Doors stick to concrete slab entrance. Concrete slab is not structural - slab on grade and moves with frost. Potential liability issue if doors do not function as emergency exit.	Replace Canopy, support columns and slab with structural slab / foundation columns and roof system. Would recommend major regrading to allow water off the roof better drainage away from building.	$50,000.00	2|3
A5.4	Exterior Walls - Base of wall at Barn	Roof water penetrating products and plywood applied over existing wood framing. Under-drain along perimeter per documents not found.	The materials used in this system below grade are made for this application and will fail and moisture at the old frame system.	Excavate and replace detail against building and install waterproofing system made for this application along with under-drain system. 110 Lnft	$60,000.00	4

Total Potential CIP Costs **$143,000.00**

Building #5
Cape Elizabeth Community Services - Electrical and Technology Systems

*Priority Scale: #1 = 1 year; #2 = 2 years; #3 = 5 years; #4 = Future

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost	* Priority
E5.1	Lighting	Most lights are T8 fluorescent fixtures with electronic ballasts.	Most fixtures are in good condition, however fixtures in the Event space are showing signs of aging and some fixtures need lens / louver replacement.	Replace lenses and louvers as required. Automatic controls should be added to provide manual ON and automatic OFF functions.	$12,000.00	3|4

Total Potential CIP Costs **$12,000.00**

Building #5 - Cape Elizabeth Community Services - Architectural - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
A5.2	Interior - Suspended Ceilings	Suspended ceilings are in reasonably good shape. Some panels throughout the facility have water stains and are damaged from maintenance access to space above	Suspended ceiling for the most part is comprised of 2 x 2 panels. Change out stained and damage panel on a yearly basis.	Replace existing suspended ceiling panels with new panels. This will become more difficult as panels get dirty and aged. Surface will not match - older panels will become darker. Recommend consider changing out entire rooms at same time.	$0.00
A5.3	Interior Walls	Drywall systems at office and meeting rooms, toilets and conference rooms.	Interior drywall system should is in good serviceable condition and should be repainted on an as need requirement.	Repaint interior walls as part of a maintenance of a maintenance program.	$0.00
A5.5	Exterior Walls	Exterior wood clapboard siding and trim corner boards	The paint system on the siding is in good serviceable condition. The coating has been up for 10 years - in the next 5 to 8 years a new coat of paint will be required.	The Block veneer system and EIFS panels should be replaced with a new masonry veneer system of a more durable product	$0.00
A5.8	Roof System Replacement	2 Tab medium weight asphalt roof shingle.	Roof system installed in 2002 - has approximately 10 to 15 years left in lifespan cycle.	Replace Roof shingles when required.	$0.00

Total Potential CIP Costs **$0.00**

Building #5 - Cape Elizabeth Community Services - Mechanical - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
M50.1	Boiler	The boilers are operational and showing signs of leakage from the combustion chamber	There are locations at the boilers where insulation has been charred.	Review overall condition of boiler sections and make repairs as needed.	$0.00
M50.2	Fuel Oil Transfer	Fuel oil lines are installed at the same level as the tank discharge port. Lines are installed under the lower combustion air opening.	The installation of the fuel line is non-code compliant. The raised fuel line pose a tripping hazard and at risk of damage possibly causing oil leakage.	Reinstall the fuel line in accordance with code.	$0.00
M50.3	Heating Hot Water Pumps	The pumps are supported directly from structure without vibration isolation. Pump supports are installed on the system side of the expansion couplings. Many of the pump accessories are showing signs of water leakage.	During normal operation, pump vibration will be transferred through the pump supports to the structure and may become objectionable to occupants in the space above.	Install vibration isolation support devices. Support pumps in accordance with manufacturer's recommendations. Repair water leaks at pump accessories.	$0.00
M50.4	Combustion Air	The lower duct opening is blanked off above the fuel oil line.	The lower opening has been blocked off due to the proximity to the fuel line. The fuel line has been insulated. After the reinstallation of the fuel line, unblock the duct opening.		$0.00

Community Services - Mechanical

M50.5	Boiler Room Ventilation	Ventilation is provided to the boiler room through the supply fan SF-1 and associated motor operated damper. The damper and fan are controlled by the local wall-mounted thermostat.	The thermostat opened the damper. The fan did not operate.		$0.00
M50.6	Domestic Hot Water Heater	The domestic hot water heater in the boiler room is showing signs of leakage and is resting directly on the floor. The heating in the Janitor Closet is resting directly on the floor.	The heater in the boiler room has been leaking. The heater is not installed on a housekeeping pad.	Replace the boiler room heater and install the new heater on a housekeeping pad. Install a leak retention pan and housekeeping pad under the heater in the Janitor Closet	$0.00
M50.7	Ventilation of Open Office, Main Lobby and adjacent Corridors	Cooling is provided in the Office Area. Ventilation is provided in the Lobby or Corridors.	The Open Office area is open to the Lobby through a large wall opening. The two spaces are not conditioned in a similar manor.	Conduct an in depth study of the spaces to determine the best system to provide better comfort for the occupants.	$0.00
M50.8	Outdoor Condensing Unit	The condensing units and associated refrigeration and electrical piping are showing signs of age and damage.	The condensing unit are installed at or near ground level. The refrigeration lines are on grade or below and may be damaged by the lawn care equipment. One unit has been moved from the original location.	Re-install the condensing units in such a manor as to prevent damage.	$0.00
M50.9	LP Gas Storage Tank	The tank installation is non-code compliant. The tank is located directly adjacent to the building.	The tank is too close to the building, is not installed on a suitable surface.	Relocated and re-install the LP gas tank in accordance with code.	$0.00

Total Potential CIP Costs **$0.00**

Building #5 - Cape Elizabeth Community Services - Electrical and Technology Systems - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
E50.1	Primary Service	Bank of (3) 50kVA 1phase pole mounted transformers.	Service is in good condition and sized appropriately for the building loads.	Maintain existing system. Periodically perform infrared scan of system	$5,000.00
E50.2	Service entrance and Distribution	800A 120/208V 3phase 4 wire main distribution board feeds downstream panelboards	Distribution system is in good condition and sized appropriately for the building loads.	Maintain existing system. Periodically perform infrared scan of system (See above)	$0.00
E50.3	Emergency Lighting	Emergency lighting is achieved with Self-Contained Emergency Battery Units with remote heads. Exit signs are internally illuminated.	Emergency battery units and exit signs appear to be in serviceable condition.	No action required	$0.00
E50.4	Fire Alarm System	Notifier AFP-200 system installed during 2002 construction.	System is in serviceable condition. No trouble reported.	No action required	$0.00
E50.5	Security Surveillance System	Older Integral Technologies system. Mixture of legacy and upgraded video platforms.	The camera system has encountered multiple camera failures and data corruption.	Install new surveillance system cameras and cabling, integrate with the new system in use in other town buildings.	$10,000.00

Total Potential CIP Costs **$15,000.00**

Town Hall

Building Description

Town Hall

Exterior - Interior

Originally built in the 1920s
Additions added on – no information available
Renovated in 1994 – minor interior work
Combination of wood stud bearing walls, wood floor framing and roof framing
Wood clapboard siding
Mix of existing windows and new windows
Asphalt roof shingles – 2-tab
Existing wood stud walls with plaster surface
Renovated stud walls with drywall
VCT floors, carpet, wood floors and exposed hard plaster ceilings as well as suspended ceilings in office areas
Building is fully sprinklered

Mechanical

Heat generation – H.B. Smith cast iron steam boiler, 2003
Oil storage – Inside, two 275 gal. tanks
Combustion Air – Tjernlund commercial forced air, packaged pressure control
Breeching/Chimney – galvanized steel, non-insulated / brick masonry, unlined
Domestic hot water generation – oil-fire hot water heater
Direct Digital Control (DDC) – Invensys, Schneider Electric, partial
Heating – steam radiators, individual electric or self-contained radiator valves
Electric Heating – electric baseboard radiation, electric unit heaters
Zone Control – DDC system electronic zone valves

Town Hall

Mechanical (continued)	Ventilation – operable windows Air Conditioning – window-type air conditioners Toilet Exhaust – individual toilet exhaust fans vented to outside of building IT Room Cooling – split AC unit
Electrical	Main Distribution Panel – 400A, 120/240V 1-phase, 3-wire Standby Generator – 100kW - propane Emergency Lighting – self-contained battery units. All lights on standby generator. Fire Alarm System – Notifier System 500 Intrusion System – none Security Surveillance System – none Voice/Phone/Intercom/Paging – modified VOIP

Town Hall

Architectural Systems Evaluation

Interior Systems Descriptions

Town Hall

The interior of the building is a mix of original wood stud and plaster and newer renovated spaces with stud and drywall. The flooring is an original wood trip flooring system blind nailed into a wood board decking system.

All the framing for the floors and roof is rough sawn wood. The interior has been well kept up with the exception of the basement level.

The exterior clapboard siding has been recently painted with new corner boards and the windows are being replaced partially on a yearly basis.

The asphalt shingled roof needs replacement and our understanding is that some of that roof has been replaced and the remainder will be replaced as the budget allows.

There were a few cracked plastered walls that would need repair at the time repainting of the space is required. The carpet is worn in many locations and should be replaced. Recently removed carpet in one office was not replaced but the existing original wood floor was refinished. We would encourage more of this renovation type work throughout the building as it fits well with the character and the age of the building.

Interior Systems Evaluation – Code Items

Stairwells

There are main stairwells on each side of the building that are original to the building with wood handrails, dividing wall and wood stair treads. The wood treads have been carpeted over and the carpet is worn. The stairwells have accessible rooms with doors off the stairwells.

Recommend a major upgrade to the stairwells to bring them into compliance with the life Safety Code.

The exit doors to these stairwells on the second floor have had new one hour rated fire doors installed as part of the 2004 renovation and are compliant with code.

Town Hall

Original Stairwell Construction with Door to Storage Room

Exit Stairwell

Non-Compliant Stairs

Town Hall

Exit Stairwell

Non-Compliant Stairs

Basement Level Conference / Cafeteria

There is a space being utilized as a conference/cafeteria area. Mounted on the wall is a sign noting a maximum capacity of 57. This space has only one means of egress to an open stairwell. This means of egress has no door separating the space from the stair. Per Life Safety Code, two means of egress are required from this sub grade level space.

Recommend consultation with the local Fire Department about the functional use of this space and the egress issues.

Sub Grade Space in Basement

Conference/Cafeteria

Town Hall

Second Floor Conference Room

In the second floor conference room there is a door that leads to a fire escape to the ground level. There is no exit sign over the door and has panic hardware suggesting another means of egress.

The occupant load of this office suite is at such a level where this suggested means of egress door is not required. With the exit door not required, the metal fire escape could be removed from the building enhancing the appearance.

Conference Room Exit Door

Exit Door

Exterior Fire Escape

Exterior Fire Escape From Conference Room

Town Hall

Toilet Rooms

There are a number of toilet room accessories that need to be relocated to be in compliance with ADA.

There is one toilet room off the council chambers that is approximately 6" short of the required clearance width but has more than enough distance in the length to compensate for this shortfall. Plus the fact it is an existing space does show the intent to comply.

Recommend relocation to be in compliance.

Paper Towel Dispenser too Close to Sink

Tissue Dispenser too High

Grab Bar Needs to be Higher

Town Hall

Drain Line in Conflict with Knee Clearance

Conference Room

Main conference room behind the council bench. The only means of access is through a stairwell.

Recommend when stairwells are renovated for code compliance that this door issue be addressed.

Conference Room Next to Council Chambers

Town Hall

Elevator

Elevator does meet the intent of ADA. Access to this vertical accessibility system is accomplished by an accessible route though is very remote relative to the defined ADA entrance to the building.. Improved signage would be an assist to the public not familiar with the building. The size of the elevator is not current with the 2005 ADA requirements. The car as it stands is grandfathered until the time it would be relocated then it will be required by law to be sized up accordingly.

Elevator Entrance From the Council Chambers

Side Entrance
ADA Entrance

The door and frame at this entrance needs to be replaced. Both door and frame are rusted and the exterior trim, although recently painted, should be replaced.

Side Entrance Door

Town Hall

Interior Doors and Frames

Those doors and frames that were not replaced as part of the renovation project are showing chips along the bottom edge.

These chips cannot be repaired and eventually the veneer will start to delaminate away from the core.

Recommend door replacement with kick plates as the maintenance budget would allow.

Chipped Bottom Edge of Doors

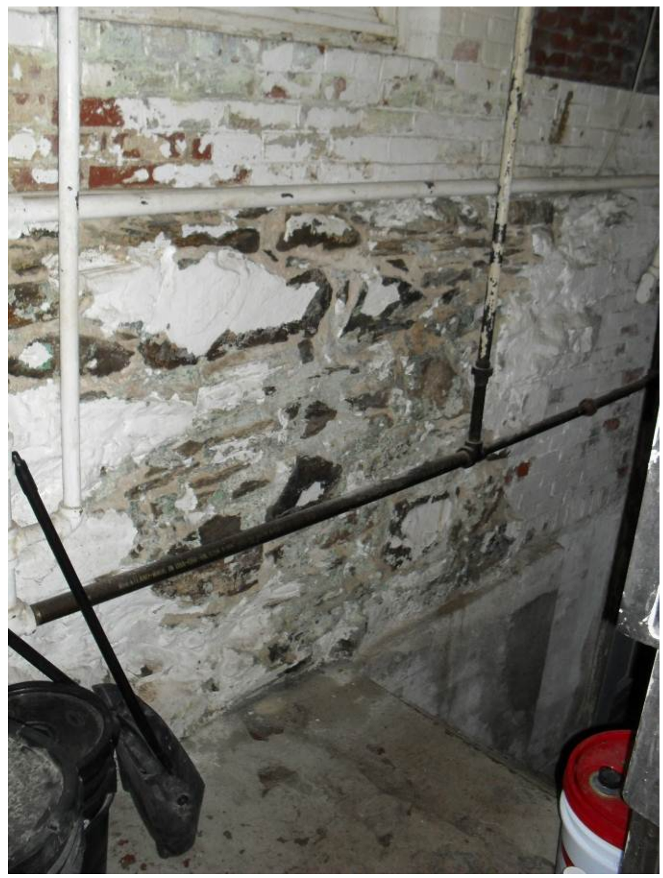
Town Hall

Basement Foundation Walls

The basement foundation walls are a combination of stone and brick which is consistent with this type of construction for this age building. In a number of locations there is evidence of water penetration through the walls. This is a tough issue to resolve, especially with a pitched roof system around the building.

The correct way to stop water through the stone wall is to apply an exterior water proof system over the stone in conjunction with a new underdrain system draining out from the building.

Stone Wall Foundation with Evidence of Water Penetration



Town Hall

Typical floor framing with rough framing and diagonal boarding.

Floor Framing

Exterior

The exterior of the building is showing a lot of recent upgrade work relative to painting, windows, flashing, and trim work. We would recommend a maintenance program to maintain the appearance of this building for the town.

Recently Repaired and Repainted Front

Town Hall

Side Entrance

Rear of the Building

Town Hall

Public Side Entrance

Partial roof area that has some areas that have been replaced. There are also badly deteriorated shingles that need to be replaced.

Town Hall

Town Hall Roof Structure

Through a series of additions to the town hall over the years, the roof structure has ended up being a complicated series of framing structures over the original framing. A series of beams have been extended up carrying new wood frame structures which where plated down to the original structure. The spans of beams appear to be very long for the live loads required by current code. The connection of the main carrying beams is very suspect relative to bracing. The ability of the actual connection to transfer loads down the building is also questionable. Existing wood shingles were left in place when the additions were made. This has left a tremendous amount of combustible material in that attic even though it is sprinklered. With the bad wiring condition of this building the potential for a serious fire event is very strong.

There is also open ended ductwork, which we believe is part of the old gravity vent system when the building was used as a school. The shafts to these vent locations extend from the first floor to the roof making for a direct pathway in the event of a fire.

We would recommend that a very thorough structural analysis be requested before any more roof replacements or repairs are conducted. As an option to that structural analysis, exploring the concept of removing the structure and providing a new framed roof and insulation system at the attic floor line for improved energy efficiency for the building should be considered.

Attic Framing - Beams

Town Hall

Attic Beam Connection and Abandoned Ductwork

Exterior Walls

Currently there is a window replacement program in progress. If the goal is to upgrade and renovate the building, we would recommend new blown-in insulation installed from the interior side of the exterior walls. This insulation system for the exterior walls will increase the energy efficiency of the building.

Town Hall

Mechanical Systems Evaluation

Boiler Room

The boiler room does not meet code.

The heating steam is generated from one H.B. Smith series 19A cast iron boiler with a Carlin oil-fired burner. According to the boiler nameplate, the net heat output of the boiler is 2,817 sq. ft. and, based on the State of Maine inspection certificate, was installed in 2003. The boiler appears to be in good condition. The water showing in the sight glass is clear and the burner is interlocked with the Direct Digital Control (DDC) system.

We would recommend re-trimming the steam boiler for conversion to hot water, removal of all steam heating system components and piping, and the installation of a hot water heating system.

Boiler Plant

Boiler 1

Town Hall

The fuel oil storage does not meet code. Fuel oil is stored in two oil tanks located in a room adjacent to the boiler room. The oil fill pipe is installed closer than two feet to the adjacent window and does not meet code. Fuel lines are installed along the wall, in front of the door and routed into the boiler room through an open hole in the brick wall.

We would recommend the relocation of the fuel oil storage in accordance with code.

Oil Tank

Fuel Oil Lines

Town Hall

The emergency switches do not meet code. Two emergency oil burner switches are located outside of the boiler room indicating there may be two separate safety circuits. Code would require a single safety circuit to shut down all devices.

Oil Burner Emergency Switches

Right switch is labeled for hot water.

The breeching and chimney system does not meet code. The boiler and domestic hot water heater breechings appear to be a combination of single-wall un-insulated galvanized steel and older single-wall riveted un-insulated steel. The boiler and domestic hot water heater enter the breeching at the same level. The masonry chimney is unlined and does not meet code.

Town Hall

Combustion air is provided through the dedicated Tjernlund Products model PAI-6 commercial combustion air intake fan rigidly mounted directly to the boiler room ceiling. Interlock between the fan and the boilers is unknown.

Forced Combustion Air Fan

Condensate from the steam heating system is returned to the duplex pump condensate receiver tank located adjacent to the boiler. The condensate tank has been recently replaced. The tank is vented to the boiler room and does not meet code.

Town Hall

The boiler room is not code compliant.

There are numerous penetrations and openings in the ceiling and walls. A non-fire rated wall has been installed to provide storage space for various combustible paper products. The door to the adjacent spaces is not fire rated.

Typical Hole on Plaster Ceiling

Typical Boiler Room Wall Penetrations

Town Hall

Noncompliant Wall for Storage Room

Note: Combustible products on shelving.

