

City of Big Rapids, Michigan Old Mecosta County Jail



Architectural Assessment

Old Mecosta County Jail

Architectural Assessment

Prepared for
The City of Big Rapids
226 North Michigan Avenue
Big Rapids, MI 49307

Prepared by
Preservation Forward, LLC.

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Front page image: Old Mecosta County Jail
220 S. Stewart Street, Big Rapids, MI 49307 | Preservation Forward, LLC.
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Acknowledgements

Jessica Flores, MSHP, meets the professional qualifications for the Secretary of the Interior Professional Qualification Standards for a Historic Preservation Professional. Jessica Flores served as Preservation Forward's Project Manager and as Principal Investigator. Field investigation was completed by Jessica Flores on June 18, 2024. The report, including graphics and mapping, was authored by Jessica Flores, Architectural Historian in July 2024.

Disclaimers

The opinions, findings, and conclusions expressed in this report are those of Preservation Forward, LLC., and the author and are not necessarily those of the City of Big Rapids, Michigan.

Abstract

Preservation Forward was contracted by the City of Big Rapids to carry out an architectural assessment of the Old Mecosta County Jail referred to as the Old Jail located at 220 S. Stewart Street, Mecosta County, Michigan. This project is funded through the City of Big Rapids. The Old Jail was constructed in 1893 as a jail kit house. In 1897, a sheriff's residence was constructed as an addition to the jail kit house to the east and served as a county jail and sheriff's residence through 1965. The 1897 Old Jail (encompasses the 1893 kit house) is a two-story, Queen Anne style structure of brick masonry construction that boasts hipped roofs, gables, and turrets popularized in the late 19th century during the Victorian period of American architecture. The Old Jail is the oldest public structure located within the original plat in what was then the Village Big Rapids. The Old Jail was registered as a Michigan Historic Site in 1980 by the Michigan History Division, Department of State.

This architectural assessment is an exploratory investigation, analysis of existing building conditions, and an evaluation of the field investigation findings of the Old Jail. As part of this architectural assessment, the Old Jail was also evaluated against the National Register of Historic Places¹ (NRHP) Criteria for Evaluation. Preservation Forward recommends that though there is some minor loss of integrity within the interior of the structure that the exterior retains its integrity and significance and recommends its eligibility for listing in the National Register of Historic Places. This architectural assessment will provide an understanding of the existing conditions of the Old Jail and serve as a pathway toward future rehabilitation efforts for the Old Jail.

¹ The National Register of Historic Places, How to Apply the National Register Criteria for Evaluation, National Register Bulletin. The Criteria for Evaluation are found in the Code of Federal Regulations, Title 36 Part 60.

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Introduction

Jessica Flores of Preservation Forward was contracted by the City of Big Rapids, Michigan in June 2024 to carry out an architectural assessment of the Old Mecosta County Jail referred to as the Old Jail located at 220 S. Stewart Street, Mecosta County, Michigan. This architectural assessment is funded by the City of Big Rapids, Michigan. The project boundary is centralized to the footprint of the Old Jail where the structure is located on a 1-acre parcel of land in a setting that is a mix of residential and commercial structures. The scope of work includes an architectural assessment and evaluation of the Old Jail. Recommendations are provided for immediate stabilization, preservation in situ, and preventative maintenance of the structure.

Jessica Flores visited the Old Jail on June 18, 2024, to conduct the architectural assessment of the structure. The weather was 75 degrees and sunny with little clouds. Accompanying Preservation Forward on this site visit was Ms. Becca Murphy, a recent graduate of Eastern Michigan University's Graduate Program in Historic Preservation, whom Jessica Flores is mentoring. In addition, three undergraduate students from the Interior Design Program in the School of Planning, Design, and Construction at Michigan State University also attended the field investigation. The Old Jail was photographed with a traditional 35mm film camera photography.

This architectural assessment evaluates the existing conditions of the Old Jail on the exterior and with limited accessibility within the interior (as the second floor is a private residence that was not included in the field investigation). The interior images are limited to the basement and first floor. The architectural assessment was undertaken by Jessica Flores who meets the Secretary of the Interior's Standards as a Historic Preservation Professional. This report provides an architectural assessment of the Old Jail.

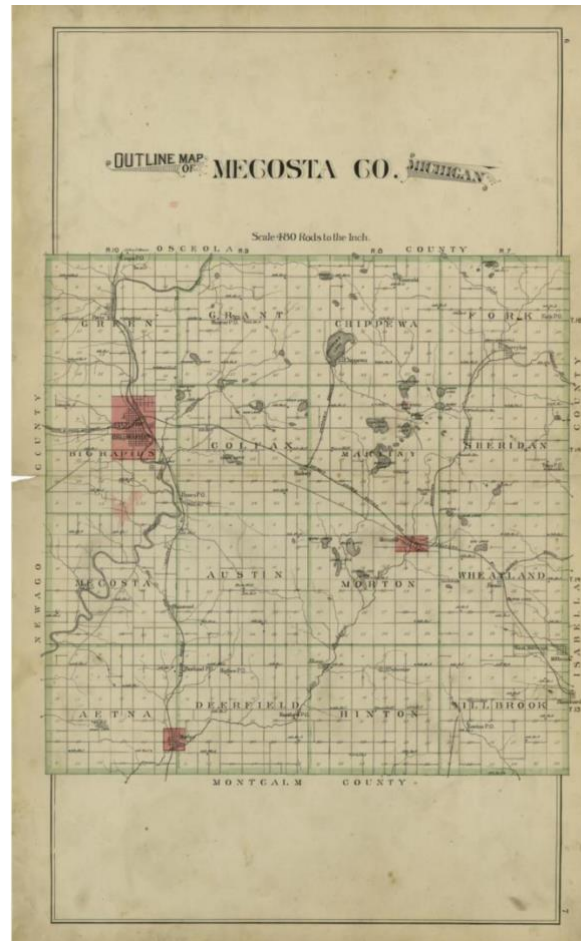


Figure 1 Mecosta County Map, c.1900. The Old Mecosta County Jail is Township 15 N, Range 10W, Section 14 in the north-central section of the parcel of land at 220 S. Stewart Street, Big Rapids, Mecosta County, MI. Figure credit: Library of Congress Geography and Map Division Washington, D.C.



Figure 2 The Old Mecosta County Jail parcel map, c.1900. Arrow shows location of the Old Mecosta County Jail. Figure credit: Library of Congress Geography and Map Division Washington, D.C.



Figure 3 Current map of the Old Mecosta County Jail. Figure credit: Historical Marker Database

A Brief History of the Old Mecosta County Jail

The following historical narrative is taken from the Old Mecosta County Jail which was registered in 1980 as a Michigan Historic Site by the Michigan History Division, Department of State:

“Big Rapids became the county seat in 1859 and incorporated as a city in 1869. This building, antedated by two other jails, served as the county jail and sheriff's residence from 1893 until 1965. The oldest public structure in the original plat of the village of Big Rapids, it features gable and hip roofs and turrets characteristic of Queen Anne style architecture. The adjacent grounds have been used for a park and for concerts.”

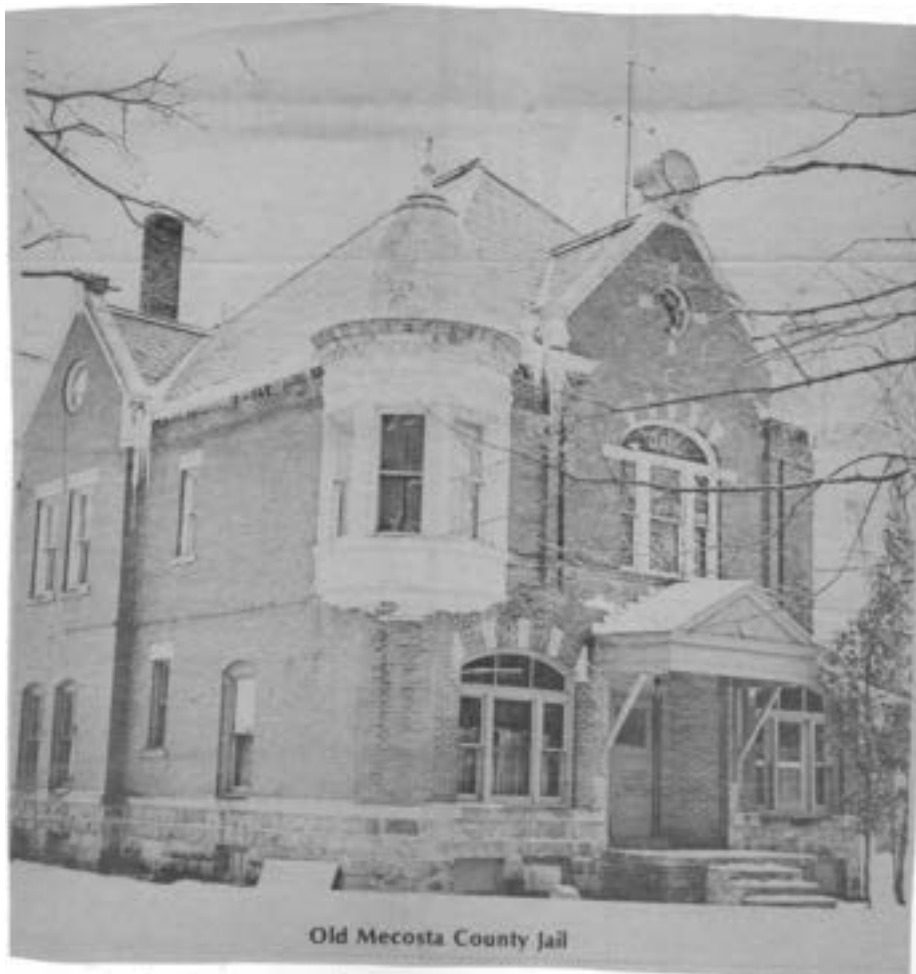


Image 1 An image of the Old Mecosta County Jail, 1893. Photo credit: MI Gen Web Project as part of the US Gen Web Project.

The following historical narrative excerpt is taken from the Mecosta County webpage:

“The plat for the Village of Big Rapids was recorded on November 3, 1859, and the plat for French’s addition (Glen Elm) was recorded on May 9, 1860. The State Legislature authorized the incorporation of the City of Big Rapids in April 1869.

The Grand Rapids and Indiana was the first railroad to enter Mecosta County. In June 1869 the GR&I railroad crossed the Little Muskegon River and the Village of Morley was created. Construction of the next section of track to the Village of Paris started in late July 1869 and the Village of Stanwood came into existence. The GR&I reached the city limits of Big Rapids on June 20, 1870, and the Village of Paris on July 1, 1870.

Construction of the GR&I continued for several years until the line reached Petosky in December 1873.

Early county prisoners were housed in the County Sheriff’s private house or a local hotel or the Kent County jail or the Newaygo County jail. In 1862 county residents decided not to erect a county jail. The first county jail was erected in the summer of 1868. This jail was situated in the same place where the Old Historic Jail built in 1893 is presently located on Stewart Street. Construction for the present county jail was completed in 1965. This jail was renovated in 1986. The Mecosta County Board of Commissioners approved another jail renovation & expansion in 2000 with scheduled completion in 2001.”



Image 2 Old Mecosta County Jail, a registered Michigan Historic Site in 1980, by Michigan History Division, Department of State.

Methodology

Introductory Research

Prior to the initiation of the architectural assessment, a records check was conducted at the State Historic Preservation Office (SHPO) for previously recorded information on the Old Mecosta County Jail. The records check included a review of any extant, relevant cultural resource management reports, archaeological investigations, NRHP nominations, and other research reports. Online research, including published histories, oral interviews, and other related information on the Old Mecosta County Jail was reviewed to supplement the architectural assessment.

Architectural Assessment Methodology

The architectural assessment always begins with the exterior building system of the structure. This includes walls, windows, doors, roof, floor, foundations, and insulation—also chimney if applicable. Assessment also includes observing the shape, massing, scale, materials, and form of the structure. For example, identifying any structural issues such as curving, bows, sags, dips, or humps. On the interior of the house, assessment includes observing the interior building envelope that includes the basement, windows, doors, wall and ceiling surfaces, floor, attic, fireplaces, and fixtures. In addition, mechanical, electrical, and plumbing systems are assessed. Almost every structure changes over time. These changes (to the structure) help to tell the story of how the structure evolved from its original construction to present day. Architectural assessment can help to evaluate existing conditions to understand if rehabilitation is feasible and if the extant problems are formidable but worth the effort. There are degrees of urgency when evaluating a structure that an architectural assessment can help to prioritize.

Architectural Assessment

The Old Mecosta County Jail was constructed in 1893 and is designed in the Queen Anne style as a two-story structure in a rectilinear plan constructed of variegated, brick masonry with a random uncoursed, river rock foundation and features gable and hipped roofs of slate construction with double turret decoration typical of the late 19th century Victorian period of American architecture.

