TO: Chair and Members  
General Issues Committee | WARD(S) AFFECTED: City Wide

COMMITTEE DATE: August 9, 2011

SUBJECT/REPORT NO:  
Fire/EMS Stations Mould Repairs (HES11011/PW11059) (City Wide)

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RECOMMENDATION

That the mould related remediation and repairs at the following Hamilton Emergency Services (HES) Fire/EMS Stations estimated at $1,800,000 be approved and funded from the Unallocated Capital Levy Reserve Account No. 108020:
Fire Station 11  
(Renovation to reinstate dormitory) $950,000

Fire/EMS Station 7  
(Renovation to reinstate EMS quarters, Repair to building envelope, foundation, and HVAC) $185,000

EMS Station 5  
(Building Science Assessment, Repair to building envelope, foundation, and HVAC) $110,000

Fire Station 27  
(Repair and reinstatement) $155,000

Various Fire/EMS Stations  
(Stations 1, 2, 3, 4, 6, 8, 9, 10, 12, 14, 15, 16, 17, 18, 26, 28, 29, 30)  
(Miscellaneous minor remediation and repairs) $400,000

**TOTAL** $1,800,000

**EXECUTIVE SUMMARY**

The purpose of this report is to request additional funding to complete extensive repairs caused by mould at Fire Station 11, Fire/EMS Station 7, EMS Station 5 and Fire Station 27 and minor remediation and repairs at 18 additional locations. Completion of this work is recommended by staff in order to ensure the continued health, safety and wellness of staff at these locations. It is also to maintain current Fire/EMS response times for continued public safety. Additionally, delays in repairs could lead to further building degradation and additional costs. It is important that the City be duly diligent to ensure that policies and procedures as well as response time demonstrate full commitment to worker safety. Failure to address the building issues in a timely manner could have further compliance, legal, and financial implications.

In September 2010, suspected mould was identified in the dormitory at Fire Station 11. Staff retained Trow Associates Inc. (Trow) to determine if mould was present and if necessary, provide recommendations on site remediation. Trow confirmed the presence of mould in the staff dormitory and recommended immediate removal of the building to reduce any risk to the health and wellbeing of the building occupants. Other areas within the station were cleaned as per Trow’s recommendation. Subsequent air sampling indicated that the mould spore levels were no longer elevated.

Also in September 2010, Fire/EMS staff located at Station 7 documented a potential health hazard. The site was investigated and interior renovation work was undertaken to address a leaking hot water heater as well as the interior finish deterioration believed to be a result of water penetration issues. Trow was contracted to perform air quality and other environmental testing to analyze the existing conditions and materials for the presence of mould. Mould was identified and promptly remediated. However, subsequent air sample tests indicated there were still elevated levels of mould spores in the EMS quarters. EMS staff was relocated from the building. Fire staff was able to
remain in their portion of the building as it was not affected in the same way. Air samples in this area showed mould spores to be within an acceptable range.

Maintaining crews at appropriate locations to ensure adequate depth of response to emergency situations is critical. For this reason, EMS staff was relocated to onsite trailers while intrusive mould inspection was pursued in this area. Through testing, Trow identified that the types of mould found were indicative of materials being frequently exposed to high moisture levels. Accordingly, Trow’s Building Engineering Team was engaged to investigate and provide comment on the source(s) of moisture and the potential water penetration through the building envelope. They determined that the North, West, and East walls of the building were compromised and required repair to prevent water infiltration. Short term solutions were identified and implemented to address the immediate concerns. Long term strategies now need to be implemented to bring the building to an acceptable standard.

At both affected sites, Fire Station 11 and Fire/EMS Station 7, services were able to remain at these two locations. Alternate accommodations were made available through short-term accommodations allowing emergency response capabilities to be maintained in the interest of public safety.

Due to the confirmation of mould at the two sites, the heightened concerns of Fire and EMS staff, and the heightened awareness of public to recent mould issues in the media, Hamilton Emergency Services (HES) and Corporate Facilities Management (CFM) felt it prudent to proactively investigate the entire Fire/EMS Station portfolio for potential mould growth in order to ensure the health and wellness of staff at these sites. Trow was, therefore, retained by CFM to conduct mould assessments at all Hamilton Fire/EMS Stations. The assessments were to evaluate building components for potential water intrusion and the possibility of hidden mould contamination as well as signs of visible mould within all HES sites.

In order to complete the 30 assessments a schedule for inspection and analysis was developed and all assessments were completed as of May 2011. Upon completion of these initial assessments, the findings were then used to recommend further investigative work and strategies where applicable. This was done in order to provide recommendations for appropriate remedial and corrective actions where necessary.

With the completion of these assessments, when mould was identified within the sites, the mould was promptly remediated by qualified abatement contractors under the supervision of Trow and following the recommended procedures of the Canadian Construction Association (CCA) “Mould Guidelines for the Canadian Construction Industry” (CCA document 82-2004).