Noncompliant Wall and Door to Adjacent Areas

Town Hall

The boiler room Barber Colman/Invensys Direct Digital Control (DDC) panel controls the boiler room equipment and is accessible through the signal software.

Direct Digital Control System Components and Heating Hot Water Pump Starters

Steam is provided to the building steam system through individual zone valves controlled through the DDC system.

Steam System Zone Valves

Town Hall

Domestic hot water is generated from an oil-fired hot water heater located in the boiler room. The age and overall condition of the heater is unknown.

Oil-fired Domestic Hot Water Heater

Heating of General Office Spaces

Heating is provided in the building through old-style cast iron steam radiators or cast iron baseboard radiation with a variety of self-contained automatic control valves, electric automatic steam control valves, or no control valves. When the system is heating, the steam radiators would be very hot. Some of the old wiring has been abandoned in place. Some of the wiring connections to the electric valves are exposed. As a whole, there is a substantial lack of controllability.

Example of Self-Contained Control Valve on Cast Iron Radiator

Notice exposed abandoned control wiring at valve.

Town Hall

Example of Self-Contained Valve on Cast Iron Baseboard Radiation

Example of Electric Automatic Control Valve on Cast Iron Radiator

Notice the exposed wiring connection to the right of the valve.

Example of Steam Radiator Without an Automatic Control Valve

Town Hall

In some locations, heating is provided by local individual electric baseboard radiation or ceiling-hung electric unit heaters controlled by the respective wall-mounted electric thermostat.

Example of Electric Baseboard Radiation

Example of Electric Unit Heater

As noted above, we would recommend the removal of all steam heating system components and the installation of a hot water heating system.

Town Hall

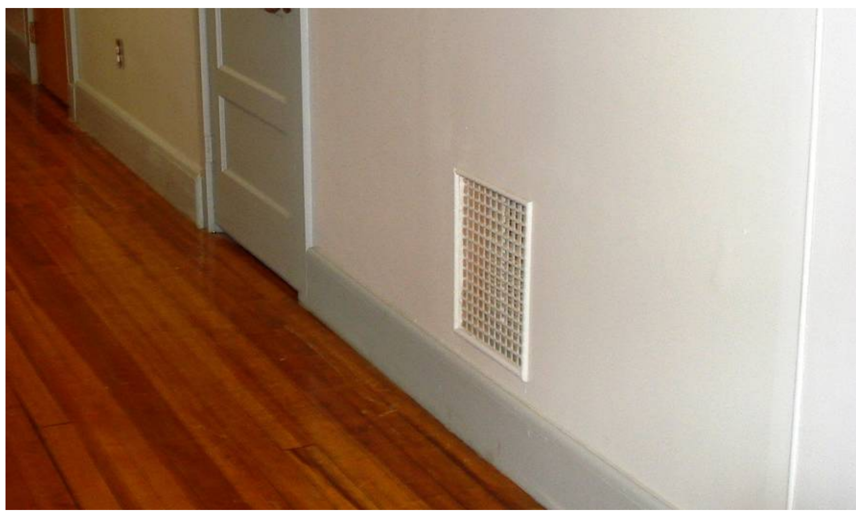
Ventilation and Cooling of General Office Spaces

Based on the abandoned sheet metal ductwork in the attic space, and the wall vent in the second floor corridor, at some point in the history of the building, it would appear there was some means of ventilation provided.

Currently, in general, there is no mechanical ventilation provided. Occupants open windows for ventilation and fresh air. Cooling is provided in certain areas through the use of window-mounted air conditioning units installed in the operable windows or more permanently installed through the exterior walls of the building.

We would recommend the installation of an engineered ventilation and air conditioning system.

View of Old Wall Vent



View of Abandoned Ductwork in Attic

Town Hall

Example of Window Air Conditioning Unit Installed in Window

General Toilet and School Department Copier/Print Room Exhaust

Exhaust is provided in the toilets and the print/copy room through individual ceiling-mounted exhaust fans interlocked to operate when the lights are on. The discharge of each fan is either ducted directly to outside of the building through the exterior wall caps or a common duct to the roof vent. It is unknown if each exhaust fan is provided with a backdraft damper.

We would recommend the installation of time delay relays at each exhaust fan to allow the fan to remain operating for a delay period after the lights are turned off.

View of Toilet Ceiling Exhaust Fan

Town Hall

View of Exhaust Fan Roof Vent

In one of the council chambers toilets there is a section of power and cable wiring installed under the pipe insulation.

We would recommend proper installation of the wiring.

View of Power Wiring and Cable Installed Under Pipe Insulation

Town Hall

Elevator Machine Room Exhaust

At the time of review, we did not have access to the elevator machine room. Code would require temperature control ventilation for the machine room.

Recommend further view and the possible installation of the proper exhaust in accordance with code.

Council Chambers and Associated Spaces Heating, Ventilation

Heating is provided in the Council Chambers through three cast iron steam radiators. There is ventilation serving the chambers or associated spaces. A separate study is being considered to provide ventilation and air conditioning to the Chambers.

Ground Floor I/T Tech Conference Room Ventilation

There is no ventilation provided to the tech conference room. Heating is provided through ceiling-mounted cast iron radiators similar to the one at the end of the small corridor. A small dehumidifier has been provided to reduce the humidity levels. The capacity of the dehumidifier is unknown. The discharge of the container is installed through the wall. Termination of the other end is unknown.

We would recommend the installation of proper ventilation for the basement tech conference areas.

View of Tech Conference Room and Corridor

Town Hall

View of Dehumidifier Located in Tech Conference Room

I/T or Data Office Cooling

Cooling is provided in the I/T office through a dedicated Fujitsu 3-ton split air conditioning system installed through one of the basement windows. The insulation value of the window in-fill is unknown. At the time of review, the unit was operating. The condensate from the indoor unit is piped to the outside.

I/T Office Split Air Conditioning System

In-Door Evaporator Unit

Town Hall

I/T Office Split Air Conditioning System

Outdoor Condensing Unit

Unknown Dryer Ventilation

Through the wall of the room to the left of the ground floor elevator entry, we observed flexible duct and an inline fan typically used for dryer exhaust. If this is being used as drier exhaust, is does not meet code.

We would recommend further review and possible corrective action.

View of Space to the Left of the Elevator

Town Hall

View of Possible Dryer Duct Installed Through Wall

View of Drier-Type In-Line Exhaust Fan

Town Hall

Electrical Systems Evaluation

Primary Service and Service Transformer

The Cape Elizabeth Town Hall is served by a residential style 240V 1 phase 3 wire, 50kVA pole mounted transformer with overhead service drop to a 400A (320 class) self-contained meter mounted to the exterior of the building.

Central Maine Power Company does not track peak demand for this type of service but estimates 20kW peak demand. Primary service has ample capacity for the building loads.

Primary Service Transformer

Town Hall

Self-Contained Utility Meter

Town Hall

Service Entrance and Distribution

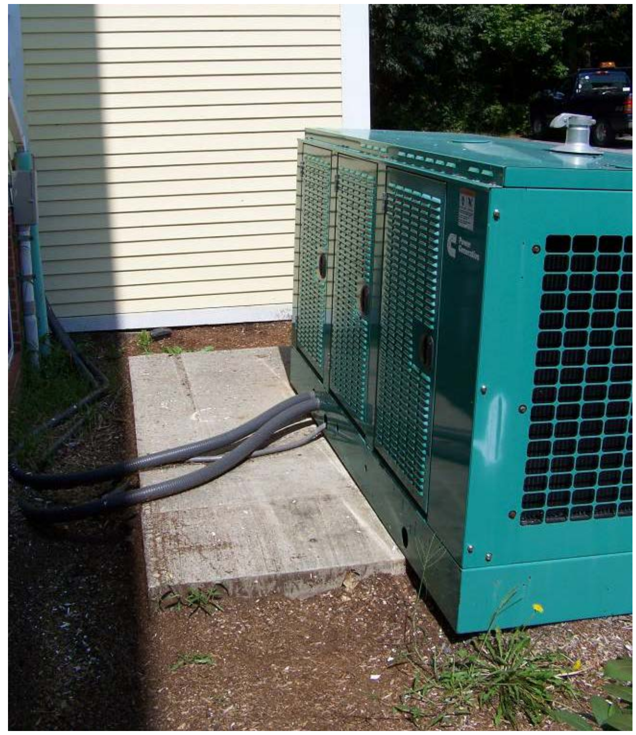
The main service consists of secondary conductors from the exterior meter directly feeding the normal side of a 400A automatic transfer switch; no service disconnecting means was observed. National Electrical Code requires service entrance conductors to be provided with a service disconnecting means. Currently there is no way to safely perform maintenance on the transfer switch without having Central Maine Power Company disconnect power to the building.

The standby portion of the automatic transfer switch is connected to an exterior 100kW 120/240V 1 phase 3 wire self-contained Cummins Onan propane gas generator. The generator was observed to have shifted from its concrete base.

Main Panel & Automatic Transfer Switch

Town Hall

Standby Generator



Town Hall

The main distribution panel is a 400A 120/240V 1 phase 3 wire Crouse-Hinds panelboard located in Cape Courier lease space in the basement. The main distribution panel is fed by the automatic transfer switch and in turn feeds multiple panels throughout the Town Hall. Distribution equipment varies in age and condition from very old Federal Pacific load centers to newer Siemens panels.
Some of the distribution equipment appears to be in poor condition and many different wiring types were observed including knob and tube, cloth covered, romex (some with undersized ground conductors), metal clad, and single conductors in conduit. Many code violations were observed including multiple open junction boxes, undersized grounding conductor, minimum clearances not met, and unsupported cables.

Main Distribution Panel

Town Hall

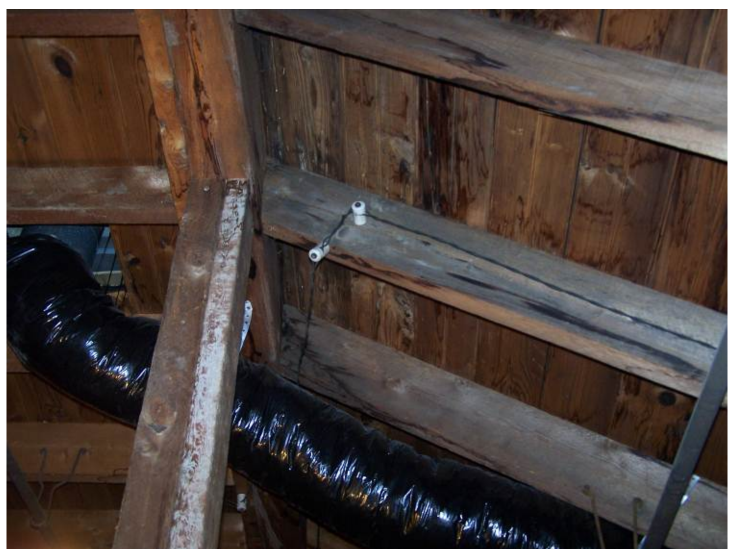
Wiring above Main Distribution Panel

Federal Pacific Stab-Lok Loadcenter

Town Hall

Open Junction Box

Knob and Tube wiring



Town Hall

Lighting

The Cape Elizabeth Town Hall is served by a variety of lighting fixtures (lens troffers, parabolic troffers, compact fluorescent downlights, incandescent fixtures, surface wraps, pendant bowls). Many fixtures have been updated to T8 and bent tube T8 lamps. Some areas are equipped with multiple level switching and several occupancy sensor control devices were observed.

Lens Troffers

Council Chambers

Town Hall

Incandescent Downlights

Emergency Lighting

Emergency lighting was observed throughout the building. These units are surface wall mounted self-contained battery units with remote heads (EBUs). Generally EBUs are in serviceable condition with some updates. Several are showing signs of age. Coverage is good in most areas.

Life Safety Lighting

Town Hall

Exit signs observed are internally illuminated units with integral battery. Signs are in good condition. Coverage is good.

Exit Signs

Fire Alarm System

The Town Hall is served by a fire alarm system. The fire alarm system is a Notifier Sytem-500. Notification appliances, smoke detectors and pull stations are located throughout the building. In the event of an alarm, the system reports directly to Portland monitoring / dispatch facility. Coverage appears good in most areas although several areas were observed to have insufficient notification appliance coverage.

Fire Alarm System

Building #6
Cape Elizabeth Town Hall - Architectural

***Priority Scale:** #1 = 1 year
#2 = 2 years
#3 = 5 years
#4 = Future

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost	* Priority
A6.1	Flooring Systems	VCT floors at offices and storage, carpeting in hallways and offices, ceramic tile in toilet rooms and exposed refinished wood floors in some areas	Carpeting is worn and in need of replacement. VCT and other floor systems are in good serviceable condition.	Replace all carpeted floors - install rubber flooring in stairwells in lieu of carpet.	$25,000.00	3
A6.2	Interior Door and Frames	A mix of hollow metal doors and frames and hollow metal frames with wood doors	Majority of the wood doors are old birch veneer doors and delaminating due to the dry environment and should be replaced.	Replace Old Birch veneer doors and upgrade lockset at same time.	$30,000.00	3
A6.3	Elevator	Hydraulic elevator with 2 sided car to 4 levels.	The elevator meets all current ADA and Life Safety code requirements. May want to consider updating audible alarm and panel to current code.	Upgrade control panel and audible alarms at each level.	$25,000.00	4
A6.4	Interior Stairwells	Wood stair treads, risers and framing. System are not	Stairs and doors to stairwell are non compliant for existing from upper and lower levels.	Replace wood stairwells with new Code compliant stair system and railings.	$100,000.00	3
A6.5	Exterior Doors and Frames	Front entrance doors have been recently repaired and repainted. Exterior public entrances are hollow metal frames and doors.	Side entrance doors and frames - ADA entrance are rusted and do not work compliant. Use of this entrance for ADA accessibility is non compliant on a few items along with the ramp entrance.	Replace frame, door. Entrance trim work and columns and ramp system to create compliant ADA accessibility ramp and door entrance.	$30,000.00	2
A6.6	Exterior Fire Escape and Door	Metal exit door and panic hardware at second level to metal. fire escape stair	At one point per the use at that time this fire escape stair may have been required. Based on current use of building and second level layout this means of egress is not required.	Remove metal fire escape stair and exit door. Fill in opening with window and siding to match up with current siding.	$35,000.00	4
A6.7	Foundation System	Brick bearing wall on grouted stone foundation	Moisture and water entry are traditional issues with these types of foundations. Any interior waterproofing system will not hold up. Only way to solve water and moisture entry issues is apply an external waterproofing system and protection board with a product made for this application.	Install new perimeter waterproofing system around all sides of building.	$80,000.00	4

Fire Station - Building Envelope and Roof

A6.8	Roof System	Asphalt shingles on plywood decking - pitched. EPDM roof membrane on roof insulation over plywood decking and wood framing.	Asphalt shingles - some areas have been recently replaced - some areas are in need of replacement. Structural wood framing system is a series of add ons, scabbed frames and attached in a questionable structural configuration.	**Strongly recommend a study of the entire roof structural system before any future shingle replacement. The wood structure is very questionable relative current applicable loads and potentially will require a large re-structure project to remove and replace framing with new shingles and EPDM roofing.**	$25,000.00	

Total Potential CIP Costs **$350,000.00**

Building #6
Cape Elizabeth Town Hall - Mechanical

***Priority Scale:**
#1 = 1 year
#2 = 2 years
#3 = 5 years
#4 = Future

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost	* Priority
M6.1	Steam Boiler Heating System Conversion	The boiler room is non-code compliant. The low pressure steam boiler was installed 2003, in good condition	In general steam boilers are a highly inefficient means of heating a building. Convert heating system to hot water to maximize efficiency	Re-trim the existing Smith boiler to convert to hot water service. Remove all steam heating system components. Install heating hot water system.	$245,000.00	3
M6.2	Space Heating Temperature Control	The control of the space heating is provided by a variety of components and systems.	The space temperature controls are a hodge-podge of system and lacks adequate controllability.	Expand the existing DDC system to include all temperature control functions.	$15,000.00	2
M6.3	Ventilation and Air Conditioning	Mechanical ventilation is not provided in the building. Air conditioning is provided through window air conditioners installed in the windows or through the walls.	Window air conditioning units may be effective in cooling small areas but are inefficient for cooling larger office areas.	Install an engineered ventilation and air conditioning system.	$350,000.00	3

Total Potential CIP Costs **$610,000.00**

Building #6
Cape Elizabeth Town Hall - Electrical

***Priority Scale:** #1 = 1 year
#2 = 2 years
#3 = 5 years
#4 = Future

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost	* Priority
E6.1	Service entrance and Distribution	400A main panel feeds multiple panels throughout the building. Panels have been added at various times. Some distribution equipment is very old and unserviceable.	Distribution system needs to be replaced with new equipment. Main distribution equipment should not be in locked lease space.	Remove existing distribution and replace with new in central electrical room.	$40,000.00	1
E6.2	Power Wiring	Many different wiring types including knob and tube, cloth covered romex, romex with undersized ground.	Many code violations. Many instances of unsupported wiring, open junction boxes. Some of the wiring poses a fire hazard.	Remove power wiring and replace with new.	$70,000.00	1
E6.3	Lighting	Most lights are T8 fluorescent fixtures with electronic ballasts but there a variety of other fixtures including some incandescent.	Most fixtures are in good condition.	Replace incandescent fixtures with compact fluorescent.	$10,000.00	1
E6.4	Security Surveillance System	No surveillance system in use in the building, although the new system servicing several other town buildings is located in server room in basement.	No system installed	Install new surveillance system cameras and cabling, integrate with the new system in use in other town buildings.	$10,000.00	4

Total Potential CIP Costs **$130,000.00**

Building #6 - Cape Elizabeth Town Hall - Architectural - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
A60.1	Interior - Suspended Ceilings	Suspended Panels ceilings are in reasonably good shape. Exposed flat plaster ceiling in other locations.	Suspended ceiling for the most part is comprised of 2 x 4 panels. Change out stained and damage panel on a yearly basis.	Replace existing suspended ceiling panels with new panels. This will become more difficult as panels get dirty and aged. Surface will not match - older panels will become darker. Recommend consider changing out entire rooms at same time.	$0.00
A60.2	Interior Walls	Combination of new drywall and old plaster wall especially exterior walls.	Interior drywall system should be considered for repainting. Exterior masonry wall at the garage is in the process of being repair and the paint will be patched up to match.	Repaint interior walls as part of a maintenance of a maintenance program.	$0.00
A60.3	Door Hardware	Door Hardware has lever style door handles with the appropriate exit devices at all exits.	The door hardware system meets all current ADA and Life Safety code requirements.	No action required - Hardware should be updated when door is replaced	$0.00
A60.4	Exterior Walls	Rough wood stud bearing walls with 1x boarding sheathing and wood clapboards. Interior face is a 1" +/- plaster wall direct to the studs.	The exterior walls are in good condition with new painting and trim boards.	No Action Required.	$0.00

Total Potential CIP Costs **$0.00**

Building #6 - Cape Elizabeth Town Hall - Mechanical - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
M60.1	Fuel Oil Storage	Fuel oil is stored in two oil tanks located an the adjacent non-fire rated space.	The current fuel oil storage does not meet code	Relocate the fuel oil storage in accordance with codes	$4,500.00
M60.2	Condensate Receiver Tank and Pumps	The condensate pump set and associated tank appear to be relatively new.	The condensate pump set and receiver tank appear to be in good condition. The vent pipe is installed to vent directly into the boiler room and is non-code compliant.	Install the vent pipe to vent outside of the building in accordance with code. If the steam system is replaced with hot water, remove the condensate tank and all associated controls, piping and wiring.	$500.00
M60.3	Exhaust Fans	Exhaust fans are provided for the toilets and other areas. The fan discharge is ducted to outdoors.	The toilet exhaust fans are interlocked to cycle on and off with the respective lights. Code would require the fans remain on after the space is vacated and the lights are off.	Install the necessary components to delay the off function of the fans.	$500.00

Total Potential CIP Costs **$5,500.00**

Building #6 - Cape Elizabeth Town Hall - Electrical and Technology Systems - Operations & Maintenance Budget Items

ITEM	System	System Status	Assessment of System	Recommended Maintenance System Replacement	Probable Cost
E60.1	Primary Service	Primary is supplied by a 120/240V 50kVA 1phase pole mounted transformer. Service is a residential style 400A (320 class) service.	Service is in good condition and sized appropriately for the building loads.	No action required	$0.00
E60.2	Standby System	100kW generator and 400A transfer switch provide standby power to entire building.	System is in good condition. Generator is too close to building and has been shifted from its concrete pad. No main disconnect before the transfer switch.	Relocate generator to a more remote location. Re-feed transfer switch via main disconnect.	$10,000.00
E60.3	Emergency Lighting	Emergency lighting is achieved with Self-Contained Emergency Battery Units with remote heads. Exit signs are internally illuminated.	Emergency battery units and exit signs appear to be in serviceable condition.	No action required	$0.00
E60.4	Fire Alarm System	Notifier System-500 system. Installation date unknown.	System is in serviceable condition. No trouble reported.	No action required	$0.00

Total Potential CIP Costs **$10,000.00**

Cape Elizabeth Transfer Station

Transfer Station

The building is a pre-engineered metal framed structure on a structural concrete slab and foundation. The metal siding and roof panels are exposed fastened to purlins between the column structures. The building design accommodates a lower compactor trailer system for trash removal to another site. The interior steel frame is showing some minor rust but no visible short term issues with the structure.