The Old Mecosta County Jail is located on a 1-acre parcel of land just adjacent to Downtown Big Rapids, a traditional downtown setting, at the 200 block of Stewart Street. The Old Mecosta County Jail has a deep setback from the road where the topography is a flat, grassy parcel that leads to the east elevation (façade) of the structure. A grassy area exists at both the north and west elevations of the structure and to the south a parking lot exists. A later, garage addition is located at the southwestern corner of the structure. Observance of the landscape (which surrounds the Old Jail) features trees, bushes, and grass yards.

East elevation (façade)



Image 3 Head-on view of the old jail's façade, looking west. Vegetation is growing in areas against the foundation at grade. Vegetation brings moisture against the rock and grows against mortar which accelerates deterioration.

At the east elevation (façade) a portico with a front-gabled pediment with decorative panel and dentils is supported by two columns with handrails and decorative baluster. Two, additional structural members have been installed to support the portico. Two, windows highlight each side of the central portico with a fixed window flanked by two, double-hung windows with an arched fanlight that shows a sunburst design within the arch. Two, brick pilaster columns extend from the pediment at the gable and span to the limestone belt course at the center section of the façade. Limestone and brick soldier courses decorate the lintel above the windows. Two, turrets are the noteworthy decorative details of the façade with double-hung windows within the turret,

decorative dentils, Queen Anne scroll details that culminates in a bulbous, onion dome with spire atop.



Image 4 Close-up of upper façade, looking west. The portico has structural issues related to moisture penetration. The turrets show paint peeling and deterioration. Metal atop the turret shows signs of age and rust. Some areas of the façade have brick discoloration from water channeling down the brick and not into a water removal (gutter) system.

The center section of the upper façade has a matching window to that at the first story with a center section of the fanlight that reads: Jail.

An oriel window with limestone accents graces the façade just below the front-gable with an ellipse parapet that reads 1893 at the center. Windowsills and lintels are made of limestone. The turrets appear to be constructed of wood and decorative, pressed metal. The structure boasts both gable and hipped roofs of slate construction. There are three points of entrance/egress to the house. An entrance exists at the east elevation at the portico, at the south elevation along the side portico, and at the west elevation at the second story that extends to stair to the ground level.



Image 5 South turret on façade, looking west. Brick discoloration is occurring from water infiltration in brick where water is being channeled down the brick due to lack of water (gutter) removal system. Paint is peeling on the turrets. Also, rust is visible on the dome above the turret. Some caulking issues around the turrets and windows that create small fractures in the brick.



Image 6 Deteriorated brick on south end of façade, looking west. Visible cracking in the mortar joints where mortar is missing and could have water penetration from the inside impacting the brick. Some brick has spalled from the façade where likely water has located behind the wall cavity or incompatible mortar has been placed in the joint. The discoloration of the stone has lichen-like appearance of moisture growth on the belt course of limestone.



Image 7 Close-up of south turret and its exposed metal material, looking west. Paint failure is visible where paint is peeling and has delaminated from its surface. Rust and water markings on the rim of the dome show that water is penetrating the dome.



Image 8 View of north turret and its rusted dome, looking northwest Rust and water markings on the rim of the dome show that water is penetrating the dome. The dome appears to be in good condition despite the water infiltration and cosmetic issues.



Image 9 View of intersection between north turret and façade brick, looking west. There appears to be mortar that has been inserted in patching locations across the structure. This mortar appears to be a different aggregate mix than the original “mother” mortar mix. This mortar can be stronger than the brick itself and jeopardize the ability for the brick to have an expansion and contraction when temperatures change.



Image 10 View of entryway porch held up by wooden supports, looking north. The portico on the façade has significant damage to due water entering the portico from vacancies/voids and vegetation against the floorboards and foundation of the structure. The two, front columns show wood rot and damage. The porch is later than the original structure. The decorative portico appears to be original, but the columns, flooring, and balustrade are later features. The porch needs immediate attention before further deterioration occurs.



Image 11 View underneath porch staircase to find original stone staircase, looking north. The original structure boasted an aggregate mix for risers and treads. Later, wood boards were added which show visible signs of water damage, wear, and deterioration from vegetation growth.



Image 12 Deteriorated brick and mortar underneath north side of porch, looking west. Brick around the porch is deteriorated due to water and moisture against the brick which is causing spalling of the fire skin exterior on the brick. This is problematic. We want to keep water and vegetation away from brick. Mortar joints show discoloration due to lichen, moss, biological growth against the masonry.



Image 13 Stone foundation on south side of façade and its cracking replacement mortar, looking west. Small, expansion and tensile cracks in the mortar along the foundation.



Image 14 Rectangular window to raised basement on south side of façade at the foundation level, looking west. Visible water damage and wood rot. Water could be coming off the hose which is installed against the window sash/casing, because of vegetation against the window, or a combination of both.

Overall, the east elevation is in fair condition with the following minor to moderate conditions:

- Water channeling across masonry on façade
- Structural issues at the portico with mix of original and later materials
- Vegetation against the foundation, portico, and basement windows
- Incompatible mortar placed in joints with original mortar mix
- Paint failure on turrets resulting in rust and delamination

West elevation (rear)

The west elevation (rear) of the structure encompasses the original 1893 jail kit house as well as a garage addition at the southwest corner. The west elevation is a two-story, brick masonry structure with a side-gabled roof, brick corbelling decorative detail at the fascia. At the southwest corner, a garage was constructed in the 1930's. The south elevation of the garage boasts two, garage doors with four, glass lights across the bay doors. The west elevation of the garage shows two, double-hung, one-over-one windows. On the west elevation of the jail kit house, two, six-over-six windows (with one-over-one storm windows) with limestone lintels boast wrought iron grates at the first story. At the second story, a metal, exterior staircase extends to a single-door

entry with window and limestone lintel. A single, six-over-six window (with one-over-one storm) boast the same limestone lintel.



Image 15 Oblique view of circa 1930s garage addition. This addition is adjacent (attached) to the 1893 kit jailhouse which is directly west of the main sheriff's residence that was constructed in 1897. Two, one-over-one windows are located at the west elevation of the garage with side-gabled roof.



Image 16 Direct view of the jailhouse's west elevation, looking east. There's a significant amount of vegetation against the rear of the structure. Overall, the masonry at this elevation looks to be in good condition. A small shed is located at the northwest corner of the west elevation.

Overall, the west elevation is in good condition with the following minor to moderate conditions:

- Water channeling across masonry on façade see limestone belt course at center of elevation with water/moisture markings
- Vegetation against the foundation, portico, and basement windows

North elevation

The north elevation encompasses the 1893 jail kit house, the 1897 sheriff's residence, and a 1959 single-story, side-gable addition that was originally utilized as a sheriff's office; however, is currently utilized as a public meeting space and classroom. The northwest section of the north elevation is constructed of the original jail kit house. This section is comprised of two-stories with a series of four, double-hung windows with limestone lintels and sills at both the lower and upper stories. Metal grates cover the first-floor windows and resemble a similar pattern as the west elevation windows at the lower story. A limestone belt course spans the center of the northwest elevation. The random river stone is highly visible at this area and has a large amount of biological material (vegetation) that has grown across the elevation.



Image 17 The northwest section of the west elevation shows small trees, ivy, ferns, and other biological growth that has spread across this elevation. Vegetation against masonry creates a vehicle for moisture to penetrate brick, stone, and mortar joints.



Image 18 Looking east at the 1959 addition located at the center section of the north elevation. This addition has an asphalt-shingled roof with vegetation growing against the flashing and valleys of the roof where the addition adjoins the sheriff's residence. Ivy has spread across the lower and upper stories of this

elevation. Note that the center of the north elevation has a three-story section of the 1897 sheriff's residence with metal grates across the double-hung windows (with limestone sills and lintels) at both the second and third stories. The third story culminates in a front gabled pediment that reads 1897 at the decorative modillion at the parapet. Gable trim spans the pediment with brick corbelling at the gable return.



Image 19 Looking south at a detail view of the north elevation at the second and third story. Note the windowsill at the third story has discoloration from vegetation and moisture penetration. Brick below the windows has spalled in areas where the fire skin has spalled off the brick. Vines grow against the upper portion of the elevation.



Image 20 Looking southwest at the parapet of the north elevation. Moss and other lichen are visible on the face of the slate roof tiles. Paint has delaminated with peeling at the gable trim and molding. Mortar patching is visible on the east elevation of the chimney. Water has entered areas of the molding and trim

and caused paint to bleed onto brick in areas. Decorative brick dentils and corbelling is visible across the north elevation and is in good condition.



Image 21 The north elevation has a covered portico located at the northeast section of the elevation. There are several areas of concentrated moisture penetration in this area, specifically, flashing at the 1959 addition and the sheriff's residence. Tensile cracking is visible just above the portico, as well as, spalling of the brick and voids in the mortar joints. Brick is discolored in this area from moisture and vegetation. Wood shows paint delamination and peeling. Various areas of wood rot where the roof intersects with wood and water is trapped.

The north elevation receives the shade for most of the daylight hours. The biological growth (vegetation) is common of a north elevation. However, deterioration of the masonry is a concern

when vegetation spans the foundation and upper portions of the elevation. Overall, the north elevation is in fair condition with the following minor to moderate conditions:

- Water channeling across masonry on façade
- Vegetation against the foundation, upper elevation, and windowsills
- Incompatible mortar placed in joints with original mortar mix
- Paint failure on gable trim resulting in rust and delamination

South elevation

The south elevation encompasses the 1893 jail kit house, the 1897 sheriff's residence, and a 1930's garage at the southwest corner of the elevation. The south elevation has minimal biological growth (vegetation) due to the orientation of this elevation as south facing. The southeast section of the elevation has four windows at the lower level and three windows at upper story. At the lower level, three, two-over-two windows have rounded, arch upper sashes with limestone sills. A small one-over-one window is located between the three, arched windows and has a limestone sill and lintel. At the center section of the south elevation, a narrow portico has a lean-to roof. Just west of this portico is a basement cellar door.



Image 22 Looking northeast at the south elevation. A small portico exists at the rear of the 1897 sheriff's residence where the kitchen is located.



Image 23 Looking north at the south elevation. This is the center of the south elevation where the kitchen is located just off the portico. Also, the first-floor windows are where the jail cells are located. This section of the south elevation boasts two-stories with a series of four, double-hung windows with limestone lintels and sills at both the lower and upper stories. Metal grates cover the first-floor windows and resemble a similar pattern as the north elevation windows at the lower story. Rust has bled onto the limestone belt course at the center section of the south elevation. This rust is visible against the masonry. A gentle/firm bristle brush and soap can clean this from the masonry.

Overall, the south elevation is in good condition with the following minor to moderate conditions:

- Water channeling across masonry on façade see limestone belt course at center of elevation with water/moisture markings on sills
- Vegetation against the foundation and basement windows

Interior

The interior of the structure has retained much of its historic fabric and integrity as the jail kit house (circa 1893) and the sheriff's residence (circa 1897). The floorplan has changed very little since the structure's dates of construction. The main entry to the sheriff's residence is accessed by entering the portico at the east elevation. Additionally, another entry is located at the northeast corner of the structure on the north elevation. Rear egress points are located at the side portico on the south elevation at the rear of the jail kit house on the west elevation. The interior boasts most of its original windows, flooring, decorative wood trim and molding. The parlor and library are

located just to the north and south of the main entrance. Chair and picture rail decorative details are still in situ. The second and third floors were not accessible for evaluation as they're used as part of a private residence. The kitchen is at the rear of the sheriff's residence. The 1959 addition at the north elevation was originally used for a sheriff's meeting space but is currently used as a community meeting space. The former jail cells are all intact with their original fixtures and mechanisms intact. The jail kit house, sheriff's residence, 1930'S garage, and 1959 addition were evaluated with some noted structural and cosmetic concerns. Specifically, plaster deterioration at north elevation where 1959 addition is located. Also, a distinct concern is the scent of cat urine that permeates the entirety of the interior.

Mechanical, electrical, and plumbing (MEP) systems have been updated since the construction of the jail kit house and sheriff's residence. Electrical systems appear to have been updated with common light switches, as well as original push button systems still extant.

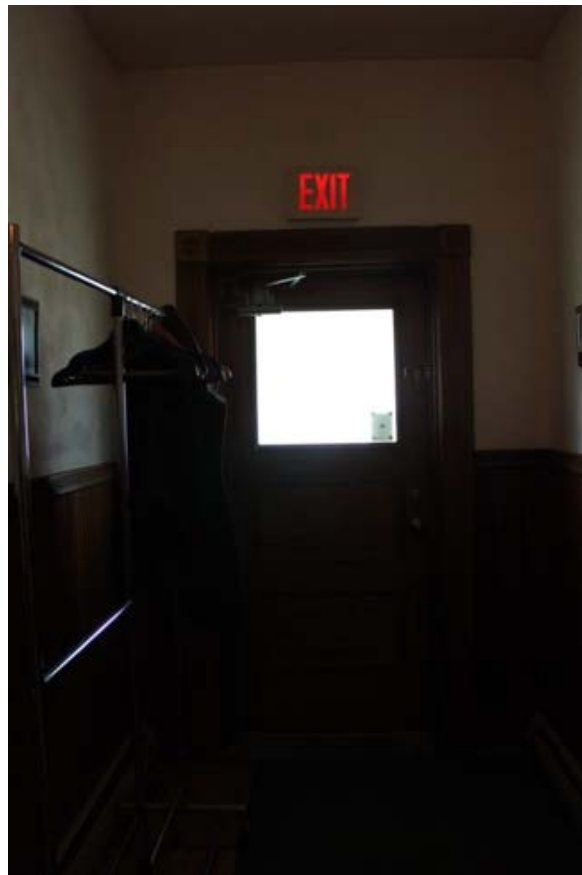


Image 24 Looking east at the main entrance door at the foyer of the sheriff's residence.



