

Winchendon Senior Center  
Conditions Assessment  
January 2020

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## **Introduction**

The Winchendon Senior Center (WSC) operates out of the "Old Murdock High School" located at 52 Murdock street in Winchendon. The building was constructed between 1885 and 1887 and served as the Winchendon High School until 1961. It was renovated in 1974 and reopened as part of the middle school. On January 28, 1988, the building was entered in the National Register of Historic Places. The school building was formally closed in 1995 and remained vacant until 2008, when it began functioning as the new Winchendon Senior Center.

The building is considered a 2 1/2-story structure with a partial above-grade basement and limited finished area occupying a portion of the attic. The building is an example of Romanesque Revival and comprised of solid masonry construction, including granite base, brick and brownstone masonry walls, and adorned with decorative brownstone features. The building has a bell & clock tower located in the northeast corner of the building along with several chimneys incorporated into gabled-parapets located around the perimeter of the structure. The roof is wood-framed with a hipped profile and numerous dormers. The roofing is slate with copper flashing and related decorative features.

In August of 2019, the Town observed damage to the exterior brick masonry of the Senior Center. Tighe & Bond was contacted to conduct a preliminary evaluation of the building masonry. Based on our observations, the brick and stone masonry at the bell & clock tower and the chimneys, was determined to be in poor condition. Substantial movement was apparent by cracks and displaced masonry. It was evident that further investigation would be necessary to determine the cause of the masonry deterioration, and the required repairs to correct the problem. Preliminary recommendations to protect primary pedestrian entrances and areas located near the bell & clock tower and badly damaged chimneys were made to the Town to avoid injury to the public from falling masonry.

Subsequent to that site visit Tighe & Bond, with consultant Structures North, performed a more comprehensive assessment of the building exterior and interior. This report outlines the findings of that assessment, evaluates the existing problems, and provides prioritized recommendations and associated budgetary costs for the repair of the masonry.

## **Section 1**

# **Existing Conditions Assessment**



### **Winchendon Senior Center**

The Existing Conditions Assessment presented in Section 1 describes the existing physical conditions of the Winchendon Senior Center (WSC). Our assessment includes both Architectural and Structural conditions that we observed during our site visits.

The conditions assessment was conducted from November 19, 2019, through November 21, 2019. A visual inspection of the exterior and interior of the Senior Center Building and clock tower were conducted to identify building deficiencies in the Architectural and Structural systems. Our observations were used to establish recommended repairs for the building and to assist in determining the probable construction costs associated with the recommendations.

Tighe & Bond retained the services of Structures North Consulting Engineers, Inc. (Structures North, SN) to conduct the survey of the exterior masonry façade for the building and clock tower. Structures North photographed the exterior building elevations, and documented deterioration in the brick masonry by clearly identifying areas of damage or deterioration on the photo-elevations. Structures North provided probable construction costs for recommended repairs.

Tighe & Bond performed the conditions assessment for specific components of the exterior building envelope including roofing, flashing, and exterior doors and windows. Our findings are documented in the report.

Tighe & Bond also assessed specific components for the building interior including visible architectural and structural systems comprising interior finishes, load bearing walls, beams, floor systems, and support columns. Damage to interior finishes, deterioration or evidence of deficiencies in the structural systems was documented. We were also



able to view portions of the roof framing within the attic to identify areas displaying evidence of excessive deflection or water infiltration.

Completing the building interior assessment, we reviewed and documented general building code compliance components relative to accessible routes, accessible restrooms, exit stair enclosures, and elevator access. A preliminary building code review will be used to determine if any of the proposed modifications will require additional building code compliance upgrades.

The following describes observations of the existing architectural and structural systems noted by Tighe & Bond and or Structures North during our site visits. Select referenced photos are included in Appendix B.

## 2.1 Building Exterior

The exterior building facade survey was conducted by Structures North, Inc (SN). Their report is appended to this report (See Appendix A). A summary of Structures North Report follows:

### Exterior Brick Masonry

The primary areas of deterioration in the exterior brick façade include the clock tower, from the 2<sup>nd</sup> level above the third floor (3+2) to the bell deck, the ventilation chimneys, and the west boiler chimney. The brick masonry in these locations is generally in poor condition.

- The deterioration of the clock tower façade at elevation 3+2 includes cracks in the southeast corner of the clock tower where the east face of the brick masonry is separated from the clock tower (See photo 1 Appendix B). Corresponding cracks were also observed in the east face at the northeast corner of the tower where the brick is sheared through and a crack approximately 1-inch wide has resulted (See photo 2 Appendix B).
- The single wythe corbels on the east face of the tower are displaced outward carrying the brownstone arches and sill above the brownstone arches with them. The displacement is approximately 1-1/2 inches near the top of the corbel (See photo 3 Appendix B). The outward displacement continues above the brownstone into the brick and brownstone belt course above.
- The majority of the observed clock tower deterioration is a direct result of rust jacking associated with the flat plate steel lintels above the seven arched windows located between level 3+2 and the bell tower deck on each face of the clock tower (See SN photo 8 in Appendix A). The steel lintels are substantially corroded, and the resulting expansive characteristics of rust is physically lifting the brick and brownstone upward to varying degrees on each side of the tower. This rust jacking effect, lifting and damaging the brick and brownstone, provided a path for water infiltration into the clock tower masonry walls, leading to cyclical freeze thaw damage, accelerating the deterioration of the masonry.
- Deterioration was observed on all sides of the clock tower between elevation 3+2 and the bell deck. However, the east side of the tower exhibited the worst of the deterioration.

- The ventilation chimneys on the east and north elevations are badly deteriorated. The deterioration observed includes split capstones, and cracks in the corbeled chimney brick (See photo 4 Appendix B). In addition, the iron posts supporting the copper cap will need protection to prevent corrosion because of dissimilar metals (See photo 5 Appendix B).
- The ventilation chimney on the south elevation is in good condition, except for the iron posts supporting the copper cap. The post will need protection to prevent corrosion because of dissimilar metals (See photo 6 Appendix B).
- The deterioration observed for the active boiler chimney located on the west elevation includes cracked brick and deteriorated mortar joints (See photo 7 Appendix B)

The masonry for the remainder of the building was observed to be in fair condition. Mortar joint deterioration was observed across the entire building façade and represents the second largest component of the observed masonry deficiencies. Other observed deficiencies include failed joint sealants, damaged and deteriorated flashings, and organic growth on the building façade.

- In general, some degree of mortar joint deterioration of the exterior masonry facade was observed on all building elevations. The Structures North report defines the percentage of mortar joint deterioration that was observed on each building elevation.
- Opened joints in brownstone parapet copings and brownstone sills were observed throughout the exterior building façade (See SN photo 12 Appendix A)
- Opened joints at the interface of brick surfaces and stone surfaces were observed in many areas on the building facade (See SN photo 9 Appendix A)
- Flashing between dissimilar masonry and where stone profiles create projecting surfaces should be replaced and sealant joints replaced

### Windows

The WSC windows appear to be original to the building. The windows, except for a few, appear to be in relatively good to fair condition. Most of the windows require normal maintenance, including scraping and painting and replacement of perimeter sealant joints. The paint, joint sealant, and window glazing are potential hazardous materials and could require abatement.

- The window on the south side of the clock tower is in poor condition. Wood rot is visible on the window frame (See photo 8 Appendix B)
- The window units located on the north side of the clock tower beneath the roof interface are also in poor condition. Wood rot is visible on the window frame (See photo 9 Appendix B).



### Doors

The exterior doors were replaced during a previous renovation. The doors are in relatively good condition. One exception being the basement door on the north side of the building.

- The entrance door located on the south elevation is located approximately 4 risers (2'-4") above grade. The aluminum door and frame are in good condition. The door appears to be relatively new (See photo 10 Appendix B). There is also a wood door located adjacent to the aluminum entrance door. The door is inactive, and the hardware has been removed. The wood door is in fair condition.
- The second entrance door located on the south elevation is an at grade entrance and provides access to the building elevator and access to all floors of the facility. The aluminum door and frame are in good condition. The door appears to be relatively new (See photo 11 Appendix B).
- The entrance door located on the east elevation is located approximately 12 risers (7'-0") above grade. The aluminum door and frame are in fair condition, but appears to be older than the building entrance doors located on the south and north elevations (See photo 12 Appendix B).
- The entrance door located on the north elevation is located approximately 4 risers (2'-4") above grade. The aluminum door and frame are in good condition. The door appears to be relatively new (See photo 13 Appendix B). There is also a wood door located adjacent to the aluminum entrance door. The door is inactive, and the hardware has been removed. The wood door is in fair condition.
- The north elevation also includes a hollow metal double door that provides access to the basement. The double door is in poor condition. Corrosion is visible on the door and frame (See photo 14 Appendix B).
- The west elevation includes an access door to the basement. The single door is in fair condition (See photo 15 Appendix B).

### Roofing System

The roofing system consists of slate roofing tile over roofing felt underlayment and associated copper flashing. It was reported that portions of the slate roofing were replaced at some point in the past. The slate appears to be a standard commercial grade "weathering" green slate as indicated by the soft hues of brown/beige slate among the green slate. The roof flashing is a combination of copper and lead-coated copper depending on application. Copper is also used for ridge roll flashing as well as chimney, bell tower, cupola caps, trim, flat roofing, and decorative finials. In general, the existing slate roofing is in fair condition.

- We observed some broken and fractured slate (See photo 16 Appendix B)
- It was also observed that gable wall parapet flashing is damaged (See photo 17 Appendix B), most likely caused by sliding snow and ice. In general, all observed

flashings appear to be in fair condition and will require some repairs in conjunction with the roofing repairs (See photo 18 Appendix B).

- The existing snow pads currently installed on the roof appear to be sub-par and should be replaced with better quality product as part of the roof repairs (See photo 19 Appendix B)

#### Clock Faces

The clock faces are constructed of wood and are in fair condition. Deterioration was observed at the following locations (See SN tower clock faces in Appendix A):

- East Face - Wood rot was observed extending horizontally across the middle of the clock face
- South Face - Wood rot was observed on the bottom of the clock face between 3 and 7
- West Face - Wood rot was observed on the bottom of half of the clock face at several locations between 4 and 9

## **2.2 Building Interior**

The building interior consists of three interior floors and a basement level. The floors, walls, and ceilings throughout the building are in very good condition. There was no evidence of severe deterioration or distress of any of the major building structural elements. We did observe some water infiltration damage in the north stairwell.

#### First Floor

The building first floor consists of the office area, kitchen, dining room, and meeting areas. The first floor of the building can be accessed by stairs leading up from the exterior doors located on the north, south, and east building elevations. In addition, the first floor can be accessed by an elevator located at a second entrance on the south side of the building.

- Interior finishes included wood strip flooring, vinyl, ceramic tile, and carpet. The walls and ceilings are comprised of plaster and lathe or gypsum wall board, depending on original and new renovations
- The walls and ceiling on the first floor are in good condition. We did not observe any significant cracking in the walls or ceilings (See photo 20 Appendix B).
- The wood doors were observed to be in good condition
- The wood flooring is also in good condition, we did not observe any noticeable sagging or deflections
- The first floor has two unisex rest rooms with one toilet and lavatory fixture in each room

#### Second Floor

The auditorium is located on the second floor above the dining room. In addition, an exercise room and pool table room are also located on the second floor. The second floor can be accessed by stairs located on the north and south sides of the building. In



addition, the second floor can also be accessed by an elevator located on the south side of the building.

- Interior finishes included wood strip flooring, vinyl, ceramic tile, and carpet. Walls and ceilings are comprised of plaster and lathe and gypsum wall board, depending on renovations
- The walls and ceiling on the second floor are in good condition. We did not observe any significant cracking in the walls or ceilings.
- The Billiard Room ceiling exhibited some peeling paint. This appears to be poor adhesion rather than moisture related problems.
- The auditorium has exposed ornate wood trusses (See photo 21 Appendix B) and wood doors (See photo 22 Appendix B) and are in very good condition
- The wood flooring is also in very good condition, we did not observe any noticeable sagging or deflections (See photo 23 Appendix B)
- We observed water infiltration on the west wall of the north stairwell leading up to the third floor (See photo 24 Appendix B)
- The second floor has men's and women's rest rooms with one toilet and lavatory fixture for each. There is also a convenience shower facility.

### Third Floor

The third floor can be accessed by stairs located on the north and south sides of the building. In addition, the third floor can also be accessed by an elevator located on the south side of the building.

The rooms on the third floor are located within the building roof lines. The third-floor spaces consist of a reading/meeting room, a storage room, attic access, and access to the clock tower.

- Interior finishes included wood strip flooring and carpet. The walls and ceilings are comprised of lath and plaster and gypsum wall board, depending on original and new renovations.
- The walls and ceiling on the third floor are typically in good condition. We did observe one area requiring repair that is associated with the tower masonry damage.
- The floors were also in good condition and we did not observe any noticeable sagging or deflections

### Attic

The attic can be accessed from the third floor through three different doors. The roof framing, consisting of rough sawn timber can be observed from the attic.

- The roof framing that we observed was in good condition. We did not observe any evidence of distress or indications of water infiltration damage (See photos 25 and 26 Appendix B).
- We did observe and hear pigeons within the attic space

### Clock Tower Interior

The clock tower is accessed from the third floor through a door located in the reading/meeting room. There are four levels within the tower that are accessed by a series of metal ships ladders and wooden ladders. The clock tower houses the clock mechanism, pendulum box, and bell.

- The intermediate floor levels within the clock tower are constructed from wood framing and appear to be in fair condition (See photo 27 Appendix B)
- One of the rungs on the ladder up to the top level of the clock tower is broken and does not provide for safe access (See photo 28 Appendix B)

### Basement

The building has a full basement with several rooms that include a boiler room, storage rooms, men's and women's restrooms, a television room, and a clothes donation storage room. The basement of the building can be accessed by stairs located on the north and south sides of the building. The basement can also be accessed by the elevator located on the south side of the building. In addition, the basement can be accessed directly by exterior doors located on the west and north sides of the building.

- The walls and ceiling in the basement are in good condition. We did not observe any significant cracking in the walls or ceilings. It was reported that students from high school shop classes have done some masonry repointing in the basement.
- The basement floors are concrete and in relatively good condition (See photo 29 and 30 Appendix B)
- The basement level has men's and women's rest rooms. The Men's Room contains 2-toilets, 3-urinals, and 2-lavatories. The Women's Room contains 3-toilets and 2-lavatories.

### General Building

WSC staff that were interviewed during our site visit indicated that the Clock Tower had been struck by lightning on at least one occasion in the past which may have contributed to some of the damage observed on the clock tower façade.

- The WSC currently does not have a lightning protection system installed on the building or clock tower

### Hazardous Material Survey

Our condition assessment did not include a hazardous materials survey. Prior to any renovation project, an inspection should be completed for the areas where proposed improvements will occur, and suspect materials should be tested for the presence of hazardous materials such as lead, asbestos, and PCBs.

## **Section 2**

# **Recommendations**

### **Architectural and Structural Improvements**

Section 1 presented structural and architectural deficiencies identified during the existing conditions evaluation. The proposed repairs to the WSC focuses on repairing the building and clock tower masonry facade and improving the overall building envelope.

#### Building Code Application

Historic Buildings are covered in the International Existing Building Code (IEBC 2015). Chapter 12, Section 1202 – Repairs, states that “repairs to any portion of a historic building or structure shall be permitted with original or like materials and original methods of construction, subject to the provisions of this chapter”. In addition, if the local building code official deems the current condition of the clock tower and chimneys to be “unsafe conditions”, then no work shall be required beyond what is necessary to remedy the unsafe condition. Section 1202 - Repairs, will allow the necessary repairs to stabilize the masonry chimneys, building façade, and clock tower, without the need to upgrade the building for seismic loads as would normally be the case with other structures.