There are some minor siding panel repairs that should be done to keep the elements out even though water penetration will not be detrimental to the structure. Also the exterior personnel door could be replaced due to a large dent in the outside skin.

We would recommend an approximate $5,000 budget be carried for this remedial work. We would also recommend a budget of $100,000 to replace the compactor support frame.

Front View

Cape Elizabeth Transfer Station

Interior View

View of Compactor

Cape Elizabeth Transfer Station

Side View

Swap Shop

The swap shop buildings are constructed of 2 x 6 wood stud framing on a concrete foundation. The roof framing consists of a wood truss system bearing on exterior stud walls with a plywood roof sheathing and asphalt shingles. The exterior wood siding is a plywood panel directly nailed to the studs. The corner and soffit boards are all wood trim systems.

The roof shingles are in good shape and should last for a long period of time. The plywood siding and wood trim systems are in various stages of deterioration and should be considered for replacement within a short period of time.

We would recommend an approximate $25,000 budget should be carried for this remedial work.

Front View

Cape Elizabeth Transfer Station

Side View

Back View

Interior View

Bus Garage – School Buses

Building and Site Description

Bus Garage

As part of this study the Director of Facilities and Transportation requested we look at the potential of providing a school bus carport for the town's school buses which are now parked at the public works facility. The task was to see if we could provide such a parking carport for the town's 13 buses at its present parking location.

Attached is a scheme for this facility which would consist of a concrete foundation and steel structure open on the sides and ends with a roof system pitched to the back to draw water off the roof. The scheme shows a layout of an open ended structure where buses would drive around and enter the bus-port through a new driveway and allow them to face out for the next morning.

This structure would likely need a DEP permit process for surface drainage and site reconfiguration. The structure would have no electrical or heat systems but we would recommend a night lighting system and camera surveillance for security purposes.

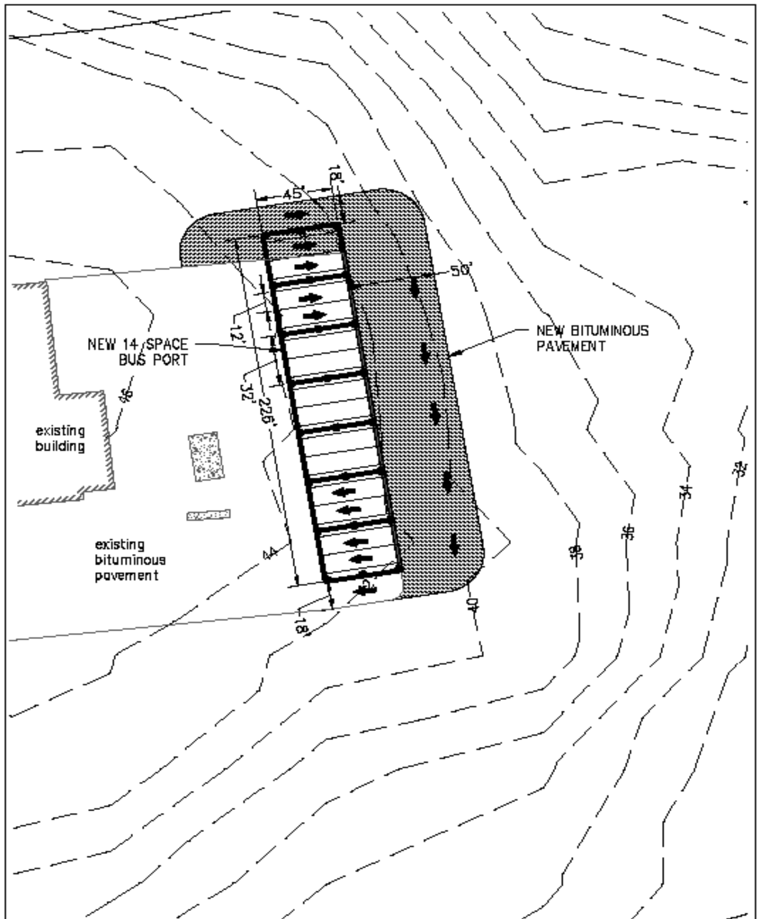
The probable cost for this structure would be in the range of $250,000 to $300,000 construction cost.

Location Plan

CAPE ELIZABETH PUBLIC WORKS BUILDING

Bus Garage – School Buses

Plan – Bus Carport



NEW 14 SPACE BUS PORT

Building Security Systems

Elementary, Middle and High School

System Description

High School

Security

The issue of building security for the schools as part of our observations should be looked at to bring the schools up to current state standards for schools. Both school complexes lack a comprehensive security system for monitoring the building entrances, the corridors, visitors to the building and a building lockdown system in case of an event within the building.

The current state standard for a security system at a school is a combination of various technology systems on a single security software backbone. All of these systems can be integrated on a web-based package. By mounting the systems on the school web, the monitoring and control for the system can be mounted to any PC inside and outside the building, thus allowing for all parties responsible for the safety of the building and its occupants to monitor and respond in case of an event.

A typical comprehensive system of components would consist of an electronic door intrusion and lock down system that monitors exterior doors for door open, electronic locks at the entrance and key corridor locations to be closed off to sectionalize the building in case of an event. A secure visitor's entrance vestibule is a key component to tracking all visitors to the building and avoids unknown people within the building. In case of an event when the school would have to be put in lockdown, the cross corridor doors and stairwells would close and sectionalize the building and allow access only to sections through a card access system. This may involve also revising the locks on classroom doors to a manual secure latch set. Securing all classrooms from corridors would be part of the lock down process, thus allowing administration to declare any section of the building clear upon a

Building Security Systems

walk through. The last component for the system would be a widespread interior and exterior camera surveillance system.

The layout of complexes would dictate a large amount of cameras to cover all key and blind areas. The administration offices for both of these building complexes are not located with security in mind; offices are remote to the layout and not central. The responsible for security and monitoring lies with the administration staff and comprehensive surveillance camera. Electronic locks will greatly improve their ability to provide that security of a modern school.

We know that the software infrastructure for this type of system is currently being reviewed and priced for potential installment. To reach the level of security noted you should consider this upgrade as an add-on to you current web-based software system.

High School Security System Upgrade

Door Intrusion System	$100,000	
Electronic Locks/ Card Access	$90,000	
Additional Cameras & Programming	$40,000	
Total Potential Security Upgrade Cost		$230,000

Pond Cove Elementary / Middle School Upgrade

Door Intrusion System	$100,000	
Electronic Locks/ Card Access	$125,000	
Additional Cameras & Programming	$40,000	
Total Potential Security Upgrade Cost		$265,000

Educational Program Study

Pond Cove Elementary/Middle School

Elementary School

The Town of Cape Elizabeth School Department has requested a program study with a goal to review space availability for future programming such as full-day kindergarten. Based on current and projected enrollments, this will require five to six kindergarten classrooms. Our study indicates that in order to achieve this program change, kindergarten classrooms will have to be relocated, or the current space renovated. Currently the four kindergarten classrooms are located in the wing which was renovated in 2004. The school department directive is to reallocate current spaces within the school versus adding another addition.

According to current enrollments, student classroom sizes are within caps in all grades.

Current Enrollment for 2012/2013:

- Kindergarten (18 student per room cap) 72 total students with half days, 36 students per half, 4 classrooms, 9 students per classroom
- 1st Grade (20 student per room cap) 126 students, 6 classrooms, 21 students per classroom
- 2nd Grade (20 student per room cap) 105 students, 6 classrooms, 17-18 students per classroom
- 3rd Grade (22 student per room cap) 120 students, 6 classrooms, 20 students per classroom
- 4th Grade (22 student per room cap) 127 students, 6 classrooms, 21-22 students per classroom

Projected Enrollment for 2020:

- Kindergarten (18 student per room cap) 84 students, 6 classrooms, 14 students per classroom
- 1st Grade (20 student per room cap) 96 students, 6 classrooms, 16 students per classroom
- 2nd Grade (20 student per room cap) 100 students, 6 classrooms, 16-17 students per classroom
- 3rd Grade (22 student per room cap) 102 students, 6 classrooms, 17 students per classroom
- 4th Grade (22 student per room cap) 104 students, 6 classrooms, 17 students per classroom

The current enrollment does allow you to increase the student per classroom number but still remain under the cap. One second grade classroom could be utilized for new future educational programs. Following the projected enrollments for 2020, first and second grades could each be reduced by one classroom and still be under the 20 student per classroom cap. This again would increase the student per classroom numbers, but allow some extra classroom space for future educational programs.

Educational Program Study

The current classroom organization of the elementary school is grouped by grade with some special ed. classrooms inserted into each grade cluster. The current cafetorium is shared by both the middle and elementary school (see plans A1 and A2).

In the study, it has been found that there is not an adequate teacher workroom and conference room space in the building to accommodate the teaching staff. Because of the linear layout of the plan, teachers need to leave their grade cluster to utilize the spaces that are available. As part of any future space reallocation this need should be considered.

Recommended classroom sizes per Department of Education State Standards:

- Kindergarten recommended 1000 sf.
  Current 840 sf. average
- First-Fourth grades recommended 800 sf.
  Current 1st grade: 745 sf. average
  Current 2nd grade: 750 sf. average
  Current 3rd grade: 730 sf. average
  Current 4th grade: 835 sf. Average

Recommendations for changing to all day kindergarten classes are to relocate kindergarten to the current first grade wing, or to renovate the kindergarten wing. The current kindergarten wing was constructed to allow for a future second story. This level cannot be used for either the kindergarten or first grade classrooms as dictated by Life Safety Code. We do not consider moving the kindergarten classrooms to the fourth grade wing an option for security and monitoring reasons. With the current number of students, five to six kindergarten classrooms are required.

Moving to the first grade wing, the kindergarten classrooms would be closer to administrators, the building entry and exit, and bus drop-off. This allows for better security and safety of the students. The current classroom sizes in this wing are, however, smaller than the current kindergarten classrooms, going from 840 sf. currently to 745 sf., 255 sf. under the state standard. The first grade classrooms would then move to the current kindergarten wing, which would need to be renovated to accommodate the six first grade classrooms (see Option 1 A3 for layout).

A second option is to renovate the current kindergarten wing with six kindergarten classrooms. This renovation could include adding toilets within the classrooms and could allow for maintaining a larger classroom size. This would keep the kindergarten students further away from administration (see Option 2 A4 for layout).

Educational Program Study

Middle School

The Town of Cape Elizabeth school departments' other request was to look at options for relocating special education programs currently located in the basement of the middle school. The current basement location is not designed for, and is not adequate for classroom space. There is no ventilation system, only one means of egress, and the special ed. students are separated from the rest of the student body. These special ed. spaces should be integrated within the team spaces rather than contained to one area of the building, as they are now.

If the town looks at the possibility that will require an addition to the middle school eliminating the original 1934 building from school programming, then a more sizable new addition would be required.

The middle school populations and classroom sizes are:
Current Enrollment for 2012/2013:

- 5th Grade (25 student per room cap) 120 students, 6 classrooms, 20 students per classroom
- 6th Grade (25 student per room cap) 145 students, 8 classrooms, 18 students per classroom
- 7th Grade (25 student per room cap) 119 students, 5 classrooms, 23-24 students per classroom
- 8th Grade (25 student per room cap) 142 students, 6 classrooms, 23-24 students per classroom

Projected Enrollment for 2020:

- 5th Grade (25 student per room cap) 94 students, 6 classrooms, 15-16 students per classroom
- 6th Grade (25 student per room cap) 104 students, 8 classrooms, 13 students per classroom
- 7th Grade (25 student per room cap) 104 students, 5 classrooms, 20-21 students per classroom
- 8th Grade (25 student per room cap) 116 students, 6 classrooms, 19-20 students per classroom

Per the current enrollments, one fifth grade classroom and two sixth grade classrooms could be utilized for new educational program space and both grades would remain under student cap of 25 students per classroom. Following the projected enrollments for 2020, two fifth grade classrooms, three sixth grade classrooms and one eighth grade classroom could be used for future educational program needs. All grades would be under the cap of 25 students per classroom. If the number of students does accurately follow the projected path, this could potentially free up 4,200 sf. of classroom space in the middle school for future educational programs in 2020.

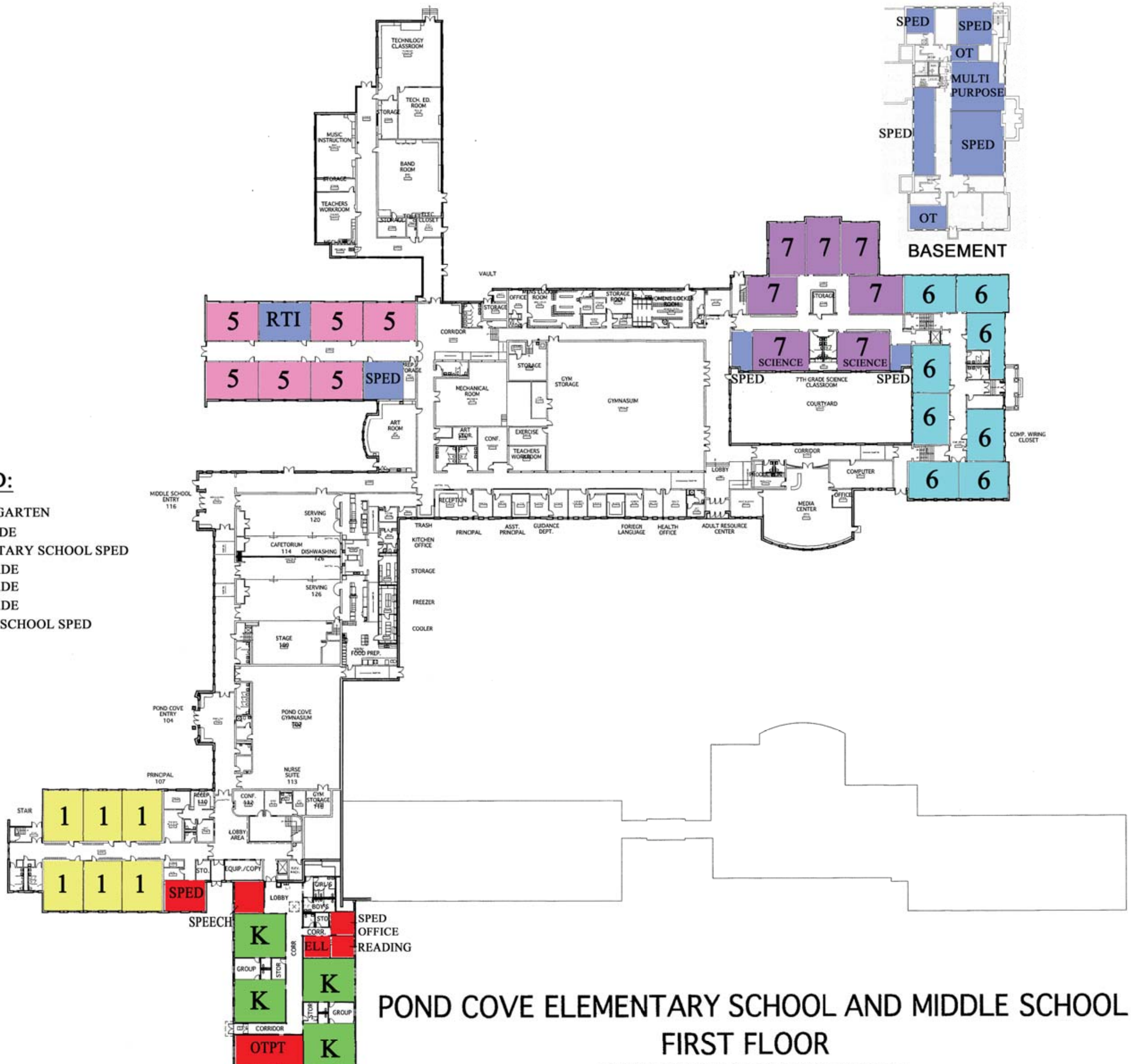
Educational Program Study

Recommended classroom sizes per Dept. of Education State Standards:

- Fifth-Eighth Grades Recommended 800 sf.
  Current 5th grade: 750 sf. average
  Current 6th grade: 670 sf. average
  Current 7th grade: 710 sf. average
  Current 8th grade: 688 sf. average

There is a total of 4,400 sf. of special ed. Program space located in the basement now. At this time, there is not enough square footage available elsewhere in the building to relocate this program without an addition to the building.

