CAMBRIDGE PUBLIC SCHOOLS

159 THORNDIKE STREET CAMBRIDGE, MASSACHUSETTS 02141

September 18, 1990

To The Honorable Members of the School Committee:

Air Quality Project - 9/18/90 Status Report

Please be notified that the attached report from Environmental Health & Engineering is a summary of our progress on various air quality projects in the high school and elementary schools. Also, attached is a summary description of the systemwide HVAC preventive maintenance plan prepared by E.H.E., along with a sample of a detailed plan for the Fitzgerald School.

Respectfully submitted,

Mary Lou McGrath,
Superintendent of Schools

MLM/tg

attachments:
1. Letter from E.H.E., 8/28/90, Air Quality Update for Cambridge Public School System.
2. Letter from E.H.E., 8/29/90, Preventive Maintenance Summary.
3. Report from E.H.E., August, 1990, Preventive Maintenance Task items for M.E. Fitzgerald School.

Environmental
Health &
Engineering

Ms. Mary Lou McGrath
Superintendent
Cambridge Public Schools
159 Thorndike Street
Cambridge, MA 02141

RE: Air Quality Update for the Cambridge Public School System

The following list details the progress to date of projects implemented in response to air quality concerns in the Cambridge Public School System:

- January 1990: Report issued to school district, documenting the air quality observed at the Cambridge Rindge & Latin School Complex. This report suggests steps that should be performed by the school system to address and remediate air quality problems within this complex.

- Kitchen Exhaust cleaned all coils, and replaced all filters in the heating ventilation and air conditioning (HVAC) systems of the War Memorial, Cambridge Rindge & Latin Complex, King, Morse, Fitzgerald, Harrington, and Fletcher Schools. This work was performed to remove from these coils dirt which is a media for biological growth, and impedes air flow through the units, resulting in lower ventilation rates. Kitchen exhaust is working in Tobin School and will start at the Peabody in mid-September.

- The pneumatic control system for the HVAC systems in the Rindge & Latin School has received considerable attention. Air compressors have been replaced, and major repairs have been made to seal leaks in the main pneumatic supply lines. This, along with other repairs which are being made to upgrade the system, will result in the proper and reliable operation of the HVAC systems, including better temperature control and increased volumes of ventilation air. Work to completely rehabilitate the pneumatic control systems controlling unit ventilators is currently underway.

- Code violations in the Rindge & Latin School Complex noted in the January 1990 report by Environmental Health & Engineering have been repaired.

- New air distribution systems were designed for classrooms with unit ventilators in the Rindge & Latin Complex. The purpose of these modifications was to better distribute supply air to the occupied space within classrooms. Installation of these modifications is currently underway. Additionally, higher capacity coils are being installed to permit more fresh air to be admitted to the rooms.

- A new exhaust system has been designed for the Cambridge Rindge and Latin corridors and is currently being installed.

8/28/90 2:11 PM

Environmental Health & Engineering Inc.
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Newton, Massachusetts 02159
TEL (617) 964-8550 FAX (617) 964-8556

- Larger re-heat coils were specified for rooms serviced by rooftop units (RTUs) in the Rindge & Latin Complex to permit more outside air to be admitted. These modifications are currently being installed.

- Modifications to the exhaust systems servicing various shop areas in the Rindge & Latin Complex have been designed to avoid the circulation of these nuisance odors in sensitive areas of the building. Installation of these modifications are currently in progress.

- Follow-up monitoring was performed in the Rindge & Latin Complex to assess environmental pollutant levels in the building. The results of these tests showed that the quality of the environment was well within acceptable guidelines.

- New Penthouse to eliminate leaking problems in Media Center has been installed.

- A new ventilation system to ventilate a science classroom and science storage area has been designed and is currently being installed in the Fitzgerald School.

- A design which includes architectural, electrical and HVAC specifications was prepared for a new woodworking shop at the Fitzgerald School. Currently, these modifications are in progress.

- Specifications for electrical and HVAC changes were made to convert the old woodworking shop of the Fitzgerald School into two rooms.

- A facilities manager was selected and hired for the School department. It will be the facilities manager's role to maintain the physical plant of all school property, including all mechanical and HVAC systems.

- All information necessary for implementing a system-wide physical plant maintenance program has been gathered and entered into a facilities management work order system. This work order system will help prioritize maintenance resources and serve as the basis for a preventive maintenance program. Additionally, this system will track the progress of maintenance work orders and facilitate budgeting for labor, outside contractors, and maintenance materials.

- Exhaust fans on the Rindge & Latin complex have been inspected and reconditioned.

- Air handler filters have been changed during the month of August, 1990, at Cambridge Rindge & Latin, War Memorial, King, Fitzgerald, Harrington, Peabody, Kennedy, Maynard and Fletcher. Filters are on order and scheduled for change at Morse, Longfellow, Graham-Park and King School. This changeout is designated by a dated, orange sticker.