The recommended repairs to the masonry facade can be implemented in a phased approach, with the most severely deteriorated areas being repaired first. We divided the repairs into three phases as follows:

Phase I – Critical Repairs that must be completed to eliminate a potentially “unsafe Condition”.

- Hazardous materials survey
- Clock tower masonry repairs
- Chimney masonry repairs above the roof level
- Clock tower window replacement
- Selective roof repairs related to the execution of the clock tower and chimney work

Phase II – Recommended repairs that should be completed within five years to prevent further deterioration of the building structure.

- Roof and flashing repairs for the remainder of the roof
- Building masonry repairs – cutting and pointing masonry
- Interior finish repairs – Repair damage resulting from water infiltration due to masonry and roof deterioration

Phase III – Recommended long term repairs that will protect the building structure from further deterioration or damage.

- Window restoration and maintenance for the entire building



- Joint sealant replacement – schedule for 10 year replacement intervals
- Lightning protection

The following architectural and structural improvements are proposed to stop the current deterioration of the building and clock tower and to prevent a potential catastrophic collapse of the clock tower masonry façade.

The extent of the recommended exterior building façade repairs are outlined in Structures North report (See Appendix A). The illustrated work areas include Tower East, Tower North, Tower South, Tower West, East Elevation Center Top, Clock Faces, and the Chimneys. The following is a summary of the masonry façade repairs recommended by Structures North.

### **Phase I – Critical Repairs**

#### Hazardous Material Survey

As previously stated, our condition assessment did not include a hazardous materials survey. Prior to any renovation work, a hazardous building materials (HBM) survey should be completed for the areas where proposed improvements will occur, and suspect materials should be tested for the presence of hazardous materials such as lead, asbestos, and PCBs. The results of survey should be incorporated into the construction documents, and if positive, HBM's industry standard specifications should be prepared to properly specify the procedures for removal and disposal of the hazardous building materials. We have carried an allowance in our opinion of probable construction costs, in an attempt to capture some of this cost.

#### Clock Tower

The recommended repairs to each face of the clock tower façade between tower level 3+2 and the bell deck include the following:

- Selectively demolish the outer brick wythe and brown stone and rebuild the facade using a mixture of old and new brick and brown stone of matching size and shape
- Remove the corroded steel flat plate lintels supporting the brick masonry above the seven arched windows and infilling the space between brick piers that currently are supporting the lintels with solid masonry. Once the infill masonry is complete, the brownstone can be anchored to the newly installed solid masonry.
- Install supplemental stainless-steel helical anchors to tie the newly constructed face brick back to the inner wythes of the masonry walls
- Install supplemental stainless-steel helical anchors to tie the existing face brick to the inner wythes for the masonry walls for the remainder of the clock tower face

#### Ventilator Chimneys

The recommended repairs to each ventilation chimney include the following:

- Remove the copper chimney caps and steel support post to allow for masonry façade repairs



- Provide corrosion protection for the steel support posts. The corrosion protection to include sandblast surface preparation and a high-performance coating system.
- In addition, provide dissimilar metal isolators between the copper cap and steel support posts
- Selectively demolish the outer wythes chimney face brick and brown stone cap and rebuild the facade using a mixture of old and new brick and brownstone
- Install supplemental stainless-steel helical anchors to tie the newly constructed face brick to the inner wythes of brick masonry

#### Working Chimney

The recommended repairs to working chimney include the following:

- Selectively demolish the outer chimney face brick and brown capstone and rebuild the facade using a mixture of old and new brick, and brownstone
- Install supplemental stainless-steel helical anchors to tie the newly constructed face brick to the inner (backup) brick structure

#### Clock Faces

The recommended repairs for the wood clock faces include the following:

- Replace the sections of the wood clock face that are deteriorated

#### Roofing and Flashings

All proposed roofing repairs will need to be coordinated with the recommended masonry repairs to the clock tower and chimneys. The recommended roof repairs are as follows:

- Remove existing slate roof, including copper flashing, to facilitate the installation of the roof supported scaffolding necessary to repair the brick masonry clock and bell tower along with the masonry chimney stacks, and gabled parapet walls
- Install a temporary membrane roofing system and protection board to provide a water tight roof assembly and to permit installation and support of scaffolding associated with the clock tower and chimney repair work.
- Upon completion of all above-roof repairs including masonry and roofing repairs associated with the clock/bell tower and copper-cap repairs to chimneys, the scaffolding may then be removed to facilitate the roof deck preparation for slate and flashing reinstallation
- Reinstall existing salvaged slate and supplement with new slate to facilitate roof repairs, incorporate new copper flashing in accordance with industry standards and practices.

#### Clock Tower Windows

The windows are important to the architectural character of the building. They need to be repaired and or restored in-kind. Each window should be individually inspected, and the following items checked and repaired as needed.

- Check sash chords, weights, and locking hardware and repair as necessary
- Replace damaged or failing glazing and glass

- Strip peeling paint from sill, sash, window frame, and related trim
- Repair damaged window sills, sash, and related trim; prime and repaint. Use epoxy repair/restoration products as needed to restore window components to like new condition.
- Repair or replace existing weather stripping. If weather stripping is not present install new bronze type weather stripping.
- Replace all perimeter sealant with new paintable silicone sealant

**Phase II – Recommended Repairs**Building Elevations:

Reference Structures North report (See Appendix A) which highlight the recommended areas of repair for the building structure.

- Some degree of mortar joint repointing of the exterior masonry facade is required on all building elevations. Structures North report outlines the percentage of mortar joint repointing that is required on each building elevation.
- Re-anchoring of the outer wythe brick is expected throughout the building exterior. The re-anchoring is anticipated to include drilling small diameter stainless steel helical anchors into the brick façade in a grid pattern for the purpose of tying the façade to the backup brick structure.
- All opened joints in brownstone parapet copings and brownstone sills are recommended to be re-pointed with mortar
- Opened joints at the interface of brick surfaces and stone surfaces need to be repointed leaving room to properly fill with backer rod and joint sealant
- Flashing between dissimilar masonry and where stone profiles create projecting surfaces should be replaced, including new joint sealants

Remainder Of Roofing and Flashings

New and salvaged slate roofing materials, including ice and water shield, roofing underlayment, copper flashing, snow guard assemblies, snow pads, and gutters and down spouts can be installed once all the proposed masonry repair work above the building roof has been completed. The recommended roof repairs for the remainder of the building roof are as follows:

- The existing slate material will require being supplemented with matching new slate to accommodate for breakage
- New copper and lead-coated copper flashing will be required and incorporated into the slate roofing replacement and repairs
- The roof should be provided with a new snow guard system comprised of snow pads as well as snow rail-type guards, to better control sliding snow and ice

Building Interior

- Once all masonry and roofing repair work is complete, the interior plaster repairs can be performed in the north stair shaft

**Phase III – Recommended Long Term Repairs**Lightning Protection

The building and clock tower do not currently have a lightning protection system. Based on the height and use of the building, it is strongly recommended that a lightning protection system be installed. The lightning protection system should include the following:

- Multiple aerial terminals connected with a copper grounding conductor
- Multiple risers located at the corners of the building
- Dedicated lightning rods designed to keep the lightning discharge from damaging the existing electrical service

Building Windows

The windows are important to the architectural character of the building. They need to be repaired and or restored in-kind. Each window should be individually inspected, and the following items checked and repaired as needed.

- Check sash chords, weights, and locking hardware and repair as necessary
- Replace damaged or failing glazing and glass
- Strip peeling paint from sill, sash, window frame, and related trim
- Repair damaged window sills, sash, and related trim; prime and repaint. Use epoxy repair/restoration products as needed to restore window components to like new condition.
- Repair or replace existing weather stripping. If weather stripping is not present install new bronze type weather stripping.
- Replace all perimeter sealant with new paintable silicone sealant
- Consider exterior or interior storm panels



## Section 3

### Opinion of Probable Construction Costs:

#### Architectural and Structural Improvements

Section 2 presented the recommended structural and architectural repairs for the clock tower, chimneys, and building. Section 3 is our opinion of the costs associated with the recommended repairs.

As previously stated, the recommend repairs to the facade can be implemented in a phased approach, with the most severely deteriorated areas being repaired first. This will allow the Town of Winchendon to spread out the repair costs over multiple years if desired. The three phased approach we considered is as follows:

Phase I – Critical repairs that must be completed immediately to eliminate a potentially “unsafe Condition”.

Phase II – Recommended repairs that should be completed within two to five years to prevent further deterioration of the building structure.

Phase III – Recommended long term repairs that will protect the building structure from further deterioration or damage should be completed within six to ten years.

Our Engineers Opinion of Probable Costs (OPCC) for each phase are tabulated in Appendix C and summarized in Table 3-1.

Table 3-1 presents a summary of each alternative and estimated total project cost.

**TABLE 3-1**  
Construction Phase OPCC Summary

<b>Alternative</b>	<b>Total Phase Cost</b>
Phase I — Critical Repairs	<b>\$1,560,000</b>
Phase II —Recommended Additional Repairs	<b>\$1,950,000</b>
Phase III — Long Term Additional Repairs	<b>\$1,720,000</b>

Tighe & Bond is available to discuss the recommendations outlined in this report at the Town of Winchendon convenience.





**Tighe&Bond**

## **APPENDIX A**



6 December 2019

Mr. John R. Frawley PE  
Senior Structural Engineer  
Tighe & Bond  
53 Southampton Road  
Westfield, MA 01085

Reference: Winchendon Senior Center, 52 Murdock Ave., Winchendon, MA  
Exterior Masonry Conditions Assessment

Dear John,

At your request we conducted a follow-up exterior masonry conditions assessment of the Winchendon Senior Center, 52 Murdock Ave., in Winchendon, MA. The assessment followed Tighe and Bond's 19 August 2019 initial assessment based on a 7 August 2019 visit in which portions of the building were accessed using the town's fire department ladder truck. In the subsequent assessment, we were provided with a 125' Genie lift and were able to access all sides of the building except for the west elevation, which was surveyed with binoculars from the ground. The Tighe and Bond memo of 19 August 2019 identified areas of severe masonry deterioration with concern for potential failures. In this report, we provide further information as to masonry construction, more detail on specific areas of deterioration, deterioration mechanisms, and anticipated repair methods.

**Background and History** The history of the Winchendon Senior Center (WSC), or as it was originally called, "The Old Murdock High School," is well documented. The best sources of documentation that we were able to find include the National Register of Historic Places application forms from 29 December 1987 and the Massachusetts Cultural Resource Information System inventory No. WIN.71 from June 1986. The WSC was designated a National Register property on 28 January 1988. Excerpts from the National Register registration form are included in the appendix to this report.

The WSC was built between 1885 and 1887 in Romanesque Revival style design by architect H.M. Francis of Fitchburg, MA. The building operated as a high school until 1961. It was remodeled in 1974 and opened as part of the middle school. Use as a school building reportedly ended in 1995. The current use as the senior center has been in effect since 2008.

**Building Description** The WSC is 2 ½ stories with a partially above grade basement level and the top story (third floor) occurring within complex roof lines. Exterior walls are solid loadbearing brick with ornamental stone fenestrations. The outside facing brick is hard medium-red brick laid up in running bond with narrow mortar joints and without headers, or possibly with blind headers. The backup brick was observed from within the tower is a softer common brick with conventional mortar joint widths of about 3/8". Inner and outer brick courses would necessarily align only occasionally based on the differences in mortar joints. The outer brick mortar is medium hard with a very fine sand and a colorant. The colorant may be carbon black and the mortar appears dark gray.



The building style is highly ornate with Romanesque arched entries and patterned brick. Decorative stone occurs as belt courses, sills, capstones, arch stones, pilasters and capitals, lintels, grotesques, and lettering. Some of the major features of the building elevations include the clock tower on the northeast corner; ventilation chimneys on the west side of the south entry, the south side of the east entry, and the west side of the north entry; third floor three and four arched parapet capped pediment on the north, south, and east elevations; flying arch buttressing of the working chimney on the west elevation, and a solid coursed ashlar granite base of the building that is capped in a granite water table transitioning to brick at the first floor.

The clock tower deserves particular attention as it is the primary area of deterioration. The interior of the tower is accessed from the third floor and there are four levels inside accessed with a combination of ships ladders and wood ladders. The first level above the third floor, (3+1), (see Tower Elevation Key attached), has the narrow slot windows that you see from the exterior and contains the clock pendulum box. The second level above the third floor, (3+2), is a tall space that contains a wood framed room housing the clock mechanism. It is at this level that the tower begins to corbel outward on the outside while maintaining its interior dimension. The thickness of tower walls appears to be 21 1/2" up through the second level before it begins to widen. The thicker walls occurring above the second level are supported on corbeled brick at the tower corners and between seven small brownstone arch windows. Behind the arch windows that you see from the outside is 5 courses of single wythe stacking bricks separating the windows on top of which the weight of the tower above is transferred on three 3/8" x 3" flat plate lintels (See Photo 1). Above the second level there is a massive curved brownstone base occurring at the bell deck level, (3+3). The curved stones occur between three windows of the bell deck and at the corners with highly decorative cantilever arched stones. The bell deck transitions the clock tower inward on the massive curved stones and the tower outside dimension narrows and the brick walls become 8" thick above the transition stones to the fourth and last framed level within the tower comprising the clock room deck (See Photo 2). From the clock room deck to the top of tower masonry is 12'-8" and from the deck to the underside of the steeply sloping wood framed tower peak is 25'-8". At the fourth level (3+4), the clock deck, the outside face of brick is inset from corner exterior pilasters and the windows have deep carved brownstone lintels over brick piers between windows. Above the brownstone clock deck water table and below the brick is inset patterned. The clock opening is Roman arched with five courses of rowlock brick on the inside and molded brownstone arches on the exterior. Above the clock face the exterior is faced in rusticated coursed brownstone. The clock face is comprised of horizontal tongue and groove boards battened vertically and at the perimeter and is attached to the tower masonry with iron brackets.

**Detailed Areas of Deterioration** The major areas of deterioration include the tower upward from the second level above the third floor (3+2) to the bell deck, two of the three ventilation chimneys, and the west working chimney. In addition to the specific deterioration areas that are described there is another significant ongoing source of deterioration that is also telling for the tower as well. That ongoing deterioration relates to the construction technique used in the outer wythe of brick. Common masonry repair items for the remainder of the tower and the rest of the building follow at the end of this section of the report.

Deterioration of Tower 3+2 to the Bell Deck, (3+3) Masonry Major deterioration of the tower starts in the area of patterned brick above the brownstone belt course just above level 3 +1 of the tower. The damage begins with separation cracks on the east face of the southeast corner and a corresponding



vertical crack on the east face of the northeast corner where the brick is sheared through and opened up almost an inch between brownstone belt courses (See Tower Work, Level 3+2 to Bell Deck, North and South Sides). Above that crack on the southeast corner the corbeling brick above has been rebuilt, but immediately beyond the corner, the single wythe corbels are displaced outward carrying with them the brownstone sill of the seven arch opening near the top of level 3+2 (See Photo 3). The water table brownstone course above the corbeled single wythe brick, the seven brownstone arches, and the water table brownstone course above the arches are all distorted outward about 1-½". The distortion is best seen with straight lines overlaying a photo from below (See Photo 4). The distortion continues above the water table into the brick and the brownstone belt course at the level of the bell deck (3 + 3). The east side of the tower between these levels is by far the worst.

