MLP GARAGE EXISTING CONDITIONS EVALUATION

EXECUTIVE SUMMARY

The Wellesley Municipal Light Plant (MLP) requires facilities that meet current codes and contemporary standards in order to support its operations. Given that the existing MLP garage currently houses functions for both the MLP and the Water & Sewer Division of the DPW, Earth Tech has been asked to consider reuse of the existing MLP garage facility and reallocation of space within the garage facility once Water & Sewer functions are relocated to an expanded DPW facility. As part of this assignment, Earth Tech has reviewed the March 2004 "Existing Building Infrastructure and Site Condition Evaluation", the March 2005 MLP "Justification" and visited the site on February 28, 2006 to confirm current conditions.

This Existing Conditions Evaluation focuses on three areas:

--the reuse of the 26,800sf existing building to accommodate MLP requirements;
--the mechanical, plumbing, and fire protection systems and requirements; and
--the electrical system and requirements

In each of the three areas, there are significant health, safety, and building code deficiencies with the existing building; there are significant costs associated with addressing these deficiencies; and once addressed, there remain significant constraints or inefficiencies given the configuration of the existing building.

Based on this evaluation, the repair and reuse of the existing garage has costs that would approach those of removal and replacement but without the benefits of a contemporary facility. Given the current condition and configuration of the MLP garage, it is clear that this facility has outlived its useful life. As such, it is the recommendation of this evaluation that removal and replacement of the existing garage provides better long-term value to the Town of Wellesley. Further delay will not produce a more cost-effective solution but rather would result in additional costs being incurred.

REUSE OPTION

The existing garage dates to 1934 and contains some 26,800 sf variously configured and accessed through a series of exterior overhead doors. The proposed replacement MLP garage area of 27,531sf (including mezzanine storage) would at first appear to be a good fit for the existing building. However, upon closer consideration that initial assumption fails because of inefficiencies, health and safety considerations, and value.

First, the layout of the existing building, its structural system(s), and bay configuration is inefficient for contemporary operations. Additional square foot area would be required to accommodate the same program elements as the proposed. A test plan indicating program areas identifies a shortfall of approximately 4,000 sf related to the garage area. For example, within the existing layout, access to truck bays and between the building and outdoor storage yard is limited and contributes to inefficient operations.

Second the configuration of spaces and systems in the existing building present health and safety concerns that would need to be addressed in any reuse scenario. These range from lack of code-compliant ventilation to the need to modify overhead door bays to safely accommodate today's vehicles.

Third, there are construction costs associated with meeting required building codes and contemporary design requirements –even in a less than ideal configuration– in the existing building. For example, the office area indicated would include code-mandated men's and women's locker facilities requiring new plumbing and drain lines under the existing slab. The level of work anticipated within the building may trigger seismic code upgrades to the existing structural system. Additional requirements are noted in the discussion of mechanical and electrical systems below.

Reuse of the existing building would need to account for costs associated with the relocation of the operations during any construction activity; and budgets would need to account for the annual cost of operations (for example, multiple garage door openings versus two proposed for the new facility).

While possible, the programmatic accommodation of the MLP requirements within the existing garage would require significant investment in, and changes to, the existing building. Even after making the necessary investment, the refurbished building would fall well short of meeting the operational needs of the MLP.

MECHANICAL CONDITIONS

This section discusses the existing mechanical conditions of the facility and evaluates the fire protection, plumbing, and HVAC systems.

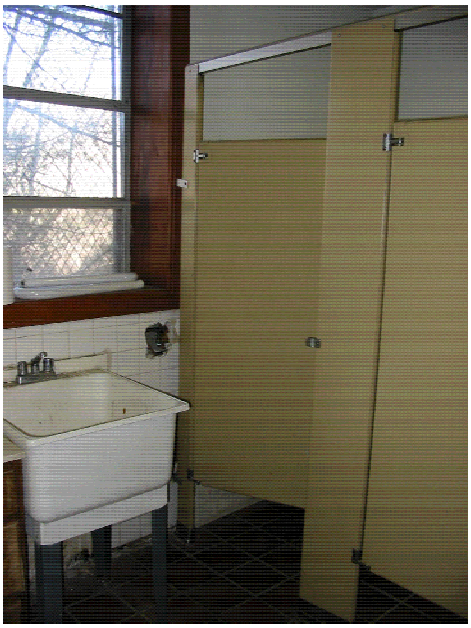
Fire Protection

The existing WMLP garage does not have a sprinkler system installed. Operating the facility without a sprinkler system poses a significant life safety risk to the personnel working in the facility. Additionally, there is over $4,000,000 of vehicles, stock, and equipment stored in this building, which would benefit from fire protection. Accordingly, we would recommend the installation of a sprinkler system in compliance with 780 CMR Massachusetts Building Code and NFPA-13 as part of any building reuse.

