



Tighe & Bond

Perry Auditorium and
Greenwood Memorial Bathhouse
Gardner, MA

Final Building Assessment Report

Prepared For:

**The City of Gardner
Massachusetts**

March 2010



Tighe & Bond

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Section 1

Introduction

The City of Gardner (the “City”) requested Tighe & Bond complete a building assessment of the Perry Auditorium and Greenwood Memorial Bathhouse buildings. To complete the assessment, Tighe & Bond conducted a site visit to each facility to observe the buildings for the purpose of assessing the general physical condition of the facilities. The site visit was conducted by a registered professional structural engineer, mechanical engineer, and electrical engineer, who also met with Don Lemieux to review facility operational and maintenance components at the Greenwood Memorial Bathhouse. Our engineers also met with Richards Reynolds the City of Gardner Building Commissioner at City Hall to review plans for the Perry Auditorium prior to the site visit. The evaluation of the building systems included the following:

- Review of existing drawings to become familiar with building systems
- Review of available existing reports
- Observation of exposed foundation walls, building exterior envelope, roof exterior, and accessible structural systems from interior spaces within the building for signs of deterioration or deficiencies
- Observation of the mechanical systems where accessible
- Observation of the electrical systems where accessible
- Estimation of existing structural, mechanical, and electrical systems remaining life and identification of deficiencies
- Review of maintenance repair history with City staff to identify intermittent or recurring issues
- Discussion with local officials regarding any inspection concerns related to electrical systems

The following sections of the Building Assessment Report provide a description of the Perry Auditorium and Gardner Memorial Bathhouse buildings, an assessment of the mechanical, electrical, and structural building systems based on observations made during the site visit, and conclusions and recommendations for additional building related work the City may want to consider. Tighe & Bond’s assessment did not include a thorough evaluation of system compliance with local, state, or federal codes, or quantification of system performance and capacity. However, the structural system recommendations largely hinge on code requirements, and therefore in the structural assessment section State code issues are generally discussed.

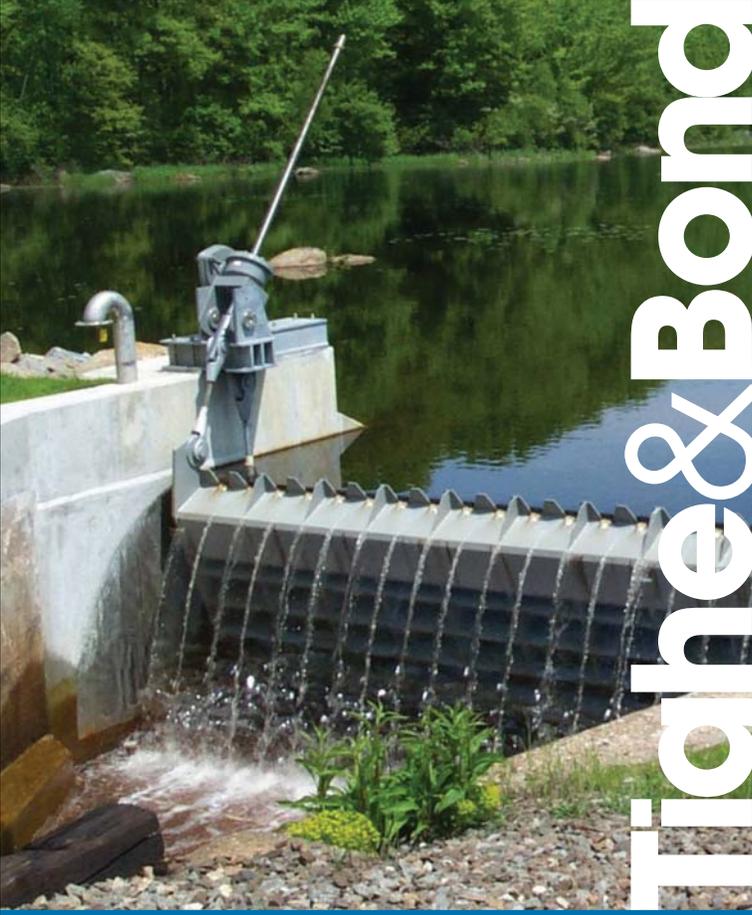
The overall condition of the systems and equipment was assessed on a scale from **Poor** to **Good**, as defined below:

- **Good:** Represents systems or equipment that are performing well and can be expected to remain useful and functioning for greater than 10 years with regular maintenance
- **Fair:** Represents systems or equipment that have minor deficiencies, but are currently performing adequately and should remain useful for between six and

ten years with regular maintenance. These items generally can be repaired and/or restored to good condition with modifications

- **Poor:** Represents items that have significant deficiencies or are not performing well and have an expected remaining useful life of less than five years. Generally these items will require substantial repairs or replacement for the system in question to remain in service

Tighe & Bond's review is based on visual observations made during field reconnaissance visits to the Perry Auditorium and Greenwood Memorial Bathhouse, discussions with current facility maintenance staff, and our mechanical, electrical, and structural experience and judgment. This building assessment does not include evaluation of asbestos, oil tanks, other hazardous materials, or telecommunications devices.



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Section 2

General Property Description

The City of Gardner possesses a wealth of buildings, structures, and sites that provide evidence of its unique history and culture. Structures like the Greenwood Memorial Bathhouse and Perry Auditorium represent connections to our past that are important to developing and maintaining a sense of place - a sense of local identity. Adaptive reuse and preservation of these structures is a critical component for preserving this sense of place.

Furthermore, preservation is one of the most effective sustainable design practices. In an effort to ensure that the Commonwealth cares for the built and natural environment, Governor Patrick has introduced ten sustainable development principles. The Commonwealth will “seek to advance these principles in partnership with regional and municipal governments, non-profit organizations, business, and other stakeholders”. Reuse and preservation of these landmark structures is consistent with this initiative.

The Commonwealth of Massachusetts is recognized as a leader in fostering the rehabilitation of existing buildings through its adoption of “rehab-friendly” regulations. Chapter 34 of the Massachusetts State Building Code (780 CMR) is intended to “maintain or increase public safety, health, and general welfare in existing buildings by permitting repair, alteration, addition, and/or change of use without requiring full compliance with the code for new construction”.

The provisions of Chapter 34 apply to existing buildings which have been legally occupied and used for a period of at least five years. Any building for which there exists an outstanding notice of violation (or other order of the building official) cannot qualify unless the proposed work includes the abatement of the outstanding violations.

Tighe & Bond conducted a site visit on November 25, 2009 to assess the structural, electrical, and mechanical building systems of two buildings in the City of Gardner. We met Richard Reynolds at City Hall to review drawings for the Perry Auditorium and were accompanied by Don Lemieux at the Greenwood Memorial Bathhouse for the walk through. The following sections provide a general description of the buildings. At the end of Section 6, we have included a table for each building that summarizes the observations made during the building assessment that require discussion or action on the part of the City, the timing for needed repairs and/or upgrades, and an opinion of probable cost for the recommended steps to be taken.

2.1 Perry Auditorium

The auditorium building is a two-story structure constructed at the west face of the existing City Hall building. The auditorium is constructed of concrete foundations with brick masonry bearing walls, which support floor and roof framing of both steel and wood structural members. The west end of the building, where the Connors Street entrance lobby is located, has a lower level below the main auditorium elevation level.

The City provided Tighe & Bond the opportunity to review existing drawings of the auditorium and the adjacent City Hall. The drawings were dated September 1938 and contained architectural, structural, and mechanical information from the building’s original

construction. Due to the condition of the drawings, the City requested they be viewed onsite, and the drawings were not copied or reproduced.

According to the existing drawings, the auditorium building is an extension of City Hall, both constructed c. 1938. The auditorium building is approximately 113 feet long in the east-west direction and 65 feet wide in the north-south direction. The drawings indicate the lower levels of the building were constructed with reinforced concrete foundations and slabs on grade. The main auditorium slab, which is one level above the Connors Street entry level, is also slab on grade. The upper lobby floor at the west end of the building and the mezzanine level has structural steel beams encased in concrete. The drawings show that the roof is comprised of wood decking with wood joists supported on structural steel trusses. The trusses span the width (65 feet) of the building and are supported on load bearing multi-wythe brick masonry.

The mechanical systems in the auditorium building include a central steam heating system that originates in the City Hall building. The steam piping runs underneath the auditorium floor and through two pipe chases from the stage to the lobby spaces. According to City personnel, the central low pressure steam system was upgraded in 2003, adding combustion air fans, a new fuel oil tank, and other improvements. The building does not have a cooling system, and City personnel indicate that the four roof top exhaust fans have been removed from the building. The primary auditorium windows appear to be replacement windows constructed of a translucent panel type window system with clear glazing on the lower portions. Photovoltaic panels are installed on the southern exposure of the roof.

The electrical distribution system includes feeders serving the auditorium. The feeders are all rated 60 Amps, 208/120 volts, three phase wire. We observed no emergency or exit lighting in the auditorium.

2.1.1 General Conditions Assessment

2.1.1.1 Mechanical Systems

The existing heating, ventilating, and air conditioning systems (HVAC) of the auditorium building were generally in **Fair to Poor** condition. The steam system in the auditorium has had several leaks that have been repaired by replacing failed sections of pipe, such as in the lavatories off the building foyer. The building envelope is considered to be in **Fair** condition due to the age of the windows and resulting impact on building energy efficiency.

The existing plumbing systems appear to be in **Fair** condition, although additional fixtures will need to be installed if the buildings use changes. Although the handicap accessible lavatories are functional, the non-accessible lavatories off the lobby entrance range from marginally functional to not functional. As a result, the building does not have enough functioning lavatory fixtures to support use of the auditorium.

The existing fire suppression system is generally in **Fair** condition, although its life expectancy is 10 or more years. The **Fair** rating is a result of the fact that the system does not appear to meet code requirements for operation of a stage, and is likely to require upgrading if the auditorium will be used for its original purpose.

2.1.1.2 Electrical Systems

All of the electrical equipment in the auditorium building is in **Poor** condition or has reached the end of its useful life. The feeders have reached the end of their useful life, and the existing feeder size would not be able to handle the required loads for a modern auditorium. There are very few fire pull stations, no horn/strobe fixtures, no emergency light fixtures, and very few receptacle outlets. The Perry Auditorium will require a complete electrical upgrade to bring the building into compliance with all pertinent building codes and with the latest industry standards for public auditoriums.

2.1.1.3 Structural Systems

The existing structural systems of the building were generally in **Good** condition, however, the building is likely to require significant code-related updates for the building to return to use as an auditorium. It is unlikely the unreinforced masonry walls will provide adequate lateral resistance to meet current code requirements and thus a supplemental lateral system would need to be constructed, or code compliance relief would need to be requested from the Board of Building Regulations and Standards (BBRS). Water damage observed throughout the building requires investigation to determine the source of the infiltration and verify that measures taken by the City have rectified the problems. Accessibility and egress both appear to require modifications to meet current codes; however these requirements should be able to be met without significant structural alterations to the building.

The structural system showed isolated areas of deterioration. Significant signs of structural deficiencies or members being overstressed were not observed during the site visit. The below grade cast-in-place concrete appeared to be in sound condition and the brick masonry was in good overall condition, however, a vertical crack in the exterior masonry wall on the southeast corner of the building was observed. No masonry control joints were noted around the exterior of the building. It appears that this crack was formed due to normal thermal expansion of the masonry and the lack of intermediate control joints. It was also noted that one of the below grade restroom walls had an area of deteriorated concrete and that a potential moisture problem could be present in two of the stairways.

There were indications of water damage throughout the building as evidenced by numerous areas of peeling and crumbling plaster ceilings, several areas where the finished wood flooring was heaving, and mold was observed on some of the wall board. Through our conversations, City personnel confirmed the building has experienced leaking from the existing wood roof resulting in water damage to the ceilings and wood floors. The City indicated previous repairs have been made to the roof in an attempt to prevent further deterioration of the building. Based on observations made during the site visit, it appears the leaks have been addressed as evidence of new water damage was not present.

2.2 Greenwood Memorial Bathhouse

The bathhouse building is a two-story structure housing an indoor pool. The building is constructed of cast-in-place concrete foundations below grade and brick masonry bearing walls, which support floor and roof framing of both steel and wood structural members. There is an elevated wood mezzanine suspended by hangers off the roof trusses that extends around the interior perimeter of the building. The structural members for the roof are fully exposed, are constructed of pitched steel angle "attic" trusses supporting wood purlins, and the roof deck is wood with glass panels on the upper half of the roof. Original construction drawings were not available for the Greenwood Memorial Bathhouse building.