The funding for inspections, analysis and remediation was obtained from various sources including the building’s operations accounts, Facility Capital Maintenance (FCM) Project ID 3541041532, and Fire Station Architectural Project ID 3540941723 in the case of the extensive mould found at Fire Station 21 during planned renovations.

Approximately $210,000 has been spent to date from the Fire Station Architectural Project ID 3540941723 to remediate and make repairs at Fire Station 21. Approximately $275,000 has been spent to date from operational accounts to address remediation and repairs at various Fire Stations.

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There is insufficient funding currently available within FCM and building operations accounts to address the root building issues identified across the Fire/EMS Station building portfolio. Small remediation and repair is required at various sites. The sites that have larger problems for which more substantial funding is required include:

- Fire Station 11
- Fire/EMS Station 7
- EMS Station 5
- Fire Station 27

**Station Assessment Summary:**

**Fire Station 11**

Located at 24 Ray Street South in Hamilton, is designed as a full-time Station. This Station requires a new addition to replace the former dormitory that had to be removed in September 2010 upon the discovery of extensive mould growth. Additionally, renovations to the existing building are required to improve the efficiency of the floor plate to meet the needs of the expansion. This addition and renovation will ensure that Station 11 can accommodate the immediate and future needs of HES and ensure continued uninterrupted service delivery in this area.

**Fire/EMS Station 7**

Located at 225 Quigley Road in Hamilton, is designed as a full-time Station. This Station requires reinstatement of the EMS quarters that were removed during intrusive mould investigation and mould remediation. The existing HVAC cold air ductwork and piping requires insulation, and the addition of two additional heaters in areas where airflow is minimal is required. Repairs to the building envelope on the North, West and East walls are required including weather-proofing, insulation, cladding and flashing at the base of the wall to ensure interstitial moisture drains to the exterior. Modifications to the metal parapet flashing of the roof will be required to ensure proper weather-proofing at the top of the wall. This approach will have the added benefit of significantly reducing the energy consumption and improving the indoor comfort level of the building.

**EMS Station 5**

Located at 1000 Limeridge Road East in Hamilton, is designed as a full-time start and stop Station. This Station requires a Building Science Condition Assessment to determine the reasons for the water infiltration and occurrence of mould. Because of the similarity in building construction to Fire Station 7, it is anticipated that repairs will be necessary to the building envelope, foundation, and HVAC. Funding requirements are not as substantial as for Fire Station 7 because some of the HVAC and foundation work was identified for lifecycle replacement during the 2011 Capital Budget process and can be funded in part through this Project ID.

**Fire Station 27**

Located at 795 Old Highway 8 in Rockton, is designed as a Volunteer Station. During the mould inspection for the other HES sites, mould growth was identified in the
mechanical room, kitchen area, co-ed bathroom and office area. Intrusive investigation, whereby areas of drywall, ceiling and flooring were removed to investigate wall and ceiling cavities, needed to be undertaken to determine the root cause of water infiltration. Trow recommended all sources of water intrusion be repaired and then the building reinstated.

It is recommended that the repairs and renovations to the Stations identified in this Report be undertaken as soon as possible to prevent further degradation of the buildings and potential reoccurrence of mould. This will allow Fire and EMS to continue to operate out of these locations so that they maintain their current deployment and response models and maintain emergency response to ensure the safety and wellbeing of the public.

Alternatives for Consideration - See Page 9

FINANCIAL / STAFFING / LEGAL IMPLICATIONS

Financial:
The Corporate Services Department, Financial Planning and Policy Division, is recommending that the repairs and renovations be funded from the Unallocated Capital Levy Reserve-108020.

The cost of the repairs and renovations are presented in the following table:

<table>
<thead>
<tr>
<th>REPAIRS AND RENOVATIONS OF FIRE STATIONS</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Fire Station 11 (Renovation to reinstate dormitory)</td>
<td>$950,000</td>
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<tr>
<td>Fire/EMS Station 7 (Renovation to reinstate EMS quarters,</td>
<td>$185,000</td>
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<td>Repair to building envelope, foundation, and HVAC)</td>
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<tr>
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<td></td>
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<tr>
<td>TOTAL</td>
<td>$1,800,000</td>
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</tbody>
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Staffing: There are no staffing implications associated with the recommendation contained in this Report.

Legal: There are no legal implications associated with the recommendation contained in this Report.

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HISTORICAL BACKGROUND

In September 2010, an unacceptable level of mould was identified in the dormitory at Fire Station 11 leading to the removal of the dormitory to ensure the continued health and wellbeing of the building occupants. At the same time, mould was identified at Fire Station 7 and EMS staff was forced to relocate to a trailer on site while the mould and water infiltration sources could be investigated and corrected.

