Appendix B

Facilities Assessment Report

Mile Lane Army Reserve Base
Middletown, CT
MEP System Evaluation

For

RKG Associates
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Durham, NH 03824

Prepared by

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Introduction

On March 4, 2008, Consulting Engineering Services, Inc. was hired by RKG Associates to survey the Mechanical, Electrical and Plumbing (MEP) systems for Mile Lane Army Reserve Base in Middletown, CT. The general intent of the survey was as follows:

- To evaluate the general condition of the existing systems.
- To generally review the existing systems for code compliance and the possibility of reuse for a new facility at this location.

Though portions of this survey delve into compliance with applicable codes, this survey is not intended to be a comprehensive review of the facility with respect to code compliance. Some code items, such as the seismic installation of the systems, have not been addressed at all herein.

This report is based on observation of visible field conditions. Field investigation was limited to visual inspection of the accessible portions of systems. Some components of the systems are not accessible and would have required limited demolition for inspection. Unless otherwise noted, information regarding capacities of existing equipment has been obtained from field observations.

The conditions of the existing systems indicated herein are from visual inspection only, and visual inspection allows for evaluating the condition of equipment and systems by experience only. The true condition of the equipment and systems can only be ascertained by testing both operational and the structural condition of the equipment and systems, neither of which was included in this evaluation. Therefore, we recommend retaining the services of a qualified service technician to evaluate the condition of existing equipment being considered for replacement; it is possible that some equipment may have a significantly longer service life than any life expectancy values indicated in this survey.

Building Overview

The army reserve center is a 15,800 square foot building on which construction was completed in 1987. The building is two-stories high in some areas however the majority of the building is a single story structure. Currently the building consists of office space, classrooms, storage, menôs and womenôs latrines, a janitorôs closet, a drill hall and a kitchen area. The main entrance which enters into corridor A is located on the north side of the building. On the south side of the building between the assembly hall and combined storage area there is a set of double doors that enters into the mechanical room and electrical room. The only access to these rooms is from the exterior of the building. The reserve center is recessed into the ground and only has a few feet of exposed wall at the front of the building/north face. The back/south face of the building has more of its exterior exposed. The building is constructed with concrete foundation walls and reinforced CMU walls. The roof of the building is standing seam metal roofing. Throughout the building there are aluminum windows which are only 3 feet tall due to the fact the building is recessed into the ground.

An overall floor plan has been included in Appendix A for convienence and reference.

Mechanical Systems

On March 4, 2008, Consulting Engineering Services, Inc. (CES) visited the Mile Lane Army Reserve Base and observed the condition of the existing Mechanical systems.

Fire Protection

There is no fire protection systems currently installed within this building.

Plumbing Systems

Current water service enters the building in the mechanical room to the left of the mechanical room double door as you enter. The water main entering is a 2 inch line. The system was winterized at the time of observation which makes it unknown as to whether it is functioning properly.

Water piping throughout the facility is copper and seems to be in good condition. It was noted in places above the ceiling that insulation was torn and falling from pipes. Molded piping insulation typically has a life expectancy of 20 years which puts the existing piping insulation throughout the building towards the end of its expected life.

Water heating is accomplished via a Super store model SSU-60C. This model is a 60 gallon indirect fired water heater located within the mechanical room adjacent to the boilers. The water heater serves the two toilet rooms (having a total of two showers and nine lavatories), the janitorôs closet (having on janitors sink) and the kitchen area. The indirect fired water heater has been installed within the last one to two years; a typical life expectancy of such a unit is between fifteen and twenty years. The kitchen is equipped with two booster heaters. The first is a Hatco model CC-12 booster heater which serves the dishwasher. The second booster heater is a Hatco model 3CS-9 booster heater which serves the pot sink. Upon visual inspection both booster heaters appear to be in good condition but are at the end of their expected useful life.

According to as built drawings the facility is served by (1) four inch and (1) six inch sanitary main. Before the two lines are joined together into an eight inch main, the four inch main ties into a 750 gallon grease trap. The condition of the grease trap is unknown.