However, the front entrance, women's locker room, pool deck access, and men's locker room were upgraded to varying degrees as part of the Greenwood Memorial Bathhouse Improvement project completed in 2006 and 2007. These drawings were reviewed as part of this evaluation. For purposes of this report the north wall is assumed to be the wall facing Crystal Lake.

2.2.1 General Conditions Assessment

2.2.1.1 Mechanical Systems

The building HVAC system is in **Poor** condition and has reached the end of its useful life. The building envelope is in **Fair** condition. The mechanical systems in the bathhouse include a single fuel-oil steam boiler that provides five pound per square inch gauge (psig) steam for the building's heating requirements. The roof over the main pool space does not appear to be insulated. The roof has two partially open vents located at each end of the pool, and a disabled bare-pipe radiator system runs the length of the pool near the roof trusses. Floor vents on the mezzanine level are covered. The bathhouse does not have a dehumidification system.

Overall, the bathhouse plumbing systems range from **Poor** to **Good** condition. The existing pool filtration system was recently replaced, although five steel sand filter tanks from the previous system are still present. When the new filtration system was installed, a significant portion of the pool water piping was also upgraded. Additionally, some of the basement HVAC piping was recently replaced. A significant portion of the sanitary and water piping for the women's shower room was replaced as part of the recent improvements project, although some original piping is also still in place and could use replacement. The majority of the sanitary and water piping for the men's shower room is also original and in need of replacement.

2.2.1.2 Electrical Systems

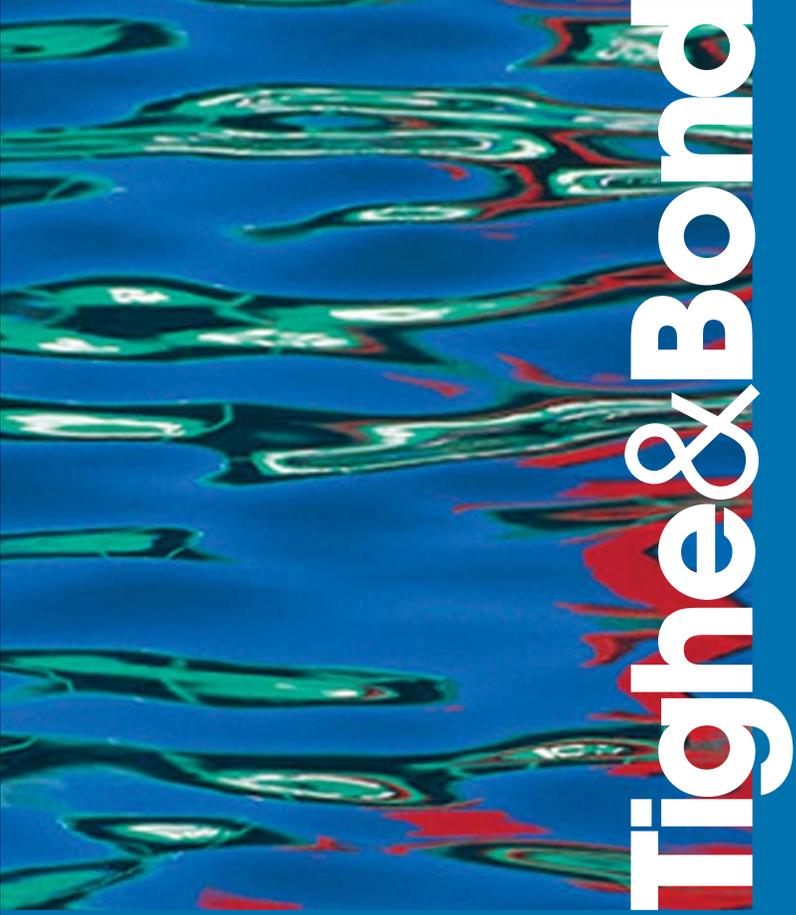
The building electrical distribution system consists of a 200 amp, 208/120 volts three-phase; four wire main distribution panel board feeding a number of branch circuits. The system was replaced as part of the recent improvement projects, appears to be in **Good** condition, and is adequately sized to meet the current demand of the facility, as well as increased loads for future expansion. Wiring and receptacles in the basement were recently upgraded and/or replaced and are in **Good** condition. The branch circuit wiring in the rest of the facility is aged and in **Fair** condition. Certain areas of the building do not have an adequate number of receptacles. The lighting in the basement and women's lavatory and locker rooms has recently been replaced and is in **Good** condition. The lighting in the rest of the building, including the upper and lower pool areas and men's lavatory and locker rooms, is in **Fair** condition. There are no emergency or exit lights present in the basement, first floor entranceway, upper and lower pool areas, or the second floor near the entrance. There are no emergency lights in women's or men's lavatory and locker rooms or on the exterior of the building.

2.2.1.3 Structural Systems

Tighe & Bond completed a structural inspection of the bathhouse building and systems in the fall of 2000. Numerous structural deficiencies were noted in the concrete foundation, masonry walls, roof construction, and the wood mezzanine through the 2000 review. An access stair connecting the men's bathroom to the basement was identified as significantly deteriorated and corrective measures needed to be implemented. This access stair was removed and the floor opening filled as part of the 2006/2007

improvements. To the best of our knowledge, no other structural deficiencies noted in the 2000 inspection have been addressed.

Overall the Greenwood Memorial Bathhouse building is in **Fair** structural condition with several areas that are in **Poor** condition. The below grade cast-in-place concrete walls have numerous areas of cracks and major spalls, and the first floor concrete slabs have areas of exposed reinforcing steel. Generally the exterior masonry walls appear to be in **Fair** condition with the majority of the walls appearing to be sound, however, there are several locations that require re-pointing, and some isolated areas are in **Poor** condition and need significant repairs. The mezzanine has isolated areas of deteriorated wood deck and the support columns at the west end of the building have deteriorated significantly with section loss at the bases.



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Section 3

Mechanical System Assessment

As part of Tighe & Bond's assessment of the mechanical systems, we reviewed available facility drawings to understand mechanical system design in order to estimate projected mechanical system life and possible mechanical system deficiencies. We also observed mechanical systems in the field to visually confirm the condition of mechanical systems and identify installation or operational issues. During the site visit, we discussed maintenance and repair histories with City personnel to identify recurrent or intermittent issues.

A discussion of identified issues and recommendations to address the issues is presented below. A table summarizing issues identified in the mechanical systems, suggested mitigation, estimated timeframe of suggested repairs (as applicable), and the opinion of probable cost for each building is included at the end of Section 6.

3.1 Perry Auditorium

3.1.1 HVAC Systems and Envelope

The auditorium building has a central steam heating system that originates in the City Hall building. The auditorium does not have a cooling system. The central low pressure steam heating system in the City Hall building was upgraded in 2003, and combustion air fans, a new fuel oil tank, and other improvements were added at this time.

The steam system piping runs underneath the auditorium floor and through two pipe chases from the stage to the lobby spaces. The main floor of the auditorium building has ten steam radiators; each located under a window. Metal deflectors are installed at the radiator air outlet grating that restrict air flow from the radiators. Many of the radiator air inlet toe-kick spaces are blocked with furniture. One bathroom was reportedly renovated in the 1990's and in this bathroom the toe-kick space has been covered with an electric heater. The auditorium's HVAC controls (e.g., thermostats, motor starters) appear to be original Barber-Coleman controls. The steam system in the auditorium has had several leaks that were repaired by replacing failed sections of pipe.

The existing steam heating system is in **Fair to Poor** condition, is failing through leaking pipes and fittings, and has reached the end of its useful life. Several pipe joints were observed to have excessive rust and corrosion build-up. According to City personnel, leaks in existing piping must be fixed on an on-going basis. The existing HVAC system does not provide conditioned air for cooling or ventilation. For comfort purposes, the City would want to consider installing conditioned outdoor air in order to use the building as an auditorium.

Overall, the building envelope is in **Fair** condition and not insulated. Roof leaks, that have since been repaired, have resulted in mold damage on some areas of wall board.

The envelope system has an estimated existing remaining life of approximately 6-10 years; however, upgrades should be made to improve energy efficiency. If the City considers repairing the existing HVAC systems, the State energy code will require that the envelope be evaluated at the same time, which may result in the need for envelope

renovations. The exact manufacturer and model of the replacement windows should be determined to evaluate the energy efficiency of the units.

3.1.2 Plumbing Systems

The building plumbing systems are in **Fair** condition; however, there are not enough functional lavatories for the auditorium to operate as an auditorium in accordance with current standards. The existing lavatories will need renovation before the building can change from its current use. Although the handicap accessible lavatories are functional, the main lavatories surrounding the lobby entrance range from marginally functional to not functional. Both water and sanitary piping has been replaced in areas where there have been leaks. A new domestic water heater was installed to provide hot water to the accessible lavatories. The new water heater is unlikely to have enough capacity to service all new lavatories.

3.1.3 Fire Suppression Systems

A fire suppression system is installed in the ceilings of the auditorium and is in **Fair** condition. Piping runs above the main ceiling, and is protected from freezing by electric unit heaters. There does not appear to be adequate fire suppression to meet the code requirements for operation of a stage. Fire suppression upgrades should address the fire alarms, sprinklers, and passive or active (HVAC) upgrades to provide smoke venting. The passage door from the stage to City Hall should be eliminated to maintain a fire-rated wall/partition between the stage of the auditorium and the City Hall building.

3.2 Greenwood Memorial Bathhouse

3.2.1 HVAC Systems and Envelope

The HVAC system at the Greenwood Memorial Bathhouse appears to be in **Poor** condition. The building uses a single fuel-oil steam boiler to provide 5 psig steam for all heating requirements. The system does not provide conditioned air for cooling, ventilation, or humidity control, and it does not have a redundant boiler. The boiler room is located in the basement, separate from other spaces. Approximately 10 years ago a fire in the boiler room resulted in soot damage observed throughout the basement. It is not known if the boiler was damaged as a result of the fire.

The age of the HVAC piping varies; some of the basement HVAC piping was recently replaced, some appears 10 years old or older, and some appears to be 50 years old or older. Many of the steam traps appear to be well beyond their useful service life, are severely corroded and subject to sudden failure. The system also has issues with leaking pipes and fittings. The HVAC controls appear to be of original construction age, or at least 50 years old.

A bare-pipe radiator system that runs the length of the pool is located in the roof truss system. The building manager indicated the system is currently disabled. Two partially open roof vents are located at each end of the pool. The pool has a wood mezzanine which extends around the pool's perimeter. There are floor vents in the mezzanine floor, however they are covered.

The existing pool filtration system has recently been replaced, and five steel sand filter tanks remain in the building from the former system. The pool's steam to hot water heater was not replaced, and is beyond its useful life. Several of the fittings and flanges are severely corroded, and may fail unexpectedly. The majority of the pool water piping

was replaced with the installation of the new pool filtration system. According to the pool manager, new PVC piping was installed and much of the metal piping has been relined.

The bathhouse building does not have a dehumidification system. Based on the observed building conditions, the high humidity is likely mitigated by the minimal insulation in the building envelope, lack of vapor retarder, and an inefficient ventilation system that allows the moist air to freely escape. The bathhouse building does not have a dehumidification system.

The building envelope for the Greenwood Memorial Bathhouse appears to be in **Fair** condition. The roof of the main pool space does not appear to be insulated, or may contain exterior insulation. The top four feet of roof at the peak appears to be made from corrugated fiberglass panels. The existing envelope appears to be significantly below today's energy efficiency standards, and the City could gain operational efficiencies without compromising moisture migration if the building envelope is upgraded.

3.2.2 Plumbing System

The plumbing system in the Greenwood Memorial Bathhouse ranges from **Poor to Good** condition. The women's locker room and men's locker room were upgraded to varying degrees as part of the Greenwood Memorial Bathhouse Improvement project completed in 2006 and 2007. These drawings were reviewed as part of this evaluation. According to the pool manager, there are currently no issues with hot water volumes or pool temperature. A majority of the plumbing fixtures were replaced as part of the recent building improvements project, and the remaining shower heads in the men's locker room that were not replaced exhibit some minor leakage and dripping but are in satisfactory condition. However, the majority of the sanitary and water piping for the men's locker room, which was not upgraded as part of the recent improvements project, is in need of replacement.

