John Brown's Fort
Building 63
Harpers Ferry National Historical Park
Flood / Storm Recovery Project

Condition Assessment Report and Preservation Repairs
February 1998

Prepared by:
National Park Service
Historic Preservation Training Center
4801 A Urbana Pike / Gambrill House
Frederick, Maryland 21704
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1976 Construction Drawings 63
Partial Restoration of John Browns Fort
Drawing No. 385 / 25003 (DSC)
13 sheets, dated November 1978
Denver Service Center

1998 Preservation Treatment Drawings 76
Condition Assessment Report and Preservation Repairs
Drawing No. 385 / 80103 (NCR)
10 sheets, dated January 1998
Historic Preservation Training Center

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I. INTRODUCTION
D. Project Responsibilities

Donald Campbell, Superintendent, Harpers Ferry National Historical Park
Bruce Noble, Chief of Cultural Resources, Harpers Ferry National Historical Park
Tim Fox, Chief of Maintenance, Harpers Ferry National Historical Park
Bob Wilhide, Maintenance Supervisor, Harper Ferry National Historical Park
Peter Dessauer, Park Architect, Harpers Ferry National Historical Park
Tom McGrath, Superintendent, Historic Preservation Training Center
Doug Hicks, Assistant Superintendent, Historic Preservation Training Center
Tom Vitanza, Historical Architect/Project Supervisor, Historic Preservation Training Center
Chris McGuigan, Team Leader/Exhibit Specialist, Historic Preservation Training Center
Anthony S. Donald, Project Architect, Denver Service Center, Architecture

E. Compliance

The 106 compliance for flood/storm repairs to John Brown’s Fort, Harpers Ferry National Historical Park, Historic Structure # 63, are covered in a 1997 programmatic agreement between the park and the State Historic Preservation Officer in West Virginia.
II. EXECUTIVE SUMMARY
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The John Brown Fort has a number of problems which fall primarily into the categories of masonry, carpentry and millwork, all of which all can be addressed and corrected through the use of in-house preservation and maintenance staff. While there are no critical fabric or structural issues that fall into a life safety concern, the current conditions will accelerate if left untreated, and may become a hazard if not corrected.

The major areas of masonry deterioration fall into two zones. The first zone is at the base of the structure. The stone water table and the fifteen courses (plus or minus) of brick above the water table have been subject to numerous submersions by the rising rivers of the Shenandoah and the Potomac. The mortar joints in the stone water table are for the most part non existant and need replacement, while the mortar joints for the brick are extremely soft and can be raked out without much effort. The mortar joints for the entire lower portion of the building should be raked out and repointed. It is recommended that a more moisture resistant mortar be used at the lower courses to help prevent deterioration when future flooding does occur. The other masonry repair zone is at the top of the end walls of the structure. The two gable end walls form a parapet wall, above the roof line, that is exposed to the elements on both sides. The soft brick combined with freeze/thaw cycles has caused these areas to deteriorate at a faster rate. It is recommended that these gable end parapet walls be raked out and repointed on both sides, and the cap stone be reset and repainted. The outer side of the walls should be repointed down to the brick band course. As with the lower portion of the structure it recommended that a denser, more moisture resistant mortar be developed for use at these locations that will be less susceptible to future deterioration.

The carpentry and millwork items that require attention are defined as doors, windows, and the cupola. While the structure of the cupola appears to be sound the trim work needs attention. The current millwork for the cupola dates to the 1970’s preservation effort and has no historic integrity; this, combined with numerous trim being rotted, open joints at trim where water can penetrate, and the somewhat difficult access for maintenance, leads to the recommendation that the majority of the millwork be removed and replaced, and the entire structure be painted. As for the doors and windows the majority of damage is at the lower levels which have been subject to flooding, moisture, and insect infestation. The main areas of concern being the door frame at the east end of the north elevation, the sash adjacent to this door, and the window sill at the north end of the east elevation. These areas will require the removal and replacement of various millwork components.
It is also recommended that the cut firewood that is stored against the east elevation be moved away from the building, as this provides a good breeding point for wood boring insects. While certain areas may require temporarily removing the item from the building for shop based repairs, some of the repairs may be more readily accomplished in place.

The sheet metal gutters and downspouts have been damaged over the years by severe snow and ice storms. The gutters and downspouts were both constructed of very short sections of lead coated copper which provides the potential for leaks at each joint. While it is assumed that the short sections were used to simulate that which may have been historically correct it does create a maintenance problem. It is recommended that the gutters and downspouts be replaced, and that additional gutter and downspout brackets be fabricated and installed to provide additional support in the event of future heavy snows and ice.

The slate roof appears to be in very good condition. Several slates will need to be replaced and the flashing at the cupola will need to be investigated and corrected when the trim at the base is replaced. When viewing the underneath side of the roof from the interior, the framing and sheathing also appears to be in very good condition; it does not appear that the roof is leaking.