Image 25 Looking south in the front parlor of the sheriff's residence.

The molding and trim between the sheriff's residence and the jail kit house differ due to styles of the time. The molding and trim in the sheriff's residence reflects a lighter wood stain and varying species to that of the jail kit house.



Image 26 Looking west in the hallway at the stairs that lead to the upper floors and kitchen to the rear of the residence in the background.



Image 27 Looking north at the stairs that lead to the upper floors of the sheriff's residence. Wood floors, trim, molding, and plaster are all in good condition in this area.



Image 28 Looking west in the kitchen. See egress door to the rear entry near the south-central portico of the sheriff's residence. The kitchen appears to have retained its original floor but looks to have had some modifications with updated appliances, countertops, and finishes.



Image 29 Looking south from the room to the north of the kitchen that extends to the jail cells.



Image 30 Looking north in the jail cell section of the jail kit house. All original jail cells are intact with operable mechanisms.



Image 31 Looking south in a jail cell at the original sink.



Image 32 Looking west in a jail cell currently used as storage.



Image 33 Looking east in the entrance to the jail cells at the room just off the kitchen.



Image 34 Looking south at the ceiling detail in the room adjacent to the kitchen and the jail cells. This ceiling is like a Quonset hut shape with corrugated metal.



Image 35 Door to a safe in the jail kit house near the jail cells.



Image 36 Northwest corner of the wall on the first floor of the jail kit house where water has penetrated within the interior of the wall and has resulted in plaster deterioration. Electrical line is rusting along wall from water penetration.



Image 37 Image of original, locked cabinet on wall just adjacent to jail cells that held keys to the cells

Overall, the interior of the structure is in good condition with the following minor to moderate conditions:

- Plaster deterioration isolated at north elevation where water has entered wall cavity
- Concern for urine scent that permeates interior of structure
- Paint deterioration on minimal areas of corrugated metal ceiling

Conclusions and Recommendations

One clear theme has emerged from this architectural assessment and that is the Old Mecosta County Jail is a steadfast and solid structure which is visible in the overall good condition of the exterior and the great condition of the interior. These are positive declarations that will help to anchor the long-term plan of action for the Old Jail. Deferred maintenance can no longer be neglected as prioritization of the overall conditions evaluated in the field assessment should be addressed.

Roof

The Old Jail has emergency intervention needs at the roof and will require regular maintenance over time to stabilize and secure the building envelope in perpetuity. Water must have a way to exit the structure swiftly and securely in a water removal system. The priority is to install a new gutter system that seals the roof entirely and is supported by new fascia and soffit where necessary (specifically, the north elevation). Also, the house should be adequately ventilated as part of the roof system. Check for ventilation voids and deficiencies to allow structure to ventilate during seasonal temperature fluctuations. This will allow moisture that has built up within the interior or in wall cavities to exit the home.

Water

Much of what has occurred within the building envelope is a direct result of neglect over time. Not intended but occurs when biological growth is against the exterior walls. The structure is open to water penetrating the house by lack of an adequate gutter system. Water is the worst enemy of a structure. Water has entered the roof, and this has permeated, specifically, at the north and east elevations. As a result of limitations in viewing the upper floors, there's uncertainty if water has entered at the upper floors in the private residence. Keeping moisture out of the roof structure and away from the walls is the most important measure to sealing the building envelope. Water will find its way at the weakest points. Rising from the foundation by capillary action if water does not have an adequate removal way out of and away from the house. Entering the house from the roof causing the mortar to spall, plaster to crumble, pipes to burst, and wood frame to rot. As a result of water in the house, molds, lichen, and fungus bloom, and begin to leave marks of discoloration on both the exterior and interior of the structure. The symptoms of water entering the house are a call to action.

Structural Concerns

Structural and tensile cracks along the north elevation have caused advanced weak areas and additional cracks in the mortar from the foundation to the upper stories. These problems will typically be caused by excessive foundation settling or heaving, or massive amounts of water entering the wall at entry points along the roof and lack of an adequate gutter system. Addressing water and vegetation at the north elevation, as well as vegetation across the foundation will begin to mitigate the structural failures and concerns.

Other related structural concerns were some minimal signs of brick spalling across the exterior building envelope. The foundation stone (river rock), limestone, and mortar were all in relatively good condition. Note areas where mortar patching was tuck pointed with incompatible mortar (a

different aggregate mix than the original, mother mortar). Mortar testing of the building envelope is crucial to tuckpointing with the correct mortar mix.

Vegetation

A structure that has moisture within it or around it will promote vegetation also referred to as biological growth. This biological growth is particularly common on older structures that are in a wooded or shady area. Though the Old Jail is not in a heavily wooded area, there are trees around the structure that create shade and bring moisture, leaves, and roots. The northern side of a structure is particularly at risk of developing biological growth due to the lack of sunlight. Without the presence of sunlight, moisture evaporates slowly, creating damp, soggy conditions this is specifically true of the northwest corner of the structure. This kind of environment is perfect for ivy, moss, and micro-organisms to survive and thrive. While the vegetation itself isn't harmful, it can cause significant structural damage to the house due to moisture and water. The Old Jail is particularly susceptible to damage from biological growth at the north elevation and on some areas of the south elevation where joint problems or cracks have already developed. There is a significant amount of biological growth on and against the structure at the foundation and in time, will cause long-term damage to the structure. Failing to address various types of biological growths, such as tree roots that are digging into the foundation and vines growing against the exterior walls, can have serious consequences and can lead to costly repairs. Biological growth must be removed carefully from the exterior walls first and a closer look at the removal of the root system may have to be inspected by a landscape professional.

Windows

At the foundation level, repair the existing basement windows by removing vegetation at the windows and any wood that has rotted or is in disrepair. Existing wood members can be removed, and new wood members can "sistered" in where old members are no longer functional. If repair of existing wood windows isn't possible, replace windows with new egress windows that allow ventilation and accessibility if necessary. Any windows that need to be replaced should be selected to match as close to the original window in materials, size, shape, and pattern as possible. Check window and doors to ensure a tight fit and prevent weather, wind, and moisture from entering the structure. Windows and doors are part of the building envelope of the structure and are an integral part of the building envelope.

There were limitations to visual inspection with the inability to enter the upper floors of the interior of the house (other than at the entry points or from an open window).



Image 38 Jessica Flores and MSU Interior Design students pictured here in the Old Jail.

Planning the Work: Structural and Cosmetic

Priority (Now) – Removal of old gutter systems and installation of new systems

- *Portico (porch) on east elevations*
 - Portico reconstruction should be evaluated by reviewing photo documentation of the original portico. The east porticos are both in disrepair.
- *Roof*
 - Install new gutter system with downspouts and catch drains from foundation that go out from structure
 - Assess existing chimney with brick spalling
 - Install new fascia and soffit where necessary- look at north and east elevations
- *Foundation*
 - Address cracking and gaps in existing mortar
 - Repoint mortar with mortar that is compatible with original mortar (mortar is evaluated and selected by a mortar analysis test)
 - Evaluate existing structural members at north and east elevations
 - Repair or replace egress windows at basement
- *Exterior Walls*
 - Gently remove biological growth
 - Gently clean rock with water and soap (no power washing) and soft brush as needed
- *Vegetation*
 - Gently remove all biological growth and vegetation from exterior walls and foundation
 - Assess nearby tree roots for growth and proximity to foundation walls

- *Windows*

- Inspect windows for weatherization and leaks
- Inspect sills and lintels and repair with a compatible mortar mix or sympathetic epoxy mix as needed
- Inspect exterior casework on windows for rot, punkiness, and or moisture warping
- Rehabilitate or replace exterior window casing as needed that matches original as closely as possible

Soon

- *Doors*

- Evaluate doors for weatherstripping and install additional weatherstripping if necessary
- Install adequate lighting at both front and rear entrances

- *HVAC*

- Inspect the existing HVAC systems for efficiency and code
- Install new HVAC system if necessary
- Vents are encouraged to be located on the roof or rear of the house

- *Electrical*

- Inspect the existing electrical systems for efficiency and code
- Install new electrical system if necessary
- Electrical panels are encouraged to be in non-descript areas of the house

- *Plumbing*

- Inspect the existing plumbing systems for efficiency and code
- Install new plumbing system if necessary
- Plumbing components are encouraged to be in non-descript areas of the house or toward the rear of the house

- *Lighting*

- Inspect the existing lighting systems for efficiency and code
- Install new lighting system if necessary

Later

- *Finishes*
 - Flooring, interior walls, ceiling, cabinets, painting, and other fixtures should be evaluated, specifically, plaster on north interior wall
 - Grading of the landscape can occur later

National Register of Historic Places

The Old Mecosta County Jail is not currently listed in the National Register of Historic Places. The Old Jail meets the fifty year or older age threshold for listing / designation. The Old Jail retains and illustrate historic significance to the history, architecture, archaeology, and culture of a community. The Old Jail is associated with events, activities, or patterns and does convey physical characteristics of design, construction, or form. Therefore, there is historic context connected with the property when evaluated against the National Register of Historic Places (NRHP) Criteria for Evaluation at the local level of significance.

Methodology for evaluating historic resources is based on the National Register of Historic Places Criteria for Evaluation which is guided and administered by the National Park Service under the direction of the Secretary of the Interior. Authorized by the National Historic Preservation Act of 1966, the National Park Service's National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archaeological resources. The National Register of Historic Places documents the appearance and importance of districts, sites, buildings, structures, and objects significant in American history and prehistory. The National Register is the nation's inventory of historic places and the national repository of documentation on the variety of historic property types, significance, condition, ownership, needs, and other information.

The Criteria for Evaluation define the scope of the National Register of Historic Places. They identify the range of resources and kinds of significance that will qualify properties for listing in the National Register. The National Register Criteria are written broadly to recognize the wide variety of historic properties associated with our prehistory and history. The National Register Bulletin How to Apply the National Register Criteria for Evaluation is a helpful guide for the evaluation of historic properties. The National Register Criteria for Evaluation evaluates historic properties by age, significance, and integrity. The rule of thumb is a property must be fifty years of age or older. The property must also reflect much as it did when it was originally constructed though it's understood that properties change and evolve over time. For a historic property to be considered eligible for listing in the National Register of Historic Places, a property must be significant.

Significance can fall within four categories:

- *Criterion A:* A property may be associated with an event, an activity, or developments in the past.
- *Criterion B:* A property may relate to people who were important in the past.
- *Criterion C:* A property may convey architectural history or craftsmanship or may be associated with landscape history or other engineering achievements.

- *Criterion D:* A property may have the potential to yield information through archaeological investigation about our past.

According to the National Register Criteria for Evaluation, “Historic properties either retain integrity (this is, convey their significance) or they do not. Within the concept of integrity, the National Register criteria recognize seven aspects or qualities that, in various combinations, define integrity. To retain historic integrity a property will always possess several, and usually most, of the aspects. The retention of specific aspects of integrity is paramount for a property to convey its significance. Determining which of these aspects are most important to a particular property requires knowing why, where, and when the property is significant.

The National Register of Historic Places Criteria for Evaluation recommendation for the Old Mecosta County Jail is that it is eligible to be listed in the National Register of Historic Places under *Criterion A and C*.

Final Thoughts



Image 39 Jessica Flores and MSU Interior Design students pictured here in the Old Jail.

In closing, an architectural assessment provides a valuable foundation for the rehabilitation, restoration, stabilization, or reconstruction of parts of a historic structure. It's my hope and intent that this document provides the information necessary for making appropriate decisions on rehabilitating and/or preserving the Old Mecosta County Jail as recommended by the “Secretary of the Interior’s Standards for the Treatment of Historic Properties.” The rich history of the Old Mecosta County Jail is a story that should be shared. The first path to preserving this history is to ensure that the future of the house has a preservation and maintenance plan in perpetuity. This architectural assessment is an opportunity to set a framework for future historic preservation efforts at the Old Mecosta County Jail.

