C. A. CROWLEY ENGINEERING, INC.
645 County Street, Unit 6
Taunton, MA 02780

MEMO:

TO: Greg Carell – The Carell Group

FROM: Jeffrey P. Krockta, P.E.

DATE: April 2, 2007

SUBJECT: HVAC Deficiencies

This memorandum is a list of deficiencies and possible renovation options identified during the introductory walk through at the site on March 28, 2007.

Deficiency List

1. Boiler – The boiler is 52 years old. It is well beyond its useful life expectancy and should be replaced. If the unit is not replaced a catastrophic failure can be expected in the near future.
2. Boiler Room Asbestos – The boiler and surrounding piping appear to have insulation that contains asbestos. Asbestos is a severe health hazard and should be abated as soon as possible.
3. Heating Distribution – The steam distribution is old and in need of renovation. The system does not perform adequately, zoning is poor and the system is terribly inefficient. The system should be replaced in its entirety.
4. Electric Service - The existing service is 225A, 240/120V, 1PH, 3W. This is inadequate for the department needs.
5. Lead Paint - There is suspect lead paint in the building. This is a serious safety hazard and should be abated.
6. Hose Tower – The structural integrity of the hose tower is in question. This should be reviewed by a structural engineer. The tower is also fire hazard, as the proper fire ratings are not maintained.
7. Apparatus Bay – While a source capture system is in place, a purge fan is not. Massachusetts Building Code requires a purge exhaust system for all enclosed parking facilities, regardless of the source capture system. This purge system would be controlled by wall mounted CO and Nox monitors. This system would provide better protection for the occupied areas upstairs.
8. Air Pressurization – There are no means for mechanical ventilation in the building. This means that any fumes that are in the Apparatus Bay will migrate upstairs to the occupied areas. This is an unhealthy situation. A central air conditioning system should be installed such that a positive pressure relationship is maintained between the occupied areas and the Apparatus Bay. This means air will move from the occupied areas to the unoccupied areas and fumes will be unable to migrate into the sleeping quarters/offices/etc.

9. Exhaust – There is no mechanical exhaust in the building with regard to the kitchen, toilet rooms, locker rooms, shower areas, laundry areas and janitor's closet. This is a violation under the current code requirements. While not a life safety issue, this may need to be addressed if the HVAC system is renovated.
10. Energy Code – The existing system does not meet any of the requirements of the Massachusetts Energy Code. Again, not a life safety issue, but will need to be addressed if the HVAC system is renovated.

All of the items listed above are important. Prioritization of the items is not possible. All of the items listed require attention. A phased 3-5-8 year plan is not plausible. The work is either completed in its entirety, or it is not started with the occupants being moved to a new facility. Renovation costs are estimated as follows:

Boiler replacement	$100,000.00
Heating distribution replacement	$100,000.00
Purge System for Apparatus Bay	$ 25,000.00
Ventilation Air/Pressurization/Air Conditioning	$100,000.00
Exhaust systems (Toilets, Showers)	$ 25,000.00
Kitchen Hood Exhaust System(NFPA 96 Compliant)	$ 35,000.00
New ATC Control System	$ 85,000.00
Total HVAC Renovation	$470,000.00

This price does not include any provisions for correcting the hose tower situation (including heat and fire rating requirements), structural modifications to facilitate the installation of new equipment, upgrading the electrical service, asbestos or lead abatement requirements. These requirements would push the total cost well above $700,000.00. More accurate numbers would depend on the design and the extent of the abatement requirements.

The only possible short-term option would be to replace the boiler. This would cost approximately $150,000.00 to $200,000.00 (including asbestos abatement, provisions for combustion air, a new condensate receiver, chemical treatment and a new chimney). This would provide assurance that the boiler will not fail in the next heating season, but it would not eliminate the various other problems in the building related to the HVAC system (hot spots, cold spots, inoperable radiation, failed controls, inadequate ventilation, etc.) Our recommendation is for a complete renovation of the building mechanical systems.

If you have any questions, please call this office.

C.A. Crowley Engineering, Inc.

Jeffrey P. Krockta, P.E.
Project Engineer