3.2.3 Fire Suppression Systems

A fire suppression system was not observed at the Greenwood Memorial Bathhouse.



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Section 4

Electrical System Assessment

As part of Tighe & Bond's assessment of the building electrical systems, we reviewed available information to understand the existing electrical systems, and estimate possible deficiencies. We also surveyed electrical systems in the field to confirm their condition and identify installation or operational issues, and discussed maintenance and repair histories with City personnel to identify any recurrent or intermittent issues. According to Richard Reynolds, the Perry Auditorium and Greenwood Memorial Pool buildings are inspected by local jurisdictional authorities on an as needed basis and no issues with the electrical systems at the facility have been identified as a result of City inspections.

Descriptions of each building's electrical systems are included below, as well as ratings of system condition, and a discussion of identified issues. A table summarizing issues identified in the electrical systems, suggested mitigation, estimated timeframe of suggested repairs (as applicable), and the opinion of probable cost for each building is included at the end of Section 6.

4.1 Perry Auditorium

Overall, the electrical system and equipment in the Perry Auditorium is obsolete, and inadequate for future use. The building should be upgraded with new electrical systems and energy efficient equipment that comply with current codes and industry standards for a modern auditorium.

4.1.1 Electrical Distribution System

The building electrical distribution system consists of a 200 amp, 208/120 volts three-phase, four wire main distribution panel board feeding a number of branch circuits. The electrical equipment and feeders are in **Poor** condition and have reached the end of their useful life. The feeder's size would not be able to handle the required loads for a modern auditorium.

4.1.2 Branch Circuits

The branch circuits are in **Poor** condition and have reached the end of their useful life. There is not an adequate number of branch circuits to serve the loads of a modern auditorium.

4.1.3 Lighting

The lighting system is in **Poor** condition, is obsolete, and has reached the end of its useful life. There is no emergency lighting or exit lighting in the auditorium.

4.1.4 Fire Alarm System

The fire alarm system in the auditorium is inadequate. There are very few fire pull stations and no horn/strobe fixtures.

4.2 Greenwood Memorial Bathhouse

4.2.1 Electrical Distribution System

The building electrical distribution system consists of a 200 amp, 208/120 volts three-phase, four wire main distribution panel board feeding a number of branch circuits. The system was replaced as part of the 2006/2007 improvements project, appears to be in **Good** condition, and is adequately sized to meet the demand of the facility, as well as potential increased loads for future expansion.

4.2.2 Branch Circuits

The branch circuits feed lighting, pumps, a boiler, fans, unit heaters, and convenience outlets. The circuits appear to be adequate to handle the loads they serve, although additional branch circuits should be added. In the basement, the branch circuit wiring has recently been replaced and is in **Good** condition. The receptacles, switches, and connections to pumps have recently been replaced and also appear to be in **Good** condition.

Near the first floor entrance, the branch circuit wiring for the lighting and convenience outlets appears to be older, and may be the original wiring. In the women's lavatory and locker rooms, the branch circuit wiring for the exhaust and unit heater appears to be original and in **Fair** condition. In the men's lavatory and locker room, the branch circuit wiring for the lighting and receptacles appears to be the original wiring and is also in **Fair** condition. The pool manager indicated there have been no branch circuit problems in these areas.

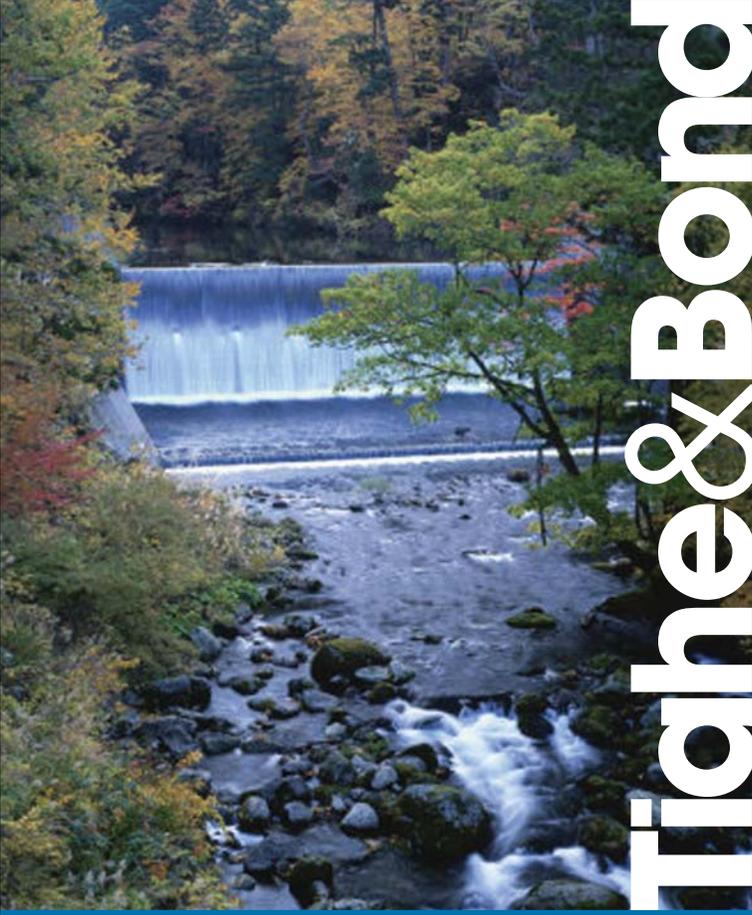
In the upper and lower pool areas, the branch circuit wiring appears to be original wiring and in **Fair** condition. The wiring to the unit heaters should be replaced in the near future. The number of receptacles in this area, as well as on the second floor near the entrance, is minimal.

4.2.3 Lighting

There are two four by four recessed fluorescent light fixtures in the entrance area which appear to be in **Fair** condition. The lighting in the pool area, exterior areas, and in the men's lavatory and locker rooms also appears to be in **Fair** condition. It appears the pool area light fixtures are not intended to be used in a damp location. In the entrance area, the lighting is not well distributed and in some places is low in intensity (especially at night). The amount of exterior lighting is minimal. The lighting in these areas should be upgraded with energy efficient lighting fixtures to add additional light. The lighting in the basement and women's lavatory and locker rooms has recently been replaced and is in **Good** condition.

4.2.4 Emergency and Exit Lighting

There are no emergency or exit lights present in the basement, first floor entranceway, upper and lower pool areas, or the second floor near the entrance. There are no emergency lights in women's or men's lavatory and locker rooms or on the exterior of the building. These lighting fixtures need to be installed throughout the Greenwood Memorial Bathhouse building.



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Section 5

Structural System Assessment

As part of Tighe & Bond's assessment of the Perry Auditorium and Greenwood Memorial Bathhouse structural systems, we reviewed existing drawings to familiarize ourselves with the facilities in order to provide an opinion of system condition. During our site visit, we visually reviewed the interior and exterior structural systems of the buildings for signs of deteriorated or deficient conditions, the attic space and underside of roof framing, accessible structural systems in some unoccupied interior spaces within the buildings, and foundation walls where visible. The roof exterior was visually observed from the ground and from upper level building floors as possible, access to the roof was gained through the attic space.

A description of the structural systems and recommendations to address identified issues is included below. A table summarizing issues identified in the structural systems, suggested mitigation, estimated timeframe of suggested repairs (as applicable), and the opinion of probable cost for each building is included at the end of Section 6.

5.1 Perry Auditorium

The auditorium building is a two-story structure attached to the west end of the existing City Hall building. It is constructed of concrete foundations with brick masonry bearing walls, supporting floor and roof framing of both steel and wood structural members. The west end of the building, where the Connors Street entrance lobby is located, extends down to a lower level below the main auditorium.

According to the existing drawings, the auditorium building is an extension of City Hall, both constructed c. 1938. The auditorium building is approximately 113 feet long in the east-west direction and 65 feet wide in the north-south direction. The drawings indicate the lower levels of the building were constructed with reinforced concrete foundations and slabs on grade. The main auditorium slab, which is one level above the Connors Street entry level, is also detailed as a slab on grade. The upper lobby floor at the west end of the building and the mezzanine level are each detailed as being constructed of structural steel beams encased in concrete. The drawings show that the roof is comprised of wood decking with wood joists supported on structural steel trusses. The trusses span the 65-foot width of the building and are supported on load bearing multiwythe brick masonry.

The existing structural systems of the building were generally in **Good** condition, with some isolated areas of deterioration noted. Significant signs of structural deficiencies or of members being overstressed were not apparent during our review. The below grade cast-in-place concrete appeared to be in **Good** condition and the brick masonry was overall in **Good** condition however, a vertical crack in the exterior masonry wall on the southeast corner of the building was observed. No masonry control joints were noted around the exterior of the building. It appears that this crack was formed due to normal thermal expansion of the masonry and the lack of intermediate control joints. Deteriorated concrete was observed in one of the below grade restroom walls that could be an indicator of a potential moisture problem in the adjacent stairways.

Peeling and crumbling plaster ceilings and heaving finished wood flooring observed throughout the building are an indicator of water damage. City personnel confirmed that the building had previous issues with the existing wood roof leaking that resulted in water damage to both the ceiling and wood floors and indicated that repairs had been made to the roof in an attempt to prevent further deterioration.

5.1.1 Roof and Ceiling Conditions

The auditorium ceilings had large areas of peeling finishes and paint throughout, but the plaster in the auditorium did not appear to be significantly cracked. Although water stains and moisture damage were apparent on the plaster within the auditorium, the plaster had not spalled or separated from its supports at the time of our review. Limited access was available to review the roof trusses, as the building has plaster ceilings; however several trusses were reviewed through an access panel above the mezzanine level. In the area reviewed, the wood deck and joists as well as the steel trusses all appeared to be in good condition with no signs of deterioration or current water damage. It appeared that the wood deck had been replaced in at least a portion of the area reviewed. The wood floor at the lower chord of the roof trusses appeared in **Good** condition, with the exception of the interface between the floor and exterior masonry wall. Along the exterior wall edge it was noted that the wood floor had signs of deterioration and possible section loss.

5.1.2 Mezzanine Level

The mezzanine level has a stepped cast-in-place concrete slab supported on concrete encased structural steel beams. The existing drawings show the front of the mezzanine has a 36-inch deep steel beam spanning the width of the building. The concrete slabs appeared to be in **Good** overall condition with only minor cracking apparent and no significant structural cracks or spalls. The 36-inch main support beam for the mezzanine appeared to be performing adequately as no significant deflections or sagging in the beam were noted and the plaster finishes on the beam did not appear to have any spalls or deterioration.

5.1.3 Main Auditorium Level and Stairways

The exterior walls of the auditorium appeared to be in **Good** condition with no signs in the plaster finish of cracking or spalls. Throughout the auditorium the finished wood floor has heaved areas. Since the structural portion of the floor in this area is detailed as a concrete slab on grade, there are no wood diaphragm or wood support members to be concerned with below the finished floor.

There are four stairways at the west entry at the Connors Street end of the building. The two stairways that are adjacent to the west exterior wall had significant areas of peeling paint and spalled plaster. The concrete and steel members of the stair appeared to be in **Good** condition. It is unclear if the water infiltration from the roof caused the damage in the stairway or if it is moisture penetrating through the exterior masonry walls. The walls appeared to be sound and there was no significant damage to the plaster or finishes on the exterior walls.

5.1.4 West Entry Lobby and Lower Level

There have been numerous mechanical penetrations through the interior masonry, concrete walls, and ceilings. Currently the walls and ceilings do not show signs of being overstressed or have significant structural cracks. However it could not be discerned from this preliminary review if any or all the walls are load bearing. At the base of the

southern exterior below grade wall there is an area of deterioration and spalled cast-in-place concrete. The finish tile has a noticeable swell adjacent to the spalled concrete suggesting the deterioration may extend beyond what can currently be visually observed.

5.1.5 Exterior Walls

The exterior masonry walls appear to be in good overall condition, with the exception of the area directly above the cornice and a vertical crack in the brick masonry on the southeast corner of the building. Above the cornice, the masonry mortar joints have areas of deterioration and cracking; however, the masonry units appear to be in **Good** condition and at this time do not appear to require replacement. The vertical crack in the brick masonry appears to be due to thermal expansion of the wall. The area of the crack should be chipped out and repaired with a backer rod and an appropriate flexible sealant.