In order to solve the issue of relocating the special ed. programs, more informational meetings and discussions with the school board are necessary to find a solution and to reach a final decision.



LEGEND:

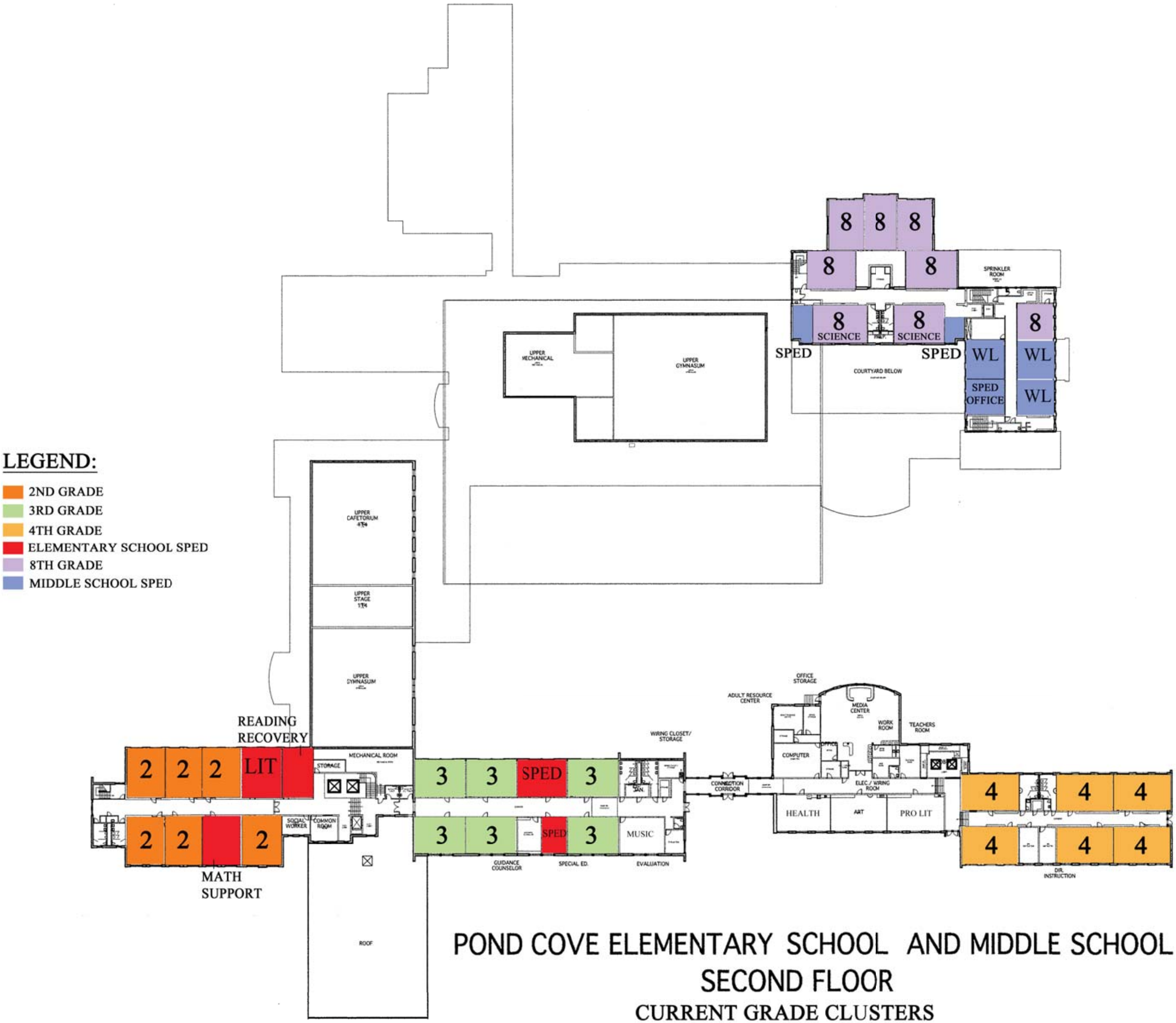
- KINDERGARTEN
- 1ST GRADE
- ELEMENTARY SCHOOL SPED
- 5TH GRADE
- 6TH GRADE
- 7TH GRADE
- MIDDLE SCHOOL SPED

POND COVE ELEMENTARY SCHOOL AND MIDDLE SCHOOL

FIRST FLOOR

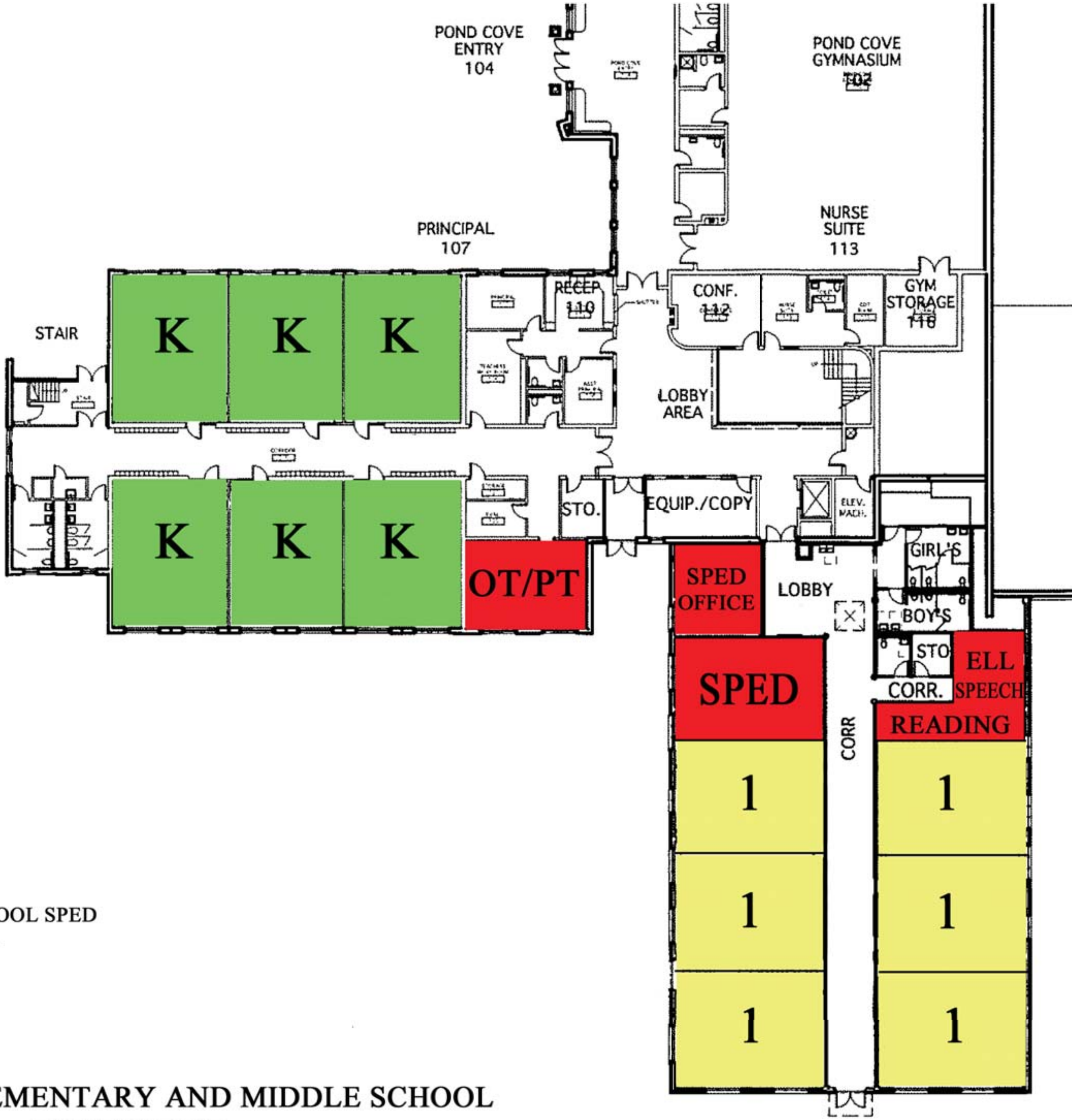
CURRENT GRADE CLUSTERS

A1



POND COVE ELEMENTARY SCHOOL AND MIDDLE SCHOOL
SECOND FLOOR
CURRENT GRADE CLUSTERS

A2

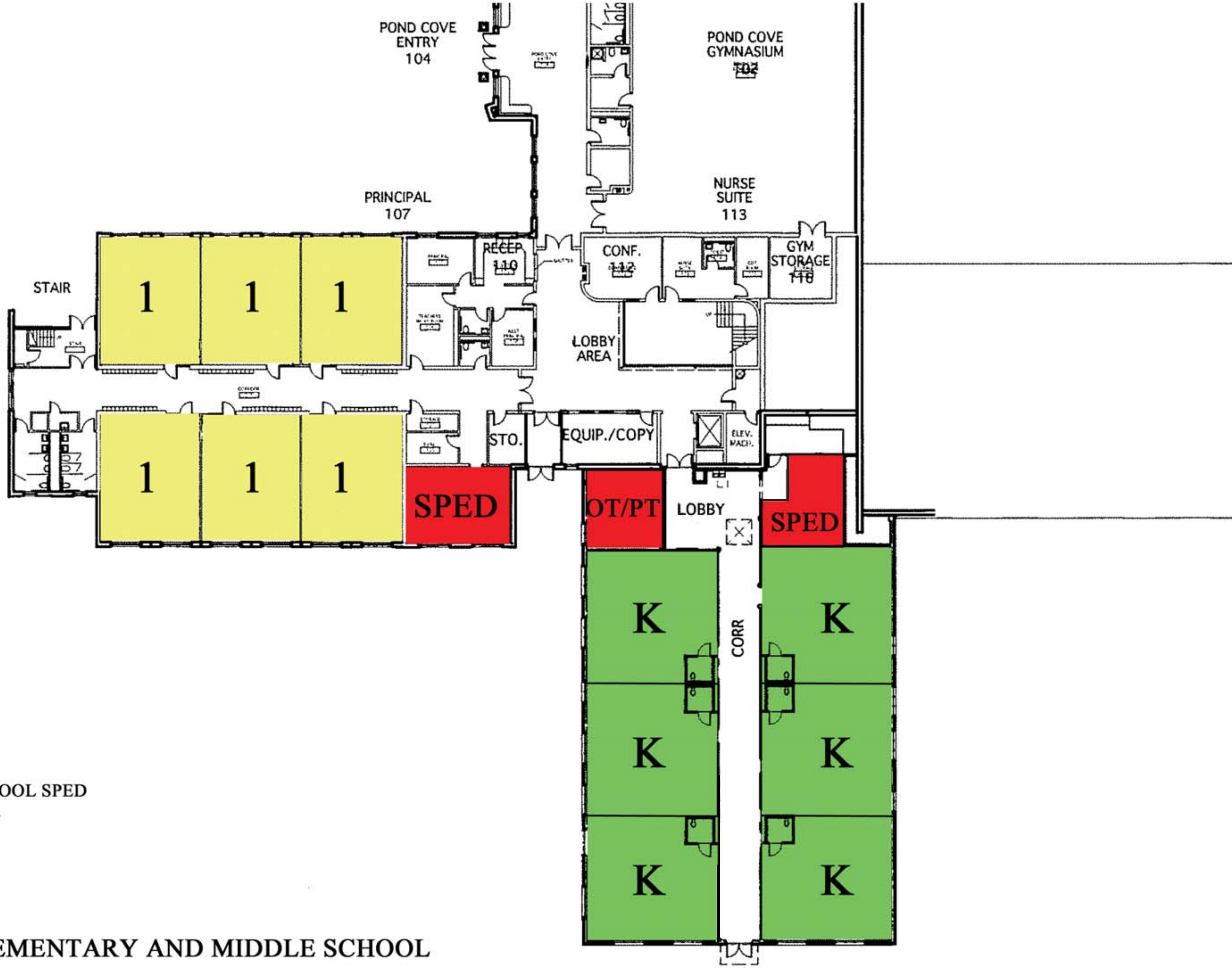


LEGEND:

- KINDERGARTEN
- 1ST GRADE
- ELEMENTARY SCHOOL SPED

POND COVE ELEMENTARY AND MIDDLE SCHOOL
FIRST FLOOR
OPTION 1

A3

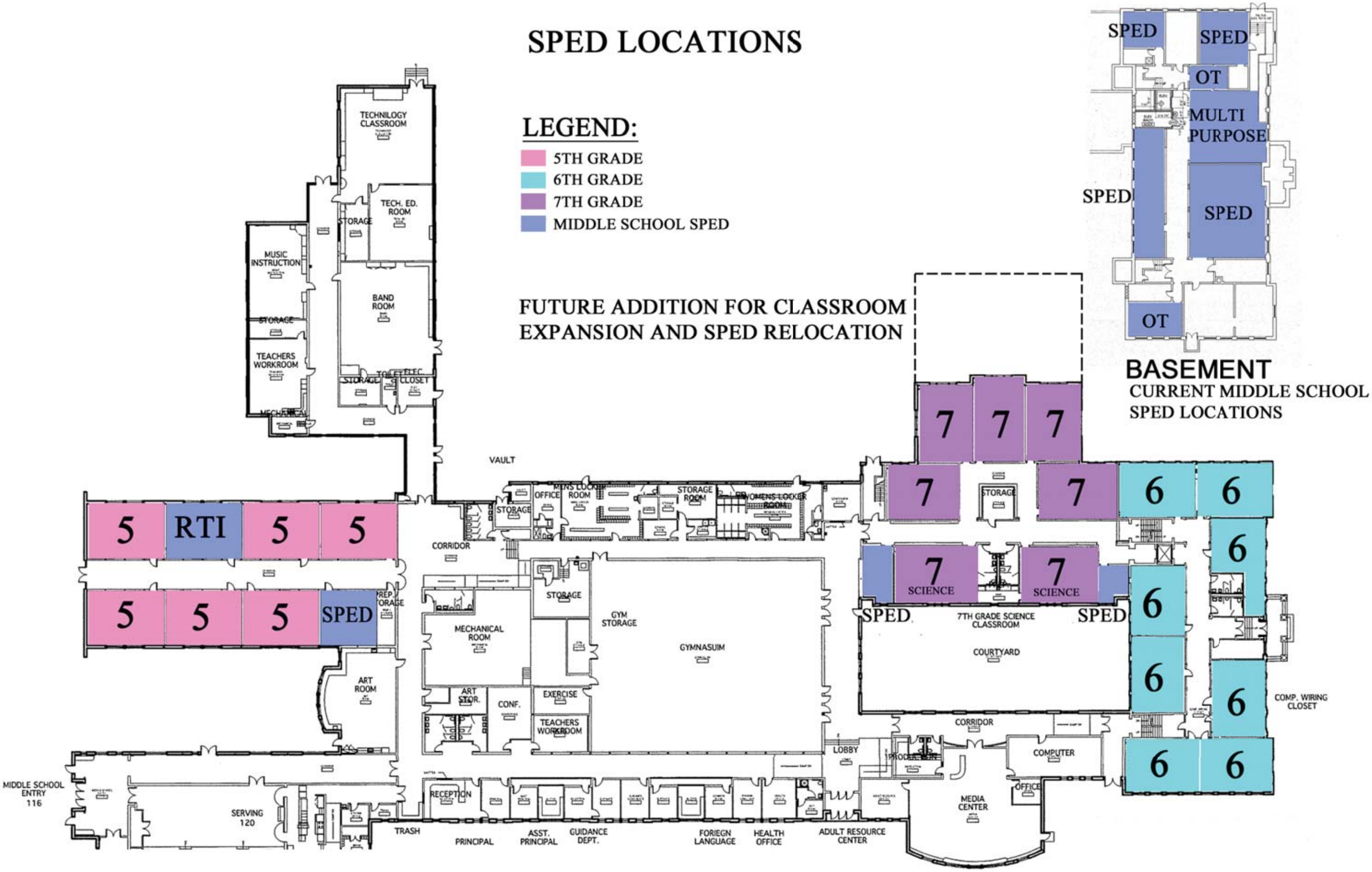


LEGEND:

- KINDERGARTEN
- 1ST GRADE
- ELEMENTARY SCHOOL SPED

POND COVE ELEMENTARY AND MIDDLE SCHOOL
FIRST FLOOR
OPTION 2

SPED LOCATIONS



POND COVE ELEMENTARY AND MIDDLE SCHOOL
FIRST FLOOR

A5

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Meetlng Notes

Date
9/6/12

Project
Cape Elizabeth Middle/Elementary School Study
Project No. 12580

Subject

Attendees
Meredith Nadeau - Superintendent of Schools
Greg Marles - Town of Cape Elizabeth Facility Director
Dan Robbins - Harriman

Goal:

- Move to all day kindergarten classes
- Reconfigure and reuse current classroom spaces.

Current:

- Half day kindergarten utilizing 4 classrooms.
- 4 classroom addition for kindergarten in 2004
- Space is remote from administration on side of complex.
- Layout K-4 buildings are very spread out in linear fashion.
- Try to utilize existing classrooms and reconfigure versus new addition.
- Existing kindergarten addition has been prepped for 2nd floor addition. Kindergarten and first grades cannot be placed on 2nd floor level per Life Safety Code.
- Current classroom utilization rate unknown.
- Enrollment projection document and end of year enrollment shows steady decline in population in previous years and upcoming years through 2020.
- Current student/classroom ratio – caps
  Kindergarten – 18 students per room
  1&2 – 20 students per room
  3&4 – 22 students per room
  5-12 – 25 students per room

Existing:

- Floor plan room labels conflict with current room use, i.e. science classroom is now a health classroom. Floor plans will be reviewed and current room function designation will be noted.

Program Items:

- Teachers organization by:
  Grades K-4
  Teams 5-12
- Special Ed program in lower level of 1934 building, Multi-purpose room, 3 Special Ed rooms, and 2 OT rooms, relocate to other location in Middle School.
- Check classroom size for Middle/Elementary student
- Dedicated Special Ed program spaces to be spread out amongst plan and not clustered.
- Teachers need more conference and workroom space.

If written notice is not received within two weeks of receipt, the above meeting notes represent an accurate summary of the meeting and its conclusions.