- To minimize the possibility of pesticide and herbicides contaminating the Rindge & Latin Complex, the greenhouse was removed from the side of the building. The removal of this structure also eliminated many pigeon roosts, which resulted in the removal of a constant source of pigeon dung. This should also help alleviate some overheating problems experienced by the adjoining rooms.

- Work is currently underway to transfer the task of monitoring the energy management systems of all school buildings from an outside contractor to the CSD facilities manager. This will permit greater school department control over building performance.

Environmental Health & Engineering

7 Wells Avenue, Suite 2 Newton, MA 02159

- Approval has been received from the Department of Environmental Protection for installation of the Glycol Loop at Cambridge Rindge and Latin Schools.

The ongoing work is being scheduled for hours that will have a minimal impact on school activities.

Sincerely,

John F. McCarthy, Sc.D., C.I.H.,
President

Environmental
Health &
Engineering

August 29, 1990

Mr. James Conry
Cambridge School Department
159 Thorndike Street
Cambridge, MA 02138

Dear Mr. Conry,

Enclosed you will find Environmental Health & Engineering's report entitled "Preventive Maintenance Program Demonstration & Summary Document for Cambridge Schools". As you requested, we will have an additional demonstration of the program specifications for the Fitzgerald School on Thursday, August 30, 1990.

Sincerely,

John F. McCarthy, Sc.D., C.I.H.
President

enclosure
JFM/mdl

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Preventive Maintenance Program Demonstration & Summary Document for Cambridge Schools

Project # 89.023

Prepared for

Cambridge School Department
159 Thorndike Street
Cambridge, MA 02138

by

Environmental Health & Engineering, Inc
7 Wells Avenue, Suite 2
Newton, MA 02159

September, 1990

To facilitate the implementation of a preventive maintenance program for the physical plant of the Cambridge School System, the PC based program Service Call Executive Version 6.2[1] has been purchased. The information necessary to describe the component parts which comprise building systems is currently being input into the program. Upon substantial completion of data entry into the program, this system will provide the necessary organization to integrate and manage the organization of the following tasks:

- Corrective Work Orders.
- Preventive Work Orders.
- Inventory Control.

Properly and faithfully implemented, this program will provide the facilities manager with the tools necessary to monitor and manage the progress of work orders, and the inventory required to facilitate efficient operations of the facilities. The program will also aid the facilities manager and financial planner by gathering the data necessary for budgeting maintenance and capital outlays.

Currently, data entry for the War Memorial, Rindge & Latin, Fitzgerald, Kennedy, and Morse Schools are substantially complete. It is expected that the work order system for these buildings will be operational by September 4. The additional schools will be included in the program as the necessary data is collected and organized for entry into the program. In the following paragraphs, a brief description of the preventive maintenance approach is given, with special emphasis on the features of the program and its implementation.

WORK ORDERS

For this system to properly operate, all work assignments will be dispatched by the facilities manager to the person(s) performing the work through work orders. Work orders may be either to persons internal to the operation, or external contractors. In either case, all tasks will be implemented with the proper documentation, i.e. a work order.

The work order will provide a description of a task to be performed, the location of where the task is to be performed, who will perform the task, and the priority of the task relative to other work orders currently in progress. The work order also requests from the person who performs the task a description of the work performed, including a breakdown of the materials and labor needed to complete the task.

The distinction between a corrective and preventive work order will usually be based upon whether the work order is scheduled far in advance, or is in response to a current problem. Corrective work orders will occur for problems such as inoperable lights, heating systems, etc, while preventive work orders will be generated on a regularly scheduled basis. Examples of preventive work orders will include changing of filters in air conditioning systems, service of the burners in the boilers, etc. In all cases, it will be the responsibility of the facilities manager to plan the work necessary to solve a particular problem, translate this plan into a description of work to be performed and generate the subsequent work order(s) to the various trades and/or outside contractors.

Upon receipt of a work order, the person/contractor performing the work assigned will complete the work and provide information documenting the material and labor resources allocated for

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1 Omni Comp, Inc, State College, PA.

completion of the order. In this way, important feedback will be given to the facilities manager documenting the completion of the task and the resources necessary to maintain particular systems.

If, for some reason, a work order cannot be completed within the allocated time, the system will track the problem and provide the information necessary to complete the order. For example, if the work order cannot be completed for lack of a particular part, this work order will be maintained on the work order backlog, with the notation made as to the particular parts needed to complete the work. An accumulation of work orders on backlog will indicate to the facilities manager that a problem exists with the current availability of resources relative to demands. With this information the manager can plan necessary corrective action to expedite repairs.

Figure 1 is a sample work order to be performed at the Fitzgerald School. This work order covers the preventive maintenance of Exhaust Fan #1 located on Roof "A" of this building. This work order is assigned to the HVAC Mechanic, who receives the order as shown in this figure. It is now the responsibility of the HVAC Mechanic to perform the tasks specified on the work order.