The exterior concrete walls appeared to be in good condition from the limited areas that were accessible. Normal weathering was noted, but no significant structural deficiencies were observed.

5.1.6 Foundations

At the time of our visit the foundations were not accessible to review. It appears the foundations are performing adequately as there were no signs of excessive or differential settlement observed.

5.2 Greenwood Memorial Bathhouse

The bathhouse building is a two story structure housing an indoor pool. It is constructed of cast-in-place concrete foundations below grade and brick masonry bearing walls, which support floor and roof framing of both steel and wood structural members. There is an elevated wood mezzanine that is supported by hangers off roof trusses above that extends around the interior perimeter of the building. The structural members for the roof are fully exposed and are constructed of pitched steel angle "attic" trusses supporting wood purlins; the roof deck is wood with a glass membrane for the upper half of the roof. Original construction drawings were not available for the Greenwood Memorial Bathhouse building. However, the front entrance, women's locker room, pool deck access, and men's locker room were upgraded to varying degrees as part of the Greenwood Memorial Bathhouse Improvement project completed in 2006 and 2007. These drawings were reviewed as part of this evaluation. For purposes of this report the north wall is assumed to be the wall facing Crystal Lake. Overall the building is in **Fair** condition with several areas, or systems, that are in **Poor** condition.

5.2.1 Roof Conditions

The main support members for the roof are structural steel trusses that span the width of the building. Overall the trusses appear to be in **Fair** condition with the main span members showing signs of surface rust and pitting but not significant section loss. However, the bearing points at the majority of the trusses do have advanced rusting and some section loss.

The wood roof deck shows deterioration around the eave elevation, adjacent to the truss bearing, and areas of decay and moisture damage were apparent. The upper portion of the roof could not be accessed to review the glass panels, but there was moisture

damage observed on the wood framing supporting the glass. It is not clear if the moisture damage is caused by leaks in the roof or the considerable condensation that occurs on the underside of the roof.

Recently, we have discussed the possibility of installing a solar thermal system on the roof of the Greenwood Memorial Bathhouse. Generally, a weight of ten pounds per square foot (PSF) is carried for the additional load that a thermal solar system would add to the roof. Based on the condition of the roof at the bathhouse, we do not recommend that a solar system be installed at this time.

5.2.2 Mezzanine Level

The mezzanine floor is constructed of a wood deck with wood beams and extends around the entire perimeter of the pool. The beams are supported around the exterior edge by the masonry walls and on the interior side by a wood girder with hanger supports at each roof truss. At the west end of the building, the mezzanine girder is supported on six cast iron columns.

The wood floor is generally in **Fair** condition with numerous areas of minor decay and several locations where the decay has advanced and may require replacement of the deck or support beams. At the east end of the building the mezzanine girder aligns with a roof truss above and is supported by hangers along its span. At the building's west end, support for the girder is provided by six cast iron columns that appear to be filled with concrete. All six columns have some deterioration at their base, and four of the six have substantial rust and section loss of the cast iron.

5.2.3 Main Floor Level

The floor surrounding the pool is a concrete slab with tile finish. The same tile finish extends up the exterior walls to the underside of the mezzanine and as a result the top surface condition of the slab and the interior condition of the masonry walls could not be verified. Several locations of rust staining were noted on the floor slab, indicating that the reinforcing steel of the slab is deteriorating. From Tighe & Bond's review of the slabs in 2000, several areas of spalling concrete and stalactites were noted on the underside of this slab. Due to the current rust staining on the slab in conjunction with the previous deficiencies noted on the underside of this slab, we would recommend this portion of the **building's structural system be investigated further** to determine the integrity of the floor slab. This would entail review of the underside of the existing floor around the pool, removal of the floor tile, and inspection of the floor surface for indications of deterioration. Based on the conditions observed, a determination of the allowable capacity for the floor would be developed.

Adjacent to the exterior door at the west end of the building the interior finish tile has delaminated from the masonry back-up. This condition has exposed mold growth and deterioration of the exterior wall. Although the condition of the masonry back-up was not verified, due to the presence of the finish tile, it is possible the same condition exists elsewhere throughout the building.

5.2.4 Exterior Masonry Walls

Overall, throughout the building the masonry walls appear to be in **Fair** condition with the exception of the northwest corner and the lower section of the north wall which are in **Poor** condition and should be addressed. Other than the locations identified above, the masonry walls appear to be sound and have only isolated areas that would require re-pointing. The condition of the interior side of the masonry walls could not be verified

either above the floor elevation due to the finish tile, or below the floor due to restricted access. As a result, the existence of mold on the exterior walls could not be verified.

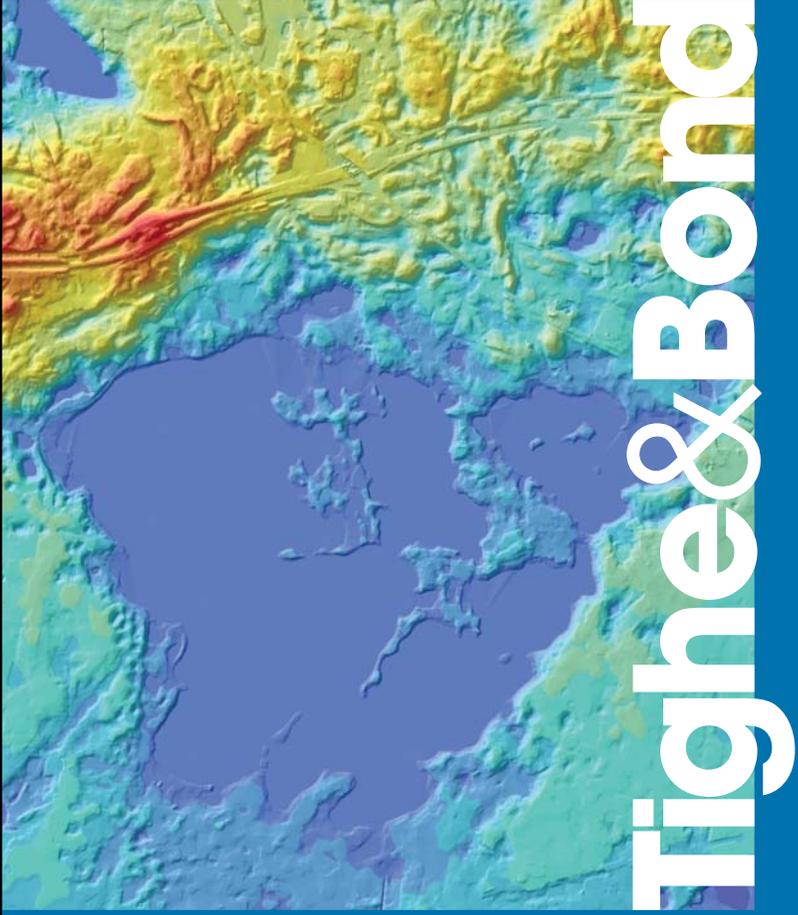
Significant efflorescence and deteriorated mortar joints were observed from the exterior side of the wall throughout the lower portion of the south, west and north walls. This lower section of the wall appears to be consistent with the area below the concrete slab surrounding the pool. This lower section of the north wall has deteriorated to the point of requiring replacement as the majority of the mortar is either soft or has deteriorated and portions of the brick units have spalled and failed.

The northwest corner of the building where the delaminated interior tile is located appears to have undergone some substantial damage and deterioration throughout the life of the building. There are diagonal cracks extending from both corners of the door opening at this location, indicating that some settlement has occurred. In addition, the granite door sill has cracked and a section of the outermost wythe of brick has failed and separated from the remaining masonry wall.

5.2.5 Foundations

The basement cast-in-place concrete is in **Fair to Poor** condition. There are several areas of cracking in the walls and exposed reinforcing steel in the slabs, as well as efflorescence staining that is apparent in a number of the cracks. Condensation was noted on the underside of the first floor slab and there was a significant amount of peeling paint in the basement, indicating moisture penetration through the concrete walls and slabs.

On the exterior side of the west exit door there is substantial damage to both the masonry wall and the concrete foundation. Significant erosion of the concrete, caused by weathering and potentially exacerbated by calcium chloride from the pool, has exposed the aggregate as well as the reinforcing steel in several areas. In addition, there are numerous cracks with efflorescence along the north and west sides of the building's foundation.



Section 6

Recommendations and Opinion of Probable Costs

Tighe & Bond's evaluation assessed the general physical condition of the various systems and system conformance to typical design standards. We offer the following recommendations and opinion of probable costs for implementation of recommendations for the Perry Auditorium and Greenwood Memorial Bathhouse. The probable costs reflect equipment and construction for implementation of the recommendations. The table at the end of this section summarizes the recommendations for each building to address the issues identified through this building assessment, as well as our opinion of the probable cost to complete the construction.

The discussion of recommendations and presentation of our opinion of probable costs in this section includes capital costs only; however, we suggest that the City consider the recommended improvements from a life cycle cost perspective as well. Additionally, we encourage the City to consider improvements made to these buildings from a sustainable design and energy efficiency standpoint as well.

Incorporating sustainable design from the start of a project is one of the most important steps to reducing the added cost of a sustainable project. Among other strategies, it allows for "right sizing" of infrastructure and mechanical equipment and dimensional planning to reduce material use. We suggest the City consider investments in these buildings from a life-cycle analysis perspective that includes initial design and construction costs, operating costs, and maintenance, repair, and replacement costs. The future savings resulting from the choice of equipment to meet sustainable goals should be factored into the project's life cycle cost evaluation. Installing high efficiency HVAC, lighting, domestic hot water systems, and improving the building envelope can result in reduced operational energy consumption, which effectively reduces typical equipment payback periods to acceptable terms.

6.1 Perry Auditorium

6.1.1 Mechanical Systems

The following issues were identified through assessment of the Perry Auditorium mechanical systems. Depending on the system component and life expectancy, the likely timeframe for making the following improvements is within the next 10 years, depending on system component:

- The existing steam heating system has reached the end of its useful life and is failing through leaking pipes and fittings that are fixed as issues arise. Additionally, although the heating system is adequately sized to meet the building's current level of use, it is not adequate to meet the load of a fully operating auditorium. The opinion of probable cost to replace the heating system depends on the type of system selected:
 - A hot water heating system separate from the building complex has a probable cost of \$325,000

- Replacing all of the steam piping and terminal units has a probable cost of \$150,000
- A hot water system using steam heat from the complex has a probable cost of \$195,000
- Since the existing auditorium flooring requires repair, the City may wish to consider installation of a radiant heating system below the new floor. A radiant system using heat from the building system carries a probable cost of \$70,000 (this does not include the cost to replace the floor)
- HVAC equipment to cool and ventilate the spaces will have a probable cost of \$500,000 for three air-conditioning units, associated equipment, and duct distribution. One of the three units is recommended to be used to handle cooling loads from the stage area (e.g., theatrical lights)
- If the HVAC systems are upgraded and repaired, the building envelope should be renovated and upgraded at the same time in order to allow proper sizing of the new HVAC systems. The current building envelope has an expected life of six to ten years:
 - To allow for effective HVAC upgrades, the windows should be replaced, and wall and ceiling insulation added at a cost of approximately \$60,000
 - It should be noted that the current envelope may be impacted by mold damage from past water leaks which should be assessed and addressed
- There are an inadequate number of functional lavatory fixtures for the auditorium to be used for that purpose. The existing lavatories will need renovation before the building can be put back into use as an auditorium. If the lavatory fixture count is increased to meet code requirements, the newly installed domestic water heater will likely be undersized
- The fire protection systems (e.g., fire walls, fire alarms, sprinklers) should be upgraded to meet the requirements for a theater stage. Fire protection measures will also require passive or active (through the HVAC system) upgrades to provide smoke venting
 - The passage door from the stage to the central building complex will probably need to be eliminated to maintain a fire-rated wall/partition between the stage of the auditorium and the City Hall building. An opinion of probable cost of \$25,000 is estimated to upgrade the fire suppression system and remove door access from the City Hall building

6.1.2 Electrical Systems

The following issues were identified through assessment of the Perry Auditorium electrical systems. The Perry Auditorium needs a complete electrical upgrade to bring the building into compliance with all pertinent building code provisions and with the latest industry standards for public auditoriums.

