Mechanical and Electrical Systems
Existing Conditions Narrative

Kathleen Ryerson Elementary School
Madison, Connecticut

3/11/10

Prepared By
Consulting Engineering Services, Inc.
811 Middle Street, Middletown, Connecticut 06457
CES Project No. 29066.00

A. ***PLUMBING NARRATIVE***

APPLICABLE CODES AND STANDARDS

The plumbing systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements, including the Bureau of School Facilities.

1. 2005 Connecticut State Building Code
2. 2005 Connecticut State Fire Safety Code
3. 2003 International Building Code(IBC)
4. 2003 International Plumbing Code
5. 2003 International Energy Conservation Code
6. NFPA, Latest Version
7. ASHRAE 90.1
8. State Department of Education School Construction Program

PLUMBING UTILITIES

1. Domestic Water:
   a. Existing Domestic Water Service: The building is currently served from CT Water Company.
2. Natural Gas:
   a. Existing Natural Gas Service: The building is currently served by natural gas fed from the local utility's distribution system.
3. Sanitary:
   a. Existing Sanitary Service: The School's sanitary sewer system provides sanitary waste drainage for plumbing fixtures located throughout the School. The sanitary waste piping discharges to a septic tank and leaching field.
4. Storm:
   a. Existing Storm System: Building is served by a combination of gutters and roof drains with internal rain leaders.

PLUMBING FIXTURES AND SPECIALTIES

1. Existing plumbing fixtures are as follows:
   a. Water closets are floor mounted; tank type, vitreous china.
   b. Lavatories are vitreous china. There are a variety of types of faucets.

DOMESTIC HOT WATER SYSTEMS

1. Existing Domestic Hot Water System: The Schools domestic hot water is generated by a natural gas fired water heater. A new Bock Model EZ80-199N water heater was installed summer of 2009.

B. ***FIRE PROTECTION NARRATIVE***

FIRE PROTECTION SERVICE

1. There is no central fire protection system (sprinklers) currently at the facility.

C. ***MECHANICAL NARRATIVE***

APPLICABLE CODES AND STANDARDS

The mechanical systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements, including the Bureau of School Facilities.

1. 2005 Connecticut State Building Code
2. 2005 Connecticut State Fire Safety Code
3. 2003 International Building Code(IBC)
4. 2003 International Mechanical Code
5. 2003 International Energy Conservation Code
6. NFPA, Latest Version
7. ASHRAE 90.1
8. State Department of Education School Construction Program

EXISTING SYSTEMS

1. Boiler Plant: The building is heated by two, dual fuel H.B. Smith hot water boilers which were installed summer of 2009.
2. Buried Fuel Tanks: Refer to 2004 Underground Storage Tank Report done by Flagship Environmental LLC, 2004.
3. Heating and Ventilation (H&V) systems at the classrooms consist of unit ventilators along the perimeter wall and relief air/exhaust grilles connected to central exhaust systems.

4. Air conditioning is provided at specific areas such as administrative areas, library, nurse's offices and computer lab with combination of window air conditioners and ductless split units.
5. Misc. HVAC notes:
   a. (H&V) systems also consist of a ducted air handling unit at the Multi-Purpose Room and cabinet heaters and fin tube radiation at other commons areas.
   b. Temperature controls at individual rooms are local, pneumatic controls. Temperature control systems serving the boiler room were upgraded to an Alerton DDC system during summer of 2009.

D. ***ELECTRICAL NARRATIVE***

APPLICABLE CODES AND STANDARDS

The electrical power, interior lighting, and fire alarm systems will be reviewed in conformance with the requirements of the following codes and regulations and all applicable local authority requirements, including the Bureau of School Facilities.

1. 2005 Connecticut State Building Code
2. 2005 Connecticut State Fire Safety Code
3. 2003 International Building Code(IBC)
4. 2003 International Energy Conservation Code
5. 2005 National Electrical Code, NFPA 70 (NEC)
6. Illuminating Engineering Society Lighting Handbook (IESNA), 9th Edition
7. ASHRAE 90.1
8. State Department of Education School Construction Program

EXISTING SYSTEMS

1. The building is served by an electrical service rated at 600 amperes, 208Y/120volts, 3-phase. This service equipment consists of a 600 amp main disconnect switch, distribution section and metering per utility company requirements. The service equipment is original to the building and is in fair condition.

2. The underground electrical feeder was replaced in 2003.
3. There are a number of electrical panels located throughout the facility. These panelboards are original to the facility. The condition of these panelboards is good to poor. The majority of the panelboards do not have spare circuit breakers available for new circuits to be added, or have space to add new circuit breakers.
4. Lighting at classrooms, corridors and administrative areas consists primarily of fixtures with acrylic lenses and T8 fluorescent lamps. The Multi-Purpose Room is served by T5 fluorescent fixtures. Lighting throughout the facility is in good condition and light levels are within recommended levels.
5. Site lighting has fair coverage with pole mounted fixtures and building mounted fixtures.
6. The fire alarm system is a Notifier system with a Fire Lite dialer. There are manual fire alarm pullstations throughout the building and smoke detectors within the corridors.
7. Emergency lighting is handled by 2-head emergency lighting fixtures with integral battery packs.

E. ***MEP SYSTEMS CONCLUSION***

In general, the systems are original to the building and are 40+ years old, thus have met their useful life expectancy. The heating plant, water heater and controls at the heating plant were recently replaced (summer 2009). Expansion of the Alerton DDC system is recommended. The following capital needs survey form highlights the major systems in need of replacement and their respective capital costs to implement.

Town of Madison								
Capital Needs Survey Form								Total Floor Area (sf):
Kathleen Ryerson Elementary School								38,523

Note: The "System Priority Rating" (1 to 4 rating) and "Condition of the Existing System Rating" (1 to 5 rating) are to be reviewed together to assist in prioritizing replacement and/or upgrades. As an example, we recommend line items with a System Priority rating of 1 and Existing Conditions rating of 1 be prioritized for replacement and/or upgrades.

SYSTEM	System Priority 1 to 4 (1-Highest Priority, 4-Lowest Priority)	Condition of the Existing System 1 to 5 (1 Poor, 5 Excellent)	Last Major Reconstruction (Year)	Projected Replacement (Year)	Quantity	Unit Price	Current Replacement Cost	REMARKS
Division 2 - Site Construction								
Site - Electrical								
Site - Lighting								
Well Water System								Not included in our review
Site - General								N/A
Division 15 -Plumbing								
Plumbing Fixtures and Distribution System	3	3	1968	2018	38,523	$12	$462,276	
Water Heater			2009					No short term recommendations.
Division 15 - HVAC								
Hot Water Boilers			2009					No short term recommendations.
Ventilation Systems Including:	3	3	1968	2018	38,523	$22	$847,506	Upgrade/replace unit ventilators (UV's)
Unit Ventilators								(assumes no state funds due to UV's)
Air Handling Equipment								
Exhaust Systems								
Temperature Control Systems								
Air Conditioning Systems	4	3		2018	38,523	$12	$462,276	
Division 16 - Electrical								
Electrical Feeder			2003					No short term recommendations.
Overall Electrical Renovations - includes:	2	3	1950	2010	38,523	$15	$577,845	
Electrical Service								
Distribution and Local Panels								
Lighting								
Emergency Lighting								
Misc Low Voltage Systems								
Fire Alarm System								
Added Elect Cost for A/C Systems	4	3		2010	38,523	$5	$192,615	Upgrade to 1000A - 480Y/277V
							$2,542,518	
							$ 66	per so