Deterioration of Ventilation Chimneys and West Working Chimney Masonry The ventilation chimneys on the east and north elevations are badly deteriorated (See Chimneys and East Elevation Center Top work scope, attached). The ventilation chimney on the south side is in much better condition, but in need of corrosion protection of the iron posts that support the copper cap. The chimney on the east side has split brownstone capstones with the crack extending into the corbeled brick below. This chimney needs to be rebuilt from the cap down to the start of the corbeling brick as well as the outer face of brick from the corbel start to the top of the brownstone band (See the upper portion of East Elevation Center Top work scope).

The north ventilation chimney is deteriorated from the brownstone cap down to the brownstone band below. This chimney needs to be rebuilt from the chimney cap down to the brownstone band below.

The active boiler chimney on the west side has a crack through eight courses below the corbeled brick top. The brick should be rebuilt across these cracks. The corbeled brick needs to be removed and reset, which means taking the massive concrete cap off. The cap is in good condition and can be reinstalled. The remainder of the active boiler chimney on the west side should be repointed 100%.

The south side ventilation chimney is in good condition except for the steel pipe support of the copper ventilator cap. The steel pipe support is corroding badly, so the cap and support need to be removed, corrosion protected, and reinstalled.

Construction of Outer Wythe of Brick The exterior brick of the WSC is hard medium-red with fine mortar joints while the back-up inner wythe brick is a common salmon brick with conventional mortar joints (See Photos 5 and 6). The outer brick is laid up in running bond with no apparent headers. They may have used blind headers, which is a technique where they take the back-up brick and rotate them occasionally into notches cut into the back of the facing brick. Without dismantling the masonry, this condition cannot be determined for certain. The facing brick expands and contracts differently than the backup brick due to different heat and moisture exposure as well as due to different absorption properties. The result is that over time the outer brick separates from the inner brick and a void occurs in the collar joint between wythes. As water enters the collar joint and freezes, it gradually works the exterior brick outward. The evidence of this effect can be seen at the brownstone detailing at the edges of the stone where the brick was originally in alignment and has become proud of the stone (See Photo 9). Although the construction is anticipated to be the same throughout, the problem of movement of the outer wythe is manifesting only in certain portions of the elevations. Those locations are likely related to exposure and are places on the building with more moisture and temperature cycling occurring, such as on the south and east elevations.



Common Masonry Repair Items Common masonry repair items typically include pointing, cleaning, and flashing and sealants. A degree of repointing is necessary on all elevations to a certain percentage, beyond the other areas of repair or reconstruction.

General Deterioration Repointing of narrow jointed exterior brick masonry is the second largest component of the repair work, after the tower masonry repairs. Repointing should be done on all elevations to some degree. The approximate percentages are as follows: North – 80% of east end, 30% of the center, 100% of the east end below the windows, and 40% of the area beyond that; South - 40%; East - 100% below windows at the south end and 20% beyond the windows, 80% of the north end, and 100% of the center; West - 70% of the north end and center, and 60% of the east end.

In general, the exterior of the building has a certain degree of atmospheric soot, darkening the mortar and the brick. Of greater effect, however, is organic growth occurring mostly on the north side of the building masonry, but to some extent on other elevations and the side returns of the north side (facing east or west). Cleaning usually requires a detergent, brush, pressure wash, and rinse. Special organic cleaner, such as Prosoco Enviro Klean, should be used on the north elevation where it is most discolored.

Particular attention needs to be paid to top surfaces of exposed brownstone, including trim and coping caps. When water is allowed to enter the joints between exposed stone on horizontal surfaces, it then gets into the brick below and behind it and delaminates the brick upon freezing. All open joints in parapet caps, brownstone sills, and projecting stone surfaces should be repointed or sealed.

Flashing between dissimilar masonry and where stone profile creates a projecting surface were not observed in general. In only a few instances was a sealant applied in a repair application. There are dissimilar masonry conditions and projections that would benefit from flashing and sealants (See Photo 7).

**Deterioration Mechanisms** Deterioration mechanisms for the major areas of repair are discussed in detail in this section. The major areas of deterioration include the clock tower from level 3 +2 to the bell deck as well as the chimneys. The deterioration mechanisms are readily apparent and predictable, and relate most to natural expansion and contraction, and water intrusion with subsequent cyclical freezing.

Deterioration of Tower 3+2 to the Bell Deck (3+3) Masonry The cause of the deterioration of the tower 3 + 2 level to the bell deck level was readily apparent from within the tower above the clock room. From near the top of the ships ladder to the bell deck (level 3 + 3), one can observe the inside of the seven brownstone arches that occur on each tower elevation. Between the arches are six single wythe brick piers by six bricks high (See Photo 1). The piers create openings in the back-up brick to the brownstone arches on the exterior. Above the piers are (3) 3/8" x 3" flat plates that are continuous over the piers and about equally distributed over the 19" pier length. These steel plates have corroded, exfoliated, and rust jacked, lifting the brick and stone up to varying degrees on each side, but on the east side where the most damage occurs on the exterior, about 1/2" to 3/4" (See Photo 8). Once the plates lifted the masonry above, a gap opened in the band course above the arches and allowed water to get into the masonry below and subsequently freeze cyclically. It is the long term effect of water entering gaps in the masonry caused by rust jacking of the steel plate lintels that over time has caused significant damage to the tower masonry. Removal of these rust-jacking plates must be made a

priority in the restoration work.

Note that the tower masonry arrangement requires that all of the masonry remain in compression so that the conglomeration of materials remains in line by friction between elements. With the rust jacking noted above, the weight of the tower gets shifted outward to the corner corbeling (See Photo 4). This movement has caused the masonry to become overloaded and cracking ensued. Much of the prior masonry restoration on the tower was in these corners corbeled brick. The repairs were implemented without understanding and correcting the cause, and so deterioration has continued and reoccurred.

Deterioration of Ventilation Chimney and West Working Chimney Masonry The deterioration of the east and north ventilator chimneys is due to a corrosion cell between the copper cap and the iron pipe supports and the anchors to the brownstone cap. In both cases, the expanding of the corroding iron pipes and anchors have split the stone and allowed water to get into the brick below (See Photos 10 and 11). Subsequent cycling freezing of the water in the collar joint between bricks has caused the brick to deteriorate significantly, necessitating partial reconstruction.

At the working chimney, expansion and contraction of the chimney due to on and off demand of the heating system likely opened up cracks in the mortar joints allowing water to enter the outer wythe. The working chimney requires rebuilding brick across cracked joints and 100% repointing (See Chimney Work illustration).

General Deterioration of Outer Wythe of Brick General deterioration of the outer wythe of brick in numerous locations is due to either inadequate blind headers, or no headers at all. The result is that over time the outer brick moves away from the back-up brick with normal expansion and contraction. In order to secure deterioration of outer brick, the face needs to be reanchored to the back.

**Anticipated Repair Methods** This section of the report is focused on any special requirements in the proposed restoration work that warrants special description.

The cost of accessing the tower for repairs by scaffolding is a significant percentage of the cost. For that reason, it is recommended that all of the work on the tower be done in one phase so that access costs won't be reincurred.

For the removal of the three steel plate lintels causing rust jacking on the inside of the seven-arch brownstone at clock tower level we recommend that the arches be filled in sequentially with solid masonry in a phased approach. The approach consists of removing the steel in one arch between single wythe piers and building a solid block of masonry. Once one pier has a sister pier installed next to it, the remainder of the lintel is removed to the face of the next pier. Lintels and piers are removed and infilled one arch at a time until all seven arches are solidified with solid masonry. Once in place, the outside face brownstone arches can be anchored to the back-up brick from the back side by drilling and anchoring to the back face of the brownstone. It is possible that some of the steel lintels could be left in place by corrosion protecting with impressed current cathodic protection. The lintels on the east side are so badly jacked that the only option is to remove them and infill with solid masonry.



For the reconstruction of ventilator chimneys on the east and north sides, and for repair to the ventilator chimney on the south side, we recommend that the copper chimney cap as well as the steel pipe base be removed and properly corrosion protected. Dissimilar metals should be separated with a galvanic isolator to prevent further corrosion cell from occurring. The steel pipe is sacrificial to the copper cap in this case. Replacement anchorage to the top of rebuilt brownstone (replacement is proposed to be in cast stone), should be by stainless steel adhesive anchors. Corrosion protection of the steel pipe base can be to sandblast to bare metal and coat with high performance paint (3-coat epoxy system). An alternative to restoring the existing iron pipe base would be to make a new chimney cap base with hot dip galvanized finish but still with the galvanic isolator between the copper and galvanized steel.

General outer wythe brick reanchoring throughout the building exterior is anticipated to consist of drilling small diameter stainless steel Helifix ties at the intersection of the head and bed joint downward through the face brick and into the backup brick. The reanchoring should be done on a 16" x 24" grid pattern throughout the remainder of the east elevation beyond the areas of exterior brick wythe reconstruction.

As far as reconstruction of damaged masonry and masonry repointing, a careful match of existing mortar properties and appearance is necessary. Existing mortar can be analyzed petrographically to determine composition of sand, natural cement, lime, and colorant. Petrography is an expensive process – roughly \$3,000 per sample. Should petrography not be used to determine mortar composition, then we recommend a 1:1:6 mortar mix, cement, lime, and sand, with a fine sand and a colorant to match existing mortar be used in the outer wythe restoration. Replacement brick must also be carefully matched in size, color, and finish and consideration should be given to rebuilding prior mis-matched masonry repair areas.

Repairs to the building may be phased. The first phase should include the tower masonry restoration as well as the chimneys – both of which are necessary to prevent further loss of masonry and the associated hazards. The remaining elevations/building areas can be phased in one to three additional phases and should be grouped by elevation.

Should you wish to discuss the observations, findings, and recommendations of this report, please do not hesitate to contact this office.

Very Truly Yours,  
Structures North Consulting Engineers, Inc.



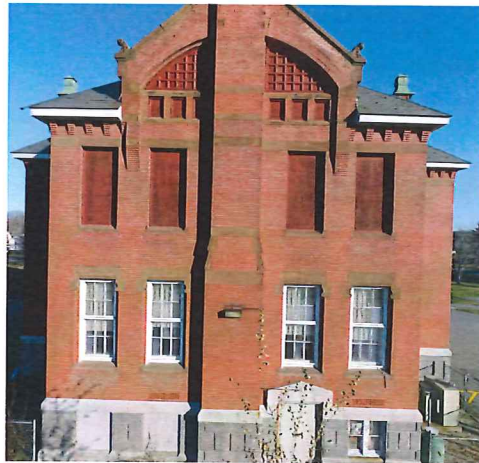
Edward Moll, P.E.  
Principal

attachments: Key Plan Photos; Representative Photos; Tower Elevation Key; Tower Work Level 3 + 2 to Bell Deck (4 sides) and Chimney Work; National Register Application Excerpts





**NORTH ELEVATION**



**WEST ELEVATION**



**KEY PLAN**



**EAST ELEVATION**

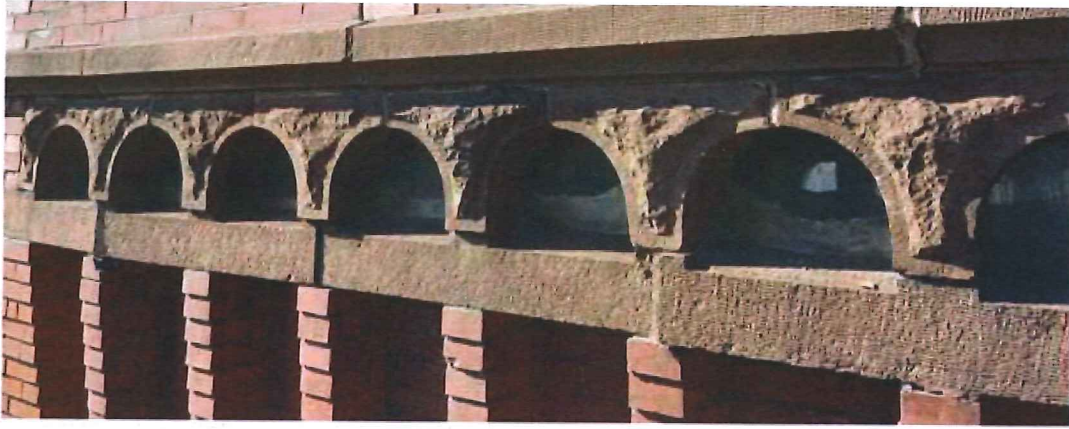


**SOUTH ELEVATION**

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**ILLUSTRATIVE**  
**PHOTOGRAPHS**

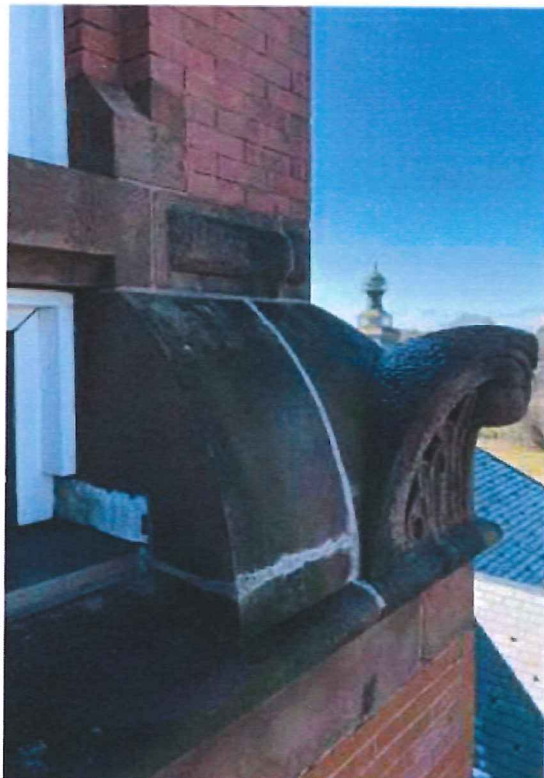


**EXTERIOR**



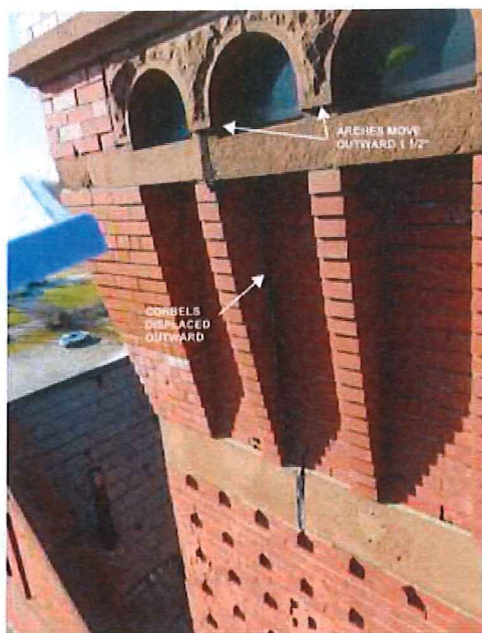
**INTERIOR**

**Photo 1 - Tower 7-Arch Openings at top of Level 3 +2**



**Photo 2 - Massive  
Curved Stones  
Transition Tower  
Exterior Masonry from  
30" at Level 3 = 3 to 8"  
for the Remaining  
Height**