Since the building electrical systems will need to be updated if it is renovated, the expected timeframe for making the following improvements will be determined by either major work being done on the building, or the continued deterioration of electrical systems. The electrical systems should be upgraded or replaced in the next one to two years. The following issues with the Perry Auditorium electrical systems were identified:

- All of the electrical equipment in the Perry Auditorium is in poor condition or has reached the end of its useful life.
- There are very few fire pull stations and receptacle outlets, no horn/strobes, and no emergency light fixtures.
- Our opinion of probable cost for a complete electrical upgrade of the building is \$325,000

6.1.3 Structural Systems

Although structurally the auditorium building appears to be in good condition, it may require significant repairs and updates for the building to return to use as a public auditorium. It is unlikely the unreinforced masonry walls will provide adequate lateral resistance to meet current code requirements and thus either a supplemental lateral system will need to be constructed or code compliance relief can be requested from the BBRS.

The cause of the water damage throughout the building should also be investigated further to determine the source of the infiltration and verify it has been rectified by the roofing work. Accessibility and egress both appear to be items that will also require modifications to meet current codes; however these requirements should be able to be met without significant structural alterations to the building.

Overall the Perry Auditorium is in good structural condition with isolated areas of deterioration. No global structural deficiencies were noted at the time of our visit. If the building is going to continue to be used as it is currently (i.e. as storage), the deteriorated areas should be investigated further to determine the type and extent of repairs needed. These areas should be repaired to prevent further deterioration of the building.

If the building is to be reused as an auditorium, in addition to repair of the deficient items detailed in this report, other code compliance items per 780 CMR, The Massachusetts State Building Code (MBC) will need to be addressed as well. Chapter 34 of the MBC governs the alterations and repairs of existing buildings. The provisions of 780 CMR Chapter 34 are intended to maintain or increase the public safety, health, and general welfare in existing buildings by allowing repairs, alterations, additions and changes of use without requiring full compliance with the building code for new construction.

For the purposes of this report it is assumed the redevelopment of the building will not result in a change from what was previously an Assembly (A-1) use group. A review of chapter 34 indicates that 780 CMR 3404.0 - "Requirements For Continuation Of The Same Use Group Or Change Of Use Group Resulting In A Change In Hazard Index Of One Or Less" will apply to any alterations, repairs or changes in use to the existing Perry Auditorium building. The existing A-1 use of the building is considered a high hazard index; therefore unless the building is developed as a Night Club or a "High Hazard" use, the above section of Chapter 34 will still apply.

- Some of the key requirements within section 3404.0 are as follows:
 1. 3404.1 - Structural repairs and alterations shall comply with 780 CMR 3408.0 –Structural Requirements for Existing Building.

2. 3404.5 & 6 - The number and capacity of existing means of egress must comply with the current building code section 780 CMR Chapter 10.
3. 3404.18 – Accessibility requirements for persons with disabilities shall comply with the Massachusetts Architectural Access Board 521 CMR.

The structural requirements for existing buildings requires that the structural work for alterations, repairs and additions to existing buildings be designed and constructed in accordance with the code requirements for new construction for the loads specified in 780 CMR 3408.0. In addition, structural investigations and evaluations are required on the existing buildings. The extent of the investigations and evaluations are dependent on the level of work proposed for the building. The investigations and evaluations must be conducted by a registered professional engineer or a registered architect.

At a minimum, 780 CMR chapter 34 Existing Structures will require that the structural systems within the building be evaluated and strengthened where required to support the gravity and lateral loads as specified in chapter 34. Special requirements for unreinforced masonry will include connecting all bearing walls to the roof and floor diaphragms in the building. In addition, any unreinforced brick masonry parapets, located around the perimeter of the roof, will be required to be tied to the roof diaphragm. Based on these requirements, the opinion of probable cost to upgrade the building's structural systems to be compliant with the MBC for use as an auditorium is \$925,000. This cost assumes that an independent lateral system will not be constructed within the building. If relief from the required lateral resistance system is not granted from the BBRs, construction of an independent lateral resisting system will be required at an additional cost of approximately \$350,000.

6.1.4 Continued/Alternative Use Considerations

Given the location of the auditorium in the downtown area directly adjacent to City Hall, re-use of the building for a municipal purpose other than an auditorium was considered as part of this evaluation. Following completion of the necessary building upgrades the facility could potentially be utilized as general office space for a municipal department or other entity by constructing partitions or installing cubicle type structures. However, while conversion to office space may have relatively low capital costs, the costs for operating and maintaining that type of large unique structure as an office environment with appropriate heating and cooling would most likely be cost prohibitive in its current configuration.

Construction of a second level within the building, with possible connection to City Hall, would potentially eliminate the large open space and make operation of the building as office space more cost effective. However, the large scale alteration and additional weight of a second floor would likely require that the building be upgraded with supplemental lateral restraint systems to meet current seismic requirements.

A second floor would also need to be made accessible to those with disabilities by utilizing the existing elevator in City Hall and a proper walkway, or by constructing a new independent elevator as part of the renovations. Based on these requirements, it is anticipated that cost of constructing a second floor and the appropriate upgrades so that the space could be utilized effectively as office space would be cost prohibitive when compared to purchasing or leasing existing office space, or demolishing and rebuilding the structure.

The conversion of the auditorium for use by the police department or other “essential” service, such as space for emergency management or fire department use, will automatically require upgrade of the structure to meet the current building code, including all seismic requirements. While there is lower level space with access from Connors Street, the size of the basement area is too small to utilize for vehicle access and the substantial structural and mechanical alterations required would make this infeasible.

If the decision is made to discontinue use of the facility and wait on making repairs and upgrades (i.e. mothballing), the sprinkler system will still need to remain in service for fire protection. The existing system is a wet type system so freeze protection will be required if the heat is turned off. Electric heaters are currently used to prevent freezing; however, low voltage heat tracing could be utilized in lieu of the electric heaters to prevent freezing of the sprinkler system and drains. If the City wants to also turn off the water service to the building to prevent further water damage from leaking or freezing pipes, the sprinkler system could potentially be changed over to a dry type system, however, the cost to do this would be substantial. A dry type system requires additional equipment located in a heated space to provide and control pressurized air in the system. Maintenance costs are also higher with a dry type system due to increased complexity.

If the facility is mothballed the City should also restrict access and discontinue use of the building.

6.2 Greenwood Memorial Bathhouse

6.2.1 Mechanical Systems

Due to evaporation from the pool, the building has a high-humidity environment. The building appears to have achieved a balanced condition where the high humidity does not significantly affect the current building systems. The high humidity conditions are most likely mitigated by:

- A minimally insulated building envelope that has no vapor retarder
- An energy inefficient ventilation system that allows moist air to freely escape

Two major concerns exist when discussing recommended changes to a balanced facility:

1. All recommendations should be implemented concurrently when considering changing the entire HVAC operation in order to maintain the mitigation of high humidity. For example, upgrading the building envelope without installing a dehumidification system could save energy but trap excessive moisture within the spaces, causing new issues

To address these concerns, our suggested approach to renovations begins with reviewing the energy and water use of the facility.

- If the bills are within budget requirements, minimally upgrade the facility by addressing the following:
 - Replace all corroded piping and equipment in building heating and pool heating systems

- Replace all steam traps and place them under maintenance contract
- Replace the boiler or add boiler capacity to minimize possible heating loss due to breakdowns
- Replace water fixtures that were not upgraded as part of the recent improvements project with higher efficiency, low water use models
- If the bills are not within budget requirements, or there are other issues which must be resolved, a major upgrade of the facility will be required:
 - Review moisture migration through the existing envelope and document issues that may occur if the moisture pathway is eliminated
 - Redesign building envelope and HVAC systems to insulate the building while managing moisture issues

The specific issues, recommended mitigation, and opinion of probable cost for the HVAC, plumbing and envelope systems are described below.

- The existing HVAC system does not provide conditioned air for cooling, ventilation, or humidity control. The steam heating system that heats the building and pool water has reached the end of its useful life and pipe and fitting leaks are common. Several pipe joints were observed to have excessive rust and corrosion build-up, and repairs are being made on an ongoing basis. Steam traps and the pool heater were severely corroded and should be replaced before they fail. HVAC equipment to cool and dehumidify the spaces would have a probable cost of \$290,000 for two air-conditioning units and one pool dehumidifier unit, associated equipment, and duct distribution
- The existing building envelope functions significantly below today's energy efficiency standards. Energy and operational efficiencies are achievable if the envelope is upgraded. If the HVAC systems are upgraded and repaired, the State energy code will require that the envelope be assessed and as a result renovations may be required. A possible solution to enhance the building's exterior envelope and energy efficiency is an External Insulation and Finishing System (EIFS). This system would be an externally applied insulation system that could be installed around the entire exterior perimeter of the building. Additional investigations would be required to determine if the building's masonry walls would be adequate for installation of such a system. In addition, the existing masonry wall's ability, or lack thereof, to allow moisture to migrate would need to be considered prior to recommending an EIFS system. Based on the size of the building, the cost of an EIFS system would be approximately \$250,000.
- The sanitary and water piping for the men's locker room was not upgraded during the recent improvements project which focused on the women's locker room. Therefore, if significant repairs are undertaken at the pool facility, the plumbing serving the men's locker room should be replaced. Based on the cost of plumbing upgrades for the women's locker room work, it is estimated that the men's locker room plumbing upgrades would cost approximately \$30,000.

6.2.2 Electrical Systems

The existing electrical service in the bathhouse is new and provides adequate capacity for expansion. However, the following electrical system components should be addressed:

- Branch circuit wiring in the majority of the building requires replacement and/or upgrading. Additional branch circuits and receptacle outlets should be added
- The lighting in all areas except the basement, women's lavatory, women's locker room, and the entrance to the men's locker room requires upgrading
- Emergency lighting and exit lights should be installed throughout the building
- A fire alarm system should be installed
- The opinion of probable cost for the electrical improvements identified above is \$125,000

6.2.3 Structural Systems

The Greenwood Memorial Bathhouse requires **significant modifications** to remain in service. Numerous structural systems within the building are in **Poor** condition and require significant repair or replacement. It is difficult to put a timeline on structural repairs based on system condition because the building code requires that all the repairs and/or upgrades occur at the same time. Some local officials may allow a phased approach to structural modifications in order to spread renovation costs over several years.

A hands-on review of the condition of the roof deck was not completed during this building assessment; however the roof trusses appear to need repairs to their bearing points and potentially isolated repairs to the main spans. Due to the absence of existing drawings or design information for the roof, a more detailed review of the roof deck and the trusses will be required to determine their respective capacities.

It has been suggested that a solar thermal pool heating system could help reduce operational costs for the facility and may prove to be an economically feasible option if grant funding is available. It is our understanding that the system (although not yet sized) would impart 10 PSF to the roof system. This loading is usually easily accommodated by an existing roof system. However, in consideration of the slender nature of the truss elements, the observed corrosion, the need for repairs at bearing points and main spans, and the lack of design drawings; we recommend that no additional loads be placed on the roof until such time that a more detailed evaluation can be completed.

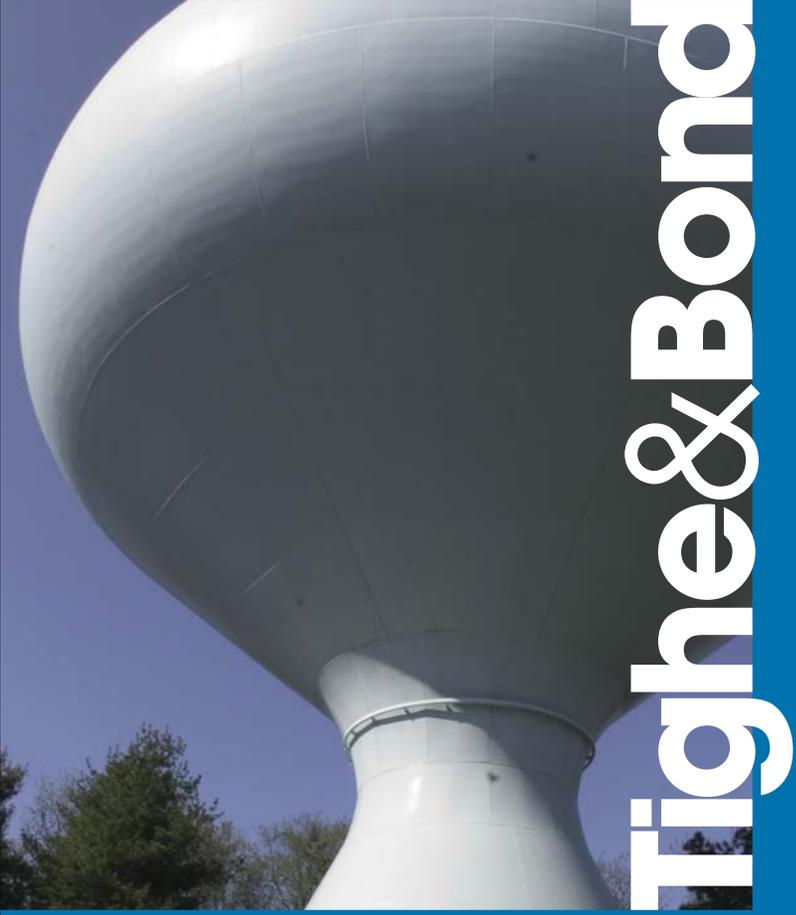
The previous building conditions assessment indicated the concrete floor surrounding the pool is in **Poor** condition. Additionally, the presence of rust staining on the top surface of the floor was observed during the inspection conducted for this report and it is likely this floor will require full replacement. The majority of the lower section of the north wall as well as portions of the west wall will need to be replaced due to the significant deterioration throughout these portions of the walls. At this time the lower section of the south wall appears to only require minor repairs; however the interior face of this wall was not verified and other areas within the building exposed to similar conditions have substantial deterioration. Due to the current rust staining on the slab in conjunction with the previous deficiencies noted on the underside of this slab, we would recommend this portion of the **building's structural system be investigated further** to determine the integrity of the floor slab.