Central Boiler Plant

Existing Conditions

The central boiler plant for the facility consists of two LP fired Laars model CB-M2-250N condensing boilers. The boilers are rated for 250,000 Btu/hr input and 223,300 Btu/hr output. The boilers are three years old; a typical life expectancy of a boiler such as this is between 20 and 25 years.

There are three outdoor 1,000 gallon propane tanks mounted on a pad at grade adjacent to the building that serve the boilers. These tanks are all three years old; a typical life expectancy of an outdoor above grade propane storage tanks is 30 years.

The boilers are located in the existing mechanical room adjacent to the water heater. Each boiler has one direct vent exhaust pipe and one direct vent air inlet pipe that terminate outside the building. The boilers sit on a small pad to the far right of the mechanical room entrance. There are two pumps that serve the main building heating hot water loop. These pumps are both Taco model S63CXH2R-7056, ¾ HP pumps that are three years old; a typical life expectancy on pumps such as this is 30 years.

The hot water supply and return piping is distributed to two air handlers, one make up air unit, six unit heaters and several pieces of fin tube radiation.

Boiler Controls

The boilers and associated pumps are controlled by a Tekmar model 263 boiler controller.

Air Handlers

The HVAC systems serving the building consist of a central boiler plant, unit heaters, fin tube radiation, a ductless split air conditioning system, a make-up air unit with a hot water coil and two air handling units with DX cooling coils and hot water heating coils.

The two air handling units within the building are located in the mechanical room. Each air handler has a heating coil and a coiling coil and an associated condensing unit located adjacent to the building on grade. The air handlers and condensing units are approximately 25 years old which puts them at the end of their expected useful life. At the time of observation both units were shut down so the working condition of both is unknown.

The larger of the two air handlers located in the mechanical room is a twenty-five ton unit. This unit heats and cools the entire building other than the front lobby and five offices adjacent to the entry. The second of the two air handlers located in the mechanical room is a five ton unit. This unit heats and cools the front lobby and five offices adjacent to the entry. Both units return air through plenum returns within the facility.

The two mechanical room air handlers receive outside ventilation air through a shared ductwork system that is connected to two motorized outside air damper. This ductwork currently provides minimum outside air but is sized to provide full economizer.

Air Handler Control System

Each air handling unit is controlled by stand alone controls.

Ductless Split Air Conditioning System

The indoor unit is located within room 121A while the outdoor unit is located in the front of the building to the right of the main entrance as you approach the building. The system is sized to provide 9,500 BTUH of cooling and 9,000 BTU/HR. The units look to have been installed within the last 3 to 5 years. This system has a typical life expectancy of 20 to 25 years.

Make Up Air Unit

The make-up air unit is located above the kitchen. This unit provides 100 percent outside air to the kitchen and has a hot water coil in it. At the time of observation the unit was concealed above the ceiling so the age and condition remains unknown.

Exhaust Fans

There are four centrifugal fans serving the faculty. One is located in the mechanical room and this serves the two bathrooms and one janitorôs closet. The second is also located within the mechanical room and this serves the mechanical room itself. The third and fourth fans are both located on the roof above the kitchen. One of the fans is an upblast fan that serves the kitchen hood while the other is also an upblast fan that serves the dishwasher. All four of these fans are 25 years old which puts them at the end of their expected useful lives.

Fin Tube Radiation

There is fin tube radiation installed throughout the facility. The fin tube is all controlled locally with Honeywell thermostats connected to motorized valves. At the time of observation the fin tube seemed to be operating in a satisfactory manner.

Electrical Systems

Power Systems

Power is brought to the building underground via a 300kVA pad mounted transformer located at the rear of the building. The conduits are routed underground to the mechanical room and then run along the wall to the main electrical room. If the main service were to be modified, code requires that the main disconnect switch be located immediately where the conduits enter the building. Currently this is not the case. Either the service feeders must be concrete encased or the location of the main disconnect be relocated appropriately. The conduits currently terminate at a 1200 Amp, 208/120 Volt, 3-phase, 4-wire main distribution panel. The main distribution panel appears to be in good condition; however it is approaching the end of its life expectancy.

Electrical loads throughout the building are served by four panelboards. The panelboards appear to be in good condition; however they are approaching the end of their life expectancy.