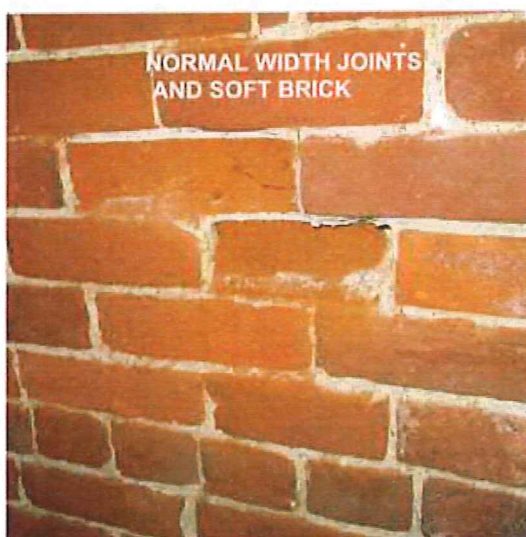




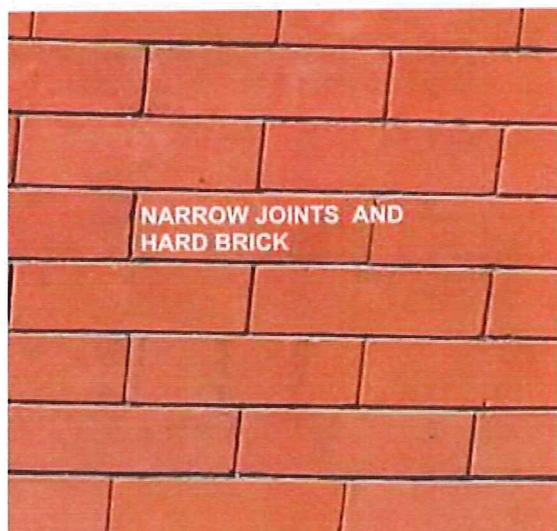
**Photo 3 - Single Wythe Corbels of Tower Displaced Outward**



**Photo 4 - Distortion of Tower Masonry Above 7-Arches**



**Photo 5 - Tower Interior Brick and Mortar**



**Photo 6 - Tower Exterior Brick and Mortar**



**Photo 7 - Projecting Elements Candidates for Flashing**

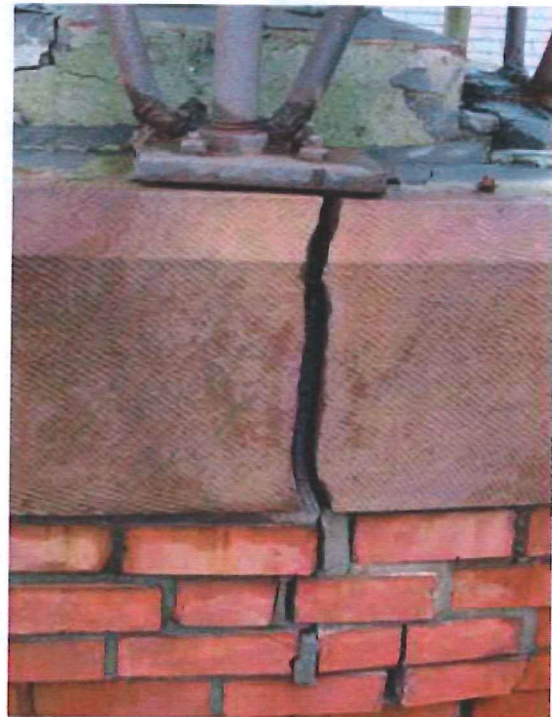


**Photo 8 - Rust Jacked Steel Plate Linels at 7 - Arch opening Brick Backup**





**Photo 9 - Brick Proud of Brownstone  
Due to Outer Wythe Delamination**



**Photo 10 - Ventilator Base  
Corroding and Splitting Stone**



**Photo 11 - Ventilator Base  
Corroding and Splitting Stone**



**Photo 11 - Rebuild Bricks Across  
Cracks in Lower East Tower**



**Photo 12 - Open Joint in  
Gable End Brownstone  
Coping Cap**



**Photo 13 - Open Joint in  
Faceted Turret Corners**

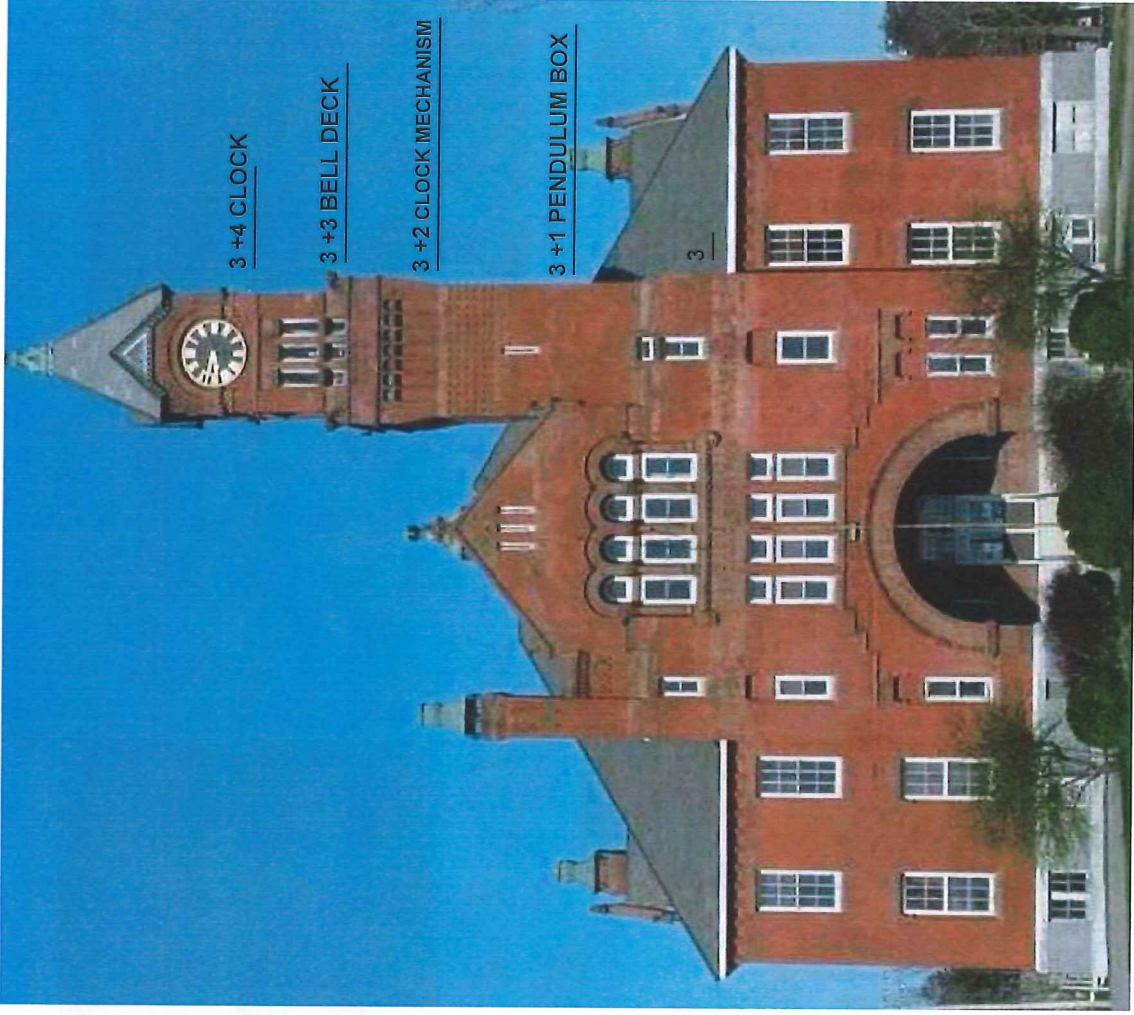


**Photo 14 - Organic  
Growth West Side of  
North Elevation**



**Photo 15 - Organic  
Growth West Side of  
Lower Tower**





TOWER ELEVATION KEY

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**WORK AREAS ILLUSTRATED:**

TOWER EAST  
TOWER NORTH  
TOWER SOUTH  
TOWER WEST

EAST ELEVATION CENTER TOP

CLOCK FACES

CHIMNEYS

## BELL DECK

6

8

3

19

5

21

5

LEVEL 3 +2

### RESTORATION WORK ITEMS:

- REPOINT 100%
- RETROFIT ANCHOR BRICK  
FROM 3 +1 TO 3 +2



- INDICATES REBUILD  
OUTER MASONRY

## TOWER EAST

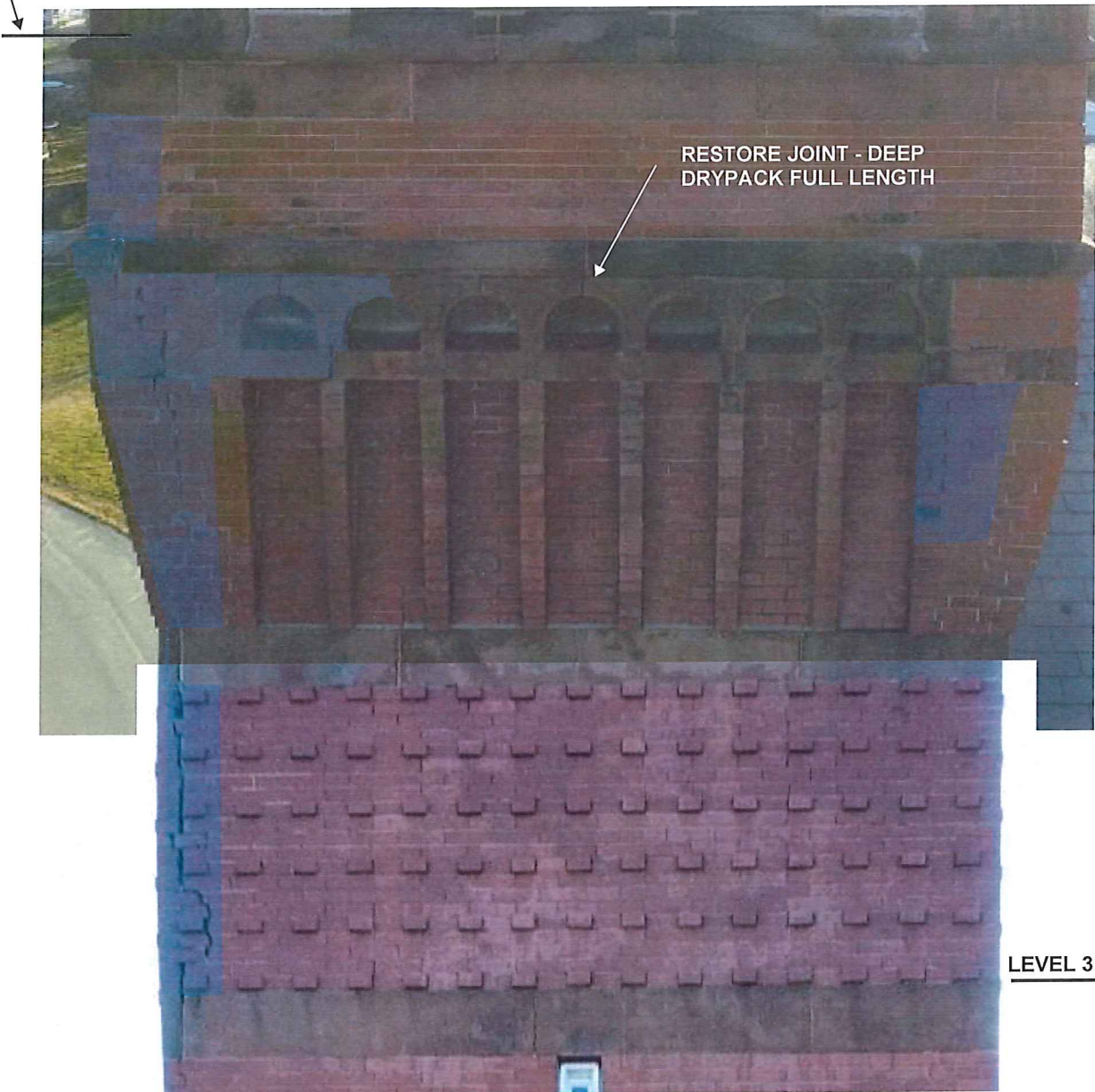
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BELL DECK



RESTORATION WORK ITEMS:  
REPOINT 30% BALANCE OF AREA

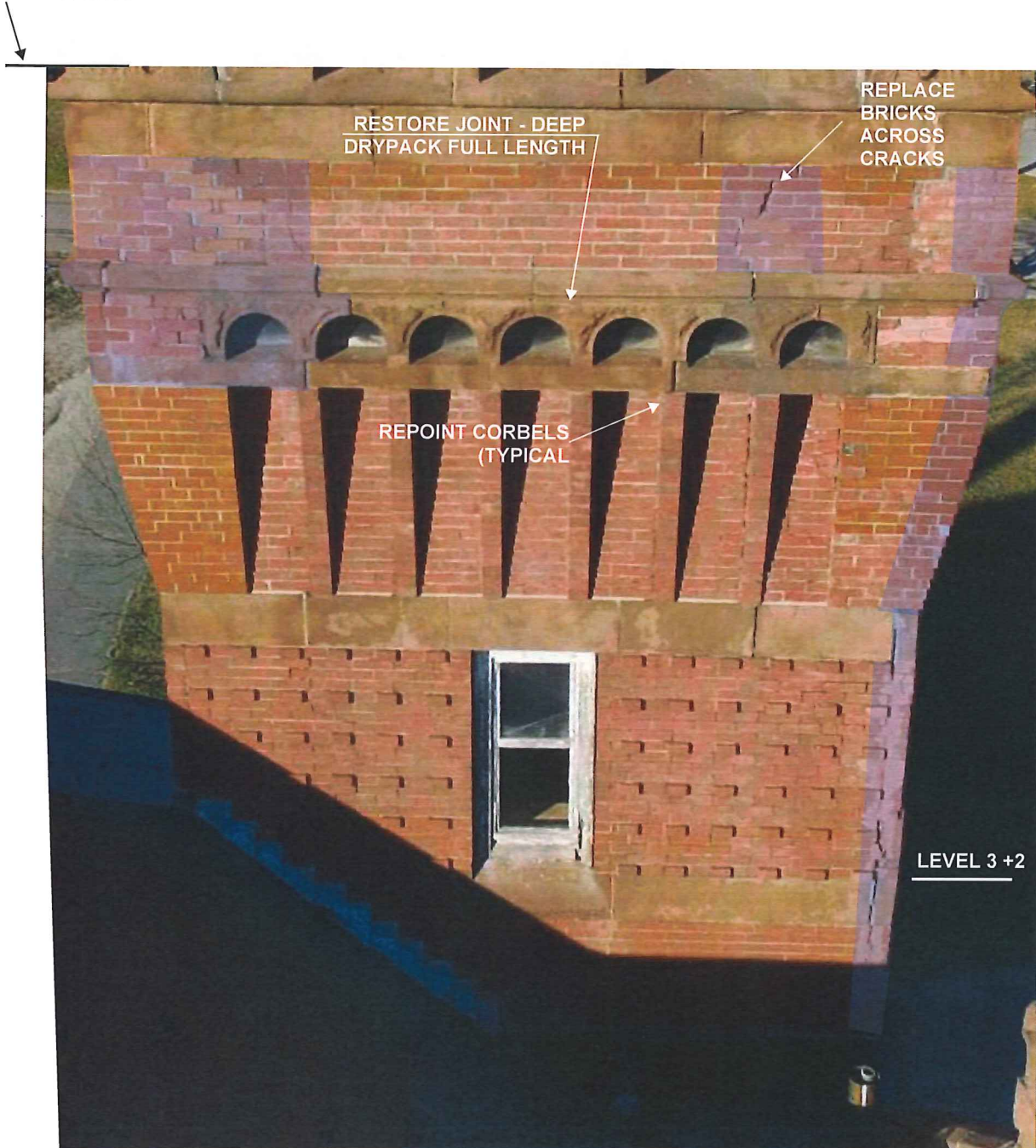
 - INDICATES REBUILD  
OUTER MASONRY

## TOWER NORTH

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BELL DECK



**RESTORATION WORK ITEMS:**  
REPOINT 30% BALANCE OF AREA

 - INDICATES REBUILD  
OUTER MASONRY

## TOWER SOUTH

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BELL DECK



**RESTORATION WORK ITEMS:**  
• REPOINT 100%

■ - INDICATES REBUILD  
OUTER MASONRY

## TOWER WEST

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REMOVE VENTILLATOR,  
SUPPORT RODS, AND BASE  
PLATES. CORROSION PROTECT  
SUPPORT RODS AND BASE  
PLATES AND REINSTALL WITH  
STAINLESS STEEL ANCHORS.  
PROVIDE NEW SEALANTS.