Plumbing

The existing plumbing systems are antiquated and in poor condition. Within the shower and toilet facilities, the shower valves leak, the floor drains are slow to drain, and the toilet facilities are not ADA compliant.

Picture P-1



Picture P-2

A slow drain was also detected for the kitchen sink drain, indicating a clog in the system. Accordingly we would recommend removing existing fixtures, installing new fixtures in accordance with current building codes, and power cleaning the sanitary piping.

There are several garage areas throughout the facility; within each garage area there are floor drains to capture any snowmelt or miscellaneous vehicle fluids (e.g., oil, gas, antifreeze). Upon evaluation of the site and facility an oil/gasoline interceptor was not found. Therefore all vehicle

fluids are entering the sanitary system without any pretreatment. This is a code violation in accordance with 248 CMR Massachusetts Plumbing Code, MWRA regulations and EPA regulations. During the site investigation fresh oil was seen around a floor drain (see picture P-3). In addition, the floor drains do not contain trap primers, which can lead to floor drains drying out and allowing sewer gases to infiltrate the facility. The current plumbing code 248 CMR Paragraph 10.10 (10.5) requires all floor drains to have trap primers.

Picture P-3

Accordingly we would recommend removing all under slab sanitary piping leading to floor drains including the sanitary piping which connects the facility to the sewer main. Removing this piping eliminates any oil or gas that may be embedded in the piping. A new floor drain system could then be installed and connected to an oil/gasoline interceptor located outside the facility. All new floor drains shall have trap primers in accordance with 248 CMR Chapter 10. This work will involve extensive slab cutting, trenching and patching.

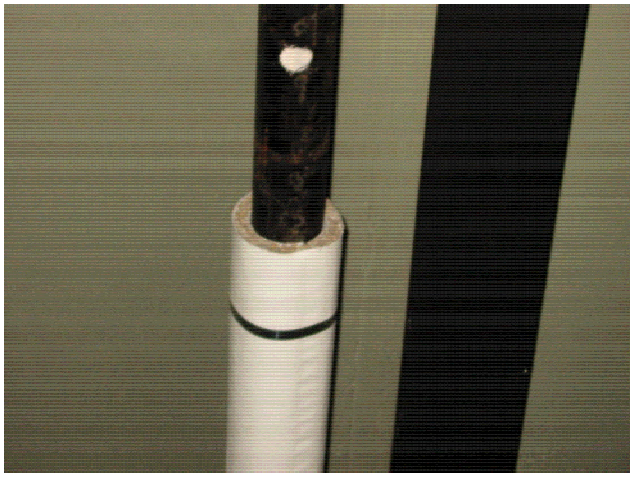
HVAC

Ventilation. Ventilation pertains to the clean fresh air that is required for a building in accordance with 780 CMR Massachusetts Building Code, which in turn refers to the 1993 BOCA Mechanical Code Chapter 16. The existing facility does not contain a working fresh air ventilation system and its windows are inoperable due to the age and condition of the window mechanisms. This is evident in the excessive amount of exhaust odors within the building. The air quality of the building is poor; and strong exhaust and oil odors are prevalent in the office areas, garage areas, and storage areas, which pose a health hazard to the personnel working in the facility. In accordance with current building codes, an exhaust system is required in all bathrooms, locker rooms, and garage areas. The garage areas are required to run continuously unless operating in conjunction with a carbon monoxide detection system. In addition, the locker room and bathroom exhaust should operate during working hours. There were three exhaust fans observed within the facility (see picture P-4). The exhaust fans were manually controlled by a switch and only one

of the three was operational. The operational exhaust fan removed air from a storage area and exhausted the air into a garage area, hence the fan acted as a transfer fan, instead of an exhaust fan. Accordingly we would recommend installation of a complete ventilation system including a CO detection and exhaust system.

Picture P-4

Heating. Originally the building had a steam heating system, which has been replaced by a combination of indirect gas fired and electric unit heaters. The steam system appears to have been abandoned in place; therefore there are steam unit heaters, piping, radiators and a boiler still located within the facility. The piping and boiler are insulated with a material that is suspected to contain asbestos. This material is exposed and may create a dangerous condition if inadvertently disturbed. (see picture P-5). Note that a separate investigation of potential hazardous materials within the existing building is currently being conducted. Based on the results of that survey and testing, we would recommend all identified materials be abated or removed in accordance with proper procedures.