Many receptacles within 6ô-0ò of a water source do not appear to be GFCI protected. Some rooms do not contain an adequate amount of receptacles.

Telecommunications Systems

Telecommunications services are brought into the building via underground service. The telephone distribution equipment is located in the main electrical room and appears to be in good condition, and adequate for future use.

It appears all equipment for data distribution in the building has been removed including servers, racks, switches, etc.

Some rooms do not contain telecommunications outlets.

Lighting Systems

Most of the lighting fixtures are inefficient T12 fluorescents controlled via local switches. Lighting levels throughout the building are inadequate. Spot readings of light levels in many areas indicated 15-20 footcandles, which is quite low. Many fixtures contain lamps that are no longer in operation, which could be from damaged ballasts or burnt out lamps. It was also noted that some ballasts are very noisy.

Emergency lighting is provided via wall mounted self contained battery packs lights. The building currently does not have full coverage for emergency lighting. Many areas have damaged emergency lights, or lack them altogether. Lighting at the exterior of the building at exit doors appears to be in good condition, however it could not be verified if they contain two lamps, which is a code requirement.

Some rooms do not contain occupancy sensors, which are required under current energy codes.

Exit signs are located throughout the building. There are multiple locations where additional exit signs would be recommended in order to provide a clearer pathway to the exits. Some exit signs also appear to be damaged and should be replaced.

Exterior lighting fixtures in the parking lots are controlled via a timeclock located in the main electrical room. It could not be determined if the fixtures are in working order, however they appear to be in good physical condition.

Fire Alarm System

The building is served from a Simplex #2001-8023 zoned fire alarm control panel. The control panel is connected to the city via a ñSig Comò master box. A remote fire alarm annunciator located in the main entry vestibule contains 8 zone indicators to inform the fire department where in the building there is trouble.

Throughout the building, detection and notification of fire is provided by horns, horn/strobes, smoke detectors, heat detectors and manual pull stations. Some areas require additional devices to comply with current codes. For example, some egress paths do not contain manual fire alarm pull stations and some required areas do not contain fire alarm horns or strobes. In addition, some devices are damaged and should be replaced.

Code requirements for fire alarm device spacing and locations are not met in some areas.

Recommendations

The following recommendations are based on our analysis of the existing systems as well as the issues identified by the building ownerôs representative. Our opinions of approximate cost are noted in parentheses.

1. Provide dampers and relief ductwork through the roof so that both air handlers can be made capable of full economizer so free cooling may be provided to the facility at certain times of the year. Not only will this save the owner money but it is a current code requirement. ($20,000)

2. Replace existing controls with full DDC controls to give the ability for setbacks and economizer. ($55,000)

3. Determine if electrical wiring is plenum rated and if not analyze option of ducting returns or rewiring facility with plenum rated wiring or conduit. (rewiring cost = $115,000) (duct work cost = $60,000)

4. Consider replacing the current air handling equipment and condensing units based on their age and expected remaining useful life. ($60,000)

5. Determine age of current make up air equipment and possibly replace based on age and expected remaining useful life. ($25,000)

6. Consider replacing all four exhaust fans based on their age and expected remaining life. ($5,000)

7. Consider replacing both Hatco booster heaters based on their age and expected remaining useful life. ($5,000)

8. Consider inspection of current grease trap to determine exiting condition. ($1,500)

9. Insulate piping where existing insulation has been damaged or fallen off. Confirm condition of current piping insulation and replace where necessary.

10. Consider replacing all electrical panels due to the age of the equipment. ($45,000)

11. Provide additional exit signs and emergency lights for full building coverage and replaced damaged devices. ($10,000)

12. Consider providing occupancy sensor control of light fixtures throughout building for code compliance and additional energy savings. ($12,500)

13. Consider replacing light fixtures and adding an appropriate quantity of fixtures for proper illumination of all rooms. ($100,000)