Due to the mould identification at the two sites, there was a heightened awareness and concern amongst Fire and EMS staff. To ensure their due diligence and the continued health and wellness of staff, HES and CFM retained Trow to investigate the entire Fire Station portfolio for potential mould growth. The assessments were to evaluate building components for potential water intrusion and the possibility of hidden mould contamination as well as signs of visible mould within the HES sites. The assessments were completed in May 2011 and the findings were then used to recommend further investigative strategies where applicable and to provide recommendations for appropriate remedial and corrective action where necessary as detailed below.

Historical Station Background:

Fire Station 11

On September 14, 2010 staff at Fire Station 11 expressed a concern regarding suspect mould growth in the dormitory and the potential of migration into the kitchen and other areas of the Fire Station. Trow was retained to determine the presence and extent of mould growth, if any, and to provide recommendations. On September 15, 2010 Trow conducted mould spore sampling. They conducted a visual assessment and collected tape lift samples and air samples. Suspect visible mould was observed in the dormitory at the time of the site visit. The results of the tape samples in the dormitory identified abundant mould growth within some of the dormitory areas sampled, some of which were considered toxigenic moulds. Three of the samples were identified as Cladosporium. The fourth sample was identified as Cladosporium Aspergillus. Air sample results revealed that concentration of Aspergillus spores in the Kitchen were elevated in comparison to the outdoor sample, indicating the likely presence of sources of mould amplification within the building. The kitchen area was adjacent to the dormitory and since no obvious source of mould was visually identified in the rest of the building it was inferred that the elevated source of mould spores found in the kitchen area were a result of infiltration from the dormitory area. Based on the results of the air sampling and visual assessment, Trow recommended that the dormitory area be immediately isolated from the remaining parts of the site and the other areas of the building containing elevated mould spores be cleaned and negative air units installed to scrub the indoor air. Due to the large extent of mould growth and the risk to the health and wellbeing of the building occupants, the dormitory was removed. The other areas of the site were cleaned as Trow recommended and subsequent air sampling indicated that the mould spore levels were no longer elevated.

The dormitory at Fire Station 11 was a previous addition to the main building. Its building construction was similar to that of a portable. Mould problems can occur in any building that regularly experiences water damage, poor ventilation and/or has problems with humidity control. Portable type construction is susceptible to roof, wall, and window
leaks and, therefore, tend to be common sources of mould. It is suspected that poor design and construction led to the water infiltration in this building. The site now needs to be brought back to its original size to allow the staff to operate effectively. Better building principles should be employed to ensure longevity of the building.

**Fire/EMS Station 7**

At approximately the same time as the issues arose at Fire Station 11, a staff member located at Fire/EMS Station 7 lodged a health complaint. The site was investigated and interior renovation work was undertaken to address a leaking hot water heater as well as interior finish deterioration believed to be a result of water penetration issues. Trow was contracted to perform air quality and other environmental testing to analyze the existing conditions and materials, for the presence of mould. Mould was identified and promptly remediated. However, subsequent air sample tests indicated there were still elevated levels of mould spores in the EMS quarters. EMS staff was relocated to onsite trailers while intrusive mould inspection was pursued in this area. Through testing, Trow identified that the types of mould found were indicative of materials being frequently exposed to high moisture levels. Accordingly, Trow’s Building Engineering Team was engaged to investigate and provide comment on the source(s) of moisture and the potential water penetration through the building envelope. They determined that the North, West, and East walls of the building were compromised and required repair. Short term solutions were identified to address the immediate concerns. Long term strategies now need to be implemented to bring the building to an acceptable standard. Reinstatement of the EMS quarters that were removed during intrusive mould investigation and mould remediation is required. Trow further recommends the following building repairs: that existing HVAC cold air ductwork and piping be insulated and that two additional heaters be installed in areas where airflow is; that repairs to the building envelope on the North, West and East walls be made including weather-proofing, insulation, cladding and flashing at the base of the wall to ensure interstitial moisture drains to the exterior; that modifications to the metal parapet flashing of the roof will be made to ensure proper weather proofing at the top of the wall. This approach will have the added benefit of significantly reducing the energy consumption and improving the indoor comfort level of the building.

**EMS Station 5**

During the overall Station mould inspection, mould growth was identified at EMS Station 5. Mould was remediated but a Building Science Condition Assessment is underway to determine the reasons for the water infiltration and occurrence of mould. Because of the similarity in building construction to Fire/EMS Station 7, it is anticipated that repairs will be necessary to the building envelope, foundation, and HVAC and that they will be similar in nature and cost. Funding requirements are not as substantial as for Fire/EMS Station 7, however, because some of the visible issues, including HVAC replacement and foundation repair work, was identified by ReCAPP®, the City’s Capital Asset Planning tool that helps to plan and prioritize the renewal of physical assets using lifecycle planning principles. The funding was requested and approved during the 2011 Capital budget process and can be funded in part through this Project ID. This repair work will have the added benefit of significantly reducing the energy consumption and improving the indoor comfort level of the building.