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Appendix

A: Structural Assessment Report Visual Inspection Checklist

B: National Register Criteria for Evaluation

C: National Park Service Preservation Brief #47

D: Secretary of the Interior's Standards for the Treatment of Historic Properties

E: Incentives for Historic Preservation

Structural Assessment Report Visual Inspection Checklist

Part 1: Property Description

Type of Construction:

Wood Frame	Brick
Steel Frame	Stone
Concrete	Other (List)

Building Classification:

Residential	Government
Commercial	Religious
Institutional	Industrial

Characteristics:

<u>Building Age:</u>	0-25yrs	25-120 yrs	50-100yrs	100 + yrs		
<u>Foundation:</u>	Pier	Slab	Chain Wall	Basement	Other	
<u>Roof Type:</u>	Hipped	Gable	Mansard	Pyramid	Flat	Other
<u>Roof Cover:</u>	Slate	Metal	Tile	Asphalt	Asbestos	Other
<u>Wall Finish:</u>	Stucco	Wood	Vinyl	Masonry	Asbestos	Other
<u>Landscape:</u>	Walkway	Driveway	Fences	Sculpture/Fountain	Structures	
<u>Interior Condition:</u>	Mold/Mildew	Falling Plaster	Structural Damage	Other		

Flood Data:

<u>Nature of Water</u>	Standing	Flowing	Seepage	Water Marks	Other
<u>Space where water entered</u>	Basement	Crawl	First Floor	Roof	Other
<u>Depth of water measured from main floor (+/-)</u>					

Evaluation:

<u>Collapsed or off Foundation</u>	Minor	Moderate	Severe
<u>Leaning/Other Structural Damage</u>	Minor	Moderate	Severe
<u>Damage to Window/Doors</u>	Minor	Moderate	Severe
<u>Chimney, parapet, or other falling hazards</u>	Minor	Moderate	Severe
<u>Roof Damage</u>	Minor	Moderate	Severe
<u>Foundation Damage</u>	Minor	Moderate	Severe
<u>Damaged Cladding: Material brick</u>	Minor	Moderate	Severe
<u>Damaged Electrical/Mechanical/AC Systems</u>	Minor	Moderate	Severe
<u>Landscape damage</u>	Minor	Moderate	Severe

Estimate Building Damage:

None	30-60%
10%	60-90%
1-30%	90-100%

II. THE NATIONAL REGISTER CRITERIA FOR EVALUATION

CRITERIA FOR EVALUATION:³

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. That are associated with the lives of persons significant in our past; or
- C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. That have yielded, or may be likely to yield, information important in prehistory or history.

CRITERIA CONSIDERATIONS:

Ordinarily cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register. However, such properties *will qualify* if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

- a. A religious property deriving primary significance from architectural or artistic distinction or historical importance; or
- b. A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or

- c. A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his or her productive life; or
- d. A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
- e. A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
- f. A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
- g. A property achieving significance within the past 50 years if it is of exceptional importance.

³The Criteria for Evaluation are found in the *Code of Federal Regulations, Title 36, Part 60*, and are reprinted here in full.

47 PRESERVATION BRIEFS

Maintaining the Exteriors of Small and Medium Size Historic Buildings

Sharon C. Park, FAIA



National Park Service
U.S. Department of the Interior
Heritage Preservation Services



Preservation is defined as “the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the *ongoing maintenance and repair* of historic materials and features rather than extensive replacement and new construction.”¹

Maintenance helps preserve the integrity of historic structures. If existing materials are regularly maintained and deterioration is significantly reduced or prevented, the integrity of materials and workmanship of the building is protected. Proper maintenance is the most cost effective method of extending the life of a building. As soon as a building is constructed, restored, or rehabilitated, physical care is needed to slow the natural process of deterioration. An older building has already experienced years of normal weathering and may have suffered from neglect or inappropriate work as well.

Decay is inevitable but deterioration can accelerate when the building envelope is not maintained on a regular basis. Surfaces and parts that were seamlessly joined when the building was constructed may gradually become loose or disconnected; materials that were once sound begin to show signs of weathering. If maintenance is deferred, a typical response is to rush in to fix what has been ignored, creating additional problems. Work done on a crisis level can favor inappropriate treatments that alter or damage historic material.

There are rewards for undertaking certain repetitive tasks consistently according to a set schedule. Routine and preventive care of building materials is the most effective way of slowing the natural process of deterioration. The survival of historic buildings in good condition is primarily due to regular upkeep and the preservation of historic materials.

Well-maintained properties tend to suffer less damage from storms, high winds, and even small earthquakes. Keeping the roof sound, armatures and attachments such

as shutters tightened and secured, and having joints and connections functioning well, strengthens the ability of older buildings to withstand natural occurrences.

Over time, the cost of maintenance is substantially less than the replacement of deteriorated historic features and involves considerably less disruption. Stopping decay before it is widespread helps keep the scale and complexity of work manageable for the owner.

This *Preservation Brief* is designed for those responsible for the care of small and medium size historic buildings, including owners, property administrators, in-house maintenance staff, volunteers, architects, and maintenance contractors. The Brief discusses the benefits of regular inspections, monitoring, and seasonal maintenance work; provides general guidance on maintenance treatments for historic building exteriors; and emphasizes the importance of keeping a written record of completed work.

Getting Started

Understanding how building materials and construction details function will help avoid treatments that are made in an attempt to simplify maintenance but which may also result in long-term damage. It is enticing to read about “maintenance free” products and systems, particularly waterproof sealers, rubberized paints, and synthetic siding, but there is no such thing as maintenance free when it comes to caring for historic buildings. Some approaches that initially seem to reduce maintenance requirements may over time actually accelerate deterioration.

Exterior building components, such as roofs, walls, openings, projections, and foundations, were often constructed with a variety of functional features, such as overhangs, trim pieces, drip edges, ventilated cavities, and painted surfaces, to protect against water infiltration, ultraviolet deterioration, air infiltration, and

Figure 1. Maintenance involves selecting the proper treatment and protecting adjacent surfaces. Using painter's tape to mask around a brass doorknocker protects the painted door surface from damage when polishing with chemical compounds. On the other hand, hardware with a patinated finish was not intended to be polished and should simply be cleaned with a damp cloth.



Cautions During Maintenance Work

All maintenance work requires attention to safety of the workers and protection of the historic structure. Examples include the following:

- Care should be taken when working with historic materials containing lead-based paint. For example, damp methods may be used for sanding and removal to minimize air-borne particles. Special protection is required for workers and appropriate safety measures should be followed.
- Materials encountered during maintenance work, such as droppings from pigeons and mice, can cause serious illnesses. Appropriate safety precautions need to be followed. Services of a licensed contractor should be obtained to remove large deposits from attics and crawlspaces.
- Heat removal of paint involves several potential safety concerns. First, heating of lead-containing paint requires special safety precautions for workers. Second, even at low temperature levels, heat removal of paint runs the risk of igniting debris in walls. Heat should be used only with great caution with sufficient coverage by smoke detectors in work areas. Work periods need to be timed to allow monitoring after completion of paint removal each day, since debris will most often smolder for a length of time before breaking out into open flame. The use of torches, open flames, or high heat should be avoided.
- Many chemical products are hazardous and volatile organic compounds (VOC) are banned in many areas. If allowed, appropriate respirators and other safety precautions are essential for use.
- Personal protection is important and may require the use of goggles, gloves, mask, closed-toed shoes, and a hard hat.
- Electrical service should be turned off before inspecting a basement after a flood or heavy rain, where there is high standing water.

pest infestation. Construction assemblies and joints between materials allow for expansion and contraction and the diffusion of moisture vapor, while keeping water from penetrating the building envelope. Older buildings use such features effectively and care must be taken to retain them, avoiding the temptation to reduce air infiltration or otherwise alter them.

Monitoring, inspections, and maintenance should all be undertaken with safety in mind. Besides normal safety procedures, it is important to be cognizant of health issues more commonly encountered with older buildings, such as lead-based paint, asbestos, and bird droppings, and to know when it is necessary to seek professional services (see sidebar).

Original building features and examples of special craftsmanship should be afforded extra care. The patina or aging of historic materials is often part of the charm and character of historic buildings. In such cases, maintenance should avoid attempts to make finishes look new by over-cleaning or cladding existing materials. As with any product that has the potential to harm historic materials, the selection of a cleaning procedure should always involve testing in a discreet location on the building to ensure that it will not abrade, fade, streak, or otherwise damage the substrate (Fig 1).

Maintenance Plan, Schedules and Inspection

Organizing related work into a written set of procedures, or a Maintenance Plan, helps eliminate duplication, makes it easier to coordinate work effort, and creates a system for prioritizing maintenance tasks that takes into account the most vulnerable and character-defining elements.

The first time a property owner or manager establishes a maintenance plan or program, it is advisable to have help from a preservation architect, preservation consultant, and/or experienced contractor. Written procedures should outline step-by-step approaches that are custom-tailored to a building. No matter how small the property, every historic site should have a written guide for maintenance that can be as simple as:

- 1) Schedules and checklists for inspections;
- 2) Forms for recording work, blank base plans and elevations to be filled in during inspections and upon completion of work;
- 3) A set of base-line photographs to be augmented over time;
- 4) Current lists of contractors for help with complex issues or in case of emergencies;
- 5) Written procedures for the appropriate care of specific materials, including housekeeping, routine care, and preventive measures;
- 6) Record-keeping sections for work completed, costs, warranty cards, sample paint colors, and other pertinent material.

This information can be kept in one or more formats, such as a three-ring binder, file folders, or a computer

database. It is important to keep the files current with completed work forms to facilitate long-term evaluations and planning for future work (Fig 2).

Proper maintenance depends on an organized plan with work prescribed in manageable components. Regular maintenance needs to be considered a priority both in terms of time allotted for inspections and for allocation of funding.

Maintenance work scheduling is generally based on a variety of factors, including the seriousness of the problem, type of work involved, seasonal appropriateness, product manufacturer's recommendations, and staff availability. There are other variables as well. For example, building materials and finishes on southern and western exposures will often weather faster than those on northern or eastern exposures. Horizontal surfaces facing skyward usually require greater maintenance than vertical ones; in regions with moderate or heavy rainfall, wood and other materials in prolonged shadow are subject to more rapid decay.

Maintenance costs can be controlled, in part, through careful planning, identification of the amount of labor required, and thoughtful scheduling of work. Maintenance schedules should take into account daily and seasonal activities of the property in order to maximize the uninterrupted time necessary to complete the work. Institutions generally need to budget annually between 2 and 4 percent of the replacement value of the building to underwrite the expense of full building maintenance.² Use of trained volunteers to undertake maintenance can help reduce costs.

Exterior inspections usually proceed from the roof down to the foundation, working on one elevation at

Cyclic Building Inspection Checklist: Horse Stable			Inspection date: 04/24/05	
Building Feature	Material(s)	Condition Description	Maintenance Action Required	Work Done
ROOF:				
Covering	Clay tile	Two slipped tiles	Reattach tiles	5/4/05
	Painted metal standing seam	Slight corrosion; blistering paint on metal roof section	Sand and repaint area that is peeling	6/8/05
Flashing	Painted metal	Flashing in good condition	N/A	N/A
Gutters/ Downspouts	6" half round galvanized metal	Gutter sagging; downspouts OK	Realign gutter and put on new hanger strap	5/4/05
			Flush out downspouts	5/5/05
Chimneys	No masonry chimney	N/A	N/A	N/A
Attachments/ Penetrations	Metal vent stack and weathervane	Vent stack hood has some peeling paint; vane OK	Sand and repaint vent stack	6/8/05

Figure 2. All personnel associated with a historic structure need to become acquainted with how existing building features should appear and during their daily or weekly routines look for changes that may occur. This will help augment the regular maintenance inspection that will occur at specified intervals based on seasonal changes, use, and other factors. A segment of an inspection form showing the roof elements of a horse stable is shown. The inspection report should be kept along with the maintenance plan and other material in notebook, file or electronic form.

a time, moving around the building in a consistent direction. On the interior, the attic, inside surfaces of exterior walls, and crawlspaces or basements should be examined for signs of potential or existing problems with the building envelope.

The following chart lists suggested inspection frequencies for major features associated with the building's exterior, based on a temperate four-season climate and moderate levels of annual rainfall. For areas of different climate conditions and rainfall, such as in the more arid southwest, the nature of building decay and frequency of inspections will vary. For buildings with certain inherent conditions, heavy use patterns, or locations with more extreme weather conditions, the frequency of inspections should be altered accordingly.

Note: All building features should be inspected after any significant weather event such as a severe rainstorm or unusually high winds.

INSPECTION FREQUENCY CHART		
Feature	Minimum Inspection Frequency	Season
Roof	Annually	Spring or fall; every 5 years by roofer
Chimneys	Annually	Fall, prior to heating season; every 5 years by mason
Roof Drainage	6 months; more frequently as needed	Before and after wet season, during heavy rain
Exterior Walls and Porches	Annually	Spring, prior to summer/fall painting season
Windows	Annually	Spring, prior to summer/fall painting season
Foundation and Grade	Annually	Spring or during wet season
Building Perimeter	Annually	Winter, after leaves have dropped off trees
Entryways	Annually; heavily used entries may merit greater frequency	Spring, prior to summer/fall painting season
Doors	6 months; heavily used entry doors may merit greater frequency	Spring and fall; prior to heating/cooling seasons
Attic	4 months, or after a major storm	Before, during and after wet season
Basement/Crawlspace	4 months, or after a major storm	Before, during and after rain season

Survey observations can be recorded on a standardized report form and photographs taken as a visual record. All deficient conditions should be recorded and placed on a written schedule to be corrected or monitored.