14. Provide additional fire alarm devices for full building coverage and replaced damaged devices. ($20,000)

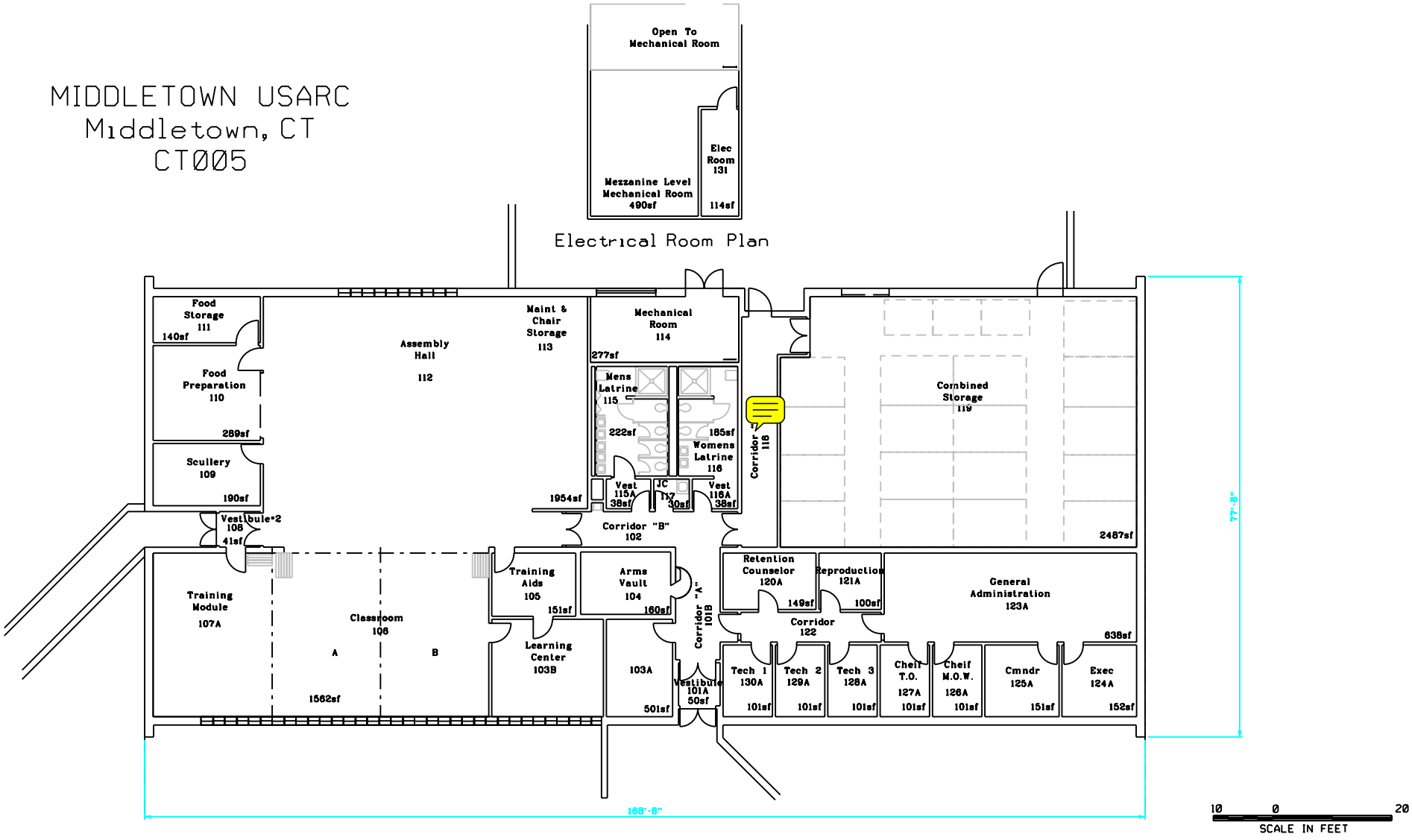
15. Consider adding telecommunications outlets in some rooms for convenience. ($6,000)

16. Consider adding receptacles in some rooms for convenience. ($7,000)

17. Provide GFCI protection to receptacles within 6ô-0ò of a water source. ($2,000)

APPENDIX A

MIDDLETOWN USARC
Middletown, CT
CT005



CT005
Architectural First Floor Plan
SGT George D. Libby USARC
499 Mile Lane
Middletown, CT

DRAWN BY:	DATE:	SHEET NUMBER:
JM Coakley	03/26/07	1 of 1