REBUILD  
SHADED  
PORTIONS OF  
CHIMNEY

REPLACE  
BROWNSTONE  
CAP

LOOSE  
BRICK

REBUILD  
BRICK  
ACROSS  
CRACKS

OPEN JOINT

LOOSE  
BRICK

DISPLACED STONE

REBUILD  
BRICK  
ACROSS  
CRACKS

RE-ANCHOR BRICK  
ON TOWER

REBUILD  
SHADED  
PORTIONS OF  
FACE BRICK

PRIOR  
POORLY  
MATCHED  
REPAIR

- INDICATES REBUILD  
OUTER MASONRY

Structures North 

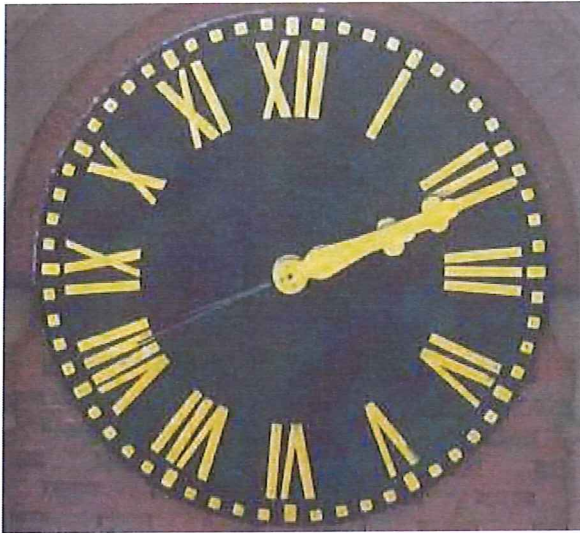
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RESTORATION WORK ITEMS:  
• SELECTIVE REPOINTING  
• MASONRY CLEANING

## EAST ELEVATION CENTER TOP

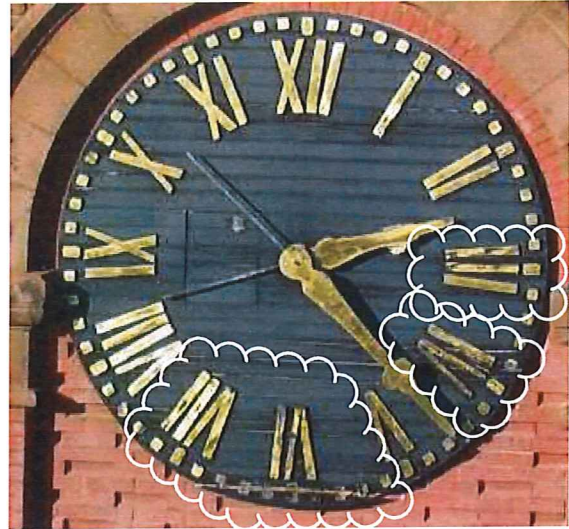
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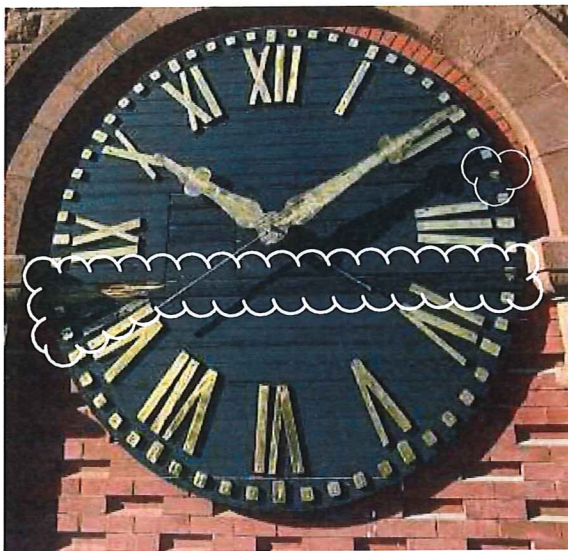


NORTH

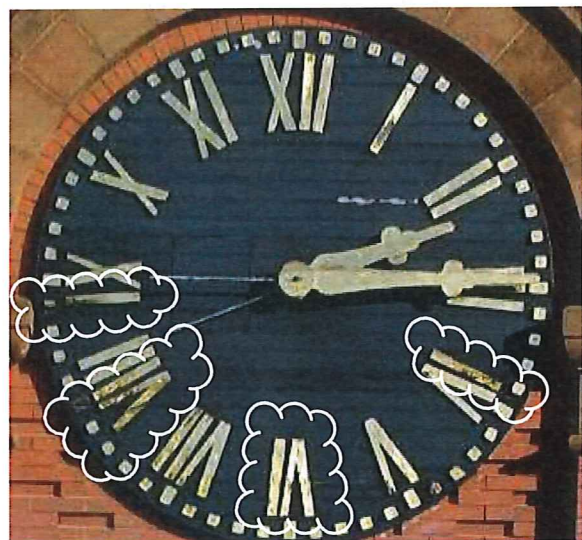
ROT DAMAGED  
AREAS OF WOODEN  
CLOCK FACE ARE  
SHOWN CLOUDED



SOUTH

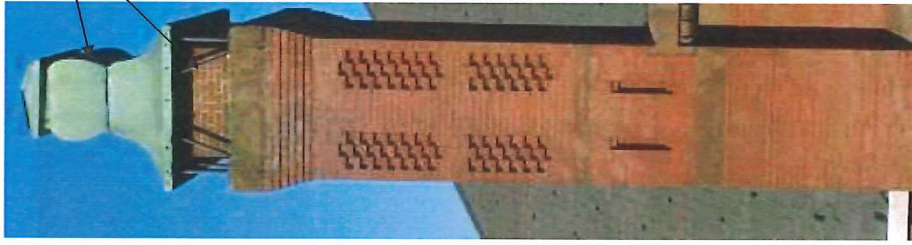


EAST



WEST

## TOWER CLOCK FACES



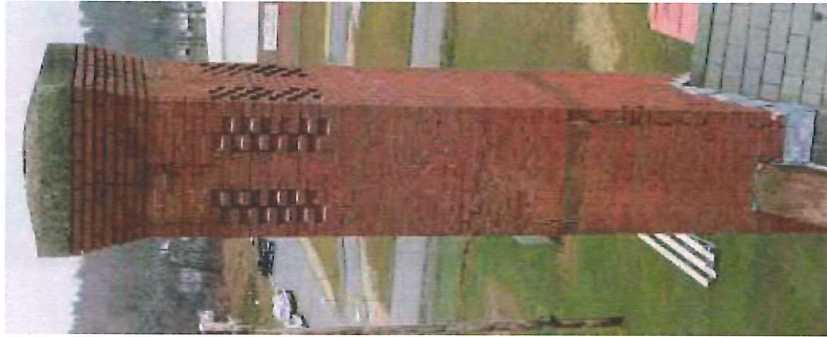
**SOUTH**  
**(VENTILLATOR)**

REMOVE VENTILLATOR, SUPPORT RODS, AND BASE PLATES. CORROSION PROTECT SUPPORT RODS AND BASE PLATES AND REINSTALL WITH STAINLESS STEEL ANCHORS. PROVIDE NEW SEALANTS.



**NORTH**  
**(VENTILLATOR)**

REBUILD CHIMNEY



**WEST OPERATING CHIMNEY**  
**(FURNACE)**

**RESTORATION WORK ITEMS:**

- 100% DEEP REPOINTING
- MASONRY CLEANING
- REBUILD BRICKS ACROSS CRACKS

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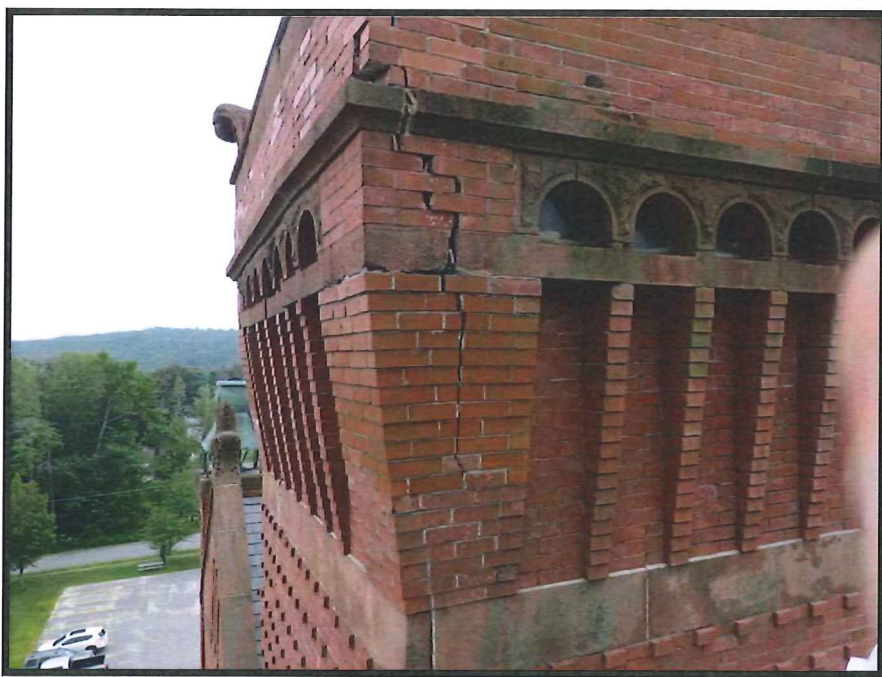
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**CHIMNEYS**  
**(SEE ALSO EAST ELEVATION**  
**CENTER TOP)**

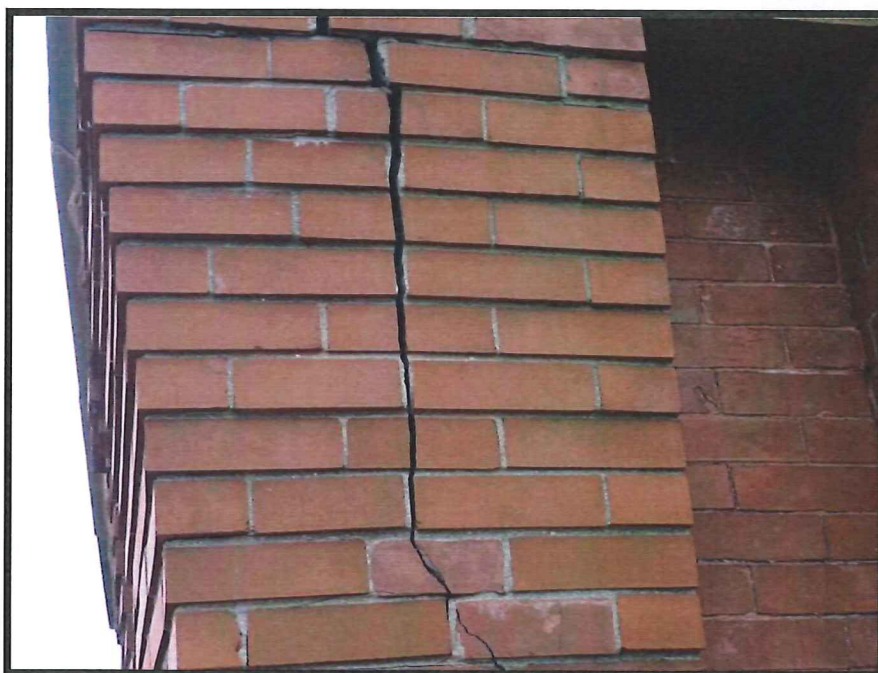
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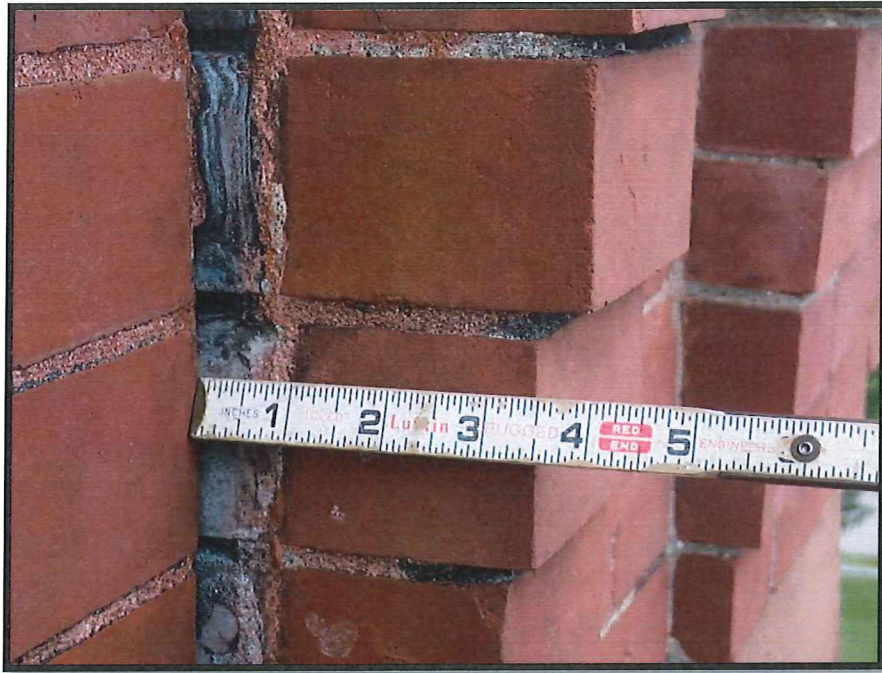
**APPENDIX B**