Middle / Elementary School

Date: 9/17/12	EXISTING SCHOOL NAME:	Cape Elizabeth Middle/ Elementary School Project No. 12580
	NUMBER OF STUDENTS	1,104
Daniel W. Cecil, AIA	GRADE CONFIGURATION	K-8

	PROGRAM OF SPACE NEEDS	EXISTING FACILITY						NOTES
	Subject	**# of Rooms**	**@**	**Room Size**	**sf**	**=**	**Area (sf)**	
A	**1948 Original Primary School**							
	Corridor A121	1	@		sf	=	0	
	Storage A116	1	@		sf	=	0	
	Workroom A125	1	@		sf	=	0	
	Toilet A114,A117,A118	4	@		sf	=	0	
	4th Grade Classroom A113	1	@	696	sf	=	696	
	Janitor A115	1	@		sf	=	0	
	4th Grade Classroom A119, A120	2	@	825	sf	=	1,650	
	4th Grade Classroom A122, A123	2	@	900	sf	=	1,800	
	Phy. Room A124	1	@		sf	=	0	
	4th Grade Classroom A126	1	@	862	sf	=	862	
							5,008	
B	**1955 Primary School Addition**							
	Corridor A100, B100, B110	3	@		sf	=	0	
	Computer A101	1	@		sf	=	0	
	Adult Resource Center A103	1	@		sf	=	0	
	Office/ Storage A104	1	@		sf	=	0	
	Media Center A105	1	@		sf	=	0	
	Workroom A105A	1	@		sf	=	0	
	Office A106	1	@		sf	=	0	
	Electrical Closet A108	1	@		sf	=	0	
	Aide Room A109	1	@		sf	=	0	
	Teachers Room A111	1	@		sf	=	0	
	Lobby A112	1	@		sf	=	0	
	Professional & Lit A127	1	@	830	sf	=	830	
	Art A128	1	@	840	sf	=	840	
	Health A129	1	@	828	sf	=	828	
	3rd Grade Classroom B101, B102,							
	B104, B114, B117, B118	6	@	730	sf	=	4,380	
	Special Ed B103	1	@	725	sf	=	725	
	Toilet A110, B105, B107, B111	3	@		sf	=	0	
	Storage A102,A107, B108, B109	2	@		sf	=	0	
	Social Worker B112	1	@		sf	=	0	
	Music Classroom B113	1	@		sf	=	0	
	Special Ed B115	1	@	356	sf	=	356	
	Guidence B 116	1	@		sf	=		
							7,959	

Middle / Elementary School

Date: 9/17/12	EXISTING SCHOOL NAME:	Cape Elizabeth Middle/ Elementary School Project No. 12580
	NUMBER OF STUDENTS	1,104
Daniel W. Cecil, AIA	GRADE CONFIGURATION	K-8

	PROGRAM OF SPACE NEEDS	EXISTING FACILITY						NOTES
	Subject	# of Rooms	@	Room Size	sf	=	Area (sf)	
C	**1962 Lunt Building First Floor**							
	Corridor C100	1	@		sf	=	0	
	Mechanical Room C101	1	@		sf	=	0	
	Stair C102	1	@		sf	=	0	
	1st Grade Classroom C103, C104, C105							
	C127, C128, C129	6	@	745	sf	=	4,470	
	Toilet C130, C132	2	@		sf	=	0	
	Janitor C131	1	@		sf	=	0	
							4,470	
D	**1962 Lunt Building Second Floor**							
	Corridor C200	1	@		sf	=	0	
	Stair C201	1	@		sf	=	0	
	2nd Grade Classroom C202, C203,							
	C204, C219, C220	5	@	745	sf	=	3,725	
	Toilet C221, C223	2	@		sf	=	0	
	Math Support C218	1	@	745	sf	=	745	
	Janitor C222	1	@		sf	=	0	
							4,470	
E	**2004 Addition Kindergarten Wing**							
	Equiptment/ Copy 100	1	@		sf	=		
	Storage 101,109,114,123	4	@		sf	=		
	Elevator Lobby 102	1	@		sf	=		
	Lobby 103	1	@		sf	=		
	Speech 104	1	@	351	sf	=	351	
	Kindergarten Classroom 105,113,118	3	@	840	sf	=	2,520	
	Kindergarten Classroom 110	1	@	826	sf	=	826	
	IC Group 106	1	@	215	sf	=	215	
	Toilet 107,108,115,116,122,125,126	7	@		sf	=		
	Corridor 111,121,128	3	@		sf	=		
	OT/PT 112	1	@	854	sf	=	854	
	K. Group 117	1	@	204	sf	=	204	
	ELL 119	1	@	198	sf	=	198	
	Reading 120	1	@	220	sf	=	220	
	SPED Office 124	1	@	222	sf	=	222	
	Mechanical Room 127	1	@		sf	=		
							5,610	

Middle / Elementary School

Date: 9/17/12	EXISTING SCHOOL NAME:	Cape Elizabeth Middle/ Elementary School Project No. 12580
	NUMBER OF STUDENTS	1,104
Daniel W. Cecil, AIA	GRADE CONFIGURATION	K-8

	PROGRAM OF SPACE NEEDS	EXISTING FACILITY						NOTES
	Subject	# of Rooms	@	Room Size	sf	=	Area (sf)	
F	**1994 Addition First Floor**							
	Corridor D100, D107, D117, D118, D130	5	@		sf	=	0	
	Storage C126, D101, D112, D113,							
	D115, D119	6	@		sf	=	0	
	Pond Cove Gymnasium D102	1	@		sf	=	0	
	Gym Office D103	1	@		sf	=	0	
	Pond Cove Entry D104	1	@		sf	=	0	
	Toilet C109, C111, C114, D105,							
	D106, D125	6	@		sf	=	0	
	Stair D108, D111	2	@		sf	=	0	
	Stage D109	1	@		sf	=	0	
	Green Room D110	1	@		sf	=	0	
	Cafetorium D114	1	@		sf	=	0	
	Middle School Entry D116	1	@		sf	=	0	
	Serving D120, D128	2	@		sf	=	0	
	Kitchen Office D121	1	@		sf	=	0	
	Trash Room D122	1	@		sf	=	0	
	Electrical D123	1	@		sf	=	0	
	Break Room D124	1	@		sf	=	0	
	Dishwashing D126	1	@		sf	=	0	
	Janitor C117, D127	2	@		sf	=	0	
	Freezer/ Cooler Recess D129	1	@		sf	=	0	
	Food Prep D131	1	@		sf	=	0	
	Vestibule D132	1	@		sf	=	0	
	Teacher Workroom C106	1	@		sf	=	0	
	Principal C107	1	@		sf	=	0	
	Teacher Leader C108	1	@		sf	=	0	
	Reception C110	1	@		sf	=	0	
	Conference C112	1	@		sf	=	0	
	Nurse C113	1	@		sf	=	0	
	Cot Room C115	1	@		sf	=	0	
	Gym Storage C116	1	@		sf	=	0	
	Elevator Machine Room C118	1	@		sf	=	0	
	Lobby C120	1	@		sf	=	0	
	Special Ed C124	1	@	475	sf	=	475	
	Evalualtion C125	1	@		sf	=	0	
							475	
G	**1994 Addition Second Floor**							
	Corridor C207, C209, C212	3	@		sf	=	0	

Middle / Elementary School

Date: 9/17/12	EXISTING SCHOOL NAME:	Cape Elizabeth Middle/ Elementary School Project No. 12580
	NUMBER OF STUDENTS	1,104
Daniel W. Cecil, AIA	GRADE CONFIGURATION	K-8

	PROGRAM OF SPACE NEEDS	EXISTING FACILITY						NOTES
	Subject	# of Rooms	@	Room Size	sf	=	Area (sf)	
	Lit Resource C205	1	@	775	sf	=	775	
	Reading Recovery C206	1	@	589	sf	=	589	
	Storage C208	1	@		sf	=	0	
	Mechanical Room C210	1	@		sf	=	0	
	Toilet C211, C211A	2	@		sf	=	0	
	Elevator Lobby C213, C214	2	@		sf	=	0	
	Teacher Room C215	1	@		sf	=	0	
	Social Worker C216	1	@		sf	=	0	
	2nd Grade Classroom C217	1	@	775	sf	=	775	
							2,139	
H	**Allied Arts Building**							
	Corridor F101, F102, F106	3	@		sf	=	0	
	Electrical F103	1	@		sf	=	0	
	Toilet F104	1	@		sf	=	0	
	Mechanical Room F105	1	@		sf	=	0	
	Teacher Workroom F107	1	@		sf	=	0	
	Foodservice Director F108	1	@		sf	=	0	
	Music Instruction F109	1	@		sf	=	0	
	Technology Education F110	1	@		sf	=	0	
	Health F111	1	@		sf	=	0	
	Storage F112, F114	2	@		sf	=	0	
	Band Practice F113	1	@		sf	=	0	
							0	
I	**Original Middle School Basement**							
	Elevator Machine Room G001	1	@		sf	=	0	
	Multi-purpose Room G002	1	@	992	sf	=	992	
	Special Ed G003	1	@	1,248	sf	=	1,248	
	Storage G004, G006	2	@		sf	=	0	
	OT G005	1	@	350	sf	=	350	
	Special Ed G007	1	@	648	sf	=	648	
	Special Ed G008	1	@	255	sf	=	255	
	Office G009	1	@	385	sf	=	385	
	Special Ed G010	1	@	385	sf	=	385	
	OT G011	1	@	144	sf	=	144	
							4,407	

Middle / Elementary School

Date: 9/17/12	EXISTING SCHOOL NAME:	Cape Elizabeth Middle/ Elementary School Project No. 12580	
		NUMBER OF STUDENTS	1,104
Daniel W. Cecil, AIA		GRADE CONFIGURATION	K-8

	PROGRAM OF SPACE NEEDS	EXISTING FACILITY						NOTES
	Subject	# of Rooms	@	Room Size	sf	=	Area (sf)	
J	**Original Middle School First Floor**							
	Stair G118, G137	2	@		sf	=	0	
	Corridor G120, G128, G136	3	@		sf	=	0	
	Storage G124	1	@		sf	=	0	
	Toilet G125, G126	2	@		sf	=	0	
	6th Grade Classroom G121, G122, G131	3	@	690	sf	=	2,070	
	Classroom G123	1	@	575	sf	=	575	
	6th Grade Classroom G127	1	@	638	sf	=	638	
	Vestibule G129	1	@		sf	=	0	
	Prep/Storage G130	1	@		sf	=	0	
	6th Grade Classroom G132, G134, G135	3	@	660	sf	=	1,980	
	Janitor G133	1	@		sf	=	0	
							5,263	
K	**Original Middle School Second Floor**							
	Stair G219, G227	2	@		sf	=	0	
	Corridor G221, G226	2	@		sf	=	0	
	Storage G222A, G225	2	@		sf	=	0	
	Toilet G220, G226A	2	@		sf	=	0	
	Elevator Lobby G218	2	@		sf	=	0	
	Locker Room G221A	1	@		sf	=	0	
	8th Grade Classroom G222	1	@	495	sf	=	495	
	WL G223	1	@	393	sf	=	393	
	WL G224, G229	2	@	695	sf	=	1,390	
	SPED Office G228	1	@	690	sf	=	690	
							2,968	
L	**1962 Middle School Addition**							
	Corridor E101, E138	2	@		sf	=	0	
	5th Grade Classroom E102, E104, E106							
	E107, E108	5	@	745	sf	=	3,725	
	RTI E103	1	@	745	sf	=	745	
	5th Grade Classroom E105	1	@	775	sf	=	775	
	Special Ed E109	1	@	552	sf	=	552	
	Storage E110, E115, E126, E129	4	@		sf	=	0	
	Vestibule E113	1	@		sf	=	0	
	Janitor E130	1	@		sf	=	0	
	Closet E119	1	@		sf	=	0	
	Mens Locker Room E121, E122	2	@		sf	=	0	
	Shower E124	1	@		sf	=	0	

Middle / Elementary School

Date: 9/17/12	EXISTING SCHOOL NAME:	Cape Elizabeth Middle/ Elementary School Project No. 12580
	NUMBER OF STUDENTS	1,104
Daniel W. Cecil, AIA	GRADE CONFIGURATION	K-8

	PROGRAM OF SPACE NEEDS	EXISTING FACILITY						NOTES
	Subject	# of Rooms	@	Room Size	sf	=	Area (sf)	
	Coaches Room E125	1	@		sf	=	0	
	Uniform Storage E128	1	@		sf	=	0	
	Womans Locker Room E131	1	@		sf	=	0	
	Shower E132	1	@		sf	=	0	
	Office E120, E134	1	@		sf	=	0	
	Concession Room E137	1	@		sf	=	0	
	Gymnasium E141	1	@		sf	=	0	
							5,797	
M	**1994 Middle School Addition First Floor**							
	Corridor E111, E112, E117, E127	1	@		sf	=	0	
	E144, E161, G102, G104	8	@		sf	=	0	
	Stair G101	1	@		sf	=	0	
	Storage E142, E171, G103	3	@		sf	=	0	
	Vestibule E140	1	@		sf	=	0	
	Janitor E116	1	@		sf	=	0	
	Toilet E114, E146, E162, E168, E169							
	G112, G113	7	@		sf	=	0	
	Lobby E139, G119	2	@		sf	=	0	
	Elevator Lobby G117	1	@		sf	=	0	
	Exercise E143	1	@		sf	=	0	
	Health Office E145	1	@		sf	=	0	
	Cot Room E147	1	@		sf	=	0	
	Data Manager E148	1	@		sf	=	0	
	Tech Hardware E149	1	@		sf	=	0	
	Alcove E150, E155, E159	3	@		sf	=	0	
	PID E151	1	@		sf	=	0	
	Guidance E152, E153	2	@		sf	=	0	
	Guidance Reception E154	1	@		sf	=	0	
	Asst Principal E156	1	@		sf	=	0	
	Principal E157	1	@		sf	=	0	
	Reception E158	1	@		sf	=	0	
	Art Room E160	1	@		sf	=	0	
	Mechanical Room E163	1	@		sf	=	0	
	Kiln E164	1	@		sf	=	0	
	Art Storage E165	1	@		sf	=	0	
	Conference E166	1	@		sf	=	0	
	Teacher Workroom E167	1	@		sf	=	0	
	7th Grade Classroom G105	1	@	682	sf	=	682	
	7th Grade Classroom G106, G108	2	@	705	sf	=	1,410	
	7th Grade Classroom G107, G109	2	@	730	sf	=	1,460	
	World Language G110	1	@	298	sf	=	298	
	7th Grade Science Classroom G111	1	@	816	sf	=	816	
	Prep G114	1	@		sf	=	0	
	7th Grade Science Classroom G115	1	@	756	sf	=	756	
	SW G116	1	@		sf	=	0	
	Computer G140	1	@		sf	=	0	

Middle / Elementary School

Date: 9/17/12	EXISTING SCHOOL NAME:	Cape Elizabeth Middle/ Elementary School Project No. 12580
		NUMBER OF STUDENTS: 1,104
Daniel W. Cecil, AIA		GRADE CONFIGURATION: K-8

PROGRAM OF SPACE NEEDS	EXISTING FACILITY						NOTES
Subject	**# of Rooms**	@	**Room Size**	**sf**	**=**	**Area (sf)**	
Media Center G141	1	@		sf	=	0	
Office G142	1	@		sf	=	0	
Adult Resource Center G143	1	@		sf	=	0	
Production G144	1	@		sf	=	0	
						5,422	
N **1994 Middle School Addition Second Floor**							
Stair G201	1	@		sf	=	0	
Corridor G202, G204	1	@		sf	=	0	
Storage G203	1	@		sf	=	0	
8th Grade Classroom G205	1	@	682	sf	=	682	
8th Grade Classroom G206, G208	2	@	704	sf	=	1,408	
8th Grade Classroom G207, G209	2	@	730	sf	=	1,460	
Special Ed G210	1	@	298	sf	=	298	
8th Grade Science Classroom G211	1	@	816	sf	=	816	
Toilet G212, G213	2	@		sf	=	0	
Prep G214	1	@		sf	=	0	
8th Grade Science Classroom G215	1	@	756	sf	=	756	
Special Ed G216	1	@	180	sf	=	180	
Elevator Lobby G217	1	@		sf	=	0	
						5,600	
TOTAL STUDENT COUNT							
TOTAL NET SQUARE FOOTAGE							

CAPE ELIZABETH SCHOOL DEPARTMENT
ENROLLMENT HISTORY & PROJECTION

	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13*
K	110	97	109	111	102	120	111	115	108	91	107	103	91	107	100
1	125	130	107	131	127	123	142	134	115	137	107	122	116	105	126
2	141	126	144	121	135	133	128	143	136	117	137	115	125	120	105
3	155	143	128	148	124	140	138	139	150	138	115	138	120	127	120
4	129	157	147	135	146	129	140	138	138	152	143	112	145	120	127
total	660	653	635	646	634	645	659	669	647	635	609	590	597	579	578
5	162	132	161	149	141	154	134	142	136	139	155	134	119	145	120
6	135	168	134	159	152	143	155	137	141	137	144	152	138	119	145
7	127	138	170	137	162	153	141	156	130	143	132	143	151	142	119
8	150	129	142	166	146	166	156	144	159	136	141	133	142	150	142
total	574	567	607	611	601	616	586	579	566	555	572	562	550	556	526
9	112	145	126	135	155	142	156	151	137	150	135	138	128	136	145
10	120	117	136	120	134	151	140	158	153	139	147	135	136	136	136
11	127	124	113	139	118	136	151	137	152	147	135	151	136	139	136
12	139	129	119	111	137	116	136	153	146	154	150	132	149	137	139
total	498	515	494	505	544	545	583	599	588	590	567	556	549	548	556
TOTAL	**1732**	**1735**	**1736**	**1762**	**1779**	**1806**	**1828**	**1847**	**1801**	**1780**	**1748**	**1708**	**1696**	**1683**	**1660**

* # of students in 1st grade increased by average percentage increase from K to 1st grade over last 5 years

* # of students in 8th grade decreased by average percentage decrease from 8th to 9th grade over last 5 years

Enrollment totals taken from the State's October 1st Resident Enrollment Report for each year.

PLANNING DECISIONS
Research & Planning

2010-11 SCHOOL ENROLLMENT PROJECTIONS FOR CAPE ELIZABETH

Prepared for:

The Cape Elizabeth School Department

Prepared by:

Planning Decisions, Inc.
P.O. Box 2414
South Portland, ME 04116-2414

February, 2011

Table of Contents

EXECUTIVE SUMMARY

One model, called the 2010-11 "best fit" model was used to project future enrollment in Cape Elizabeth. To provide reasonable cushions for use in planning school facilities, Planning Decisions summarized school enrollment projections by grade group and presented the projections within ranges of plus and minus 10% for the K-4 grade group, and plus and minus 5% for grades 5-12.

- **A brief review of residential development trends in Cape Elizabeth found the following:**

    - Although the Cape Elizabeth School Department did not request that Planning Decisions conduct a full impact study of resident development on school enrollment, Planning Decisions did briefly look at residential development trends and the historical impacts of new home development on school enrollment in Cape Elizabeth.