BUILDING COMPONENTS

For purposes of this discussion, the principal exterior surface areas have been divided into five components and are presented in order from the roof down to grade. While guidance for inspection and maintenance is provided for each component, this information is very general in nature and is not indeed to be comprehensive in scope. Examples have been selected to address some typical maintenance needs and to help the reader avoid common mistakes.

Roofs/chimneys

The roof is designed to keep water out of a building. Thus one of the principal maintenance objectives is to ensure water flows off the roof and into functional gutters and downspouts directly to grade and away from the building—and to prevent water from penetrating the attic, exterior walls, and basement of a building. (Note: Some buildings were designed without gutters and thus assessments must be made as to whether rain water is being properly addressed at the foundation and perimeter grade.) Keeping gutters and downspouts cleared of debris is usually high on the list of regular maintenance activities (Fig 3). Flashing around chimneys, parapets, dormers, and other appendages to the roof also merit regular inspection and appropriate maintenance when needed. The material covering the roof—wood shingles, slate, tile, asphalt, sheet metal, rolled roofing—requires maintenance both to ensure a watertight seal and to lengthen its service life; the type and frequency of maintenance varies with the roofing material. Older chimneys and parapets also require inspection and maintenance. With the exception of cleaning and minor repairs to gutters and downspouts, most roof maintenance work will necessitate use of an outside contractor.

Inspection:

The functioning of gutters and downspouts can be safely observed from the ground during rainy weather and when winter ice has collected. Binoculars are a useful tool in helping to identify potential roofing problems from the same safe vantage point. Careful observation from grade helps to identify maintenance needs between close-up inspections by an experienced roofer. Observation from the building interior is also important to identify possible leak locations. When access can be safely gained to the roof, it is important to wear shoes with slip-resistant soles and to use safety ropes.



Figure 3. Keeping gutters clean of debris can be one of the most important cyclical maintenance activities. On this small one-story addition, a garden hose is being used to flush out the trough to ensure that the gutter and downspouts are unobstructed. Gutters on most small and medium size buildings can be reached with an extension ladder and a garden hose. Photo: Bryan Blundell.

Depending on the nature of the roof, some common conditions of concern to look for are:

- sagging gutters and split downspouts;
- debris accumulating in gutters and valleys;
- overhanging branches rubbing against the roof or gutters
- plant shoots growing out of chimneys;
- slipped, missing, cracked, bucking, delaminating, peeling, or broken roof coverings;
- deteriorated flashing and failing connections at any intersection of roof areas or of roof and adjacent wall;
- bubbled surfaces and moisture ponding on flat or low sloped roofs;
- evidence of water leaks in the attic;
- misaligned or damaged elements, such as decorative cresting, lightning rods, or antennas; and
- cracked masonry or dislodged chimney caps.

Maintenance:

- Remove leaves and other debris from gutters and downspouts. Utilize a ladder with a brace device, if

necessary, to keep the ladder from crushing the gutter. Use a garden hose to flush out troughs and downspouts. Patch or repair holes in gutters using products such as fiberglass tape and epoxy adhesive in metal gutters. Avoid asphalt compounds since acidic material can cause further deterioration of metal gutters.

- Correct misaligned gutters and adjust, if necessary, so that water flows to drains and does not pond. If gutter edges sag, consider inserting wooden wedges between the fascia board and the back of the gutter to add support. Seal leaking seams or pinholes in gutters and elbows.

- Broom sweep branch or leaf debris away from shingles, valleys, and crickets, particularly around chimneys and dormers.

- Where mechanical equipment is mounted on flat or low-sloped roofs, ensure that access for maintenance

can be provided without damaging the roof. Clean out trapped leaves and debris from around equipment base and consider adding a protective walkway for access.

- Remove biological growth where it is causing erosion or exfoliation of roofing. Use low-pressure garden hose water and a natural or nylon scrubbing brush to remove such growth, scraping with a plastic putty knife or similar wood or plastic tool as needed on heavier buildup. Most growth is acidic and while there are products designed to kill spores, such as diluted chlorine bleach, they should be avoided. Even fairly weak formulas can still cause unexpected color changes, efflorescence, or over-splash damage to plantings or surfaces below the roof. Where appropriate, trim adjacent tree branches to increase sunlight on the roof since sunlight will deter further biological growth.

- Re-secure loose flashing at the dormers, chimneys or parapets. Clean out old mortar, lead, lead wool, or fastening material and make sure that flashing is properly inserted into reglet (slot) joints, taking care not to damage the substrate. Avoid installing new step flashing as a single metal component where multiple pieces are required to provide proper waterproofing. Also avoid attaching step flashing with mastic or sealant. Properly re-bed all step flashing. Use appropriate non-ferrous flashing metal or painted metal if needed. Since cap, step, valley, cricket, and apron flashings each have specific overlap and extension requirements, replacement flashing should match the existing material unless there has been a proven deficiency.



Figure 4. Damage to roofs often requires immediate attention. As a temporary measure, this damaged roof tile could be replaced with a brown aluminum sheet wedged between the existing tiles. Photo: Chad Randl.



Figure 5. The use of a sealant to close an exposed joint is not always an effective long-term solution. Where this decorative wood element connects to the slate roof, the sealant has failed within a short time and a proper metal flashing collar is being fitted instead. Photo: Bryan Blundell.

- Repoint joints in chimneys, parapet, or balustrade capping stones using a hydraulic lime mortar or other suitable mortar where the existing mortar has eroded or cracked, allowing moisture penetration. In general, a mortar that is slightly weaker than the adjacent masonry should be used. This allows trapped moisture in the masonry to migrate out through the mortar and not the masonry. Spalled masonry is often evidence of the previous use of a mortar mix that was too hard.

- Use professional services to repair chimneys and caps. Avoid the use of mortar washes on masonry since they tend to crack, allowing moisture to penetrate and promoting masonry spalling. Repoint masonry with a durable mortar that is slightly weaker than the adjacent masonry. Slope the masonry mortar cap to insure drainage away from the flue. If a chimney rain cap is installed, ensure adequate venting and exhaust.

- As a temporary measure, slip pieces of non-corrosive metal flashing under or between damaged and missing roofing units until new slate, shingles, or tile can be attached. Repair broken, missing or damaged roofing units with ones that match. Follow roofing supplier and industry guidance on inserting and attaching replacement units (Fig 4). Avoid using temporary asphalt patches as it makes a proper repair difficult later on.

- For long-term preservation of wooden shingle roofs coated with a preservative, recoat every few years following the manufacturer's recommendations. Be aware of environmental considerations.

- Scrape and repaint selected areas of coated ferrous metal roofing as needed; repaint on a regularly

scheduled basis. Ferrous metal roofs can last a long time if painted regularly. Alkyd coatings are generally used on metal roofs; be sure to wash and properly prepare the area beforehand. Environmental regulations may restrict the use of certain types of paints. Apply the coating system in accordance with manufacturer's recommendations. Prepare the surface prior to application to obtain good adhesion with the prime coat. Apply both a prime coat and a topcoat for good bonding and coverage; select primer and topcoat products from the same manufacturer.

- Re-secure loose decorative elements, such as finials and weathervanes. Seek professional advice if decorative elements exhibit considerable corrosion, wood rot, or structural instability. Small surface cracks may benefit from a flexible sealant to keep moisture out; sealants have a limited life and require careful inspection and periodic replacement (Fig 5).

Exterior Walls

Exterior walls are designed to help prevent water infiltration, control air infiltration, and serve as a barrier for unwanted animals, birds and insects. The primary maintenance objective is to keep walls in sound condition and to prevent water penetration, insect infestation, and needless decay (Fig 6). Depending on the materials and construction methods, walls should have an even appearance, free from unwanted cracks, and should be able to shed excess moisture. Where surfaces are significantly misaligned or where there are bulging wall sections

or cracks indicative of potential structural problems, seek professional guidance as to the cause of distress and appropriate corrective measures. Wood-frame construction generally will require more frequent maintenance than buildings constructed of brick, stone, or terra cotta (Fig 7).

Inspections:

It is best to inspect walls during dry as well as wet weather. Look for moisture patterns that may appear on the walls after a heavy or sustained rainfall or snow, recording any patterns on elevation drawings or standard recording forms. Monitoring the interior wall for moisture or other potential problems is important as well. Look for movement in cracks, joints, and around windows and doors and try to establish whether movement is seasonal in nature (such as related to shrinkage of wood during dry weather) or signs of an ongoing problem. For moderate size buildings, a ladder or mechanical lift may be necessary, though in some cases the use of binoculars and observations made from windows and other openings will be sufficient. When examining the walls, some common conditions of concern to look for are:

- Misaligned surfaces, bulging wall sections, cracks in masonry units, diagonal cracks in masonry joints, spalling masonry, open joints, and nail popping;
- Evidence of wood rot, insect infestation, and potentially damaging vegetative growth;
- Deficiencies in the attachment of wall mounted lamps, flag pole brackets, signs, and similar items;
- Potential problems with penetrating features such as water spigots, electrical outlets, and vents;
- Excessive damp spots, often accompanied by staining, peeling paint, moss, or mold; and
- General paint problems (Fig 8).

Maintenance:

• Trim tree branches away from walls. Remove ivy and tendrils of climbing plants by first cutting at the base of the vine to allow tendrils to die back, and later using a plastic scraper to dislodge debris and an appropriate digging tool to dislodge and remove root systems. Be cautious if using a commercial chemical to accelerate root decay; follow safety directions and avoid contact of chemicals with workers and wall materials.

• Wash exterior wall surfaces if dirt or other deposits are causing damage or hiding deterioration; extend



Figure 6. Stucco applied to an exterior wall or foundation was intended to function as a watertight surface. Unless maintained, rainwater will penetrate open joints and cracks that may occur over time. A spalled section of stucco indicates some damage has occurred and a wooden mallet is being used to tap the surface to determine whether the immediate stucco has lost adhesion. Photo: Bryan Blundell.



Figure 7. One of the advantages of wood shingles as a wall covering is that individual shingles that are damaged can easily be replaced. On this highly exposed corner, worn shingles have been selectively replaced to help safeguard against water damage. The new shingles will be stained to match the existing shingles.



Figure 8. The paint on the siding of this south-facing wall needs to be scraped, sanded, primed and repainted. Postponing such work will lead to further paint failure, require greater preparatory costs, and could even result in the need to replace some siding. Photo: Charles Fisher.



Figure 9. To help extend a repainting cycle, dirt and spider webs should be removed before permanent staining occurs. In this case, a natural bristle brush and a soft damp cloth are being used to remove insect debris and refresh the surface appearance.

scheduled times for cleaning for cosmetic purposes to reduce frequency (Fig 9). When cleaning, use the gentlest means possible; start with natural bristle brushes and water and only add a mild phosphate-free detergent if necessary. Use non-abrasive cleaning methods and low-pressure water from a garden hose. For most building materials, such as wood and brick, avoid abrasive methods such as mechanical scrapers and high-pressure water or air and such additives as sand, natural soda, ice crystals, or rubber products. All abrasives remove some portion of the surface and power-washing drives excessive moisture into wall materials and even into wall cavities and interior walls. If using a mild detergent, two people are recommended, one to brush and one to prewet and rinse. When graffiti or stains are present, consult a preservation specialist who may use poultices or mild chemicals to remove the stain. If the entire building needs cleaning other than described above, consult a specialist.

- Repoint masonry in areas where mortar is loose or where masonry units have settled. Resolve cause of cracks or failure before resetting units and repointing. Rake out joints by hand, generally avoiding rotary saws or drills, to a depth of 2 ½ times the width of the joint (or until sound mortar is encountered), to make sure that fresh mortar will not pop out. Repointing mortar should be lime-rich and formulated to be slightly weaker than the masonry units and to match the historic mortar in color, width, appearance, and tooling. Off-the-shelf pre-mixed cement mortars are not appropriate for most historic buildings. Avoid use of joint sealants in place of

mortar on vertical masonry wall surfaces, as they are not breathable and can lead to moisture-related damage of the adjacent masonry (Fig 10).