Picture P-5

The gas fired unit heaters were manufactured in 1992 and are now 14 years old. The electric unit heaters appear to be even older. According to the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), the median service life of a gas or electric unit heater is 13 years (2003 HVAC applications chapter 36). Therefore the unit heaters have exceeded their service life and will require frequent maintenance and eventually replacement. The unit heaters are controlled by unit mounted thermostats, which control each unit heater individually. There is no nighttime setback feature for the unit heater; therefore the units operate 24/7, even when the garage is not occupied. The gas fired unit heaters are typically located near the windows causing the unit mounted thermostat to continually cycle the respective unit heater. This cycling causes wear on the unit heater and directs the unit heater to operate even when heating is not required in the space.

The building windows are single pane and drafty. Drafty windows are prevalent in the office areas, where heating is accomplished by undersized, recessed electric wall unit heaters. The gas fired unit heater flue penetrations are not insulated and cold air can be felt infiltrating the penetrations (see picture P-6).

Picture P-6

Drafty windows, cycling of unit heaters, lack of nighttime setback controls, and un-insulated penetrations contribute to preventable heat loss within the facility, which is translated to energy costs. Correcting these problems will significantly lower energy costs. Accordingly, we would recommend removal of all unit heaters and replacement with makeup air units working in conjunction with the CO detection system, an air handling unit for the office areas, and replacement of all windows with energy efficient windows. The roof is not constructed to handle the weight of makeup air units and air handling units; therefore structural analysis and supplementary steel should be anticipated to support the units if they are to be roof-mounted.

Cooling. Cooling within the facility is limited to 3 thru-wall residential type air conditioners. Two of the three air conditioners reject their heat into an adjoining room or storage area (see pictures P-7 and P-8).

Picture P-7

Picture P-8

Since the two air conditioners are located in walls that adjoin the storage/garage area, the fresh air intake transfers air containing vehicle exhaust fumes into the office area and poses a potential health hazard to the occupants of the office. Accordingly we would recommend removing all three air conditioners and installing an air handling system with cooling and heating coils.

ELECTRICAL
This section reviews electrical systems including power, lighting, and telephone/data.

Power

Existing Conditions. The building's main electrical service is a 400A, 3-phase, 208/120V service. The service is protected by a 400A molded case self-enclosed circuit breaker and enters the building to a junction box via (2) underground 2" conduits with 1/0 conductors. Within the junction box the (2) sets of incoming conductors are spliced into one set of 250 MCM conductors and continues on to the line side of the 400A breaker. The breaker's load side conductors feed through metering current transformers within a junction box and then into a 400A double tub MLO Main Distribution Panel (MDP). The above noted conduit and conductor sizes are based on an observational estimate and further investigation would be required to confirm the actual sizes.

Picture E-1: 400A Main Electrical Service, MDP, Meter & Sub-Distribution Panel

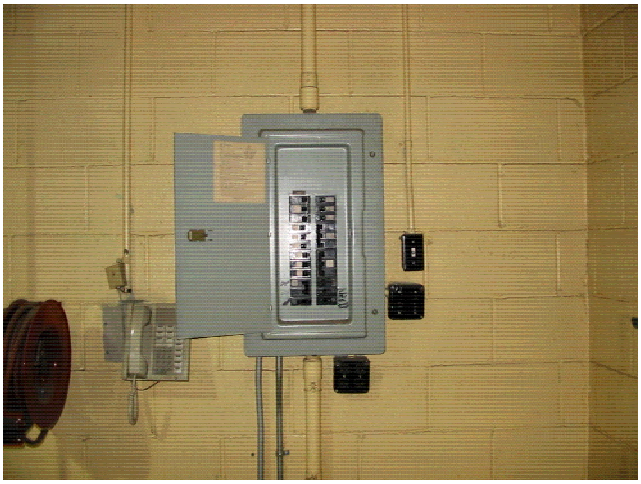
Conduits feed out of the MDP to various parts of the building including (4) sub-distribution panels, (1) panel located below the MDP, (2) panels located in the lunch room closet, and (1) panel located in the MLP shop. Above the 400A circuit breaker is an abandoned recessed mounted panel board enclosure that is being used as a junction box. Next to the MDP is a utility meter.

The sub-distribution panel located at the main service has branch circuits in metallic raceway that most likely services equipment in the adjacent area.

The (2) sub-distribution panels located in the lunchroom closet has branch circuits in mainly NM type cable that seem to service the lunchroom, locker room, kitchen, and bathroom.

Picture E-2: (2) Sub-Distribution Panels in Lunch Room

The sub-distribution panel located in the MLP shop has branch circuits in metallic raceway that most likely services equipment in the adjacent area.