Appendix B – Photo -1



Appendix B – Photo 2



Appendix B – Photo 3



Appendix B – Photo 4





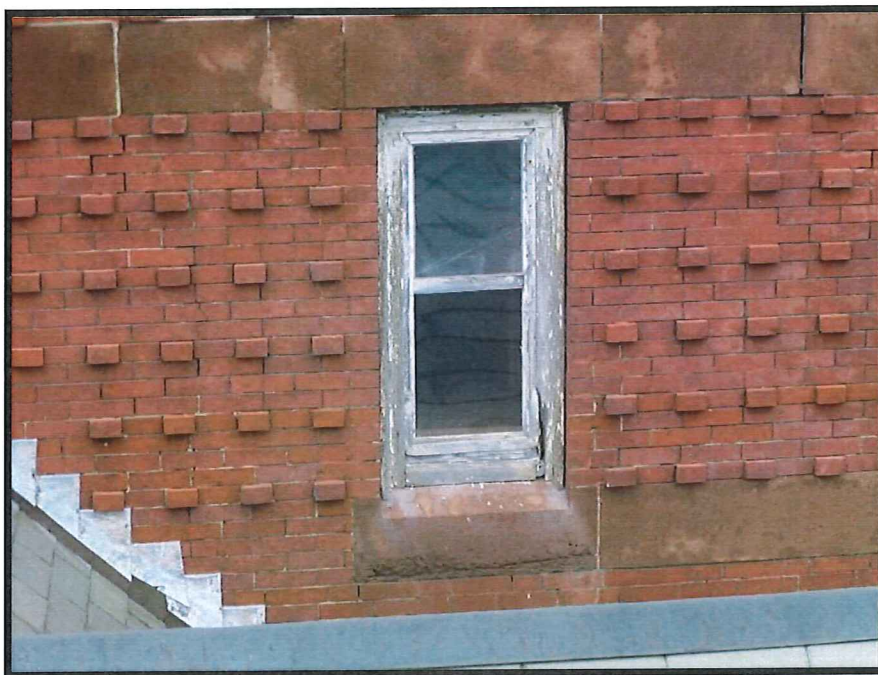
Appendix B – Photo 5



Appendix B – Photo 6



Appendix B – Photo 7

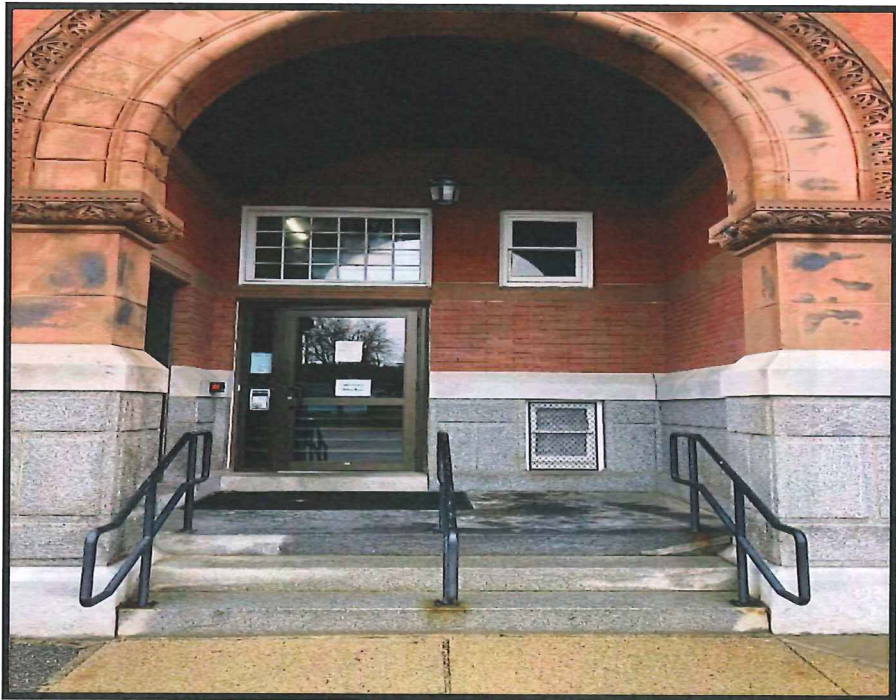


Appendix B – Photo 8





Appendix B – Photo 9



Appendix B – Photo 10

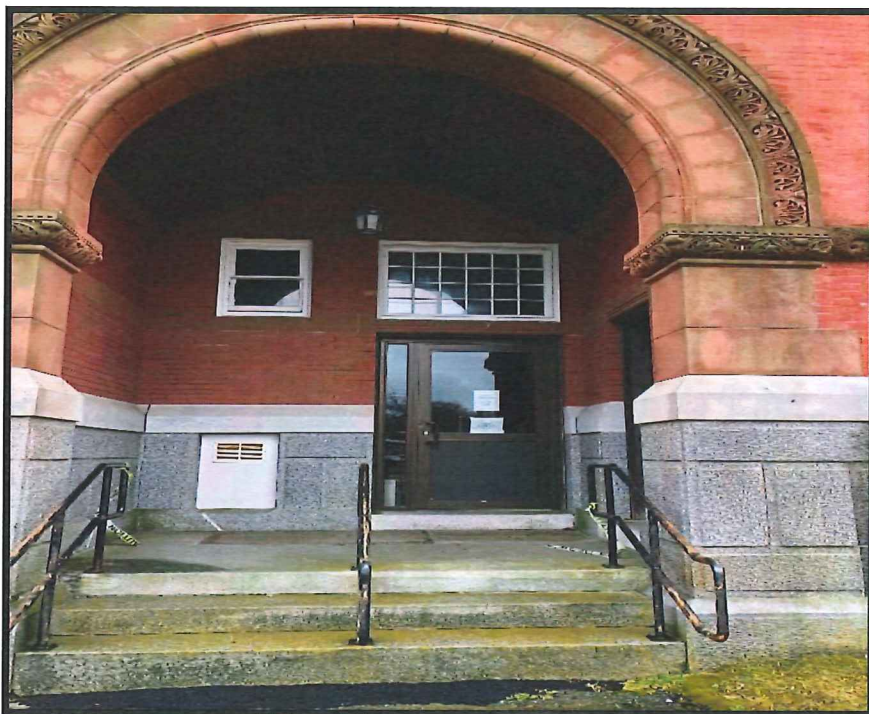




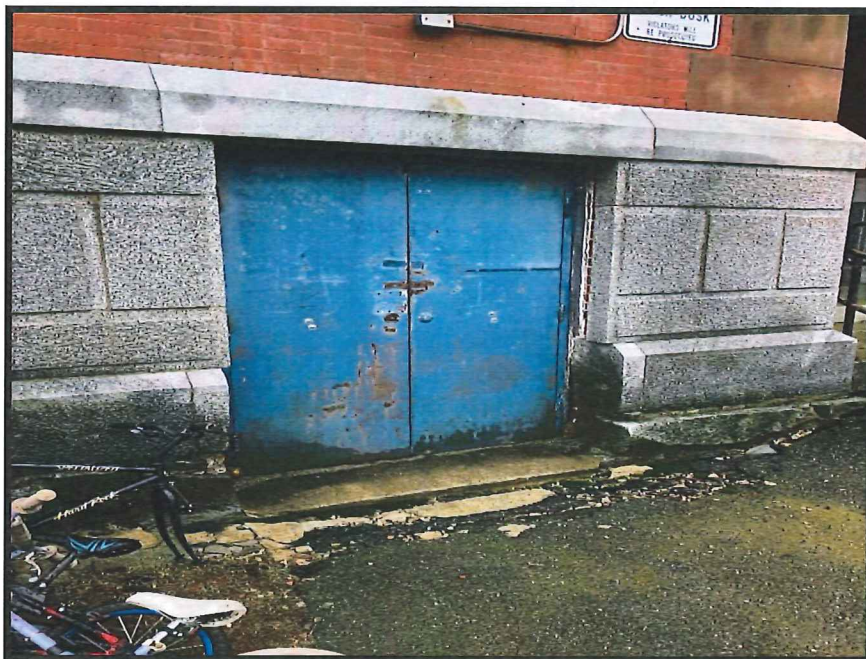
Appendix B – Photo 11



Appendix B – Photo 12



Appendix B – Photo 13



Appendix B – Photo 14





Appendix B – Photo 15



Appendix B – Photo 16



Appendix B – Photo 17



Appendix B – Photo 18





Appendix B – Photo 19



Appendix B – Photo 20



Appendix B – Photo 21



Appendix B – Photo 22





Appendix B – Photo 23



Appendix B – Photo 24



Appendix B – Photo 25



Appendix B – Photo 26

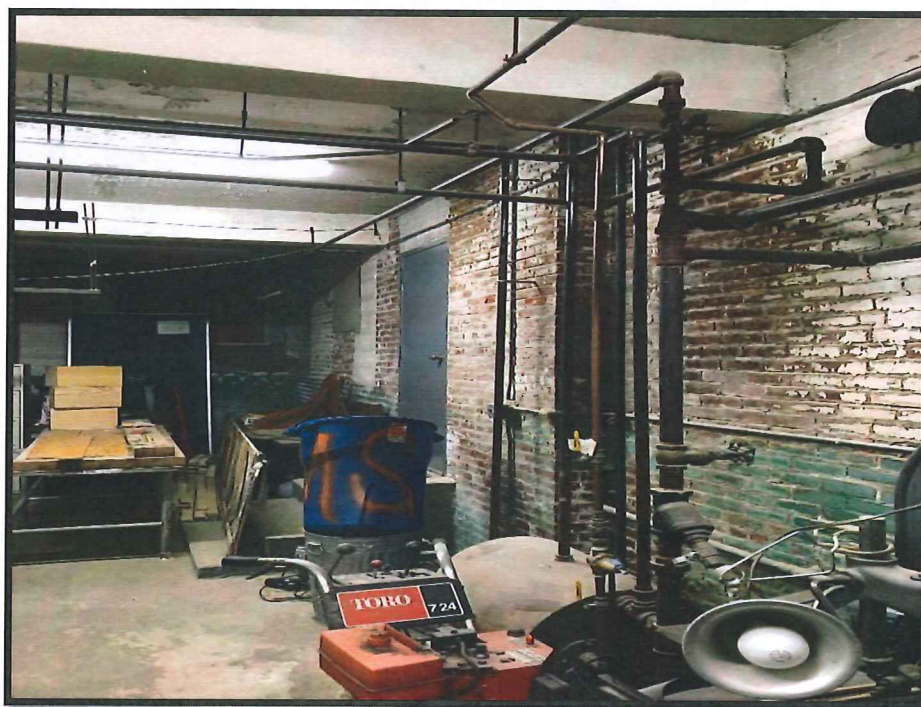




Appendix B – Photo 27



Appendix B - Photo 28



Appendix B – Photo 29



Appendix B – Photo 30





## **APPENDIX C**



ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST										Tight & Bond	
Project:		Winchendon Senior Center						Jan-20			
Location:		Winchendon, MA									
Estimate Type:		<input checked="" type="checkbox"/> Conceptual <input type="checkbox"/> Preliminary Design <input type="checkbox"/> Design Development						<input type="checkbox"/> Construction <input type="checkbox"/> Change Order <input type="checkbox"/> % Complete		Prepared By: JF	
Phase I								Date Prepared: 1/22/2020		T&B Project No.: W-1157-63	
Bid Item Number	Spec. Section	Item No.	Description	Quantity	Units	Material/Installed Cost		Installation		Total	
			MOBILIZATION, DEMOBILIZATION AND RELATED EXPENSES								
1	01025	1	Mob., Demob. & Related Exp. (5% Total Bid Excluding Items 1&2)	1	LS	\$57,100	\$57,100	\$0	\$0	\$57,100	\$57,100
SUBTOTAL PRICE - BID ITEM 1							\$57,100	\$57,100	\$0	\$0	\$57,100
			GENERAL REQUIREMENTS								
2	01025	1	General Requirements (10% Total Bid Excluding Items 1&2)	1	LS	\$114,200	\$114,200	\$0	\$0	\$114,200	\$114,200
SUBTOTAL PRICE - BID ITEM 2							\$114,200	\$114,200	\$0	\$0	\$114,200
			GENERAL CONSTRUCTION FOR ALL WORK NOT LISTED SEPARATELY IN BID ITEMS 1, 2,								
<b>CRITICAL REPAIRS</b>											
Division 4 - Masonry											
Clock Tower											
Phase I	04810	1	East Face Of Clock Tower	1	LS	\$187,955	\$187,955	\$0	\$0	\$187,955	\$187,955
		2	West Face Of Clock Tower	1	LS	\$134,175	\$134,175	\$0	\$0	\$134,175	\$134,175
		3	North Face Of Clock Tower	1	LS	\$110,086	\$110,086	\$0	\$0	\$110,086	\$110,086
		4	South Face Of Clock Tower	1	LS	\$176,096	\$176,096	\$0	\$0	\$176,096	\$176,096
Clock Tower Subtotal =										\$608,312	\$608,312
Ventilation & Operating Chimney											
	04810	1	East Ventilation Chimney	1	LS	\$56,184	\$56,184	\$0	\$0	\$56,184	\$56,184
		2	West Operating Boiler Chimney	1	LS	\$47,006	\$47,006	\$0	\$0	\$47,006	\$47,006
		3	North Ventilation Chimney	1	LS	\$64,435	\$64,435	\$0	\$0	\$64,435	\$64,435
		4	South Ventilation Chimney	1	LS	\$16,997	\$16,997	\$0	\$0	\$16,997	\$16,997
Masonry Subtotal =										\$184,622	\$184,622
Division 7- Roofing											
Phase I		1	Selective Removal of Slate Roofing For Scaffolding	1	LS	\$60,000	\$60,000	\$0	\$0	\$60,000	\$60,000
		2	Temporary Roofing Beneath Scaffolding	1	LS	\$12,000	\$12,000	\$0	\$0	\$12,000	\$12,000
		3	Selective Replacement Of Slate Roofing And Flashing	1	LS	\$138,000	\$138,000	\$0	\$0	\$138,000	\$138,000

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST										Tight & Bond	
Project: Winchendon Senior Center		Location: Winchendon, MA		Jan-20							
Estimate Type: <input checked="" type="checkbox"/> Conceptual <input type="checkbox"/> Preliminary Design <input type="checkbox"/> Design Development				<input type="checkbox"/> Construction <input type="checkbox"/> Change Order <input type="checkbox"/> % Complete		Prepared By: JF		Date Prepared: 1/22/2020		T&B Project No.: W-1157-63	
Bid Item Number	Spec. Section	Item No.	Description	Quantity	Units	Material/Installed Cost		Installation		Total	
						\$/Unit	Total	\$/Unit	Total		
		4	Repairs to Tower Slate Roofing and Flashing	1	LS	\$24,000	\$24,000	\$0	\$0	\$24,000	
		5	Removal and replacement of flat seam copper roofing	1	LS	\$18,000	\$18,000	\$0	\$0	\$18,000	
			Roofing Subtotal =							\$252,000	
Phase I											
			Division 8 - Windows								
		1	Clock Tower Window Replacement	1	LS	\$42,000	\$42,000	\$0	\$0	\$42,000	
			Window Repair Subtotal =							\$42,000	
Phase I											
			Hazardous Building Material Survey & Abatement								
		1	Hazardous Building Materials Survey	1	LS	\$12,000	\$12,000	\$0	\$0	\$12,000	
		2	Phase I Hazardous Roofing Materials Abatement	1	LS	\$13,800	\$13,800	\$0	\$0	\$13,800	
		3	Phase I Hazardous Window Materials Abatement	1	LS	\$30,000	\$30,000	\$0	\$0	\$30,000	
			Hazardous Building Material Survey & Abatement Subtotal =							\$55,800	
			SUBTOTAL PRICE - BID ITEM Phase I							\$1,142,734	
			SUBTOTAL							\$1,314,034	
			CONSTRUCTION CONTINGENCY (10%)							\$131,500	
			TOTAL CONSTRUCTION COST							\$1,445,534	
			ESTIMATED ENGINEERING COSTS (10% Phase I Items)							\$114,273	
			TOTAL ESTIMATED CONSTRUCTION AND ENGINEERING COST							\$1,559,807	
			SAY							\$1,560,000	



ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST										Tight & Bond	
Project:		Winchendon Senior Center								Jan-20	
Location:		Winchendon, MA									
Estimate Type:		<input checked="" type="checkbox"/> Conceptual <input type="checkbox"/> Preliminary Design <input type="checkbox"/> Design Development								Prepared By: JF Date Prepared: 1/22/2020 T&B Project No.: W-1157-63	
Phase II											
Bid Item Number	Spec. Section	Item No.	Description	Quantity	Units	Material/Installed Cost		Installation		Total	
1 MOBILIZATION, DEMOBILIZATION AND RELATED EXPENSES											
	01025	1	Mob., Demob. & Related Exp. (5% Total Bid Excluding Items 1&2)	1	LS	\$71,200	\$71,200	\$0	\$0	\$71,200	
SUBTOTAL PRICE - BID ITEM 1										\$71,200	
2 GENERAL REQUIREMENTS											
	01025	1	General Requirements (10% Total Bid Excluding Items 1&2)	1	LS	\$142,500	\$142,500	\$0	\$0	\$142,500	
SUBTOTAL PRICE - BID ITEM 2										\$142,500	
3 GENERAL CONSTRUCTION FOR ALL WORK NOT LISTED SEPARATELY IN BID ITEMS 1, 2,											
<b>RECOMMENDED ADDITIONAL REPAIRS:</b>											
Division 4 - Masonry											
Balance of Building (Exclusive of Clock Tower & Chimneys)											
04810	1		East Building Elevation	1	LS	\$117,686	\$117,686	\$0	\$0	\$117,686	
	2		West Building Elevation	1	LS	\$68,764	\$68,764	\$0	\$0	\$68,764	
	3		North Building Elevation	1	LS	\$57,214	\$57,214	\$0	\$0	\$57,214	
	4		South Building Elevation	1	LS	\$68,558	\$68,558	\$0	\$0	\$68,558	
Masonry Subtotal =										\$312,222	
Division 7 - Roofing											
	1		Slate Roofing and Roof Flashings	1	LS	\$960,000	\$960,000	\$0	\$0	\$960,000	
	2		Copper work and ornamental features	1	LS	\$120,000	\$120,000	\$0	\$0	\$120,000	
Roofing Subtotal =										\$1,080,000	

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST										Tighe & Bond	
Project: Winchendon Senior Center										Jan-20	
Location: Winchendon, MA											
Estimate Type:		<input checked="" type="checkbox"/> Conceptual		<input type="checkbox"/> Construction		Prepared By: JF					
		<input type="checkbox"/> Preliminary Design		<input type="checkbox"/> Change Order		Date Prepared: 1/22/2020					
Phase II		<input type="checkbox"/> Design Development		<input type="checkbox"/> % Complete		T&B Project No.: W-1157-63					
Bid Item Number	Spec. Section	Item No.	Description	Quantity	Units	Material/Installed Cost		Installation		Total	
						\$/Unit	Total	\$/Unit	Total		
Phase II Division 9 - Finishes											
		1	North Stairwell Plaster Repairs and Painting	1	LS	\$18,000	\$18,000		\$0	\$18,000	
				1	LS	\$0	\$0		\$0	\$0	
			Finishes Subtotal =							\$18,000	
Phase II Hazardous Building Material Survey & Abatement											
		1	Phase II Hazardous Roofing Materials Abatement	1	LS	\$15,000	\$15,000	\$0	\$0	\$15,000	
			Hazardous Building Material Survey & Abatement Subtotal =							\$15,000	
			SUBTOTAL PRICE - BID ITEM Phase II							\$1,425,222	
SUBTOTAL ITEMS 1 + 2 + 3											
\$1,638,922											
CONSTRUCTION CONTINGENCY (10%)											
\$163,900											
TOTAL CONSTRUCTION COST											
\$1,802,822											
ESTIMATED ENGINEERING COSTS (10% Phase II Items)											
\$142,522											
TOTAL ESTIMATED CONSTRUCTION AND ENGINEERING COST											
\$1,945,344											
SAY										\$1,950,000	



ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST										Tight & Bond	
Project:		Winchendon Senior Center								Jan-20	
Location:		Winchendon, MA									
Estimate Type:		<input checked="" type="checkbox"/> Conceptual <input type="checkbox"/> Preliminary Design <input type="checkbox"/> Design Development		<input type="checkbox"/> Construction <input type="checkbox"/> Change Order <input type="checkbox"/> % Complete		Prepared By: JF		Date Prepared: 1/22/2020		T&B Project No.: W-1157-63	
Bid Item Number	Spec. Section	Item No.	Description	Quantity	Units	Material/Installed Cost		Installation		Total	
						\$/Unit	Total	\$/Unit	Total		
1	MOBILIZATION, DEMOBILIZATION AND RELATED EXPENSES										
	01025	1	Mob., Demob. & Related Exp. (5% Total Bid Excluding Items 1&2)	1	LS	\$62,800	\$62,800	\$0	\$0	\$0	\$62,800
SUBTOTAL PRICE - BID ITEM 1										\$0	\$62,800
2	GENERAL REQUIREMENTS										
	01025	1	General Requirements (10% Total Bid Excluding Items 1&2)	1	LS	\$125,700	\$125,700	\$0	\$0	\$0	\$125,700
SUBTOTAL PRICE - BID ITEM 2										\$0	\$125,700
3	GENERAL CONSTRUCTION FOR ALL WORK NOT LISTED SEPARATELY IN BID ITEMS 1, 2.										
<b>RECOMMENDED LONG TERM ADDITIONAL REPAIRS &amp; IMPROVEMENTS:</b>											
Phase III											
	Division 8 - Windows										
		1	Window Restoration	1	LS	\$1,149,600	\$1,149,600	\$0	\$0	\$0	\$1,149,600
Windows Subtotal =										\$0	\$1,149,600
Phase III											
	Division 16 - Electrical										
		1	Lightning Protection	1	LS	\$48,000	\$48,000	\$0	\$0	\$0	\$48,000
Electrical Subtotal =										\$0	\$48,000
Phase III											
	Hazardous Building Material Survey & Abatement										
		1	Phase III Hazardous Window Materials Abatement	1	LS	\$60,000	\$60,000	\$0	\$0	\$0	\$60,000
Hazardous Building Material Survey & Abatement Subtotal =										\$0	\$60,000
SUBTOTAL PRICE - BID ITEM Phase III											\$1,257,600
TOTAL BID ITEMS 1 + 2 + 3											\$1,446,100
CONSTRUCTION CONTINGENCY (10%)											\$144,700
TOTAL CONSTRUCTION COST											\$1,590,800
ESTIMATED ENGINEERING COSTS (10% Phase III Items)											\$125,760
TOTAL ESTIMATED CONSTRUCTION AND ENGINEERING COST										SAY	\$1,716,560

## **APPENDIX D**



**NATIONAL REGISTER**  
**APPLICATION EXCERPTS**

**(INTERIOR PHOTOS AND SITE PLAN OMITTED)**

United States Department of the Interior  
National Park Service

RECEIVED

DEC 29 1987

National Register of Historic Places  
Registration FormNATIONAL  
REGISTER

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in Guidelines for Completing National Register Forms (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

## 1. Name of Property

historic name Murdock School (preferred)other names/site number Old Murdock High School

## 2. Location

street & number Murdock Avenue N/A not for publicationcity, town Winchendon N/A vicinitystate MA code 025 county Worcester code 027 zip code

## 3. Classification

## Ownership of Property

- ☐ private  
☒ public-local  
☐ public-State  
☐ public-Federal

## Category of Property

- ☒ building(s)  
☐ district  
☐ site  
☐ structure  
☐ object

## Number of Resources within Property

Contributing	Noncontributing
<u>1</u>	<u>      </u> buildings
<u>      </u>	<u>      </u> sites
<u>      </u>	<u>      </u> structures
<u>      </u>	<u>      </u> objects
<u>1</u>	<u>      </u> Total

Name of related multiple property listing:

N/ANumber of contributing resources previously  
listed in the National Register 0

## 4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this ☒ nomination ☐ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property ☒ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Vanni A. Taenag  
Signature of certifying officialDec 18, 1987  
DateExecutive Director, Massachusetts Historical CommissionState or Federal agency and bureau State Historic Preservation OfficerIn my opinion, the property ☐ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of commenting or other official

Date

State or Federal agency and bureau

## 5. National Park Service Certification

I, hereby, certify that this property is:

☒ entered in the National Register.☐ See continuation sheet.☐ determined eligible for the National Register. ☐ See continuation sheet.☐ determined not eligible for the National Register.☐ removed from the National Register.☐ other, (explain):added to the  
National Register1-28-88

Signature of the Keeper

Date of Action



**6. Function or Use** Murdock School, Winchendon, MA

Historic Functions (enter categories from instructions)

Educational/School

Current Functions (enter categories from instructions)

Educational/School**7. Description**

Architectural Classification

(enter categories from instructions)

Late Victorian/Romanesque

Materials (enter categories from instructions)

foundation granitewalls brickstoneroof asphalt

other \_\_\_\_\_

Describe present and historic physical appearance.

The Murdock School, Winchendon, built in 1885-1887, is set back behind a wide, semicircular driveway on a large, open, flat lot facing Monument Park. A fenced athletic field occupies the open space behind the school. This largely isolated setting provides the Murdock School with a distinguished prospect that enhances its position as a notable local landmark in this northcentral Massachusetts highland community. The neighborhood beyond the park is substantially residential, but three other schools--the Poland (1924), Amro W. Streeter (1939), and Murdock Junior-Senior High School (1961)--are also nearby, located within one block's distance.

The Murdock School, executed in the Romanesque Revival style by prominent North Worcester County architect H. M. Francis of Fitchburg, is a study in balanced asymmetry. It is a complex plan, 2 1/2-story structure built of monochromatic brick and sandstone with a raised basement of smooth-faced granite.

The facade (east) elevation is dominated by a 2 1/2-story, center-entry pavilion with parapeted gable and square bell and clock tower, nominally counterpoised by a tall, opposite-end chimney. Granite stairs with enclosed stoop lead to the recessed entry behind a wide, semicircular arch of smooth-surfaced sandstone, with entiched molding and imposts. Penetration on the face of the pavilion consists of 1/1 double-hung sash. Blind transoms, surmounted by shaped sandstone lintels, decorate end windows on the first and second levels. A stepped, molded sandstone course leads to the sill of the four-part window, with fixed pane transoms, centered over the entry. Continuous, smooth sandstone trim with embossed letters identifying the school and its date of construction separates the second and third levels of the pavilion. An enriched molding, sided by grotesques, underlies the sill of the arcaded, four-part window with semicircular transoms that lights the top floor. Romanesque corionettes support the arches in which ornamental faces join the molding. A sandstone gablet, surrounding the transom of the third floor window, interrupts the weathering on the clock tower and echoes a



United States Department of the Interior  
National Park Service

National Register of Historic Places  
Continuation Sheet

Section number 7 Page 1 Murdock School, Winchendon, MA

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similar treatment to the pyramidal roofline above the clock face. The facing of the tower is decorated with continuous sandstone bands, patterned brick, corbeling, crockets, plus serial arches and recessed panels. Clock faces above the belfry are set in sandstone panels and surrounded by archivolt molding that springs from corner pilasters. Three slit windows have a sill of continuous sandstone trim and are topped by rusticated sandstone blocks, leading to the peak of the gable capped by a sandstone cornice with crockets. The tall chimney stack mimics the clock tower in diminutive form by utilizing similar patterns in its enriched facing, corbeling and elaborate copper cap. The remainder of the facade, which sides the entry pavilion, consists of symmetrical, two-story, two-bay sections, with 6/6 double-hung sash windows.

Asymmetrical side (north and south) elevations imitate the facade with entries recessed behind Romanesque arches in similar central bays with parapeted gables and tall, square chimney stacks that simulate the clock towers on a small scale. Nearly identical, the north elevation is distinguished from the south only by the addition of 1 1/2-story hexagonal stair tower, which partially fills the corner of the rear ell. On each side elevation, the stair bay above the entry is defined by three narrow, stepped windows with 4/4 double-hung sash. Tri-part windows with semicircular transoms, slit windows, parapeted gables and chimney towers are differentiated on the second floor by a series (six on the north elevation, five on the south elevation) of narrow, 4/4 double-hung sash windows with single-light transoms. These openings demark the large assembly hall.

The rear (west) elevation of the Murdock School is centered by a chimney stack with buttresses that face the top of the back gable. Four 6/6, double-hung sash windows comprise the bays on the first level. On the second floor, fenestration is replaced by blind panels denoting the back of the assembly hall stage. Light to this area is provided by the tri-part windows that side the chimney.

The opulent interior of the Murdock School is finished with quartered oak and remains substantially intact, including the wainscoting, boxed-beam ceilings, and mantels of two classroom fireplaces. Lighting fixtures have been replaced several times as the original gas system was later electrified, then upgraded. Decorative molding in the ceiling panels of the assembly hall, visible on early photographs, is no longer extant. Two rooms on the first floor were subdivided, probably during the 1950s. One small room was separated into a principal's office and secretary's area. A classroom was divided to create a library and teacher's lounge. Otherwise, the school's plan is largely intact: on the first floor, large classrooms and offices ranged around a T-shaped corridor; on the second, three classrooms at the front of the building and, across a narrow corridor, the large assembly hall with stage.

continued



United States Department of the Interior  
National Park Service

National Register of Historic Places  
Continuation Sheet

Section number 7 Page 2 Murdock School, Winchendon, MA

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Renovation, in 1974, largely involved refurbishing and refinishing efforts. Fire doors were added to corridors and several classroom doors were insensitively treated with the surface application of incompatible, plain wood panels in order to meet building codes. Exterior walls were repointed and the original slate roof was replaced with one of asphalt shingles. In the main entrance, the original paired wooden doors were replaced with modern aluminum and glass. Similar substitutes were installed on the side entries in 1986. In each case, original multipaned transoms were retained. The tower clock, manufactured by E. Howard and Company of Boston, was restored and semimechanized, in 1976, by the school's three custodians as part of the town's bicentennial celebrations. A prominent and familiar feature of the landscape, the clock tower is a practical and fond reference for many Winchendon residents.

Archaeology

The site of the Murdock School must be considered to have limited archaeological potential. While the property is located close to the Millers River, a possible fishing location, no known prehistoric sites are located in close proximity to the school. Historic archaeological potential is also limited; no previous structures are known to have existed on the site and the property was most likely open space from the time Winchendon's first settlement, ca. 1735, to the date of the school's construction, 1885.

**B. Statement of Significance** Murdock School, Winchendon, MA

Certifying official has considered the significance of this property in relation to other properties:

☐ nationally ☐ statewide ☒ locallyApplicable National Register Criteria ☒ A ☐ B ☒ C ☐ DCriteria Considerations (Exceptions) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

Areas of Significance (enter categories from instructions)

ArchitectureEducation

Period of Significance

1887-1937

Significant Dates

Cultural Affiliation

N/A

Significant Person

N/A

Architect/Builder

Henry M. FrancisHenry G. Morse

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

The Murdock School retains integrity of location, design, setting, materials, feeling, workmanship, and association and meets National Register criteria A and C on the local level. The building holds associations with the development of Winchendon's educational system, with the Murdock family, which for two generations remained among the most prosperous, public spirited, and philanthropic of the town's earliest entrepreneurs, and most specifically, with Ephraim Murdock, Jr., an industrialist and real estate magnate whose will created a trust for the construction and endowment of the school. Executed in the Romanesque Revival style by H. M. Francis of Fitchburg, a leading architect in North Worcester County, the well-preserved Murdock School is also the most high style of Winchendon's school buildings.