- Correct areas that trap unwanted moisture. Damaged bricks or stone units can sometimes be removed, turned around, and reset, or replaced with salvaged units. When using traditional or contemporary materials for patching wood, masonry, metal, or other materials, ensure that the materials are compatible with the substrate; evaluate strength, vapor permeability, and thermal expansion, as well as appearance.
- When patching is required, select a compatible patch material. Prepare substrate and install patch material according to manufacturer's recommendations; respect existing joints. Small or shallow surface defects may not require patching; large or deep surface defects may be better addressed by installation of a dutchman unit than by patching.
- Where a damaged area is too large to patch, consider replacing the section with in-kind material. For stucco and adobe materials, traditional patching formulas are recommended.
- When temporarily removing wood siding to repair framing or to tighten corner boards and loose trim, reuse the existing siding where possible. Consider using stainless steel or high strength aluminum nails as appropriate. Putty or fill nail holes flush with siding prior to repainting. Back-prime any installed wood with



Figure 10. Repointing of masonry should usually be approached as repair rather than maintenance work in part because of the need for a skilled mason familiar with historic mortar. In this case, a moisture condition was not corrected and the use of a waterproof coating and off-the-shelf Portland cement mortar trapped water and resulted in further damage to these 19th century bricks. Photo: NPS files.

one coat of primer and coat end grain that might be exposed with two coats of primer.

- Prepare, prime, and spot paint areas needing repainting. Remember that preparation is the key to a successful long lasting paint job. Ensure beforehand the compatibility of new and existing paints to avoid premature paint failure. Remove loose paint to a sound substrate; sand or gently rough surface if needed for a good paint bond; wipe clean; and repaint with appropriate primer and topcoats. Follow manufacturer's recommendations for application of coatings, including temperature parameters for paint application. Use top quality coating materials. Generally paint when sun is not shining directly onto surfaces to be painted.

- Remove deteriorated caulks and sealants, clean, and reapply appropriate caulks and sealants using backer rods as necessary. Follow manufacturer's instructions regarding preparation and installation.

- Correct deficiencies in any wall attachments such as awning and flag pole anchors, improperly installed electrical outlets, or loose water spigots.

Openings

Exterior wall openings primarily consist of doors, windows, storefronts, and passageways. The major maintenance objectives are to retain the functioning nature of the opening and to keep in sound condition the connection between the opening and the wall in order to reduce air and water infiltration.

Inspection:

Wall openings are typically inspected from inside as well as out. Examinations should include the overall material condition; a check for unwanted water penetration, insect infiltration, or animal entry; and identification of where openings may not be properly functioning. Frames should be checked to make sure they are not loose and to ascertain whether the intersection between the wall and the frame is properly sealed. Secure connections of glazing to sash and between sash and frames are also important. Particular attention should be placed on exposed horizontal surfaces of storefronts and window frames as they tend to deteriorate much faster than vertical surfaces. Inspections should identify:

- loose frames, doors, sash, shutters, screens, storefront components, and signs that present safety hazards;
- slipped sills and tipped or cupped thresholds;
- poorly fitting units and storm assemblies, misaligned frames, drag marks on thresholds from sagging doors and storm doors;
- loose, open, or decayed joints in door and window frames, doors and sash, shutters, and storefronts;
- loose hardware, broken sash cords/chains, worn sash pulleys, cracked awning, shutter and window hardware, locking difficulties, and deteriorated weatherstripping and flashing;
- broken/cracked glass, loose or missing glazing and putty;
- peeling paint, corrosion or rust stains; and
- window well debris accumulation, heavy bird droppings, and termite and carpenter ant damage.

Maintenance:

- Replace broken or missing glass as soon as possible; in some cases cracked glass may be repaired using specialty glues. For historic crown glass and early cylinder glass, a conservation approach should be considered to repair limited cracks. Where panes with a distinct appearance are missing, specialty glass should be obtained to match, with sufficient inventory kept for future needs. Avoid using mechanical devices to remove old putty and match historic putty bevels or details when undertaking work.

- Reputty window glazing where putty is deteriorated or missing. Take care in removing putty so as not to crack or break old glass or damage muntins and sash frames. Re-glaze with either traditionally formulated



Figure 11. Glazing putty should be maintained in sound condition to prevent unwanted air infiltration and water damage. New glazing putty should be pulled tight to the glass and edge of the wood, creating a clean bevel that matches the historic glazing.

oil putties or modern synthetic ones, making sure to properly bed the glass and secure with glazing points (Fig 11).

- Clean window glass, door glazing, storefronts, transom prism lights, garage doors, and storm panels using a mild vinegar and water mixture or a non-alkaline commercial window cleaner. Be cautious with compounds that contain ammonia as they may stain brass or bronze hardware elements if not totally removed. When using a squeegee blade or sponge, wipe wet corners with a soft dry cloth. Avoid high-pressure washes.
- Clean handles, locks and similar hardware with a soft, damp cloth. Use mineral spirits or commercial cleaners very sparingly, as repeated use may remove original finishes. Most metal cleaners include ammonia that can streak and stain metal, so it is important to remove all cleaning residue. Polished hardware subject to tarnishing or oxidation, particularly doorknobs, often benefits from a thin coat of paste wax (carnauba), hand buffed to remove extra residue. Avoid lacquer finishes for high use areas, as they require more extensive maintenance. Patinated finishes should not be cleaned with any chemicals, since the subtle aged appearance contributes to the building's character.

- Remove and clean hardware before painting doors and windows; reinstall after the paint has dried.
- Tighten screws in doorframes and lubricate door hinges, awning hardware, garage door mechanisms, window sash chains, and pulleys using a graphite or silicone type lubricant.

Contracting Maintenance and Repair Work

Many contractors are very proficient in using modern construction methods and materials; however, they may not have the experience or skill required to carry out maintenance on historic buildings. The following are tips to use when selecting a contractor to work on your historic building:

1. Become familiar with work done on similar historic properties in your area so that you can obtain names of possible preservation contractors.
2. Be as specific as possible in defining the scope of work you expect to undertake.
3. Ask potential contractors for multiple references (three to five) and visit previous work sites. Contact the building owner or manager and ask how the job proceeded; if the same work crew was retained from start to finish; if the workers were of a consistent skill level; whether the project was completed in a reasonable time; and whether the person would use the contractor again.
4. Be familiar with the preservation context of the work to be undertaken. Use the written procedures in your maintenance plan to help define the scope of work in accordance with preservation standards and guidelines. Always request that the gentlest method possible be used. Use a preservation consultant if necessary to ensure that the work is performed in an appropriate manner.
5. Request in the contract proposal a detailed cost estimate that clearly defines the work to be executed, establishes the precautions that will be used to protect adjoining materials, and lists specific qualified subcontractors, if any, to be used.
6. Insure that the contractor has all necessary business licenses and carries worker compensation.

- Check weather stripping on doors and windows and adjust or replace as necessary. Use a durable type of weather stripping, such as spring metal or high quality synthetic material, avoiding common brush and bulb or pile weather stripping that require more frequent replacement.

- Adjust steel casement windows as needed for proper alignment and tight fit. Avoid additional weather stripping as this may lead to further misalignment, creating pathways for air and water infiltration.

- Check window sills for proper drainage. Fill cracks in wood sills with a wood filler or epoxy. Follow manufacturer's instructions for preparation and installation. Do not cover over a wood sill with metal panning, as it may trap moisture and promote decay.

- Repair, prime, and repaint windows, doors, frames, and sills when needed. Clean out putty debris and paint chips from windows using a wet paper towel and dispose of debris prior to repair or repainting. Take appropriate additional precautions when removing lead-based paint. Sand and prepare surfaces and use material-specific patching compounds to fill any holes or areas collecting moisture (Fig 12). Avoid leaving exposed wood unpainted for any length of time, as light will degrade the wood surface and lead to premature failure of subsequent paint applications. Immediately prime steel sash after paint is removed and the substrate prepared for repainting.

- Adjust wood sash that bind when operated. Apply beeswax, paraffin, or similar material to tracks or sash runs for ease of movement. If sash are loose, replace worn parting beads. Sash runs traditionally were unpainted between the stop and parting bead; removing subsequent paint applications will often help improve sash operation.

- Correct perimeter cracks around windows and doors to prevent water and air infiltration. Use traditional material or modern sealants as appropriate. If fillers such as lead wool have been used, new wool can be inserted with a thin blade tool, taking care to avoid damage to adjacent trim. Reduce excess air infiltration around windows by repairing and lubricating sash locks so that windows close tightly.



Figure 12. Good surface preparation is essential for long lasting paint. Scraping loose paint, filling nail holes and cracks, sanding, and wiping with a damp cloth prior to repainting are all important steps whether touching up small areas or repainting an entire feature. Always use a manufacturer's best quality paint. Windows and shutters may need repainting every five to seven years, depending on exposure and climate.



Figure 13. Window air conditioning units can cause damage to surfaces below when condensation drips in an uncontrolled manner. Drip extension tubes can sometimes be added to direct the discharge.

- Remove debris beneath window air conditioning units and ensure that water from units does not drain onto sills or wall surfaces below (Fig 13). Removal of air conditioning units when not in season is recommended.

- Adjust storm panels and clean weep holes; check that weep holes at the bottom of the panels are open so water will not be trapped on the sill. Exterior applied storm windows are best attached using screws and not tightly adhered with sealant. Use of sealant makes storm units difficult to remove for maintenance and can contribute to moisture entrapment if weep holes become clogged.

- Remove weakened or loose shutters and store for later repair. Consider adding a zinc or painted metal top to shutters as a protective cap to cover the wood's exposed end grain. This will extend the life of the shutters.

Projections

Numerous projections may exist on a historic building, such as porches, dormers, skylights, balconies, fire escapes, and breezeways. They are often composed of several different materials and may include an independent roof. Principal maintenance objectives include directing moisture off these features and keeping weathered surfaces in good condition. Secondary projections may include brackets, lamps, hanging signs, and similar items that tend to be exposed to the elements.

Inspection:

In some cases, projections are essentially independent units of a building and so must be evaluated carefully for possible settlement, separation from the main body of the building, and materials deterioration. Some electrical features may require inspection by a electrician or service technician. Common conditions of concern to look for are:

- damaged flashing or tie-in connections of projecting elements;
- misaligned posts and railings;
- deteriorated finishes and materials, including peeling paint, cupped and warped decking, wood deterioration, and hazardous steps;
- evidence of termites, carpenter ants, bees, or animal pests (Fig 14);
- damaged lamps, unsafe electrical outlets or deteriorated seals around connections;
- loose marker plaques, sign, or mail boxes; and



Figure 14. When inspecting connections between projections and the main building, look for areas where birds, bees and pests may enter or nest. Birds have been nesting in this porch roof and the area is being cleaned of their debris. Where an opening exists, it may be necessary to cover it with a trim piece, screening, or sealant. Photo: Bryan Blundell.

- rust and excessive wear of structural, anchorage, and safety features of balconies and fire escapes.

Maintenance:

- Selectively repair or replace damaged roofing units on porches and other projections. Ensure adequate drainage away from the building. Repair flashing connections as needed; clean and seal open joints as appropriate.
- Secure any loose connections, such as on porch rails or fire escapes.
- Maintain ferrous metal components by following manufacturer's recommendation for cleaning and repainting. Remove rust and corrosion from porch handrails, balconies, fire escapes, and other metal features; prepare, prime, and repaint using a corrosion-inhibitive coating system. Apply new primer before new corrosion sets in, followed by new topcoat. Take appropriate safety measures when dealing with existing lead-based paint and in using corrosion-removal products (Fig 15).
- Reattach loose brackets, lamps, or signs. With electrical boxes for outlets or lighting devices, ensure that cover plates are properly sealed. Prime and paint metal elements as needed.
- Keep porch decks and steps free from dust, dirt, leaf debris, and snow as soon as it accumulates using a broom or plastic blade shovel.
- Repair areas of wood decay or other damage to railings, posts, and decorative elements. Repair with wood dutchman, wood putty, or epoxy filler, as appropriate; replace individual elements as needed.



Figure 15. Metal projecting elements on a building, such as sign armatures and railings, are easily subject to rust and decay. Proper surface preparation to remove rust is essential. Special metal primers and topcoats should be used.

Prime and repaint features when necessary and repaint horizontal surfaces on a more frequent basis.

- Sand and repaint porch floorboards to keep weather surfaces protected. The exposed ends of porch floorboards are especially susceptible to decay and may need to be treated every year or two.
- Carefully cut out damaged or buckled porch flooring and replace with wood to match. Back-prime new wood that is being installed; treat end grain with wood preservative and paint primer. Ensure that new wood is adequately kiln or air-dried to avoid shrinkage and problems with paint adherence.
- Repair rotted stair stringers; adjust grade or add stone pavers at stair base to keep wooden elements from coming into direct contact with soil.
- Consider durable hardwoods for replacement material where beading, chamfering, or other decorative work is required in order to match existing features being replaced. Although appropriate for certain applications, pressure treated lumber is hard to tool and may inhibit paint adherence if not allowed to weather prior to coating application.
- Clean out any debris from carpenter bees, ants, termites, and rodents, particularly from under porches. Replace damaged wood and add screening or lattice to discourage rodents. Consider treating above ground features with a borate solution to deter termites and wood rot and repaint exposed surfaces.

Foundations and Perimeter Grades

The foundation walls that penetrate into the ground, the piers that support raised structures, and the ground immediately around a foundation (known as grade) serve important structural functions. To help sustain these functions, it is important that there is

good drainage around and away from the building. The maintenance goal is to prevent moisture from entering foundations and crawl spaces and damaging materials close to the grade, and to provide ventilation in damp areas.