    - Over the last ten years in Cape Elizabeth, the average annual number of new housing units built has declined, from 27 units added annually between 2001 and 2005, to an average of 15 units added annually between 2006 and 2010. In addition, new housing unit growth has remained fairly stable, on average, over the last three years (2008 to 2010), with an estimated 14 units added annually.

    - When looking at enrollment trends compared to new home development over the last ten years, the 2010-11 "best fit" model completed by Planning Decisions takes into account new home development of between 15 and 20 new housing units added annually. However, if new home development was to increase to average about 25 new housing units added annually, or the level of development experienced in Cape Elizabeth between 1992 and 2003, then the 2010-11 "best fit" model could potentially underestimate projected school enrollment.

    - In speaking with the Cape Elizabeth Code Enforcement Officer, Planning Decisions learned a couple new housing developments have begun which have the potential to impact school enrollment. **Planning Decisions strongly recommends the Cape Elizabeth School Department keep an eye on these new home development projects, because if the new homes being built are geared toward families with young children, or if the new homes are built out at a quicker rate than the estimated 15 to 20 new homes added town-wide, then the 2010-11 "best fit" model may underestimate future enrollment.**

- **Factors Influencing Entering Class Size (First Grade):**

Resident Birth Trends:

- Birth levels among Cape Elizabeth residents during the ten-year period (1994-95 to 2003-04), fluctuated year-to-year, declining on average. The average number of births over the last five years of the period, (1999-00 to 2003-04), was 75 births, which was lower than the average for the previous five-year period (1994-95 to 1998-99), or 80 births. The decline in the average level of resident births between 1999-00 and 2003-04 placed downward pressure on entering first grade class sizes over the last five years while fluctuations in the number of births occurring year-to-year caused fluctuations in first grade enrollment.

- The most recent five-year period (2005-06 to 2009-10) averaged 63 births, which was lower than the average of 73 births occurring during the previous five-year period (2000-01 to 2004-05). Over the last four years (2006-07 to 2009-10) births to Cape Elizabeth residents have declined further from the most recent five-year average, to average 60 births, and over the last three years (2007-08 to 2009-10) births to Cape Elizabeth residents have declined further, to average 58 births.

- Looking at birth trends over the last ten years, clearly, births to Cape Elizabeth residents have fluctuated year-to-year, but the average trends do show a significant decline in births has occurred. The question becomes whether the recent decline is a result of the current recession, and/or whether fewer fertile females are residing in Cape Elizabeth; however, it is likely the result of a number of different factors. Therefore, while the exact cause of the recent decline in resident births is uncertain and although it remains unclear whether the decline will continue or will level off, Planning Decisions will estimate future birth trends based on the most recent four-year average, or resident births should continue to average about 60 births annually, with year-to-year fluctuations occurring.

- **If resident birth levels do decline even further, or increase, then the 2010-11 "best fit" model projections could potentially overestimate or underestimate enrollment based on the nature of the change in resident birth trends. Therefore, Planning Decisions strongly recommends Cape Elizabeth keep a close eye on future birth trends to determine if changes occur.**

Net Preschool Migration Trends:

- In the first five years of the last decade, (2001-02 to 2005-06), Cape Elizabeth experienced an in-migration of preschool-aged children, while over the past five years, (2006-07 to 2010-11), Cape Elizabeth experienced a slightly lower level of preschool in-migration. However, over the last three years (2008-09 to 2010-11) preschool in-migration increased slightly from the five-year average, but remained lower than the average migration over the first five-year period. Over the last five years, preschool in-migration has continued to place upward pressure on average first grade class sizes, but with less upward pressure compared with the previous five-year period.

- Taken together, a decline in the average level of resident births combined with a slight decline in preschool in-migration, has resulted in entering first grade class sizes that, on average, declined over the last five years. However, the year-to-year fluctuations in both resident births and migration trends have caused year-to-year fluctuations in first grade class sizes. In addition, a significant decline in the level of resident births despite a projected in-migration of preschool-aged students, will result in future average first grade class sizes that will be lower than the average first grade enrollment experienced over the last ten years.

- **2010-11 Best Fit Projections for Cape Elizabeth Resident Students:**

Planning Decisions' 2010-11 "best fit" model is based on average resident birth levels in Cape Elizabeth between 2006-07 and 2009-10, and on an in-migration of preschool-aged children similar to the level occurring over the last four years.

First Grade Class Size:

✓ Under the 2010-11 "best fit" model, Planning Decisions projects first grade enrollment will experience yearly swings corresponding with swings in resident births, with enrollment ranging between 87 and 117 students through 2020-21. In addition, Cape Elizabeth should experience an average first grade enrollment of 99 students over the next ten years.

Grade Group Enrollment:

✓ Grades K-4 enrollment will decline from the current enrollment of 597 students, to reach 510 students by 2015-16. Following 2015-16, enrollment will decline further, but will level off, ranging between 473 and 487 students through 2020-21.

✓ Grades 5-8 enrollment will remain similar to the current enrollment of 550 students, with an enrollment of 553 students in 2011-12 before declining to reach 418 students by 2020-21.

✓ Grades 9-12 enrollment of Cape Elizabeth resident students will decline from the current enrollment of 548 students, to range between 531 and 539 students through 2013-14. Following 2013-14, enrollment will decline further to reach 465 students by 2020-21.

School Enrollment Projection Ranges - 2011-12 to 2020-21 (K-12) Town of Cape Elizabeth - 2010-11 Best Fit Model												
School Year	Grades (K-4)			Grades (5-8)			Grades (9-12)			Total All Grades (K-12)		
	-10%	Proj.	+10%	-5%	Proj.	+5%	-5%	Proj.	+5%	-Sum	Proj.	+Sum
2010-11*		597			550			548			1,695	
2011-12	517	574	631	525	553	581	508	535	562	1,550	1,662	1,774
2012-13	512	569	626	499	525	551	512	539	566	1,523	1,633	1,743
2013-14	491	546	601	494	520	546	504	531	558	1,490	1,597	1,704
2014-15	472	524	576	500	526	552	490	516	542	1,462	1,566	1,671
2015-16	459	510	561	467	492	517	493	519	545	1,419	1,521	1,623
2016-17	438	487	536	470	495	520	469	494	519	1,378	1,476	1,574
2017-18	427	474	521	457	481	505	464	488	512	1,347	1,443	1,539
2018-19	426	473	520	437	460	483	470	495	520	1,333	1,428	1,523
2019-20	428	475	523	428	451	474	438	461	484	1,294	1,387	1,480
2020-21	437	486	535	397	418	439	442	465	488	1,276	1,369	1,462

Sources: *2010-11 - current enrollment based on October 1st resident enrollment data supplied by the district, all other years - Projected by Planning Decisions, Inc., February 2011.

TECHNICAL NOTES FROM THE ENROLLMENT STUDY:

- **Resident Births:**

  - Planning Decisions does not use the calendar year to determine the number of resident births in a year to project future entering first grade class sizes but instead bases the "birth year" on when a student is eligible to enroll, or from October 15th of one year to October 14th of the next. Because the data supplied by the Office of Data, Research, and Vital Statistics at the Maine Department of Health and Human Services for October is based on October 1st to the 31st, the October births were split in half so that one half is put into one year and the other half is put into the following year's birth figures. This allows the cohort survival model to more accurately project entering first grade class sizes. Birth data from calendar years 2008, 2009, and 2010 is preliminary, but historically this data has been very accurate.

- **Grade-to-Grade Net Migration Ratios:**

  - In making grade-to-grade projections, Planning Decisions analyzes the historical average grade-to-grade survival ratios over the last 10, 5, 4, and 3-year periods, and applies the average that displays the "strongest" statistical relationship to existing class sizes and the projections of entering first grade class sizes.

  - When net migration ratios are discussed throughout the study, a ratio higher than 1.000 indicates a net in-migration of children occurred, and a ratio less than 1.000 indicates a net out-migration of children occurred.

- **Resident Enrollment Projections Ranges:**

  - To provide reasonable cushions for use in the planning of school facilities, Planning Decisions summarized school enrollment projections for the "best fit" model by grade group and presented the projections within ranges of plus and minus 10% for grades K-4 and plus and minus 5% for grades 5-12.

  - The total enrollment by grade grouping found in this report may be slightly different from the grade group totals in the **Appendix** by one or two students due to rounding of the data.

I. INTRODUCTION & METHODOLOGY

Change in school enrollment derives from two sources: changes in the number of births to residents, and net migration of preschool and school-aged children into and out of a community. These projections reflect both sources of change.

These projections are based on Planning Decisions' in-house cohort survival model which contains two steps. First, we analyze historical trends and relationships between entering class sizes (first grade enrollment) and resident births in the year that is six years before the enrollment year. Correlation coefficients (using Pearson's r-squared) are calculated for the last three, four, five, six, seven, eight, nine and ten-year periods regarding the relationship between first grade enrollment and births. The correlation coefficients are examined to determine which period represents the statistical "best fit" for projecting future first grade enrollment based on resident birth data.

Second, we analyze historical trends at each grade level. Specifically, we examine the grade-to-grade survival ratios. These ratios represent the number of students in a grade in one year (i.e., 1st grade in 2009-10) in relation to the number of students in the next grade the following year (i.e., 2nd grade in 2010-11). Then we calculate correlation coefficients (using Pearson's r-squared) for the last three, four, five, and ten-year periods regarding the relationship between enrollment in a grade in one year and the next grade the following year to determine which period represents the statistical "best fit" at each of the grade levels. The grade-to-grade ratios that represent the "best fit" are then applied to the current enrollment in each grade and projected first grade classes to project enrollment for the next ten years.

Sections II through V of this report provide historical enrollment trends and a set of enrollment projections which projects enrollment through 2020-21 for each grade and by grade group.

Section VI contains tables that summarize enrollment projections for each grade grouping within ranges of plus and minus 10% for grades K-4 and plus and minus 5% for grades 5-12 for use in planning of school facilities.

Grade by grade historical and projected enrollment are presented for Cape Elizabeth in the report **Appendix**.

II. FIRST GRADE ENROLLMENT

A. Historical First Grade Enrollment

A review of first grade enrollment of Cape Elizabeth residents over the last ten years (2001-02 to 2010-11) reveals enrollment that fluctuated year-to-year, declining on average. During this ten-year period, first grade enrollment ranged between 107 and 142 students, with an average enrollment of 125 students. The average first grade enrollment over the last five years (2006-07 to 2010-11), was 119 students, which was lower than the average during the previous five years (2001-02 to 2005-06), or 131 students. In addition, over the last three years (2008-09 to 2010-11) first grade class sizes declined further, averaging 115 students per year. *(See Table II-1 and Figure II-2).*

Table II-1 - Relationship of Entering First Grade Class Size to Resident Births
Town of Cape Elizabeth

Birth Year (Oct. 15 - Oct. 14)	# of Resident Births	First Grade Year	First Grade Resident Enrollment	Ratio First/Births
1994-95	94	2001-02	131	1.394
1995-96	81	2002-03	127	1.568
1996-97	76	2003-04	123	1.618
1997-98	73	2004-05	142	1.945
1998-99	78	2005-06	134	1.718
1999-00	74	2006-07	115	1.554
2000-01	86	2007-08	137	1.593
2001-02	65	2008-09	107	1.646
2002-03	81	2009-10	122	1.506
2003-04	69	2010-11	116	1.681
5 Yr Avg. (95-99)	80	**5 Yr Avg. (01-05)**	131	1.649
5 Yr Avg. (00-04)	75	**5 Yr Avg. (06-10)**	119	1.596
3 Yr Avg. (02-04)	72	**3 Yr Avg. (08-10)**	115	1.611
10 Yr Avg. (95-04)	78	**10 Yr Avg. (01-10)**	125	1.622

Births - Office of Data, Research, and Vital Statistics; Maine Department of Health and Human Services; 1st Grade Enrollment - October 1st, enrollment supplied by the district. All else calculated by Planning Decisions, Inc.

B. Factors Influencing Entering First Grade Class Size

The size of the first grade class is influenced by two factors: the number of births to residents of a community during the year that is six years prior to the enrollment year; and, net migration of preschool-aged children (number of preschool-aged children moving into the community minus the number of preschool-aged children moving out of the community) during the first grade enrollment year and the year that was six years prior. The level of preschool migration can be measured by the ratio of enrollment for the entering first grade class to the number of births to residents in the year that was six years prior.

1. Resident Birth Levels

Birth levels among Cape Elizabeth residents during the ten-year period (1994-95 to 2003-04), fluctuated year-to-year, declining on average. The average number of births over the last five years of the period, (1999-00 to 2003-04), was 75 births, which was lower than the average for the previous five-year period (1994-95 to 1998-99), or 80 births. **The decline in the average level of resident births between 1999-00 and 2003-04 placed downward pressure on entering first grade class sizes over the last five years while fluctuations in the number of births occurring year-to-year caused fluctuations in first grade enrollment.** ***(See Table II-1 and Figure II-1).***

2. Net Preschool Migration

In the first five years of the last decade, (2001-02 to 2005-06), Cape Elizabeth experienced an in-migration of preschool-aged children, with an average migration ratio of 1.649. In the past five years, (2006-07 to 2010-11), Cape Elizabeth experienced a slightly lower level of preschool in-migration, with an average migration ratio of 1.596. However, over the last three years (2008-09 to 2010-11) preschool in-migration was higher from the most recent five-year average, with an average in-migration ratio of 1.611, however, this average in-migration remained lower than the first five-year period. **Over the last five years, preschool in-migration has placed upward pressure on average first grade class sizes, but with slightly less upward pressure occurring compared with the previous five-year period.** ***(See Table II-1).***

Taken together, a decline in the average level of resident births combined with a slight decline in preschool in-migration, has resulted in entering first grade class sizes that, on average, declined over the last five years. However, the year-to-year fluctuations in both resident births and migration trends have caused year-to-year fluctuations in first grade class sizes.

C. Recent Resident Birth Trends

Between 2000-01 and 2009-10, the number of births to residents of Cape Elizabeth has declined, on average, while fluctuating year-to-year, to average 68 births annually, and range between 54 and 86 births. The most recent five-year period (2005-06 to 2009-10) averaged 63 births, which was lower than the average of 73 births occurring during the previous five-year period (2000-01 to 2004-05). Over the last four years (2006-07 to 2009-10) births to Cape Elizabeth residents have declined further from the most recent five-year average, to average 60 births, and over the last three years (2007-08 to 2009-10) births to Cape Elizabeth residents have declined further, to average 58 births. ***(See Table II-2 and Figure II-1).***

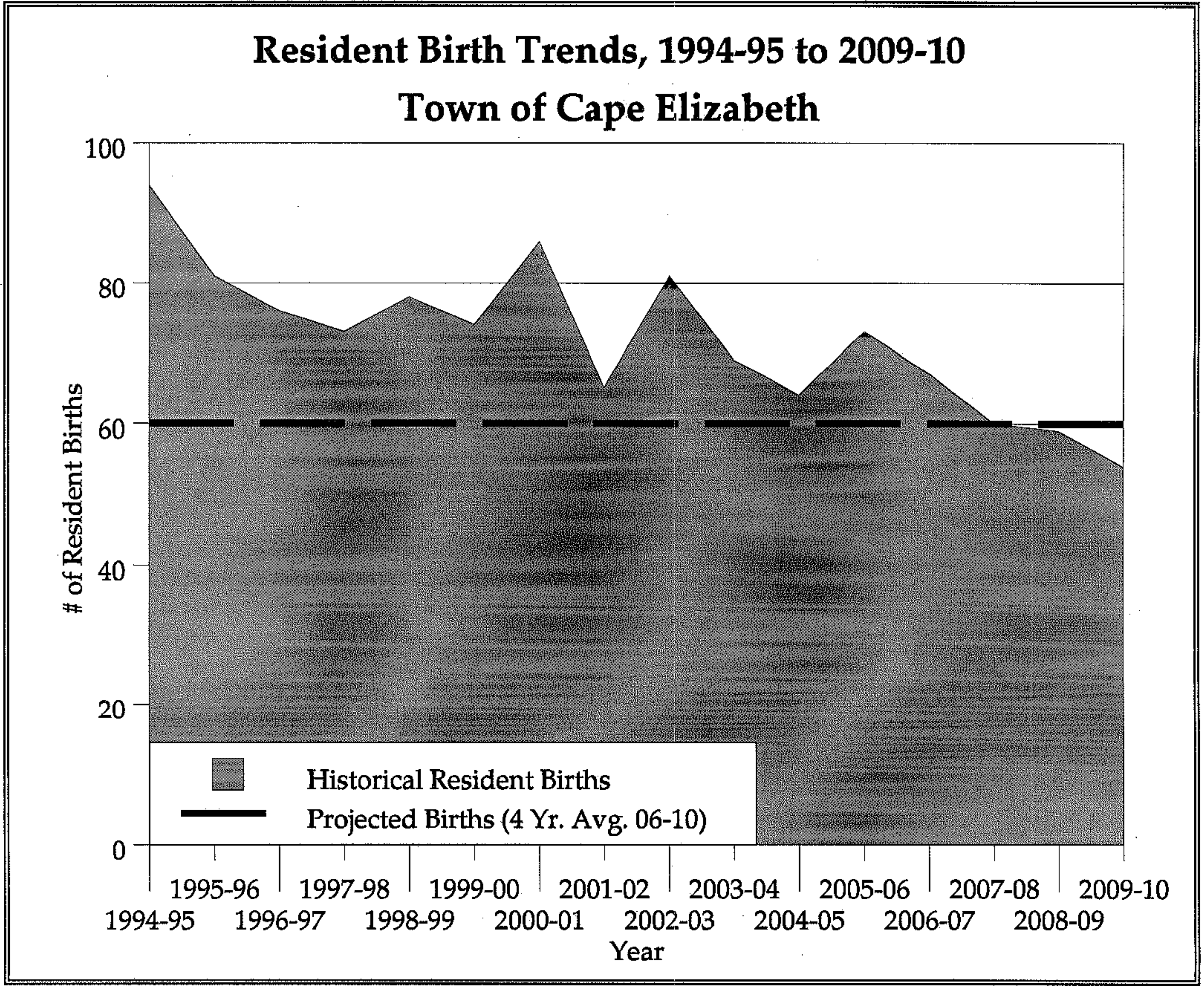
Looking at birth trends over the last ten years, clearly, births to Cape Elizabeth residents have fluctuated year-to-year, but the average trends do show a significant decline in births has occurred. The question becomes whether the recent decline is a result of the current recession, and/or whether fewer fertile females are residing in Cape Elizabeth; however, it is likely the result of a number of different factors. Therefore, while the exact cause of the recent decline in resident births is uncertain and although it remains unclear whether the decline will continue or will level off, Planning Decisions will estimate future birth trends based on the most recent four-year average, or resident births should continue to average about 60 births annually, with year-to-year fluctuations occurring.