Mold growth was observed on the west wall; however the presence of mold throughout the remainder of the building could not be verified. Provisions should be made for full assessment, and if needed, remediation of the building. The mezzanine structure will require replacement of the west line of columns as well as isolated repairs throughout the floor surface.

The magnitude of the required repairs to the Greenwood Memorial Bathhouse will trigger requirements for the building to meet current code provisions for lateral resisting systems as well as egress, accessibility and fire safety codes. Accessibility to the front entrance of the building, locker rooms, bathrooms, and the pool deck were provided as part of the improvements completed in 2006/2007. It is possible that relief could be requested from the BBRS for some of these requirements; however the building would need to be repaired to a structurally sound condition for the board to consider relief. Based on these requirements, the opinion of probable cost to upgrade the building's structural systems to be compliant with the MBC for use as a natatorium is \$2,400,000.

As requested, we have also provided a cost to demolish and rebuild the bathhouse. Assuming the new building will be 15,000 sf (concrete masonry unit with brick face), the opinion of probable cost to demolish and build a new bathhouse is \$5,320,000. If a metal structure is used for the reconstruction, the approximate construction cost drops to \$4,720,000.

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Tighe & Bond

Appendix A
Cost Opinion Summaries

TABLE 6-1
Summary of Costs
Perry Auditorium, Gardner, MA

Structural System/Component or Observed Issue	Opinion of Condition	Suggested Repair/Maintenance	Timeframe for Repair (years)	Opinion of Probable Cost
<u>Mechanical Systems</u>				
Heating, Ventilation, and Air Conditioning	Fair	Replace existing HVAC system with hot water heating system separate from City Hall	6 – 10	\$325,000
		Replace existing HVAC system steam piping and terminal units	6 - 10	\$150,000
		<i>Replace existing HVAC system with hot water system using steam heat from City Hall</i>	<i>6 – 10</i>	<i>\$195,000</i>
		<i>Install radiant heating system when floor is replaced</i>	<i>N/A</i>	<i>\$70,000</i>
	Poor	Replace leaking pipes and equipment	As needed	
		Add cooling and ventilation to HVAC system	If operated as auditorium	\$500,000
Building Envelope	Fair	Upgrades to the envelope should occur if the HVAC system is upgraded or repaired	6 – 10	\$60,000
Plumbing	Fair	Upgrade and increase number of functional toilet rooms to operate as auditorium	6 – 10, unless auditorium use	\$125,000
	Good	New hot water heater recently installed. Replace hot water heater with larger capacity unit if additional functional toilet rooms go online	10+, unless auditorium use	\$6,000

Structural System/Component or Observed Issue	Opinion of Condition	Suggested Repair/Maintenance	Timeframe for Repair (years)	Opinion of Probable Cost
Fire Suppression System	Fair	Requires upgrading if building is to operate as auditorium. Access door from City Hall to auditorium would likely require removal	6 – 10, unless auditorium use	\$25,000
<u>Electrical Systems</u>				
Existing Electrical Systems	Poor	Complete electrical upgrade is needed to operate as an auditorium	0 – 5, unless auditorium use	\$325,000
<u>Structural Systems</u>				
Existing Structural Systems	Good	Significant repairs and updates required to operate as code-compliant auditorium (with BBRS code relief)	10+, unless auditorium use	\$925,000
	Good	Significant repairs and updates required to operate as code-compliant auditorium with independent lateral system (without BBRS code relief)	10+, unless auditorium use	\$1,275,000
Total probable cost for upgrade/renovation of building for use as an auditorium (with BBRS code relief)*				\$2,441,000
Total probable cost for upgrade/renovation of building for use as an auditorium (without BBRS code relief)*				\$2,791,000
Total probable cost for demolition of the auditorium				\$175,000

Italics indicate another option for upgrade

*** - assumes installation of new HVAC system separated from City Hall system**

TABLE 6-2
Summary of Costs
Greenwood Memorial Bathhouse, Gardner, MA

Structural System/Component or Observed Issue	Opinion of Condition	Suggested Repair/Maintenance	Timeframe for Repair (years)	Opinion of Probable Cost
<u>Mechanical System</u>				
Heating, Ventilation, and Air Conditioning	Poor	Replace heating equipment with system that includes cooling, ventilation, and dehumidification.	0-5	\$290,000
Envelope	Fair	Should be upgraded/repared if HVAC system is replaced. Moisture migration must be assessed to evaluate probable cost. An EIFS system may be appropriate.	6 – 10	\$250,000 (EIFS system)
Plumbing	Good	Relatively new pool water filtration system and updated piping. Some HVAC piping recently replaced.	10+	
	Poor	Sanitary and vent piping for men’s locker room	0-5	\$30,000
<u>Electrical Systems</u>				
Electrical Distribution System	Good	Replaced in last two years and large enough to accommodate building upgrades or expansion	10+	
Wiring and Receptacles in Basement	Good	Recently replaced/upgraded	10+	
Wiring and Receptacles in Rest of Facility	Fair	Certain areas of the building do not have the required number of receptacles	6 – 10	(See total elec. cost below)

Structural System/Component or Observed Issue	Opinion of Condition	Suggested Repair/Maintenance	Timeframe for Repair (years)	Opinion of Probable Cost
Lighting in Basement, Women's Lavatory and Locker Rooms	Good	Recently replaced/upgraded	10+	
Lighting in Remainder of Facility	Fair	Lighting should be upgraded	6 - 10	(See total elec. cost below)
Emergency and Exit Lighting	Poor	Emergency and exit lighting needs to be installed throughout building	Immediately	\$125,000 (includes all required upgrades)
<u>Structural Systems</u>				
Existing Structural Systems	Fair - Poor	Significant repairs and updates required to repair the structural systems, which will trigger requirements for the building to meet current code requirements	0 - 10	\$2,400,000
Total probable cost for upgrade/renovation of building:				\$3,095,000
Total probable cost to demolish and rebuild the building (CMU with brick veneer option):				\$5,320,000
Total probable cost to demolish and rebuild the building (metal building system option):				\$4,720,000
Total probable cost for demolition of the pool:				\$160,000



Tighe & Bond

Appendix B
Perry Auditorium Photos

Client Name:

City of Gardner, MA

Site Location:

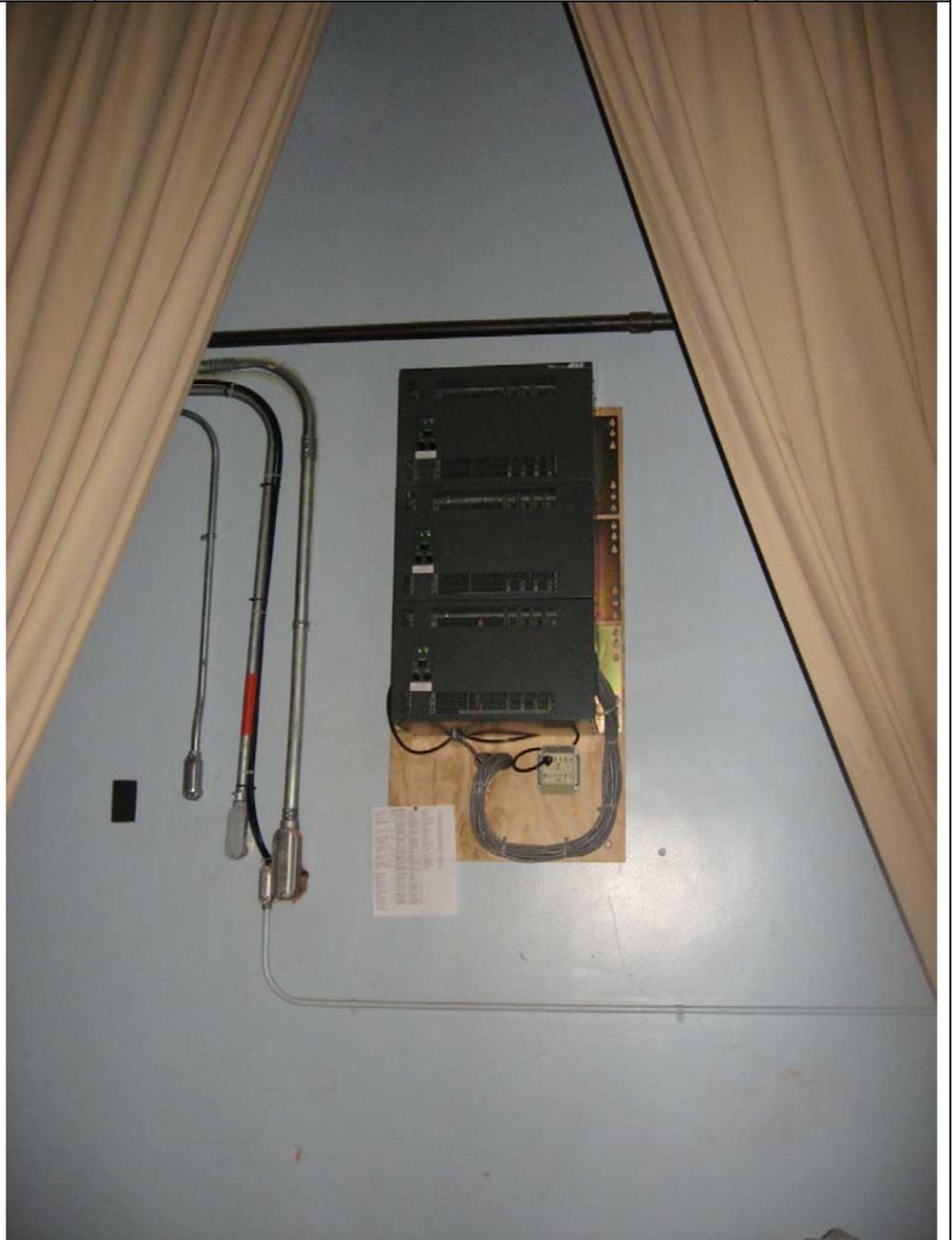
Perry Auditorium, Gardner, MA

Project No.