Upon completion of the tasks on this work order, the HVAC Mechanic reports the date, and amount of regular and overtime hours needed to complete the order. The mechanic also records the materials used (both inventory and non-inventory items), and the cost of any non-inventory items needed.

In some cases, the facilities manager will audit the work that has been performed under the work order to judge the workmanship and appropriateness of the work described in the order. In these cases, the facilities manager will note on the completed work order the date the inspection was made, and his judgement as to the quality of the work performed.

In all cases, the completed work order will be returned to the facilities manager who will see that the completed work order is logged out as completed. Additionally, from the completed work order form, important feedback information will be obtained, documenting the level of effort required and materials used for completion. Appropriate adjustments will be made to the inventory for materials used in completing the work order.

As shown on the work order (see Figure 1), each work order is assigned a priority. Often the person/contractor will receive a week's worth or more of work orders at one time, and this will enable the person/contractor to properly rank their importance. The highest priority work orders are indicated with the lowest number. Appendix A gives a brief description of how tasks will be ranked.

INVENTORY CONTROL

This program will incorporate a complete inventory management system for all maintenance related items. Once a complete list of inventory items has been established, this program will track the current availability of inventory items and report items which should be ordered.

Upon receipt of an "Inventory Quantity Low" indication, the program will issue a requisition memo alerting the purchasing department to place the order. This memo will include information describing the items, the vendor(s), the quantity to order, etc. The program will also track items which have been ordered but not yet received, to avoid duplication of ordering.

Upon receipt of items for stock, these items will be entered into the inventory. Items will be subtracted from inventory as issued for installation into the building, or transferred to other departments unrelated to the school department.

REPORT GENERATION AND SUMMARY ANALYSIS

The PM Program enables the facilities manager to track and analyze data for the justification of various management decisions. Examples include scheduling and balancing of work loads for in-house personnel; inventory maintenance and purchasing decisions; cost analysis for frequently replaced parts; and targeting systems or areas requiring capital improvements.

Preventive Maintenance Task Items for the M.E. Fitzgerald School

Project # 90.022

Prepared for

Cambridge School Department
159 Thorndike Street
Cambridge, MA 02138

by

Environmental Health & Engineering, Inc
7 Wells Avenue, Suite 2
Newton, MA 02159

August, 1990

PRI	TASK NUMBER	TRADE CODE	FREQUENCY	ESTIM HOURS	LAST PM COMPLETED	PM DESCRIPTION
SUPPLY UNIT #5 [SU-0505] (cont).						
Subtotal: 2 TASK(S).				0.0		
SUPPLY UNIT #6 [SU-0506]						
6	93	01	Quarterly	0.0	/ /	CHANGE FILTERS FILTER SIZES: (4)-16x25x2, (2)-16x20x2
8	54	01	Annually	0.0	/ /	MEMO: LUBE MOTOR BEARINGS AND DAMPERS. CHECK BELTS, REPLACE IF NECESSARY. MEARURE AND RECORD MOTOR AMPERAGE AND FAN RPM ON SUPPLY AND RETURN FANS. CHECK VIBRAT
Subtotal: 2 TASK(S).				0.0		
SUPPLY UNIT #7 [SU-0507]						
6	94	01	Quarterly	0.0	/ /	CHANGE FILTERS FILTER SIZES: (1)-16x20x2
8	55	01	Annually	0.0	/ /	MEMO: LUBE MOTOR BEARINGS AND DAMPERS. CHECK BELTS, REPLACE IF NECESSARY. MEARURE AND RECORD MOTOR AMPERAGE AND FAN RPM ON SUPPLY AND RETURN FANS. CHECK VIBRAT
Subtotal: 2 TASK(S).				0.0		
SUPPLY UNIT #8 [SU-0508]						
6	95	01	Quarterly	0.0	/ /	CHANGE FILTERS FILTER SIZES: (12)-20x20x2
8	56	01	Annually	0.0	/ /	MEMO: LUBE MOTOR BEARINGS AND DAMPERS. CHECK BELTS, REPLACE IF NECESSARY. MEARURE AND RECORD MOTOR AMPERAGE AND FAN RPM ON SUPPLY AND RETURN FANS. CHECK VIBRAT
Subtotal: 2 TASK(S).				0.0		
BUILDING SUB PANELS [SUBPNLS-05]						
8	147	03	Annually	0.0	/ /	MEMO: CHECK BREAKERS. TIGHTEN ALL CONNECTIONS.;
Subtotal: 1 TASK(S).				0.0		

1. S-916

Comm. from Mary Lou McGrath, Superintendent of Schools, transmitting a status report on the Air Quality Project at the High School.

In City Council,

Sept. 24, 1990

Placed on file