Picture E-3: Sub-Distribution Panel in MLP Shop

In the Water Department portion of the building there is another Distribution Panel that feeds a sub-distribution panel. It was unclear from observation if this Distribution Panel was fed from a separate incoming building service or was from the 400A MDP. The distribution and sub-distribution panels have branch circuits in metallic raceway that most likely services equipment in the adjacent area.

Picture E-4: Water Department Distribution Panel and Water Department Sub-Distribution Panel

Assessment

- The equipment and their installation described above are in fair condition, are of several vintages based on their installation periods, and appear to be in working condition.
- The metallic raceway throughout the facility is in fair to poor condition. In numerous places the raceway is not supported properly, it does not run along ceiling surfaces, nor is it run straight and perpendicular to walls and ceilings as a proper installation would require. *This is a violation of NEC articles 110.12 & 300.11.*

- Plate covers to both switches and receptacles are missing at various locations throughout the facility. *This is a violation of NEC article 110.27.*
- One of the panel boards in the lunchroom closet is not fully accessible with the closet doors open. *This is a violation of NEC article 110.26.*
- A disconnect switch and contactor for the air compressor are located behind the air compressor and is not accessible without leaning over or squeezing in behind the compressor. *This is a violation of NEC article 110.26.*

Accordingly we would recommend addressing code violations and consideration of a consolidation/replacement of existing equipment to support the anticipated uses and meet contemporary standards.

Lighting

Existing Conditions. The existing lighting consists of both older 8ft. strip fluorescent fixtures, HID low bay fixtures, and wall pack fixtures. A combination of switches and circuit breakers appear to provide control of the lighting but the particular control was not immediately evident as you entered an area. In various locations the light fixtures were not working either due to blown bulbs or bad fluorescent ballasts. Many of the HID fixtures did not have lens covers.

Emergency egress lighting consisted of battery backed emergency lighting units mounted on the walls.

Picture E-5: HID & 8"ft Strip Fluorescent Fixtures Wall Pack & Emergency Lighting Unit

Assessment

- The lighting level in general throughout the area is very poor and inadequate for the usage. There are many areas of shadows and of hot spots making a non-uniform and low level of lighting. In (1) garage bay and (1) small hallway there was no lighting at all.
- In general there are not enough emergency lighting units in the facility for egress lighting. *This is a violation of The Massachusetts State Building Code 780 CMR 1024.*
- There were no illuminated exit signs throughout the building. *This is a violation of The Massachusetts State Building Code 780 CMR 1023.*

Accordingly we would recommend that lighting fixtures and switches be replaced, that emergency lighting be upgraded, and exit signs be provided.

Telephone/Data

Existing Conditions. Telephone lines are provided by a multi-conductor cable entering the building underground via a 4" conduit. The cable enters a telephone termination cabinet and terminates. Several multi conductor cables feed out of the cabinet and service various parts of the building. The cables are strung in free air from ceiling frame supports and electrical raceway.

Multiple data lines enter the building underground via a 4" conduit and extend on to service various parts of the building. The cables are strung in free air from ceiling frame supports and electrical raceway.

Picture E-6: Telephone Cabinet and Data Entrance

Assessment

In general the cable installation throughout the building is in poor condition. In many places the cable hangs and does not run in a neat and orderly fashion along its supports. *This could be considered a violation of NEC article 110.12*

Accordingly we would recommend that the cabling installation be improved as part of any building reuse.

COST ANALYSIS

Based on recommendations summarized above the construction cost of the work for minimal improvements to the existing garage building would be in excess of $2 million. These costs may be broken down as follows:

Sitework	$ 100,000	allowance
Architectural upgrades	720,000	
Structural/seismic upgrade	100,000	allowance
Mechanical		
--Fire Protection	175,000	
--Plumbing	200,000	
--HVAC	325,000	
Electrical	675,000	
Subtotal	**$2,295,000**	
10% design contingency	230,000	
5% estimating contingency	126,000	
Estimated Construction Cost	**$2,651,000**	

Please note that these estimated construction costs are based on scope of work summaries and are not based on detailed design documents or take-offs and are provided for “order-of-magnitude” comparison only. Exterior building envelope work related to the masonry walls, roofing, and insulation has not been considered as part of this scope and would be in addition to the costs outlined above.

As with any project, construction costs are only one part of the total costs of the project, and the work would require “soft costs” and project contingencies to implement, adding an additional 35% to the project.

CONCLUSION

The evaluation of the existing MLP garage confirms that the repair and reuse of the existing garage has costs that would approach those of removal and replacement but without the benefits of a contemporary facility. As such, it is the recommendation of this evaluation that removal and replacement of the existing garage provides better long-term value to the Town of Wellesley.