Inspection:

Inspections at the foundation should be done in conjunction with the inspection of the downspouts to ensure that water is being discharged a sufficient distance from the building perimeter to avoid excessive dampness in basements or crawl spaces. In addition, crawl spaces should be adequately vented to deter mold and decay and should be screened or otherwise secured against animals. Look for:

- depressions or grade sloping toward the foundation; standing water after a storm;



Figure 16. This chronically wet area has a mildew bloom brought on by heat generated from the air-conditioning condenser unit. The dampness could be caused by a clogged roof gutter, improper grading, or a leaking hose bibb.

Sealants and Caulks

Using sealants and caulks has become a familiar part of exterior maintenance today. As the use of precision joinery and certain traditional materials to render joints more weathertight has waned in recent years, caulks and more often elastomeric sealants are used to seal cracks and joints to keep out moisture and reduce air infiltration. Where cracks and failing joints are indicators of a serious problem, sealants and caulks may be used as a temporary measure. In some cases they may actually exacerbate the existing problem, such as by trapping moisture in adjacent masonry, and lead to more costly repairs.

Manufacturer's recommendations provide instructions on the proper application of caulks and sealants. Special attention should be placed on ensuring that the subsurface or joint is properly prepared and cleaned. Backer rods may be necessary for joints or cracks. Tooling of the caulk or sealant is usually necessary to ensure contact with all edge surfaces and for a clean and consistent appearance.

Caulks generally refer to older oil resin-based products, which have relatively limited life span and limited flexibility. Contemporary elastomeric sealants are composed of polymer synthetics. Elastomeric sealants are more durable than caulks and have greater flexibility and wider application. Caulks and sealants can become maintenance problems, as they tend to deteriorate faster than their substrates and must be replaced periodically as a part of cyclical maintenance of the structure.

The selection criteria for caulks and sealants include type of substrate, adhesion properties, size and configuration of joint, intended appearance/color and paintability, movement characteristics, and service life. Both one-part and two-part sealants are available; the latter require mixing as part of the application process. Sealants are commonly used for a variety of places on the exterior of a building such as around windows and doors, at interfaces between masonry and wood, between various wood features or elements, and at attachments to or through walls or roofs, such as with lamps, signs, or exterior plumbing fixtures. Their effectiveness depends on numerous factors including proper surface preparation and application. Applications of sealants and caulks should be examined as part of routine maintenance inspection, irrespective of their projected life expectancy.

Installation of caulks and sealants often can be undertaken by site personnel. For large and more complex projects, a contractor experienced in sealant installation may be needed. In either case, the sealant manufacturer should be consulted on proper sealant selection, preparation, and installation procedures.

- material deterioration at or near the foundation, including loss of mortar in masonry, rotting wood clapboards, or settlement cracks in the lower sections of wall;
- evidence of animal or pest infestation;
- vegetation growing close to the foundation, including trees, shrubs and planting beds;
- evidence of moisture damage from lawn and garden in-ground sprinkler systems;
- evidence of moss or mold from damp conditions or poorly situated downspout splash blocks (Fig 16); and
- blocked downspout drainage boots or clogged areaway grates.

Maintenance:

- Remove leaves and other debris from drains to prevent accumulation. Detach drain grates from paved areas and extract clogged debris. Flush with a hose to ensure that there is no blockage. Use a professional drain service to clear obstructions if necessary.
- Conduct annual termite inspections. Promptly address termite and other insect infestations. Use only licensed company for treatment where needed.
- Keep the grade around the foundation sloping away from the building. Add soil to fill depressions particularly around downspouts and splash blocks. Make sure that soil does not come too close to wooden or metal elements. A 6" separation between wooden siding and the grade is usually recommended.
- Avoid use of mulching material immediately around foundations as such material may promote termite infestation, retain moisture or change existing grade slope.
- Reset splash blocks at the end of downspouts or add extender tubes to the end of downspouts as necessary (Fig 17).
- Lubricate operable foundation vent grilles to facilitate seasonal use; paint as needed.
- Manage vegetation around foundations to allow sufficient air movement for wall surfaces to dry out during damp periods. Trim plantings and remove weeds and climbing vine roots. Be careful not to scar foundations or porch piers with grass or weed cutting equipment. If tree roots appear to be damaging a foundation wall, consult an engineer as well as a tree company.

- Wash off discoloration on foundations caused by splash-back, algae, or mildew. Use plain water and a soft natural or nylon bristle brush. Unless thoroughly researched and tested beforehand on a discreet area of the wall, avoid chemical products that may discolor certain types of stone. If cleaning products are used, test beforehand in a discreet area; and avoid over splash to plantings and adjacent building materials.
- Selectively repoint unit masonry as needed. Follow guidance under the wall section in regard to compatible mix, appearance, and texture for pointing mortar.
- Avoid using salts for de-icing and fertilizers with a high acid or petro-chemical content around foundations, as these materials can cause salt contamination of masonry. Use sand or organic materials without chloride additives that can damage masonry. Where salt is used on icy walks, distribute it sparingly and sweep up residual salt after walks have dried.
- Use snow shovels and brooms to clean snow from historic paths and walkways. Avoid blade-type snow removers as they may chip or abrade cobblestones, brick, or stone paving. Note that use of steel snow removal tools in areas where salt-containing snow melters are used may result in rust staining from steel fragments left on the paving.

Conclusion

Maintenance is the most important preservation treatment for extending the life of a historic property. It is also the most cost effective. Understanding the construction techniques of the original builders and the performance qualities of older building materials, using traditional maintenance and repair methods, and selecting in-kind materials where replacements are needed will help preserve the building and its historic character.

Maintenance can be managed in small distinct components, coordinated with other work, and scheduled over many years to ensure that materials are properly cared for and their life span maximized. A written maintenance plan is the most effective way to organize, schedule, and guide the work necessary to properly care for a historic building. The maintenance plan should include a description of the materials and methods required for each task, as well as a schedule for work required for maintenance of different building materials and components.

Historic house journals, maintenance guides for older buildings, preservation consultants, and preservation maintenance firms can assist with writing appropriate procedures for specific properties. Priorities should be established for intervening when unexpected damage occurs such as from broken water pipes or high winds.



Figure 17. Extending downspouts at their base is one of the basic steps to reduce dampness in basements, crawl spaces and around foundations. Extensions should be buried, if possible, for aesthetics, ease of lawn care, and to avoid creating a tripping hazard. Photo: NPS files.

Worker safety should always be paramount. When work is beyond the capabilities of in-house personnel and must be contracted, special efforts should be made to ensure that a contractor is both experienced in working with historic buildings and utilizes appropriate preservation treatments.

A well-maintained property is a more valuable property and one that will survive as a legacy for generations to come.

Endnotes

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THE SECRETARY
OF THE INTERIOR'S
STANDARDS FOR
THE TREATMENT
OF HISTORIC
PROPERTIES

WITH
GUIDELINES FOR
PRESERVING,
REHABILITATING,
RESTORING &
RECONSTRUCTING
HISTORIC
BUILDINGS



U.S. Department of the Interior
National Park Service
Technical Preservation Services

INTRODUCTION

Using the Standards and Guidelines for Preservation, Rehabilitation, Restoration, and Reconstruction Projects

The Secretary of the Interior's Standards for the Treatment of Historic Properties address four treatments: preservation, rehabilitation, restoration, and reconstruction. As stated in the regulations (36 CFR Part 68) promulgating the Standards, "one set of standards ...will apply to a property undergoing treatment, depending upon the property's significance, existing physical condition, the extent of documentation available, and interpretive goals, when applicable. The Standards will be applied taking into consideration the economic and technical feasibility of each project." These Standards apply not only to historic buildings but also to a wide variety of historic resource types eligible to be listed in the National Register of Historic Places. This includes buildings, sites, structures, objects, and districts.

Guidelines, however, are developed to help apply the Standards to a specific type of historic resource. Thus, in addition to these Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings, there are also guidelines for cultural landscapes, historic lighthouses, historic vessels, historic furnished interiors, and historic covered bridges.

The purpose of *The Secretary of the Interior's Standards for the Treatment of Historic Properties and Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings* is to provide guidance to historic building owners and building managers, preservation consultants, architects, contractors, and project reviewers prior to beginning work. It is always recommended that preservation professionals be consulted early in any project.

The Guidelines are intended as an aid to assist in applying the Standards to all types of historic buildings. They are not meant to give case-specific advice or address exceptions or unusual conditions.

They address both exterior and interior work on historic buildings. Those approaches to work treatments and techniques that are consistent with The Secretary of the Interior's Standards for the Treatment of Historic Properties are listed in the "Recommended" column on the left; those which are inconsistent with the Standards are listed in the "Not Recommended" column on the right.

There are four sections, each focusing on one of the four treatment Standards: Preservation, Rehabilitation, Restoration, and Reconstruction. Each section includes one set of Standards with accompanying Guidelines that are to be used throughout the course of a project.

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project. However, new exterior additions are not within the scope of this treatment. The Standards for Preservation require retention of the greatest amount of historic fabric along with the building's historic form.

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values. The Rehabilitation Standards acknowledge the need to alter or add to a historic building to meet continuing or new uses while retaining the building's historic character.

Restoration is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project. The Restoration Standards allow for the depiction of a building at a particular time in its history by preserving materials, features, finishes, and spaces from its period of significance and removing those from other periods.

Reconstruction is defined as the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location. The Reconstruction Standards establish a limited framework for recreating a vanished or non-surviving building with new materials, primarily for interpretive purposes.

The Guidelines are introduced with a brief overview of the primary materials used in historic buildings; the exterior and interior architectural features and systems; the building's site and setting; code-compliance requirements regarding accessibility and life-safety resilience to natural hazards; sustainability; and new additions and related new construction. This overview establishes the format of the Guidelines that follow.

Choosing an Appropriate Treatment for the Historic Building

The Guidelines are intended to promote responsible preservation practices that help protect the nation's irreplaceable cultural resources. For example, they cannot, in and of themselves, be used to make essential decisions about which features of the historic building should be saved and which can be changed. But, once a treatment is selected, the Standards and Guidelines provide a consistent philosophical approach to the work.

Choosing the most appropriate treatment for a building requires careful decision making about a building's historical significance, as well as taking into account a number of other considerations:

Level of Significance. National Historic Landmarks, designated for their "exceptional significance in American history," and other properties important for their interpretive value may be candidates for *Preservation* or *Restoration*. *Rehabilitation*, however, is the most commonly used treatment for the majority of historic buildings. *Reconstruction* has the most limited application because so few resources that are no longer extant can be documented to the degree necessary to accurately recreate the property in a manner that conveys its appearance at a particular point in history.

Physical condition. *Preservation* may be appropriate if distinctive materials, features, and spaces are essentially intact and convey the building's historical significance. If the building requires more extensive repair and replacement, or if alterations or a new addition are necessary for a new use, then *Rehabilitation* is probably the most appropriate treatment.

Proposed use. Many historic buildings can be adapted for a new use or updated for a continuing use without seriously impacting their historic character. However, it may be very difficult or impossible to convert some special-use properties for new uses without major alterations, resulting in loss of historic character and even integrity.

Code and other regulations. Regardless of the treatment, regulatory requirements must be addressed. But without a sensitive design approach such work may damage a building's historic materials and negatively impact its character. Therefore, because the ultimate use of the building determines what requirements will have to be met, some potential uses of a historic building may not be appropriate if the necessary modifications would not preserve the building's historic character. This includes adaptations to address natural hazards as well as sustainability.

Incentives for Historic Preservation

Rehabilitating historic properties conserves taxpayers' dollars, conserves our local heritage, and conserves the natural environment. Rehabilitating historic buildings and using the infrastructure that is already in place to serve them is the height of fiscal and environmental responsibility.

-Donovan Rypkema, Place Economics

There are at least five measures that municipal leadership, local stakeholder groups, and historic district commissions can take to encourage historic preservation: providing incentives, imposing regulations, providing help and support to those engaged in preservation, and for preservation itself, educating the public through preservation advocacy.

An incentive is a benefit given to someone in order to encourage a person to do something specific. There are several kinds of incentives that can be used to encourage historic preservation, most of them are desirable because they offset the cost of investment in historic building rehabilitation.

Tax Incentives

Tax incentives are methods of reducing taxes for businesses and individuals in exchange for specific desirable actions or investments.

They can come in three forms:

1. Tax credits: the money you spend on historic preservation, or some fraction of it, is a reduction subtracted from the taxes you that you have to pay.
2. Tax deductions: a percentage of the money you spend on historic preservation is subtracted from your tax amount.
3. Tax abatement: the branch of government imposing the tax simply allows you not to pay all, or some fraction, of your taxes, usually for a limited period of time.

Any of these tax breaks could be provided by the federal, state, or local government.