Ephraim Murdock, Jr. (1800-1882), was the grandson of Deborah Williams Murdock (d. 1805) and James Murdock (1738-1813), who moved to Winchendon in 1766. He was the oldest son of Zebian Bixby Murdock (d. 1824) and Ephraim Murdock (1772-1853), a housewright and operator of both sleigh and blacksmith shops. Ephraim Murdock, Sr., Asa Whitney (the owner of several mills, the most important of which was a textile factory), and Isaac Morse, who ran a tannery, carrier shop and Winchendon's first hotel, were the principal businessmen in town during the early nineteenth century. The enterprises of these three men were largely responsible for prompting North (Winchendon) Village into the center of commercial activity and the nucleus of settlement in Winchendon.

☒ See continuation sheet



**9. Major Bibliographical References**Murdock School, Winchendon, MA**Previous documentation on file (NPS):**

- ☐ preliminary determination of individual listing (36 CFR 67)  
has been requested
- ☐ previously listed in the National Register
- ☐ previously determined eligible by the National Register
- ☐ designated a National Historic Landmark
- ☐ recorded by Historic American Buildings  
Survey # \_\_\_\_\_
- ☐ recorded by Historic American Engineering  
Record # \_\_\_\_\_

☒ See continuation sheet**Primary location of additional data:**

- ☒ State historic preservation office
- ☐ Other State agency
- ☐ Federal agency
- ☐ Local government
- ☐ University
- ☐ Other

Specify repository: see Assessor's mapMHC #184**10. Geographical Data**Acreage of property two acres

QUAD-Winchendon SCALE-1:25000

**UTM References**

A 18 1741340 4729860  
Zone Easting Northing

C                        

B                          
Zone Easting Northing

D                        

☐ See continuation sheet**Verbal Boundary Description**See assessors map.☐ See continuation sheet**Boundary Justification**

The boundaries of the nominated property include the school, front lawn, and driveway. Since the original 14 acres associated with the Murdock School has been diminished with the construction of a new High School and playing fields, only this immediate area is included.

☐ See continuation sheet**11. Form Prepared By**

name/title Diane Siergie, Preservation Consultant for Winchendon Historical Commission

organization Massachusetts Historical Commission date August 1987

street & number 80 Boylston Street telephone (617) 727-8470

city or town Boston state MA zip code 02116

United States Department of the Interior  
National Park ServiceNational Register of Historic Places  
Continuation SheetSection number 8 Page 1 Murdock School, Winchendon, MA

Ephraim Murdock, Sr., was one of the major builders of houses in North Village during the first half of the nineteenth century and was also the owner of considerable real estate.

In the next generation, several children of these three families intermarried. Two Murdock sons married two Morse daughters: Ephraim Murdock, Jr., married Sophia Morse and Elisha Murdock married Rhoadna Morse. Two other Murdock children joined with the Whitney family: Mary Murdock wed Amasa Whitney, Jr., a merchant who operated one of the earliest stores in North Village, and William Murdock espoused Mary G. Whitney.

These three sons of Ephraim Murdock, Sr. were largely responsible for advancing woodenware manufacture to the foremost industry in Winchendon. Both Ephraim Jr. and Elisha Murdock fostered the application of machinery to the work. Much of this new equipment was devised in the plant of their brother, William, who opened the first machine shop in Winchendon in 1839. William Murdock, who invented two types of bobbins used in textile mills and improved jack spools, also perfected a lathe for turning pails, and fabricated other machinery that greatly increased woodenware production. Ephraim Murdock, Jr., and Elisha Murdock operated factories. In 1834, Elisha Murdock, considered the father of the woodenware industry in Winchendon, founded E. Murdock and Company (incorporated in 1928 as New England Woodenware, Inc.), which became the most extensive woodenware mill in the country.

In about 1836, Ephraim Murdock, Jr., established Murdock and Company, which operated two woodenware mills, one on Millers River in Winchendon Village and the other on the north branch of the river in Slab Hollow (now known as Glenallen). Murdock and Company manufactured tubs, pails and other items. In 1849, Major Sidney Fairbanks joined as a junior partner and the firm became Murdock and Fairbanks, employing about 100 workers. Ephraim Murdock, Jr., also operated pail factories in Keene and Swanzey, New Hampshire. Besides the proceeds from a successful career of more than fifty years in manufacturing, he further augmented his estate through wise investments. He accumulated considerable real estate in Winchendon and was, for years, the principal owner and president of the Cheshire Railroad.

Ephraim Murdock, Jr., also served as a Director of the Winchendon National Bank. In local affairs, he was elected to the School Committee in 1854 and the Board of Selectmen in 1846, 1850, and 1874. He served on the building committee for the new Town Hall, in 1850, and in other years was involved in committees to establish a home for the insane, and to create a new town cemetery. In 1878, he and his wife, Sophia A. (Morse) Murdock (1805-1888), erected the I. M. Murdock Building at 98 Front Street (extant) in memory of their only child, Isaac Morse Murdock (1831-1875) and donated the property to

continued



United States Department of the Interior  
National Park ServiceNational Register of Historic Places  
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Murdock School, Winchendon, MA

use by the Church of the Unity. Before the Fire Station at 16 Pleasant Street was built by the town in 1876, Ephraim Murdock, Jr., provided an engine house and hall on Chestnut Street to the Alert Fire Company, the second oldest in Winchendon, organized in 1851.

Ephraim Murdock, Sr., initiated the family commitment to local education. In 1843, he erected Winchendon Academy, used as a private school without charge, by children of both sexes in Winchendon and other communities. When the town took no action in response to a state law requiring communities of 2,500 inhabitants or 500 families to provide a high school, Ephraim Murdock added a provision to his will leaving the Academy Building to the town on the condition that it be used for educational purposes. The town accepted the bequest, and in March 1854 opened the first public secondary school in Winchendon. When the Academy was determined inadequate in 1866, the Brick School (renamed the Wheeler School in 1904; demolished in 1965) was constructed and utilized as the high school until supplanted by the nominated property, the Murdock School. The Wheeler School was then converted to elementary grade use. In the meantime, the Academy Building, having fallen into disrepair, was condemned by the state inspector in 1894. A previous vote to replace the structure with a four-room schoolhouse was overridden in a special town meeting, which appropriated funds for repairs. The Academy was then remodeled from a temple-front, Greek Revival structure to the Colonial Revival appearance it retains today. Renamed the E. Murdock School in 1904, the building remained a grammar school until 1961 when both it and the Wheeler School were closed. The next year, after 108 years of scholastic service, the old academy building was turned over to the heirs of Ephraim Murdock, Sr. Today the edifice, with additions, serves as the headquarters for the Veterans of Foreign Wars.

Family interest in local public education extended through the next generation of the Murdock Family. Elisha Murdock, a personal friend of Horace Mann, served on the School Committee almost continuously from 1829 to 1863. Ephraim Murdock, Jr., followed his father's example. He also provided the town with a schoolhouse, in this case, the nominated property, Winchendon's third high school. In his will and that of his wife, provision was made, after specific bequests, for the creation of a trust, a major purpose of which was to allow for the construction and support of "a suitable house for a school for both sexes of scholars of not less than ten years old..." The schoolhouse was to be located within one mile of their residence at the corner of Front and Pleasant Streets ( now the site of American Legion Park) on a street named in their honor and platted between 1870 and 1886. The neighborhood immediately around the school began to develop during the same period. The estate of Ephraim Murdock, Jr., at the time of his death, in 1882, was valued at more than \$500,000.

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The Murdock School was constructed on a 14-acre holding at a cost of \$120,000 and endowed with a trust fund of \$250,000. The land on which the school was built was purchased with monies from the Murdock Estate. Completed in 1887, the Murdock School included two large classrooms, a room "devoted to philosophical apparatus," a chemistry laboratory, a music room, an art room and a "workshop for practice and experiment." By far the most elaborate school building in Winchendon--in both its high-style Romanesque Revival design and its up-to-date facilities--the costs of the school far outstripped any other in Winchendon until the eve of the Second World War. Its music room, laboratory, and lavishly appointed assembly hall were those more likely found in a larger urban community, not one that, like Winchendon, had a population of only 4,390 in 1890. And while the Romanesque Revival was a popular style for educational institutions in northcentral Massachusetts in the last decades of the 19th century (notably the 1874 Chestnut Street School, Gardner, now demolished), none were as elaborately conceived as the Murdock School. Nor do other Winchendon examples executed in brick--for instance, the nearby Poland School (1924), the Marvin School (1905), and the Streeter School (1939)--equal the Murdock School in elaboration of design and opulence of interior. Not coincidentally, the Murdock School was the only one of Winchendon's late 19th/early 20th century public schools to be privately financed.

The Murdock School was considered by contemporaries of its designer, Henry Martyn Francis (1836-1908), to be his masterpiece. Born in Lunenburg, H. M. Francis was the son of a wheelwright and carpenter, Franklin Samuel Francis, who later became developer of a stone quarry on Rollstone Hill in Fitchburg (supplier of materials for several of Fitchburg's stone bridges).

Henry M. Francis attended Groton Academy for two years after graduating from local district schools and Lunenburg Academy. From July to November 1858, he worked on the survey for the Croton River Aqueduct, part of the New York City water supply. For two years, beginning in 1859, H. M. Francis worked in the architectural office of Alexander R. Estey in Boston, before returning to Lunenburg. He worked as a carpenter there and in Westfield and Florence before joining the Simmons Organ Manufactory in Boston. After only three months, however, he left to join the office of architect George M. Harding in Portland, Maine. Nine months later, he left to spend a year with Boston architect, George F. Meaham, then returned to Harding's office until 1868, when he opened his own business in Fitchburg. His first important commission came that same year when he was asked to design the Rollstone Congregational Church in that city.

During his active, forty-year career, Francis designed about thirty school buildings, twenty-five churches, fifteen libraries, a large number of other

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public buildings as well as several hundred residences. Among his most important structures are: Fitchburg High School Building (not extant); the Wallace Library and Art Building (demolished), the Calvinistic Congregational Church (NR 1979), Safety Fund National Bank Building, and the YMCA Building (now Shawmut Worcester County Bank), all in Fitchburg; the Universalist Churches in Fitchburg, Palmer, and Monson; the First Baptist Church in Clinton; the Congregational Church in Leominster; the Stone Church in Lincoln (NR, Lincoln Center HD, 1985); the Ingalls Library in Rindge and the Clay Library in East Jaffrey, New Hampshire; and the Dickinson Library in Northfield (NR, Main Street HD, 1982). Other school buildings designed by the firm of H. M. Francis include: Lowe Hall, Cushing Academy, Ashburnham; the Lincoln School, Leominster; Lyman School, Ashby; and Westford Academy, Westford. Other libraries designed by H. M. Francis are: Fletcher Library, Westford; Hazen Memorial Library, Shirley; Newton Library, Royalston (NR, Royalston Common HD, 1976); and the Wheeler Library in Orange. Among his commercial buildings are: the Hazen Block, Shirley; the Woods Block, Leominster (NR, Monument Square HD, 1982); and the Godfrey Hadd Block, Greenville, New Hampshire. His firm designed City Hall in Somerville and the Town Halls in Groton, Lincoln, Monson, and Orange.

Henry G. Morse (d. 1910), the builder of the Murdock School, was for many years the leading contractor and builder in Fitchburg. He was born in Sterling, the son of Joseph and Ann (Winchester) Morse, but attended public schools in Lancaster and Clinton, where he learned carpentry. He arrived in Fitchburg as a young man and after three years as a journeyman, established his own business. Earning a favorable reputation for quality work, his firm was successful from the start. H. G. Morse, contractor and builder, constructed many of the finest residences, churches, and commercial buildings in the vicinity. The Murdock School was one of several in which Morse was associated with H. M. Francis.

When the Murdock School opened on August 31, 1887, three courses of study were offered: an English and Scientific Course, which concentrated on English language and literature, History, Geometry, Natural Philosophy and Chemistry; an Academic Course, which substituted Latin, French and German for certain English courses; and a Classical or college preparatory course, which expanded the above curriculum by adding college admission requirements such as Greek and Advanced Latin. The school was supported entirely by the Murdock Trust, but was considered part of the school system under the supervision of the school committee with the consent of the trustees. Pupils from other communities were allowed to attend based on payment of tuition of \$5.00 per semester in a three-term school year. In 1889, the student body numbered 109 with a faculty of seven teachers. Photos of the interior taken at the time of the building's opening show an opulent interior, with elaborate woodwork,

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fixtures, and furnishings apparently unparalleled in other schools of the period in the region.

Income from the Murdock trust fell below the amount required for operating expenses for the first time in 1916. The town appropriated payment of the difference. Around 1920, the school became known as Murdock High School. Beginning in January of that year, the school department assumed all operating expenses after the trustees, having made all the necessary repairs, turned over to the town the remainder of the income from the fund. The next year, an Industrial Arts course was added to the academic program in hope of retaining students who would otherwise drop out. Two years later, courses in Printing and Home Economics were introduced.

The scholastic magazine Murdock Murmers was initiated in 1923 and in its early years was awarded several prizes for excellence by the Central Massachusetts Interscholastic Press Association. The Student Activity Society was established in 1923. Income from the sale of the magazine along with dues, admissions to athletic competitions, and the proceeds of other sponsored events were required to finance the athletic program, publish the paper, and support the other expenses of the Society as no item was provided in the School Budget to fund such activities.

In 1927, student enrollment at Murdock High School exceeded 200. In response to the varied needs of the increased student body, revision of the curriculum was begun. By 1936, the four-course academic program consisted of College Preparatory, Secretarial, Civic, and Vocational-Household Arts. Advanced in its facilities at the time of its construction, the school by 1945 was being seen as old fashioned and lacking the latest amenities. Among the earliest recognized deficiencies of Murdock High School was the absence of a gymnasium and other athletic facilities. In that year, the principal noted the inferiority of lighting and ventilation systems, inadequately equipped laboratories and shops, and the lack of a gymnasium at Murdock High School, which prevented the town from providing the children of Winchendon with a modern secondary education. The 1949 report of the court-appointed Master, prepared in response to the Murdock Fund Trustees' petition requesting permission to transfer the Murdock School to the Town, revealed that the school, built for a student body of 100, had an enrollment of 438. As a result of these court proceedings, Murdock High School and its fourteen-acre lot were conveyed to the town of Winchendon, in 1950, for the sum of one dollar. Right of reversion to the trustees was based on violation of the retention of the name Murdock School and continued educational use of the building for children at least ten years of age.

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During the next decade, several controversies ensued over the need for a new secondary school and the disposition of the Murdock School. The modern Murdock Junior-Senior High School, constructed on the part of the original fourteen-acre Murdock School parcel north of Grove Street, was opened in 1961 and in that year, the nominated property was closed. The seven acres now associated with the school (bounded by Murdock, Park, School, and Grove Streets) include a playing field and bleachers at the western end. Only the school and its drive and lawns, which face Murdock Street (about two acres) are included in the present nomination. A negative report from the Study Committee, appointed by town meeting in 1964 to investigate the possibility of renovating the Murdock School, was overridden by the efforts of a group of citizens determined to preserve the school.

The Murdock School was remodelled in 1974 and reopened the next year as part of a "middle school complex" in which grades six, seven, and eight vary in location between the Murdock, Poland and Amro W. Streeter Schools. Currently, the Murdock School is primarily used for eighth graders, but the large, second-floor hall is also utilized for assemblies and meetings of band and chorus.

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