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Fire Station 27

During the overall Fire Station mould inspection, mould growth was identified in the mechanical room, kitchen area, co-ed bathroom and office area of Fire Station 27. Trow recommended an intrusive investigation to determine the root cause of water infiltration. Twelve exploratory access cuts were made to determine the source of water infiltration and mould and the source was identified. Mould abatement contractors were retained to abate the mould contaminated areas. Because of the intrusive nature of the inspection and the quantity of building material that had to be removed, Fire Station 27 requires repair and renovation to bring it back to its pre-mould condition. Additionally, efficiencies within the building can be realized by renovating the existing building to create a more effective interior floor plate. Cost savings can be achieved by doing this work at the same time as repair work because by doing so mobilization fees don’t have to be incurred twice.

**POLICY IMPLICATIONS**

There are no policy implications associated with the recommendation in this Report.

**RELEVANT CONSULTATION**

Corporate Services, Financial Planning and Policy Division
Corporate Services, Risk Management
Hamilton Emergency Services, Fire Division, EMS Division, Administration Section
Public Works, Transportation, Energy, Fleet, and Facilities Division

**ANALYSIS / RATIONALE FOR RECOMMENDATION**

Mould growth inside a building should be considered unacceptable from a building operations and maintenance standpoint as well as from a health risk standpoint. In Canada, recent guidelines have been published by the Canadian Construction Association entitled “Mould Guidelines for the Canadian Construction Industry” (March 2004). These guidelines indicate that indoor mould growth should be removed to prevent human exposure and damage to the materials and building. Correct remediation procedures that are governed by the extent of mould growth and safety considerations should be followed. It is critical that the root moisture intrusion problem be effectively dealt with to prevent further mould growth. Failure to do so may lead to further building deterioration, increased risk to occupants in the building through potentially adverse health effects, and increased liability from health claims and failure to maintain compliance with the Occupational Health and Safety Act.

In the case of Fire and EMS, this is even more critical as uninterrupted service delivery is critical to ensuring emergency response capabilities are maintained in the interest of public safety.

Therefore, repairs and renovation should take place at Stations 5, 7, 11, and 27 to bring the buildings back to pre-mould condition, address building defects, and to prevent future water infiltration and the reoccurrence of mould.
Further, an addition is required to bring Fire Station 11 back to the original size prior to the mould issues and the subsequent removal of the dormitory building. If the addition is not undertaken, the Station will be an inadequate size for the staff occupying it. As a temporary measure, the fitness room/weight room is being used as the dormitory. This is an inadequate long-term accommodation for a Station with full-time personnel and it needs to be restored to its original state. A need has been identified by ReCAPP®, the City’s Capital Asset Planning tool that helps to plan and prioritize the renewal of physical assets using lifecycle planning principles, to replace the boiler and boiler auxiliary systems.

Cost savings can be achieved by doing this work at the same time as the construction of the addition because by doing so mobilization fees don’t have to be incurred twice.

Additionally, efficiencies within the building can be realized by renovating the existing building to create a more effective interior floor plate.

**ALTERNATIVES FOR CONSIDERATION**

There is no alternative for consideration. The health, safety and wellness of staff will be compromised if the mould issues identified in the buildings are not addressed. This could lead to an insufficient depth of response by Fire and EMS staff.

Additionally, delays in repairs could lead to further building degradation and additional costs. For example, the building structure could become unsound and require extensive repairs because prolonged moisture causes structural damage. The longer the building defects are left unaddressed, the higher the risk to the building and occupants and the higher the costs associated with repair.

It is important that the City be duly diligent to ensure that policies and procedures as well as response time demonstrate full commitment to worker safety. Failure to address the building issues in a timely manner could have compliance, legal, and financial implications.

**CORPORATE STRATEGIC PLAN**


**Skilled, Innovative and Respectful Organization**

♦ Providing an adequate and healthy work environment to staff at these locations will promote an enabling work environment, respectful culture, health, safety, and continued well-being.

♦

**Financial Sustainability**

♦ Delivery of municipal services and management of capital assets/liabilities in a sustainable, innovative and cost effective manner is maintained.
♦ Reduced risk to the health and wellness of workers and visitors to the sites thereby increasing the ability to avoid health claims and associated liabilities; increased operational efficiencies; and avoidance of potential fines associated with not being in compliance with Ontario Health and Safety Act Regulations.

**Healthy Community**

♦ The proposed repairs and renovations demonstrate planning and management of the built environment.

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<th>APPENDICES / SCHEDULES</th>
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