If resident birth levels do decline even further, or increase, then the 2010-11 "best fit" model projections could potentially overestimate or underestimate enrollment based on the nature of the change in resident birth trends. Therefore, Planning Decisions strongly recommends Cape Elizabeth keep a close eye on future birth trends to determine if changes occur.

Table II-2 - Trends in Resident Births - 2000 to 2010 Town of Cape Elizabeth	
Birth Year (Oct. 15 - Oct. 14)	**Birth Year Total**
2000-01	86
2001-02	65
2002-03	81
2003-04	69
2004-05	64
2005-06	73
2006-07	67
2007-08 pre	60
2008-09 pre	59
2009-10 pre	54
10 Yr Avg. (01-10)	**68**
5 Yr Avg.(01-05)	**73**
5 Yr Avg. (06-10)	**63**
4 Yr Avg. (07-10)	**60**
3 Yr Avg. (08-10)	**58**

Source: Office of Data, Research, and Vital Statistics; Maine Department of Health and Human Services, 2008, 2009 and 2010 births are preliminary.

Figure II-1



Resident Birth Trends, 1994-95 to 2009-10
Town of Cape Elizabeth
100
80
60
40
20
0
# of Resident Births
Historical Resident Births
Projected Births (4 Yr. Avg. 06-10)
1995-96
1997-98
1999-00
2001-02
2003-04
2005-06
2007-08
2009-10
1994-95
1996-97
1998-99
2000-01
2002-03
2004-05
2006-07
2008-09
Year

D. Projections of Entering First Grade Class Sizes

Planning Decisions' 2010-11 "best fit" model is based on average resident birth levels in Cape Elizabeth between 2006-07 and 2009-10, and on an in-migration of preschool-aged children similar to the level occurring over the last four years.

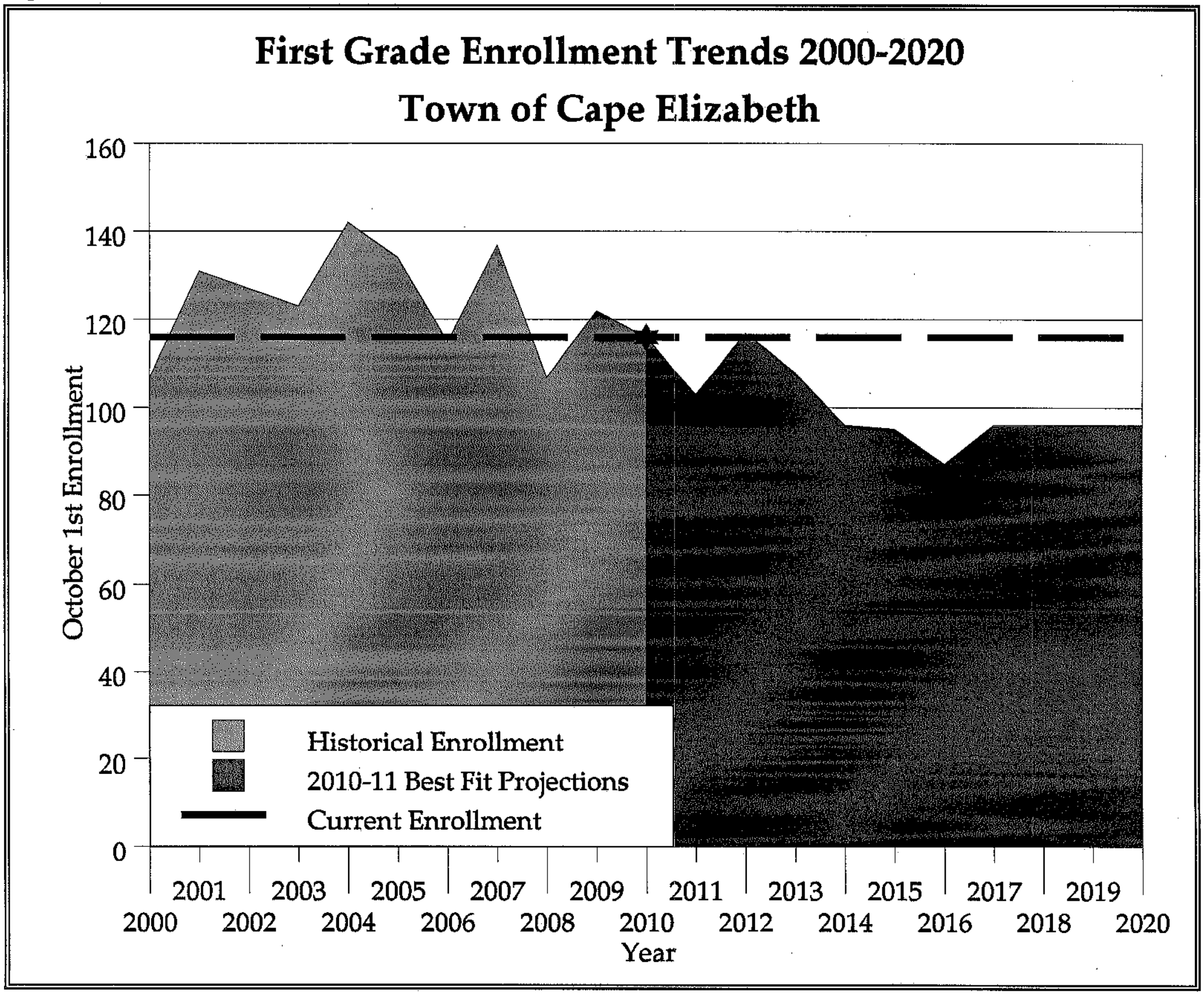
Under the 2010-11 "best fit" model, Planning Decisions projects first grade enrollment will experience yearly swings corresponding with swings in resident births, with enrollment ranging between 87 and 117 students through 2020-21. In addition, Cape Elizabeth should experience an average first grade enrollment of 99 students over the next ten years. ***(See Table II-3 and Figure II-2).***

Table II-3 - Projected Entering First Grade Class Sizes, 2011-12 to 2020-21
Town of Cape Elizabeth

Birth Year (Oct. 15 - Oct. 14)	# of Resident Births	First Grade Year	First Grade Resident Enrollment: 2010-11 Best Fit Model	First Grade Resident Enrollment: Ratio First Grade/Births
2004-05	64	2011-12	103	1.609
2005-06	73	2012-13	117	1.603
2006-07	67	2013-14	108	1.612
2007-08 pre	60	2014-15	96	1.600
2008-09 pre	59	2015-16	95	1.610
2009-10 pre	54	2016-17	87	1.611
2010-11*	60	2017-18	96	1.600
2011-12*	60	2018-19	96	1.600
2012-13*	60	2019-20	96	1.600
2013-14*	60	2020-21	96	1.600
4 Yr Avg. 07-10	60	**10 Yr Avg. 11-20**	99	1.650

Sources: Births 2004-2010 - Office of Data, Research, and Vital Statistics; Maine Department of Health and Human Services, 2008, 2009, and 2010 births are preliminary. *2010-11 to 2013-14 births estimated by Planning Decisions based the three-year average of births between 2006-07 and 2009-10. 1st Grade Enrollment - Projected by Planning Decisions, Inc.

Figure II-2


First Grade Enrollment Trends 2000-2020
Town of Cape Elizabeth
160
140
120
100
80
60
40
20
0
October 1st Enrollment
Historical Enrollment
2010-11 Best Fit Projections
Current Enrollment
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Year

III. ELEMENTARY SCHOOL ENROLLMENT (GRADES K-4)

Table III-1 - Historical and Projected Elementary School Enrollment (K-4) 2000-01 to 2020-21 - Town of Cape Elizabeth - 2010-11 Best Fit Model						
School Year	Grade					Total K-4
	K	1st	2nd	3rd	4th	
2000-01	109	107	144	128	147	635
2001-02	111	131	121	148	135	646
2002-03	102	127	135	124	146	634
2003-04	120	123	133	140	129	645
2004-05	111	142	128	138	140	659
2005-06	115	134	143	139	138	669
2006-07	108	115	136	150	138	647
2007-08	91	137	117	138	152	635
2008-09	107	107	137	115	143	609
2009-10	103	122	115	138	112	590
2010-11*	91	116	125	120	145	597
2011-12	102	103	120	127	122	574
2012-13	94	117	106	122	130	569
2013-14	84	108	121	108	125	546
2014-15	83	96	111	124	110	524
2015-16	76	95	100	113	126	510
2016-17	84	87	98	102	116	487
2017-18	84	96	90	100	104	474
2018-19	84	96	100	91	102	473
2019-20	84	96	100	102	93	475
2020-21	84	96	100	102	104	486

Source: 2000-01 to 2010-11 - historical enrollment, October 1st enrollment data supplied by the district; all other years - projected by Planning Decisions, Inc.

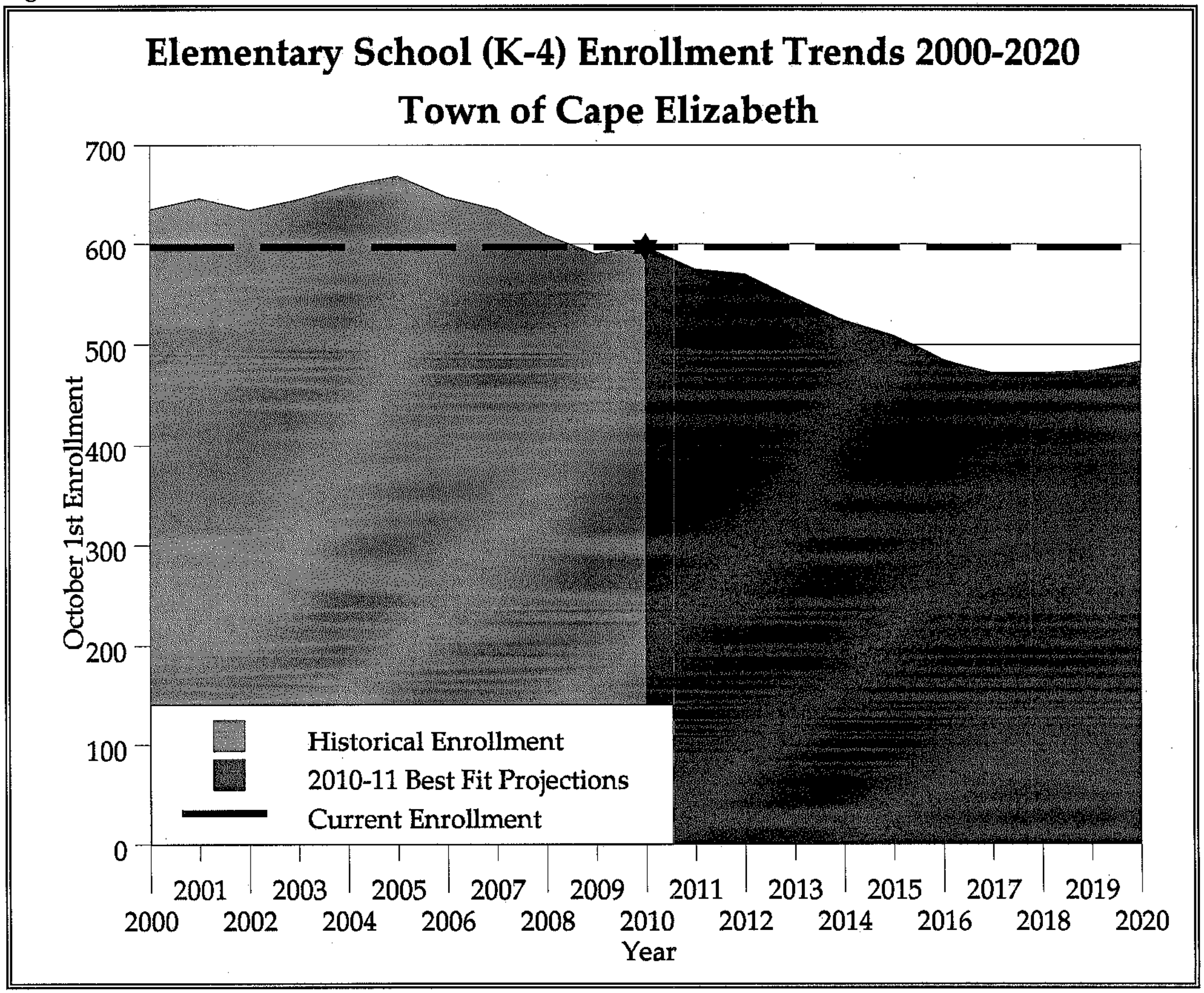
Historical Enrollment Trends:

- Grades K-4 enrollment of Cape Elizabeth students ranged between 634 and 669 students through 2007-08. Following 2007-08, enrollment declined to reach 597 students by 2010-11. *(See Table III-1 and Figure III-1).*

2010-11 Best Fit Model Projections:

- Under the 2010-11 "best fit" model, Planning Decisions projects K-4 enrollment will decline from the current enrollment of 597 students, to reach 510 students by 2015-16. Following 2015-16, enrollment will decline further, but will level off, ranging between 473 and 487 students through 2020-21. *(See Table III-1 and Figure III-1).*

Figure III-1


Elementary School (K-4) Enrollment Trends 2000-2020
Town of Cape Elizabeth
October 1st Enrollment
700
600
500
400
300
200
100
0
Historical Enrollment
2010-11 Best Fit Projections
Current Enrollment
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Year

IV. MIDDLE SCHOOL ENROLLMENT (GRADES 5-8)

Table IV-1 - Historical and Projected Middle School Enrollment (5-8)
2000-01 to 2020-21 - Town of Cape Elizabeth - 2010-11 Best Fit Model

School Year	Grade				Total
	5th	6th	7th	8th	5-8
2000-01	161	134	170	142	607
2001-02	149	159	137	166	611
2002-03	141	152	162	146	601
2003-04	154	143	153	166	616
2004-05	134	155	141	156	586
2005-06	142	137	156	144	579
2006-07	136	141	130	159	566
2007-08	139	137	143	136	555
2008-09	155	144	132	141	572
2009-10	134	152	143	133	562
2010-11*	119	138	151	142	550
2011-12	146	121	136	150	553
2012-13	123	148	119	135	525
2013-14	131	125	146	118	520
2014-15	125	133	123	145	526
2015-16	111	127	131	123	492
2016-17	127	113	125	130	495
2017-18	116	129	111	125	481
2018-19	104	118	127	111	460
2019-21	103	106	116	126	451
2020-21	94	104	104	116	418

Source: 2000-01 to 2010-11 - historical enrollment, October 1st enrollment data supplied by the district; all other years - projected by Planning Decisions, Inc.

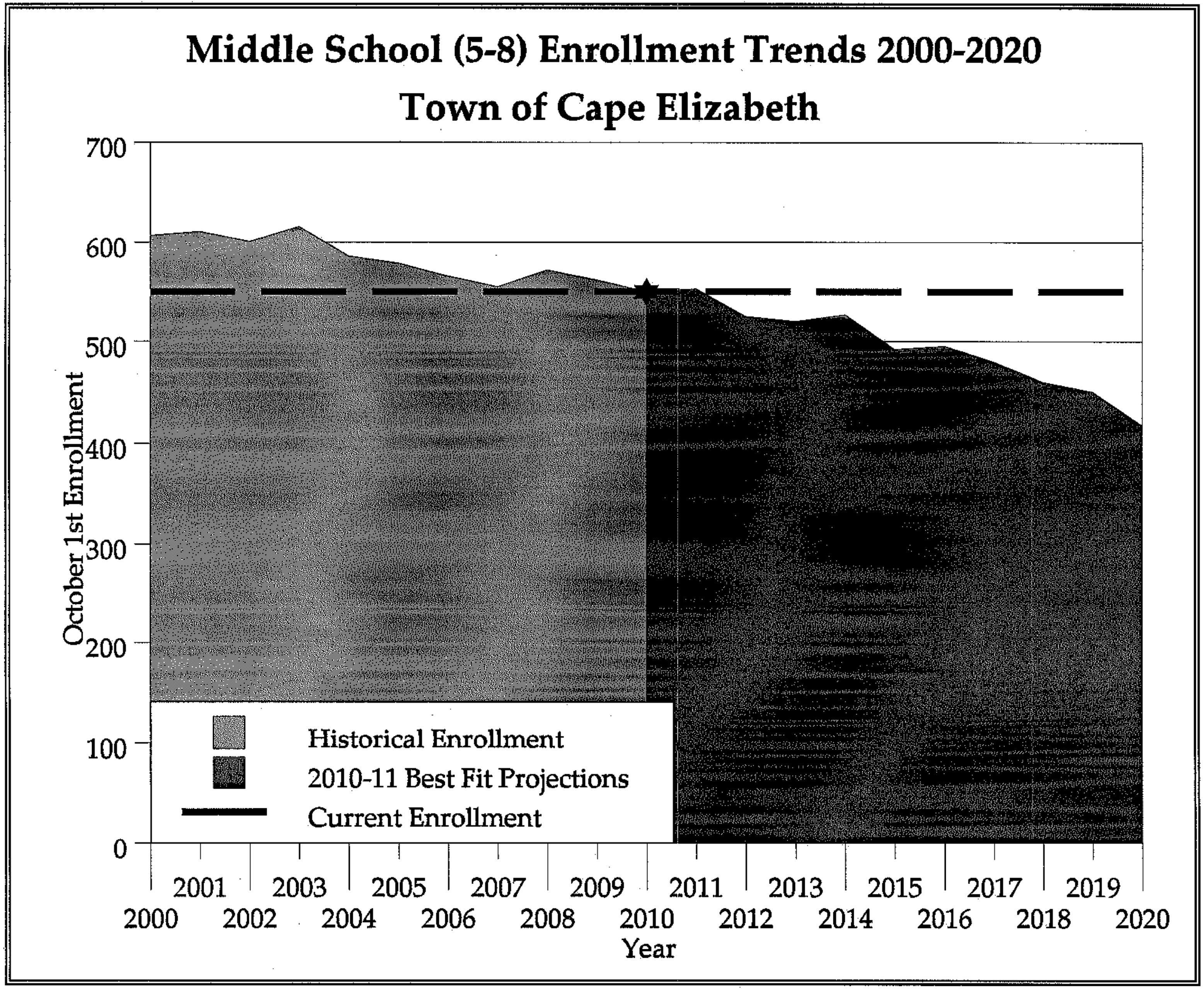
Historical Enrollment Trends:

- Since 2000-01, grades 5-8 enrollment of Cape Elizabeth students ranged between 601 and 616 students through 2003-04. Following 2003-04, enrollment declined to range between 550 and 586 students through 2010-11. *(See Table IV-1 and Figure IV-1).*

2010-11 Best Fit Model Projections:

- Under the 2010-11 "best fit" model, Planning Decisions projects 5-8 enrollment will remain similar to the current enrollment of 550 students, with an enrollment of 553 students in 2011-12 before declining to reach 418 students by 2020-21. *(See Table IV-1 and Figure IV-1).*

Figure IV-1


Middle School (5-8) Enrollment Trends 2000-2020
Town of Cape Elizabeth
October 1st Enrollment
700
600
500
400
300
200
100
0
Historical Enrollment
2010-11 Best Fit Projections
Current Enrollment
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Year

V. HIGH SCHOOL ENROLLMENT (GRADES 9-12)

Table V-1 - Historical and Projected High School Enrollment (9-12) 2000-01 to 2020-21 - Town of Cape Elizabeth - 2010-11 Best Fit Model					
School Year	Grade				Grand Total (9-12)
	9th	10th	11th	12th	
2000-01	126	136	113	119	494
2001-02	135	120	139	111	505
2002-03	155	134	118	137	544
2003-04	142	151	136	116	545
2004-05	156	140	151	134	581
2005-06	151	158	137	150	596
2006-07	137	153	152	146	588
2007-08	150	139	147	154	590
2008-09	135	147	135	150	567
2009-10	138	135	151	132	556
2010-11*	128	136	137	147	548
2011-12	136	127	135	137	535
2012-13	144	135	125	135	539
2013-14	130	143	133	125	531
2014-15	114	128	141	133	516
2015-16	139	112	127	141	519
2016-17	118	138	111	127	494
2017-18	125	116	136	111	488
2018-19	120	124	115	136	495
2019-20	106	118	122	115	461
2020-21	121	105	117	122	465

Source: 2000-01 to 2010-11 - historical enrollment, October 1st data supplied by the district; all other years - projected by Planning Decisions, Inc.