G-0384

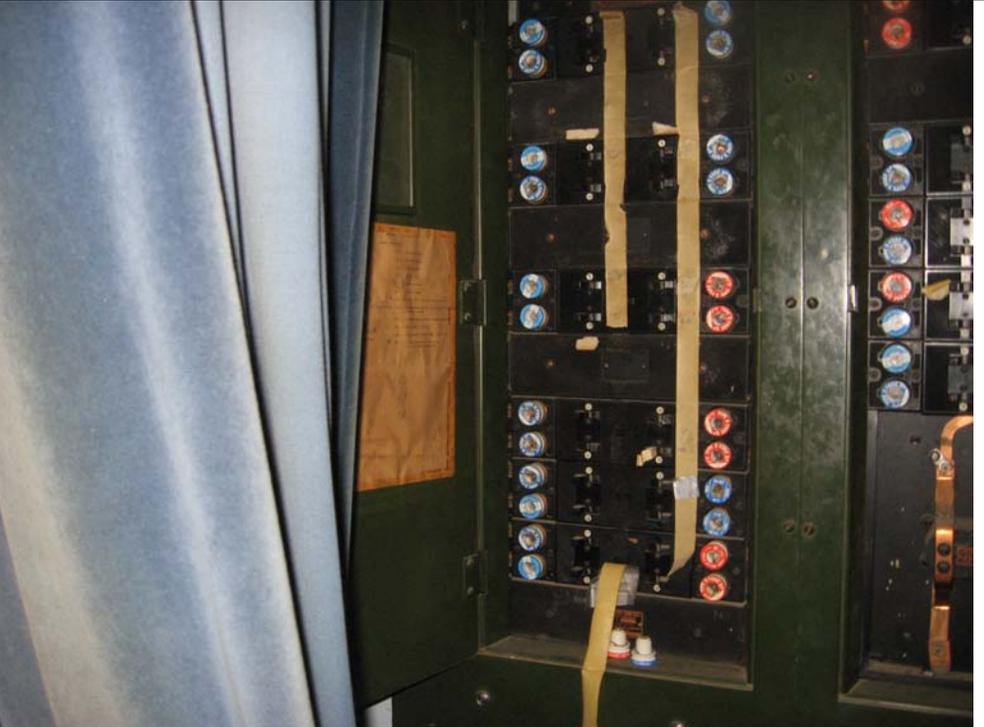
Photo No.
1**Date:**
11/25/09**Direction Photo Taken:****Description:**

Stage area tele/data systems

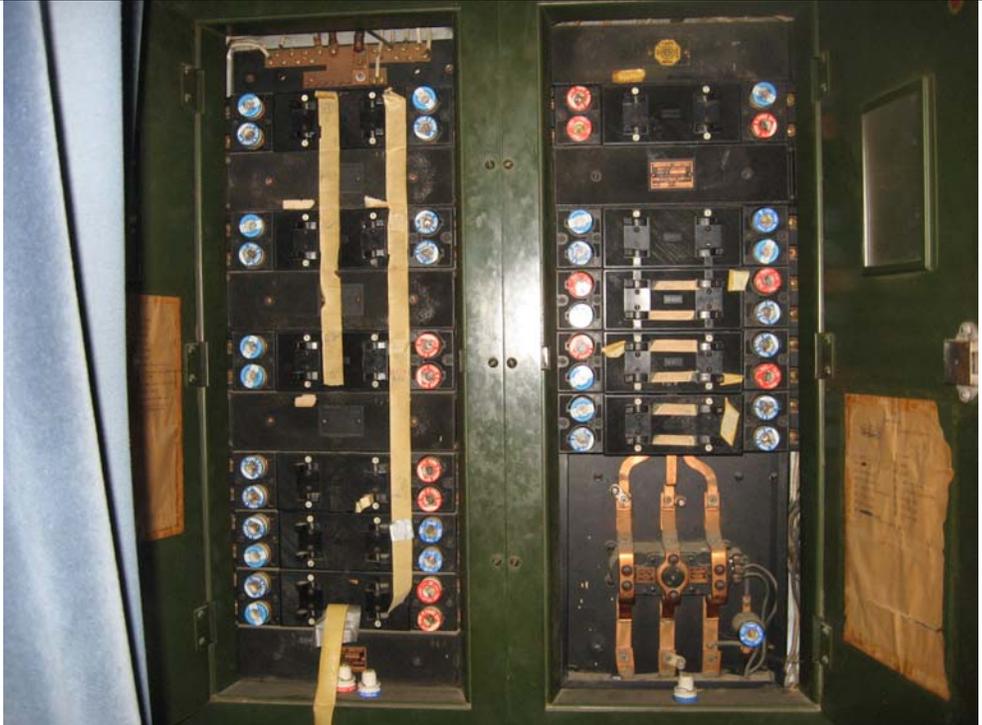


Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	
		Project No. G-0384	
Photo No. 2	Date: 11/25/09		
Direction Photo Taken:			
Description: Stage area lighting			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	
		Project No. G-0384	
Photo No. 3	Date: 11/25/09		
Direction Photo Taken:			
Description: Stage lighting overhead			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 4	Date: 11/25/09		
Direction Photo Taken:			
Description: Stage area mechanical system control equipment			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 5	Date: 11/25/09		
Direction Photo Taken:			
Description: Stage area mechanical system control equipment			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 6	Date: 11/25/09		
Direction Photo Taken:			
Description: Stage area electrical panelboards			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 7	Date: 11/25/09		
Direction Photo Taken:			
Description: Domestic hot water heater			

Client Name: City of Gardner, MA	Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
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Photo No. 8	Date: 11/25/09
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Direction Photo Taken:

Description:

Mechanical equipment with various piping systems, waste water heating and domestic water



Client Name:

City of Gardner, MA

Site Location:

Perry Auditorium, Gardner, MA

Project No.

G-0384

Photo No.
9**Date:**
11/25/09**Direction Photo Taken:****Description:**

Lighting panelboard



Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 10	Date: 11/25/09		
Direction Photo Taken:			
Description: Basement level electrical panelboards			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 11	Date: 11/25/09		
Direction Photo Taken:			
Description: Mechanical equipment panelboard			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 12	Date: 11/25/09		
Direction Photo Taken:			
Description: Basement fire alarm pull station			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 13	Date: 11/25/09		
Direction Photo Taken:			
Description: Main entrance lighting			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 14	Date: 11/25/09		
Direction Photo Taken:			
Description: Base level lighting, exit lighting and sprinkler protection			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 15	Date: 11/25/09		
Direction Photo Taken:			
Description: Stairwell lighting			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 16	Date: 11/25/09		
Direction Photo Taken: Southwest			
Description: Restroom heating			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 17	Date: 11/25/09		
Direction Photo Taken:			
Description: Balcony ventilation			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 18	Date: 11/25/09		
Direction Photo Taken:			
Description: Balcony area lighting, exit lighting and sprinkler protection			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 19	Date: 11/25/09		
Direction Photo Taken:			
Description: Auditorium lighting			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 20	Date: 11/25/09		
Direction Photo Taken:			
Description: Auditorium lighting			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 21	Date: 11/25/09		
Direction Photo Taken:			
Description: Exterior egress lighting and intake louver for air handler			

Client Name:

City of Gardner, MA

Site Location:

Perry Auditorium, Gardner, MA

Project No.

G-0384

Photo No.
22**Date:**
11/25/09**Direction Photo Taken:****Description:**

Municipal building standby generator



Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 23	Date: 11/25/09		
Direction Photo Taken:			
Description: Exterior egress lighting			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 24	Date: 11/25/09		
Direction Photo Taken:			
Description: Exterior egress lighting			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 25	Date: 11/25/09		
Direction Photo Taken:			
Description: Municipal building standby generator			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 26	Date: 11/25/09		
Direction Photo Taken:			
Description: Electrical service entrance			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 27	Date: 11/25/09		
Direction Photo Taken:			
Description: Photo voltaic array			

J:\G\G0384\T15 - Auditorium-Pool Inspections\Photos\Photographic Log_Electrical Mechanical_Auditorium FINAL.doc

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 1	Date: 11/25/09		
Direction Photo Taken:			
Description: Deteriorated plaster in west stairs.			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 2	Date: 11/25/09		
Direction Photo Taken:			
Description: Peeling and deteriorated plaster on main auditorium ceiling.			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 3	Date: 11/25/09		
Direction Photo Taken:			
Description: Existing mezzanine			

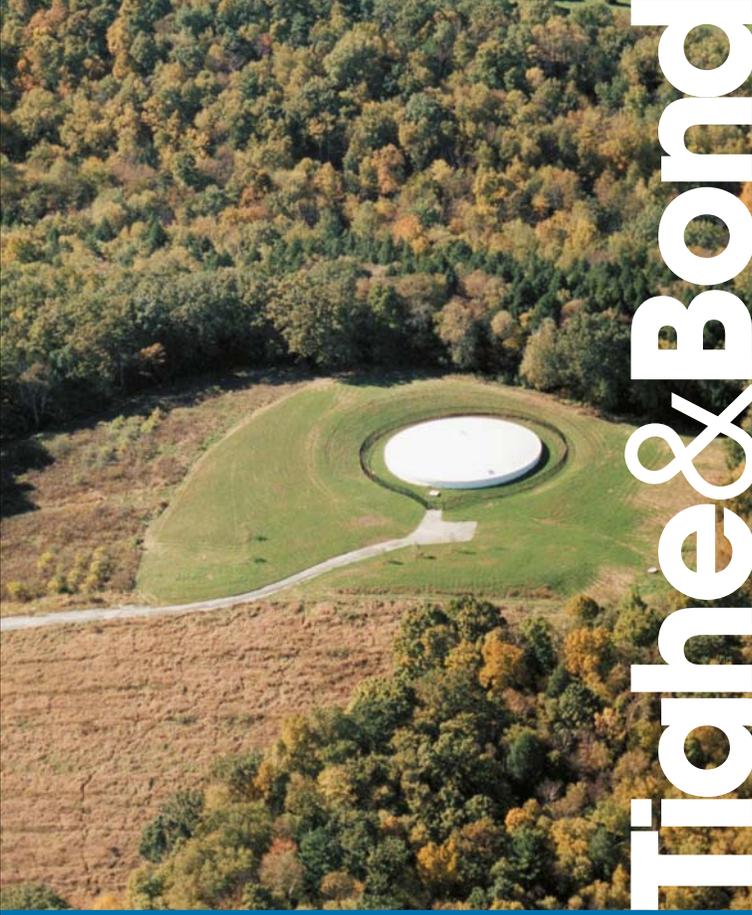
Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 4	Date: 11/25/09		
Direction Photo Taken:			
Description: Existing roof trusses and framing			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 5	Date: 11/25/09		
Direction Photo Taken:			
Description: Deteriorated edge of wood and exterior wall			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 6	Date: 11/25/09		
Direction Photo Taken: Southwest			
Description: Deteriorated and spalled concrete at basement level.			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Perry Auditorium, Gardner, MA	Project No. G-0384
Photo No. 7	Date: 11/25/09		
Direction Photo Taken:			
Description: Exterior of west entry			

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Tighe & Bond

Appendix C
Greenwood Memorial Bathhouse Photos

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 1	Date: 11/25/09		
Direction Photo Taken:			
Description: Exterior egress lighting			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 2	Date: 11/25/09		
Direction Photo Taken:			
Description: Men's room ventilation and unit heater			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 3	Date: 11/25/09		
Direction Photo Taken:			
Description: Men's room lighting			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 4	Date: 11/25/09		
Direction Photo Taken:			
Description: Pool area radiant heat			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 5	Date: 11/25/09		
Direction Photo Taken:			
Description: Second floor unit heater and area lighting			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 6	Date: 11/25/09		
Direction Photo Taken:			
Description: Second floor lighting			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 7	Date: 11/25/09		
Direction Photo Taken:			
Description: Entrance area lighting			

Client Name:

City of Gardner, MA

Site Location:

Greenwood Memorial Bathhouse, Gardner, MA

Project No.

G-0384

Photo No.
8**Date:**
11/25/09**Direction Photo Taken:****Description:**

Unit heater and lighting for heater



Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 9	Date: 11/25/09		
Direction Photo Taken:			
Description: Pool lighting unit heater and pool radiant heat			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 10	Date: 11/25/09		
Direction Photo Taken:			
Description: Pool lighting unit heater and pool radiant heat			

Client Name:

City of Gardner, MA

Site Location:

Greenwood Memorial Bathhouse, Gardner, MA

Project No.