Federal Historic Preservation Tax Incentives Program

The Federal Historic Preservation Tax Incentives program is administered by the National Park Service, Technical Preservation Services and encourages private sector investment in the rehabilitation and re-use of historic buildings. This program is only for business or other income-producing purpose (i.e., a bakery, multi-family housing, a brewery, an office complex). It creates jobs and is one of the nation's most successful and cost-effective community revitalization programs.¹ The federal government, for example, offers a Historic Preservation Tax Credit of up to 20% (i.e., a credit equal to 20% of the money spent on preservation) for the rehabilitation, restoration, or preservation of a historic building. To be eligible for the credit, the building has to be a certified historic structure, and the work on it also has to be certified as historically accurate and as following the Secretary of the Interior's Standards and Guidelines for Historic Rehabilitation. A certified historic structure is a building that is listed individually in the National Register of Historic Places or is a building that is located in a registered historic district and certified by the National Park Service as contributing to the historic significance of that district.

Financing Historic Preservation

There are limited dedicated sources of funding for historic preservation activities, communities, and not-for-profit organizations seeking to finance their historic preservation efforts need to be creative and resourceful.

Sources of funding include:

- » A community's capital revenue. This may be easily implemented through a facade improvement program as part of the Downtown Development Authority.
- » Grants from federal, state, and nonprofit programs. The Michigan Economic Development Program has specific grant programs that are strategically aligned with historic preservation efforts.
- » Private donations, organizational membership fees, and corporate contributions.
- » Income raised through special assessment districts such as a business improvement district or local "Main Street" program.
- » Revolving loan funds (which can be capitalized in many ways).
- » Tax credits, rebates, and abatements (federal, state and local).
- » Incentives such as grants, loans, and design assistance, for property owners and businesses.
- » Special fundraising and promotional events or programming.

Michigan State Historic Tax Credit Program

Public Act 343 of 2020 was signed into law by Governor Whitmer on December 30, 2020 and established the new State Historic Tax Credit Program. The State Historic Tax Credit Program is administered by the State Historic Preservation Office and will help support place-based projects while promoting the preservation of Michigan's historic resources. This program is for business or other income-producing purpose and private residences (i.e., commercial/retail/mixed-use properties and homeowner-occupied residences). The newly reinstated program offers a historic preservation tax credit of up to 25% (i.e., credit equal to 25% of the money spent on preservation) for the rehabilitation, restoration, or preservation of a historic residential or commercial building. Michigan's State Historic Tax Credit Program follows closely that of the federal historic preservation tax incentives program in that to be eligible for the credit, the building has to be a certified historic structure, and the work on it also has to be certified as historically accurate and as following the Secretary of the Interior's Standards and Guidelines for Historic Rehabilitation.

Combined Federal and State Tax Credits

Both the federal and state historic tax incentive programs are expected to be enabled once the framework for the state program is established and applications can be accepted. These programs can be layered with other federal and state incentives and utilized together on the same historic rehabilitation project.

New Market Tax Credit Program

Administered by the U.S. Department of the Treasury, Community Development Financial Institutions Fund, the New Market Tax Credit Program addresses real estate issues in low-income communities that experience a lack of investment, as evidenced by vacant commercial properties, outdated manufacturing facilities, and inadequate access to education and healthcare service providers. The New Market Tax Credit Program aims to break this cycle of disinvestment by attracting the private investment necessary to reinvigorate struggling local economies.²

Local Historic Preservation Incentives

Local incentives are often driven by local community and economic development organizations such as the Downtown Development Authority. Local incentives are designed by and for individual communities to encourage specific rehabilitation programs. These incentives can supplement the federal and state historic tax incentive programs and often apply to projects not eligible for the credits. Matching grants are one of the most common local incentives. Grants may be given to eligible applicants for such things as façade renovations, exterior maintenance, new signage, and commercial space interior renovation. Grants are commonly matched with private funds in the range of 20% to 50%. Low-interest loans are another common local incentive. The loans are given at a reduced interest rate, typically 2 to 5 points below prime. Eligible properties and projects are similar to those of matching grants. Low-interest loans can be given on a matching basis or have a cap on the low-interest portion.

Local governments often have resources available to provide incentives such as grants, low-interest loans, and public investment incentives. The programs can be administered much like any other local incentive program. Grants and low-interest loans can be funded from special taxes or economic development districts. Tax Increment Financing Authority (TIFA) and an additional local incentive program is a Special Service Area (SSA) taxing districts are common funding sources. SSAs collect a special tax on properties in the district. The monies collected must be reused to improve the district in which they were collected.

Other communities have been designated as state or local economic development or empowerment zones that can provide for financial incentives for district improvements. Some cities have offered public improvements as incentives. For example,

if a property owner invests a certain amount in a façade renovation, the city will agree to replace sidewalks, add pedestrian amenities, or make improvements in the alley next to the building. Another incentive for building improvements is a property tax freeze on renovated buildings for a specified number of years.

Local governments can offer developers or businesses such things as permit waivers (i.e., permission to bypass a regulation or piece of the building code), exceptions to particular regulations in return for certified preservation work, or density bonuses (e.g., permission to turn a historic building into a multi-unit residence in an area zoned for single-family housing).

Governments or organizations might also offer subsidies for bringing old buildings up to code in a historically appropriate manner – e.g., installing insulation without damaging either inside or outside walls. Areas that might be addressed here include wiring, plumbing, heating/air conditioning, energy conservation, lead paint or asbestos removal, and compliance with ADA (Americans with Disabilities Act) requirements.

Easements

Easement programs offer incentives to both property owners and municipalities. When donating a historic preservation easement to a governmental entity or nonprofit organization, property owners are allowed a tax deduction for a charitable contribution on their federal income tax return. The city, meanwhile, is provided a low-cost mechanism for protecting historic properties from demolition and neglect and keeping the property on local tax rolls.

With the donation or sale of a historic preservation easement, a property owner gives away certain property rights, usually the ability to alter the exterior façade of the property without permission from the easement holder. Some easement programs, however, are focused on protecting the historic interior of a property and/or the land surrounding the structure. The easement holder can be a city government, nonprofit organization, or quasi-governmental organization. In order to take advantage of the federal income tax deduction, property owners must donate the easement in perpetuity to a qualified organization for conservation purposes. In addition, the property must be listed in the National Register of Historic Places or be a contributing structure in a National Register Historic District.³

State Government Incentives

Michigan Economic Development Corporation

The Michigan Economic Development Corporation offers grants and loans to redevelop Michigan's downtowns and foster historic preservation. By encouraging a compact mixture of uses and walkable urban fabric, we decrease the impact of sprawling development and efficiently utilize infrastructure. This development promotes

environmentally and fiscally sustainable environments that attract talent and business and keep our youth here.

Additional Programs through the Michigan Economic Development Corporation:

- » **Revitalization and Placemaking Program:** The Revitalization and Placemaking Program is an incentive program that will deploy \$100 million in American Rescue Plan funding to address the COVID-19 impacts in Michigan communities. This program will provide access to real estate and place-based infrastructure development gap financing through grants of up to \$5 million per project for real estate rehabilitation and development, grants of up to \$1 million per project for public space improvements and grants of up to \$20 million to local or regional partners who develop a coordinated subgrant program. Eligible applicants are individuals or entities working to rehabilitate vacant, underutilized, blighted and historic structures and the development of permanent place-based infrastructure associated with traditional downtowns, social-zones, outdoor dining and place-based public spaces.⁴
- » **Michigan Community Revitalization Program:** Michigan communities have access to development gap financing with the Michigan Community Revitalization Program. The program promotes community revitalization through the provision of grants, loans, or other economic assistance for eligible projects located on properties that are either contaminated (facility), blighted, functionally obsolete or historic resources. The amount of support is determined by a needs analysis and funding commitments are expressed as a percentage of the Michigan Community Revitalization Program eligible investment basis. Applicants should explore all other sources prior to applying for Michigan Community Revitalization Program gap financing.⁵

Michigan State Historic Preservation Office

Jointly administered by the Michigan State Historic Preservation Office and the National Park Service, the Certified Local Government program provides an effective framework for promoting, supporting, and enhancing historic preservation activities at the local level. Through the Certified Local Government

program, communities partner with SHPO to plan for, protect, and tell the story of important historic places. In exchange, communities gain special access to exclusive grant funding opportunities, technical assistance from SHPO, and other benefits.⁶

Michigan Arts and Cultural Council

Administered by the Michigan Arts and Culture Council, these grants are for arts and culture organizations, cities and municipalities, and other nonprofit organizations ensure that every citizen and community in Michigan enjoys the civic, economic and educational benefits of arts and culture.⁷

Public Spaces Community Places

Local placemaking projects through crowdfunding, access to matching grants, and hands-on project coaching. The Michigan Economic Development Corporation, in conjunction with Detroit-based crowdfunding platform Patronicity and in partnership with the Michigan Municipal League, has developed “Public Spaces Community Places”, a creative placemaking and funding mechanism. Public Spaces Community Places program is a grant match program that utilizes donation-based crowdfunding to generate public interest and funding to revitalize or create public spaces. By utilizing web-based donations, projects are accessible to anyone willing to donate in real-time. This model we call Crowdgranting engages the public as each person plays a part in achieving place-based improvements and instills community pride as residents become invested in their surroundings.⁸

Michigan State Housing Development Authority

The Michigan State Housing Development Authority administers the federal Low Income Housing Tax Credit Program in Michigan according to a Qualified Allocation Plan. There are application deadlines and competitive scoring. Over 20,000 affordable apartments have been assisted in the state using this incentive for private owners of affordable rental housing.⁹ The Low Income Housing Tax Credit Program is an investment vehicle created by the federal Tax Reform Act of

1986, which is intended to increase and preserve affordable rental housing by replacing earlier tax incentives with a credit directly applicable against taxable income. Administered in Michigan by the Michigan State Housing Development Authority, this program permits investors in affordable rental housing who are awarded the credit – corporations, banking institutions, and individuals – to claim a credit against their tax liability annually for a period of 10 years. The Low Income Housing Tax Credit is a program that works favorably with historic preservation rehabilitation activities.¹⁰

Michigan Department of Transportation

Transportation Alternatives Program grants:

Administered by the Michigan Department of Transportation, these grants are aimed at transportation enhancement, they can involve the restoration or rehabilitation of historic transportation facilities and/or properties (railroad or subway stations, gas service stations), work on historic roads or bridges, or preservation work associated with widening or improving streets in historic neighborhoods.¹¹

The Michigan Historic Preservation Network

There are two programs through the Michigan Historic Preservation Network that aid in the restoration and rehabilitation of historic buildings.¹²

- » **The Predevelopment Loan Fund:** The Michigan Historic Preservation Network Predevelopment Loan Fund provides financial support for projects rehabbing historic buildings in Michigan. The loan fund covers reasonable third-party costs that occur in the early stages and are necessary in making the project happen.
- » **The Preservation Fund - Intervention Loan Fund:** The Michigan Historic Preservation Network Preservation Fund-Intervention Loan Fund provides low interest loans for repairs to historic buildings. The primary aim of this program is to stabilize historic properties that are threatened by one or more failures of major building systems. Further, this program is designed to align with, and support, other more comprehensive efforts to rehab the building.

Grants and loans

Government offices at all levels, private organizations, and foundations offer grants for various kinds of preservation activities, or for the preservation of specific kinds of structures or properties.

- » **Historically significant properties.** These are structures or properties that are directly connected to specific historic events or figures.
- » **Scenic byways.** These are secondary roads, often with historic interest. Work on them may entail restoration of historic landscapes and buildings, or of the historic road surface itself (original paving material, for instance).
- » **Heritage areas.** As mentioned earlier, the federal government recognizes 27 National Heritage Areas. In addition, many states also recognize and support heritage areas of various kinds, most connected to the economic and social history of the region.
- » **Tribal properties.** Native American areas often contain historic structures or landscapes, as well as burial grounds and other features related to the cultural heritage of the people living there.
- » **Miscellaneous federal grants.** Among others, there are specific federal grants for preserving battlefields, historic barns, covered bridges, maritime heritage sites, and underground railroad sites.
- » **Grants for Houses of Worship.** To ensure that America's sacred places continue to serve their communities' material and spiritual needs, the National Trust for Historic Preservation has joined Partners for Sacred Places and the Lilly Endowment to establish the National Fund for Sacred Places.¹³
- » **Grants for African American Cultural Heritage Fund.** The National Trust for Historic Preservation launched its African American Cultural Heritage Action Fund, a preservation campaign to preserve and protect places that have been overlooked in American history and represent centuries of African American activism, achievement, and resilience. Through this preservation effort—the largest ever undertaken in support of African American historic sites—we partner with and empower Black and diverse communities to expand the American story.¹⁴
- » **Grants from foundations and non-profit organizations.** Many foundations and organizations exist specifically to raise and distribute money for historic preservation and related activities. The Jeffris Family Foundation, The 1772 Foundation, American Foundation, the National Park Service, the Kresge Foundation, the Mott Foundation, the National Trust for Historic Preservation, and the Michigan Architectural Foundation.