The high school level in Cape Elizabeth consists of the ninth through twelfth grade. ***(See Table V-1 and Figure V-1).***

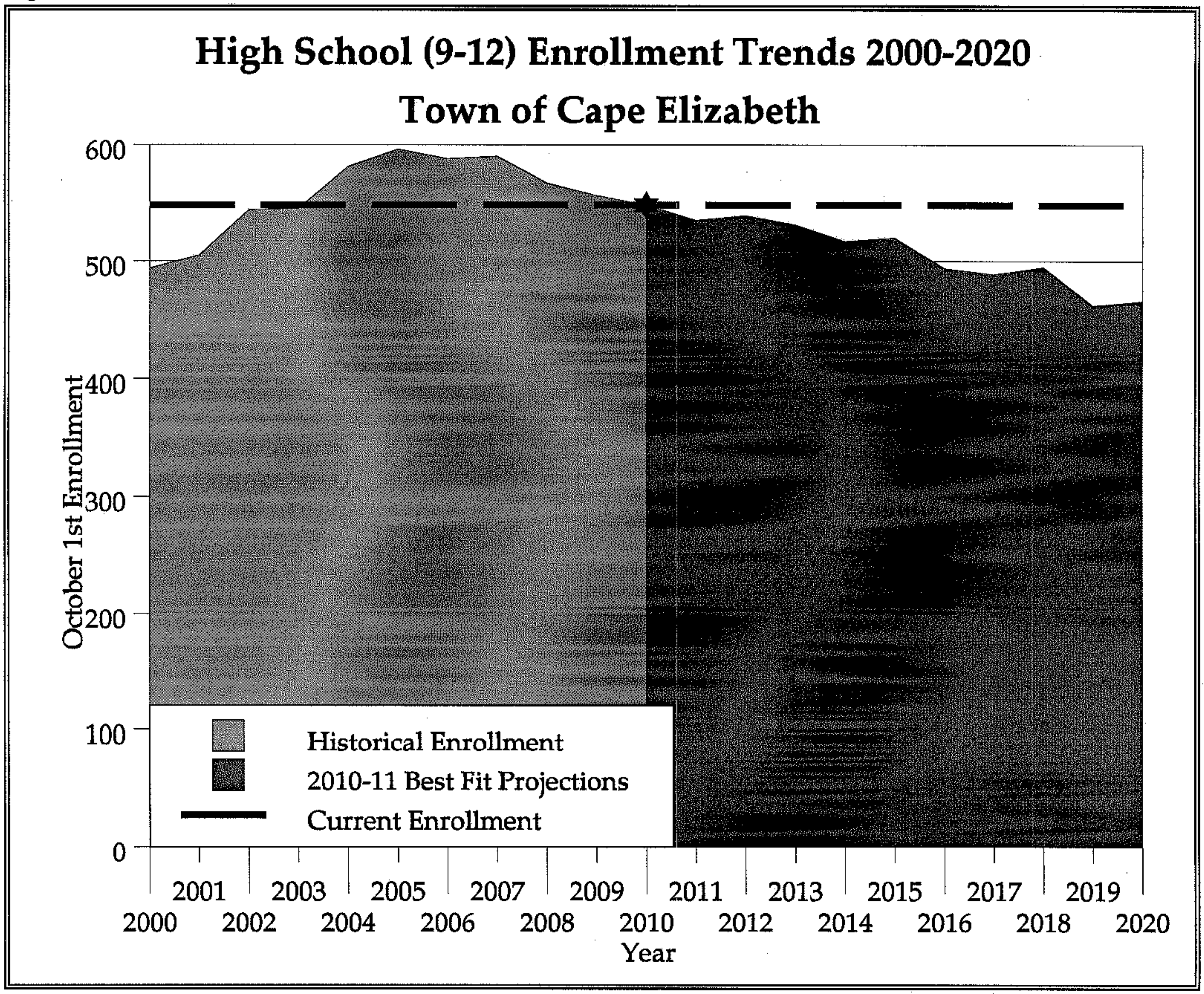
Historical Enrollment Trends:

- Since 2000-01, enrollment of Cape Elizabeth students in grades 9-12 increased from 494 students to reach 596 students by 2005-06. Following 2005-06, enrollment declined to reach 548 students by 2010-11, however despite this decline, grades 9-12 enrollment remained higher than in 2000-01.

2010-11 Best Fit Model Projections:

- Under the 2010-11 "best fit" model, Planning Decisions projects 9-12 enrollment of Cape Elizabeth resident students will decline from the current enrollment of 548 students, to range between 531 and 539 students through 2013-14. Following 2013-14, enrollment will decline further to reach 465 students by 2020-21.

Figure V-1



High School (9-12) Enrollment Trends 2000-2020
Town of Cape Elizabeth
600
500
400
300
200
100
0
October 1st Enrollment
Historical Enrollment
2010-11 Best Fit Projections
Current Enrollment
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Year

VI. SUMMARY OF ENROLLMENT PROJECTIONS FOR SCHOOL PLANNING PURPOSES

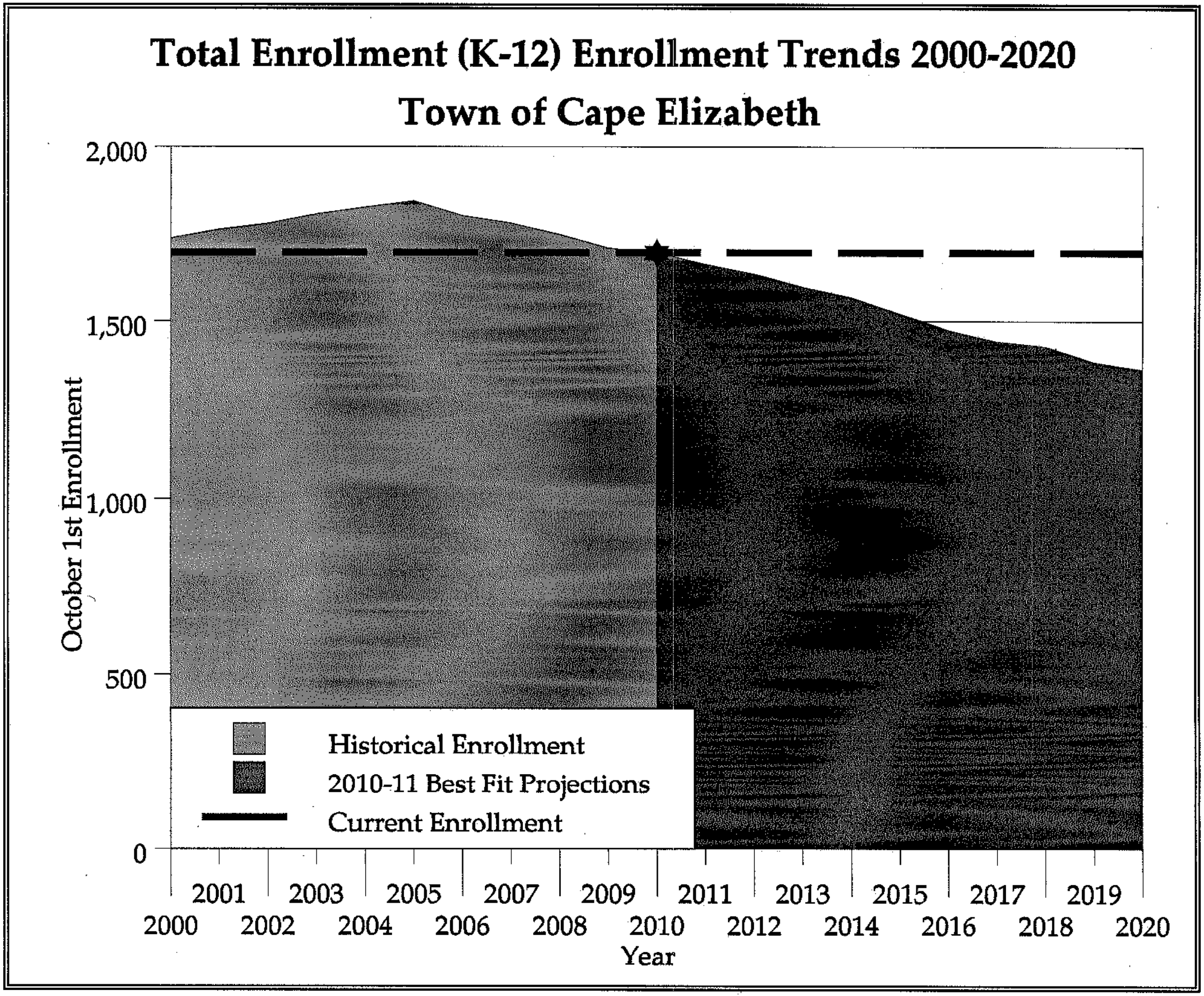
To provide reasonable cushions for use in the planning of school facilities, Planning Decisions has summarized school enrollment projections for the 2010-11 "best fit" model by grade group and presented the projections within ranges of plus and minus 10% for grades K-4 and plus and minus 5% for grades 5-12. The report **Appendix** contains grade by grade historical and projected enrollment.

School Enrollment Projection Ranges - 2011-12 to 2020-21 (K-12)
Town of Cape Elizabeth - 2010-11 Best Fit Model

School Year	Grades (K-4)			Grades (5-8)			Grades (9-12)			Total All Grades (K-12)		
	-10%	Proj.	+10%	-5%	Proj.	+5%	-5%	Proj.	+5%	-Sum	Proj.	+Sum
2010-11*		597			550			548			1,695	
2011-12	517	574	631	525	553	581	508	535	562	1,550	1,662	1,774
2012-13	512	569	626	499	525	551	512	539	566	1,523	1,633	1,743
2013-14	491	546	601	494	520	546	504	531	558	1,490	1,597	1,704
2014-15	472	524	576	500	526	552	490	516	542	1,462	1,566	1,671
2015-16	459	510	561	467	492	517	493	519	545	1,419	1,521	1,623
2016-17	438	487	536	470	495	520	469	494	519	1,378	1,476	1,574
2017-18	427	474	521	457	481	505	464	488	512	1,347	1,443	1,539
2018-19	426	473	520	437	460	483	470	495	520	1,333	1,428	1,523
2019-20	428	475	523	428	451	474	438	461	484	1,294	1,387	1,480
2020-21	437	486	535	397	418	439	442	465	488	1,276	1,369	1,462

Sources: *2010-11 - current enrollment based on October 1st resident enrollment data supplied by the district, all other years - Projected by Planning Decisions, Inc., February 2011.

Figure VI-1



Total Enrollment (K-12) Enrollment Trends 2000-2020
Town of Cape Elizabeth
2,000
1,500
1,000
500
0
October 1st Enrollment
Historical Enrollment
2010-11 Best Fit Projections
Current Enrollment
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Year

APPENDIX - GRADE BY GRADE HISTORICAL AND PROJECTED ENROLLMENT AND GRADE GROUP SUMMARIES

Entering Class to Births Ratio Worksheet
Town of Cape Elizabeth - 2010-11 - Best Fit Model

Oct 15-Oct 14 Births	Number Births	KG Year	KG Class Size	1st Grade Year	1st Class Size	Ratio 1st/Birth	Ratio 1st/K	Proj. 1st Grade	Net Preschool Migration
1994-95	94	10/00	109	10/01	131	1.394	1.202		37
1995-96	81	10/01	111	10/02	127	1.568	1.144		46
1996-97	76	10/02	102	10/03	123	1.618	1.206		47
1997-98	73	10/03	120	10/04	142	1.945	1.183		69
1998-99	78	10/04	111	10/05	134	1.718	1.207		56
1999-00	74	10/05	115	10/06	115	1.554	1.000		41
2000-01	86	10/06	108	10/07	137	1.593	1.269		51
2001-02	65	10/07	91	10/08	107	1.646	1.176		42
2002-03	81	10/08	107	10/09	122	1.506	1.140		41
2003-04	69	10/09	103	10/10	116	1.681	1.126		47
2004-05	64	10/10	91	10/11		1.607	1.130	103	39
2005-06	73	10/11		10/12		1.607		117	44
2006-07	67	10/12		10/13		1.607		108	41
2007-08*	60	10/13		10/14		1.607		96	36
2008-09*	59	10/14		10/15		1.607		95	36
2009-10*	54	10/15		10/16		1.607		87	33
2010-11 est	60	10/16		10/17		1.607		96	36
2011-12 est	60	10/17		10/18		1.607		96	36
2012-13 est	60	10/18		10/19		1.607		96	36
2013-14 est	60	10/19		10/20		1.607		96	36
10yr Total (95-04)	777	10yr Total (00-09)	968	10yr Total (01-10)	1,254	1.614	1.295	Last 10yr	47.7
10yr Avg (95-04)	78	10yr Avg (00-09)	108	10yr Avg (01-10)	125	1.622	1.166	Last 5yr	44.4
5yr Avg (05-09)	63							Last 3yr	43.3
5yr Max (05-09)	73							Proj.	37.4
5yr Min (05-09)	59								
4 yr Avg (07-10)	60								

First Grade to Births Correlation Coefficients		First Grade to Kindergarten Correlation Coefficients	
10 YEAR	0.564	10 YEAR	0.696
9 YEAR	0.614	9 YEAR	0.699
8 YEAR	0.622	8 YEAR	0.698
7 YEAR	0.626	7 YEAR	0.706
6 YEAR	0.872	6 YEAR	0.558
5 YEAR	0.933	5 YEAR	0.491
4 YEAR	**0.943**	4 YEAR	0.848
3 YEAR	0.923	3 YEAR	0.986

Ratios	1st/Birth	1st/K
Avg last 10	1.622	1.165
Avg last 9	1.648	1.161
Avg last 8	1.658	1.163
Avg last 7	1.663	1.157
Avg last 6	1.616	1.153
Avg last 5	1.596	1.142
Avg last 4	**1.607**	1.178
Avg last 3	1.611	1.147
av 1st 5	1.649	1.188
5yr Weighted	1.607	1.150

Notes: Four-year average of births (2006-07 to 2009-10) used to estimate births from 2010-11 to 2013-14. *2008, 2009, and 2010 birth data is preliminary from the Maine Department of Health and Human Services, Office of Data, Research, and Vital Statistics. The first grade from 2011-12 to 2020-21 was projected using the 4-year ratio of first grade to births.

2010-11 Best Fit Model Enrollment Projections for Cape Elizabeth, Completed February, 2011
Data produced by Planning Decisions Inc.

Enrollment Trends & Projections - Town of Cape Elizabeth - K-12 - 2010-11 - Best Fit Model

	October 1st Enrollment													Grade Group Totals				
School Year	K	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	Total K-4	Total 5-8	Total K-8	Total 9-12	Total K-12
Historical																		
2000-01	109	107	144	128	147	161	134	170	142	126	136	113	119	635	607	1,242	494	1,736
2001-02	111	131	121	148	135	149	159	137	166	135	120	139	111	646	611	1,257	505	1,762
2002-03	102	127	135	124	146	141	152	162	146	155	134	118	137	634	601	1,235	544	1,779
2003-04	120	123	133	140	129	154	143	153	166	142	151	136	116	645	616	1,261	546	1,807
2004-05	111	142	128	138	140	134	155	141	156	156	140	151	134	659	586	1,245	583	1,828
2005-06	115	134	143	139	138	142	137	156	144	151	158	137	150	669	579	1,248	599	1,847
2006-07	108	115	136	150	138	136	141	130	159	137	153	152	146	647	566	1,213	588	1,801
2007-08	91	137	117	138	152	139	137	143	136	150	139	147	154	635	555	1,190	590	1,780
2008-09	107	107	137	115	143	155	144	132	141	135	147	135	150	609	572	1,181	567	1,748
2009-10	103	122	115	138	112	134	152	143	133	138	135	151	132	590	562	1,152	556	1,708
2010-11	91	116	125	120	145	119	138	151	142	128	136	137	147	597	550	1,147	549	1,696
Projected																		
2011-12	102	103	120	127	122	146	121	136	150	136	127	135	137	575	553	1,128	535	1,662
2012-13	94	117	106	122	130	123	148	119	135	144	135	125	135	570	525	1,095	539	1,634
2013-14	84	108	121	108	125	131	125	146	118	130	143	133	125	546	520	1,066	531	1,597
2014-15	83	96	111	124	110	125	133	123	145	114	128	141	133	524	527	1,051	517	1,567
2015-16	76	95	100	113	126	111	127	131	123	139	112	127	141	509	492	1,001	520	1,521
2016-17	84	87	98	102	116	127	113	125	130	118	138	111	127	486	495	981	494	1,475
2017-18	84	96	90	100	104	116	129	111	125	125	116	136	111	473	481	955	489	1,443
2018-19	84	96	100	91	102	104	118	127	111	120	124	115	136	473	460	933	495	1,428
2019-20	84	96	100	102	93	103	106	116	126	106	118	122	115	475	451	926	462	1,388
2020-21	84	96	100	102	104	94	104	104	116	121	105	117	122	485	418	903	466	1,369

Note: Total enrollment for Grades 9-12 include post grad students reported. Planning Decisions did not project for additional post grad students due to the intermittent nature of their enrollment over the last ten years.

2010-11 Best Fit Model Enrollment Projections for Cape Elizabeth, Completed February, 2011

Data produced by Planning Decisions Inc.

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