G-0384

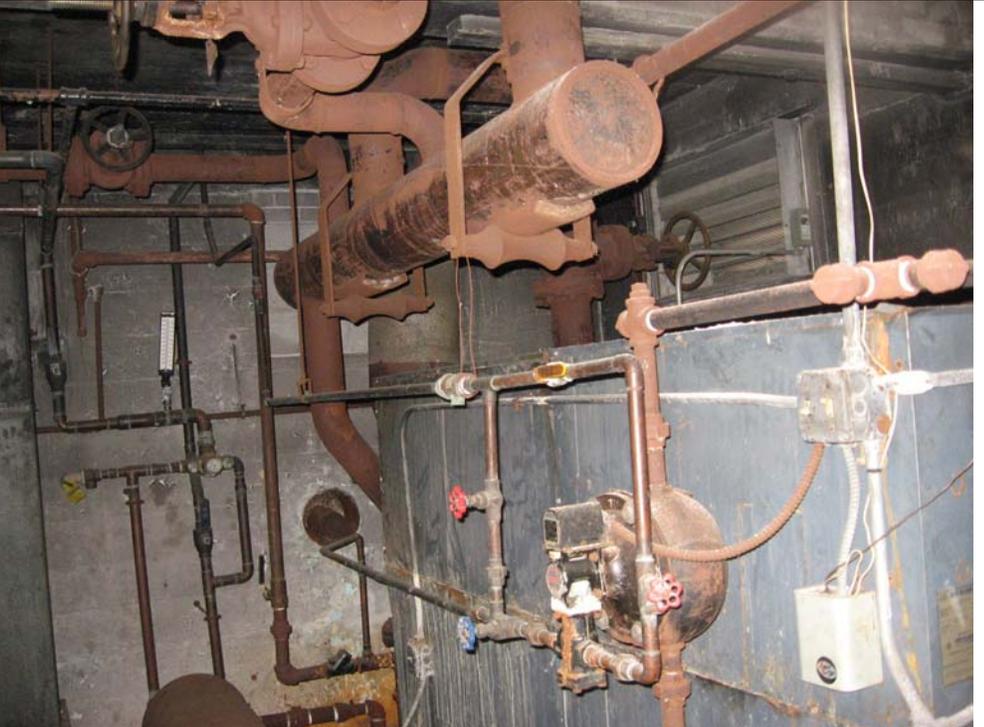
Photo No.
11**Date:**
11/25/09**Direction Photo Taken:****Description:**

Abandoned pool lighting



Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	
		Project No. G-0384	
Photo No. 12	Date: 11/25/09		
Direction Photo Taken:			
Description: Branch circuit wiring pool area			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	
		Project No. G-0384	
Photo No. 13	Date: 11/25/09		
Direction Photo Taken:			
Description: Fuel oil tanks corrosion			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 14	Date: 11/25/09		
Direction Photo Taken:			
Description: Building heating plant			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 15	Date: 11/25/09		
Direction Photo Taken:			
Description: Building heating plant for building heat and pool water			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 16	Date: 11/25/09		
Direction Photo Taken:			
Description: New branch circuit wiring to basement lighting			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 17	Date: 11/25/09		
Direction Photo Taken:			
Description: Pool water pumping			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 18	Date: 11/25/09		
Direction Photo Taken:			
Description: New lighting in basement			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 19	Date: 11/25/09		
Direction Photo Taken:			
Description: Steam condensate pump set – bad corrosion			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 20	Date: 11/25/09		
Direction Photo Taken:			
Description: New electrical service			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 1	Date: 11/25/09		
Direction Photo Taken:			
Description: South side of main entrance			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 2	Date: 11/25/09		
Direction Photo Taken:			
Description: Main entrance			

Client Name:

City of Gardner, MA

Site Location:

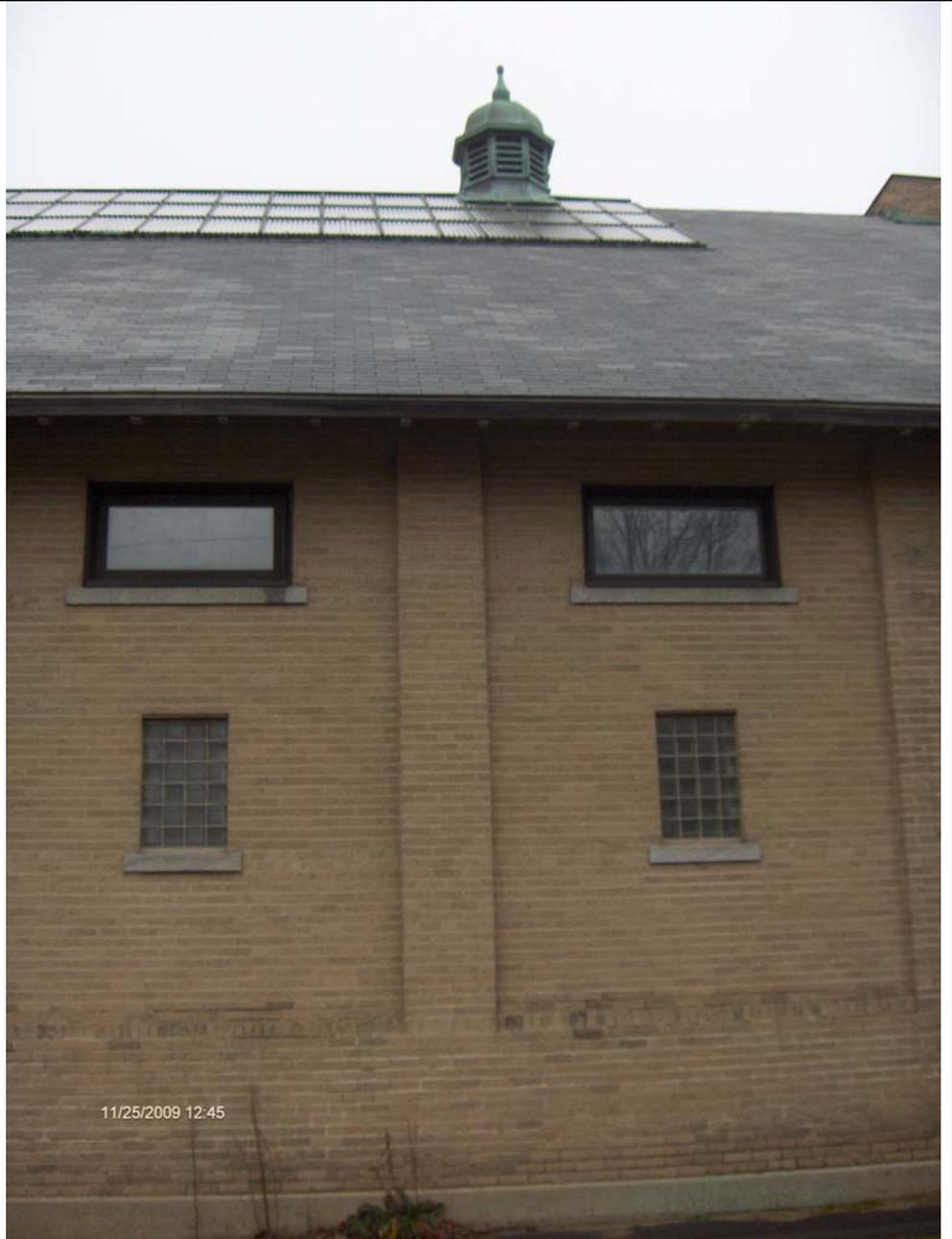
Greenwood Memorial Bathhouse, Gardner, MA

Project No.

G-0384

Photo No.
3**Date:**
11/25/09**Direction Photo Taken:****Description:**

South wall elevation



Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 4	Date: 11/25/09		
Direction Photo Taken:			
Description: West exterior wall with diagonal cracks and failed masonry			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 5	Date: 11/25/09		
Direction Photo Taken:			
Description: West all with failed masonry and spalled concrete foundation			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 6	Date: 11/25/09		
Direction Photo Taken:			
Description: North wall with deteriorated and spalled concrete and failing masonry			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 7	Date: 11/25/09		
Direction Photo Taken:			
Description: Rust stains on elevated structural slab			

Client Name:
City of Gardner, MA

Site Location:
Greenwood Memorial Bathhouse, Gardner, MA

Project No.
G-0384

Photo No.
8

Date:
11/25/09

Direction Photo Taken:

Description:



Client Name:

City of Gardner, MA

Site Location:

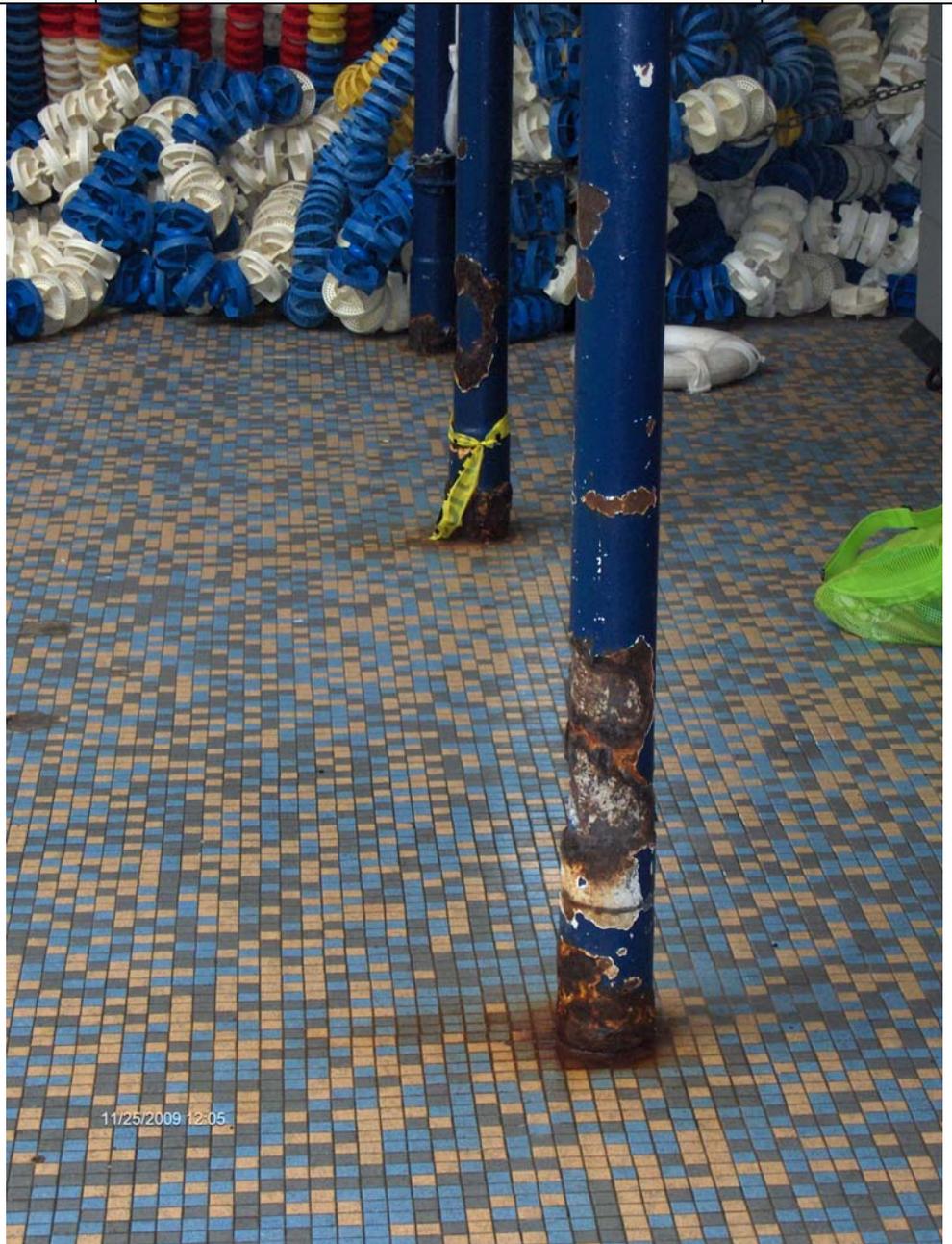
Greenwood Memorial Bathhouse, Gardner, MA

Project No.

G-0384

Photo No.
9**Date:**
11/25/09**Direction Photo Taken:****Description:**

Deteriorated base at mezzanine support columns



Client Name:

City of Gardner, MA

Site Location:

Greenwood Memorial Bathhouse, Gardner, MA

Project No.

G-0384

Photo No.
10**Date:**
11/25/09**Direction Photo Taken:****Description:**

Possible mold growth and delaminated tile at west exit door



Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 11	Date: 11/25/09		
Direction Photo Taken:			
Description: Deteriorated roof deck at eave			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 12	Date: 11/25/09		
Direction Photo Taken:			
Description: Rusted truss end bearing with section loss			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 13	Date: 11/25/09		
Direction Photo Taken:			
Description: Rusted truss end bearing with section loss			

Tighe&Bond		PHOTOGRAPHIC LOG	
Client Name: City of Gardner, MA		Site Location: Greenwood Memorial Bathhouse, Gardner, MA	Project No. G-0384
Photo No. 14	Date: 11/25/09		
Direction Photo Taken:			
Description: Roof truss elevation			

Tighe & Bond

Offices are located
throughout New England.

www.tighebond.com