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December 5, 2011

Mr. James Scully  
Superintendent of Schools  
City of Haverhill  
4 Summer Street  
Haverhill, Massachusetts 01830

**Subject:** Hunking School Preliminary Review

Dear Mr. Scully:

AECOM has performed a preliminary structural assessment on October 5 and 6, 2011 at the City owned Hunking Middle School. Recent cracking of the floor system and masonry walls reported by Tom Geary, City of Haverhill Facilities Manager, prompted the City to request this inspection. A previous snow load assessment and observation of the timber framed roof system was performed by AECOM on February 4, 2011 in response to a series of heavy snowfall events.

On October 6, 2011, Bob Hajjar, PE and Bill Blue, PE of AECOM, with the assistance of Tom Geary, Haverhill Schools Facilities Manager, visited the Hunking School to observe the condition of the ground floor of the school. A letter was prepared to present the preliminary findings of this initial site inspection... The recommendation was made to the City to vacate the north wing adjacent to the gymnasium due to the structural deficiencies. The south wing was deemed safe and not affected by the structural deficiencies which plague the north wing.

AECOM has performed an additional preliminary inspection with mechanical, plumbing, electrical, and asbestos professionals to determine the condition of the building systems. The Hunking School was constructed in the late 1950s and the lifespan of the mechanical systems has been reached and failure has occurred in many locations. The structural deficiencies have caused collapse of many of the heating, ventilation, and drainage systems. The reconstruction of the floor system in the vacated north wing could require full replacement of steamlines, plumbing systems, roof drainage, ventilation system, and electrical trunklines. These systems are antiquated in their design and replacement would require redesign to meet current codes.

The building crawl spaces are all contaminated with asbestos from the steam line deteriorated asbestos insulation and must be remediated to allow entry into these confined spaces by anyone, unless strict asbestos containment protocol is followed. The removal cost of the asbestos contaminated materials and soil will be substantial and will be required at some point during the school reconstruction or demolition. The ventilation systems must be reconfigured in the entire school to provide a negative pressure in the crawl spaces to keep contaminants from entering the classrooms above.

The electrical trunkline and junction boxes in the crawl space have fallen to the earth floor. This main electrical feed is very dangerous and must be deactivated to allow the system to be inspected and either replaced (safest option) or repaired. This line feeds the entire school including the open areas.

Roof framing is composed of glue laminated beams supporting tongue and groove planking. The three spans of the system are comprised of a center span with cantilever ends supporting hanger rod connected main spans for the classrooms. This connection is very unconventional, by today's standards, compared to more conventional saddle connections which were developed later. The use of cantilever center spans has also fallen out of favor due to unbalanced snow loads required by current building code.

This building was constructed according to building codes of the 1950's. It does not meet the current building codes and by today's standards is not a very robust type of construction. The quality of the concrete work in the floor slab is substandard and prone to deterioration.

During the post-war school building boom a move was made away from the traditional solid Victorian brick and mortar construction of earlier periods. The post-war period brought about a modernism approach to school design which resulted in simpler, more functional buildings. This resulted from the frustration associated with the heavy, solid and difficult to alter schools of the past as well as the speed and economy associated with the open-plan design and use of prefabricated building materials.

The result of this new architectural style, which commonly incorporated flat roofs, were schools that had leaking roofs and wall systems as well as difficulties with heating, ventilation and acoustic control. These schools tended to have little insulation, making them hard to heat in the winter and often too hot in the summer.

In the case of the Hunking School, the lighter type of construction associated with the ground floor and foundations might reasonably have been expected to outlast the usefulness of the structure. The reduced protection that this type of concrete system provides has proved not to have been adequate due to the harsh environment to which this structure has been exposed. This lighter type of construction, together with the harsher environment present in the crawlspace, has resulted in significant deterioration of the floor system.

By comparison to today's building codes little if any attention was paid to the affects of drifting snow associated with high-low roof conditions similar to those found at the Hunking School. Inadequate provision in the roof design for the extra snow load caused by these drifting snow conditions results in areas of the Hunking School roof possibly being incapable of supporting such a snow load event. Due to the nature of the roof construction and the foundation system that supports it, reinforcing of the roof to handle such snow events may not be practical.

This building was constructed according to building codes of the 1950's. It does not meet the current building codes and by today's standards is not a very robust type of construction. The quality of the concrete work in the floor slab is substandard and prone to deterioration.

As the current MA State Building Code is written, certain changes and modifications to existing structures require the existing structure to comply with the provisions of the modern building codes. The more extensive the changes and modifications to the structure the more likely that the structure will need to comply with the current building code. The current building code provisions which the structure might need to comply with include snow provisions, seismic provisions, and wind provisions, among others. The current school was never designed for seismic provisions and the type of construction utilized does not comply with current building code seismic requirements. Before a decision is made to rehabilitate the school with the intention of long term occupancy a thorough code

analysis should be performed so that it can be determined which provisions of the current MA State Building Code would need to be complied with and what the cost to achieve that compliance would be.

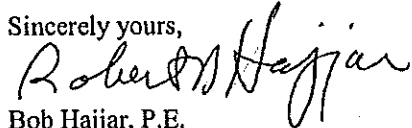
This building was constructed according to building codes of the 1950's. It does not meet the current building codes and by today's standards is not a very robust type of construction. The quality of the concrete work in the floor slab is substandard and prone to deterioration. The lighter type of construction mentioned above was not designed to withstand the wet harsh environment of this site.

Building structures have a useful life of about 50 years before the mechanical systems need to be upgraded and a major renovation takes place. As a result of the manner that the building was constructed it has outlived its practical useful life and the building structure is not worth preserving. The issues with this building are a result of the original construction and normal periodic maintenance would not have prevented the deterioration of the floor slab.

**Due to the multitude of serious deficiencies with the structural, mechanical, electrical, and asbestos issues with the Hunking School, AECOM recommends that all structural and MEP issues be evaluated to determine the cost to perform repairs or reconstruction of the affected areas of the school to allow short term ( approximately 3 years ) reoccupancy of the north wing to unify the six grade students with the rest of the school. Long term occupancy of this school building is not recommended due to continued deterioration of the floor system and inadequate load carrying capacity of the roof system.**

Please contact me if you have any questions.

Sincerely yours,



Bob Hajjar, P.E.  
Project Manager