The drawings which are provided as a basis for the recommended repairs are those which were developed for the ca. 1976 repair effort. While the doors and windows are relatively straightforward in their design, the cupola framing may or may not have been constructed as noted on the drawings. Extra care should be taken with this feature when the work is accomplished.
III. BRIEF CHRONOLOGY
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1848  The engine/guard house of the armory was designed and constructed under the supervision of Major Symington.

1859  John Brown storms the Armory and siezes the Engine House.

1891  Building sold to the John Brown Fort Company, the structure was dismantled and shipped to the Columbian Exposition in Chicago.

1893  Building open to the public at the Columbian Exposition in Chicago.

1895  The building was moved to the Murphy farm which overlooked the Shenandoah River near Harpers Ferry. (dimensions of the structure, along with several smaller details were modified during its rebuilding, and the current structure in lower town reflects the changes made at this time.)

1910  Trustees of Storer College bought the building from Mr. Murphy for $900 and had it moved to the college campus.

1958  While at Storer College, the building was recorded by the Historic American Buildings Survey (HABS)

1968  The National Park Service acquires the college campus and the building was moved to its current site in the lower town of Harpers Ferry National Historical Park. It is felt that the block foundation was installed at this time.
1976 Construction documents prepared for repairs to the structure which were to be accomplished by day labor crews under the direction of the National Park Service, Denver Service Center.
IV. EXISTING CONDITIONS
IV. EXISTING CONDITIONS

General

The current site location of John Brown's Fort is the fourth in its history. The original site is located within several hundred feet, to the north-west, of the current structure and is marked with a small obolisk shaped monument.

The structure itself is brick masonry that is laid in a common bond pattern. Over the various reconstructions, the pattern has been broken and is somewhat inconsistent. The brick work sits on a dressed stone water table. The building falls into the category of Federal style architecture.

Site

While true north would orient the fort towards the short dimensions of the end wall which parallels Shenandoah Street, the last two sets of drawings produced of the

building orients the structures north to the long dimensions such that the main elevation, with all the entrance doors, is now designated as the north elevation of the fort. In order to provide continuity of previous work at this site, this report will keep the buildings north elevation as the long elevation which will also be considered the primary elevation.

The site can be accessed from all compass points with the main route being from Shenandoah Street. The grade from the roadway leading to the point where the Potomac and Shenandoah Rivers meet, on the north side of the structure, is the most accessible for handicapped individuals from a grading standpoint. The interior floor elevation of the building is approximately five to ten inches above the exterior grading and does not provide access under the Uniform Federal Accessibility Standards (UFAS) or the Americans with Disabilities Act (ADA). For the most part the grade does slope away from the building on all elevations except on the south. On the south elevation a small depression, directly adjacent to the water table of the building, creates a small swale that allows water from the downspouts to be trapped against the masonry rather than being directed to the lawn area adjacent to this elevation.

North Elevation

The top of the dressed stone water table, at grade level, varies from five to ten inches above the surrounding grade. The mortar joints for the stone have deteriorated over time and for the most part the mortar is nonexistent. The brick masonry above the water table was laid in a common bond pattern, but the header courses vary from every seventh to eighth course, and in some areas there are no header courses but just running bond. The damage to the lower fifteen courses of brick focuses around the deteriorated mortar and can be attributed to the severe flooding that has inundated the building over the last several years, and to a possible rising damp situation.

This elevation proper can be broken into three bays, each designated by a brick arch outlined by a soldier course of brick. The upper portion of each bay is infilled with a semi-circular window sash from the spring line of the arch, and a door from the spring line to the ground. The elevation measures approximately 34'3" in length with each masonry opening measuring approximately 8'-0" wide; this leaves the brick piers at the corners and between bays at 2'-6". The pair of double-sheave doors in the center (D102) and western (D103) bays are similar in design and construction; they are 1" thick (actual) vertical tongue and groove board on the exterior and 1' thick (actual) diagonal tongue and groove on the interior. The door on the eastern end of this elevation (D101) is also constructed of tongue and groove boards but it is a single double-sheave door that

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measures 3'-10" by 8'-3" and it is centered between two glass side lights which are approximately 1'-10" by 5'-0"; the bottom portions of the side lights being a flush wood panel. While the large pair of double doors have minimal damage at the bottom portions of each leaf, the single door and frame with its associated side lights has seen more drastic decay from both moisture and insect infestation. It should be noted that the interface between all of the door and window frames and the masonry openings are/were filled in with mortar which has failed and allowed moisture to get behind the frames and rot the wood out from behind. Another issue that was noted is the glazing at the window sash; over the years the glazing compound between the glass and the wood has become brittle and cracked; this creates another place for water intrusion and eventual decay of the window components. It appeared that approximately 50% of the glazing compound is in this condition.

South Elevation

The south elevation is a mirror image of the north except that the lower portions of each bay do not have doors but are filled with recessed brick masonry. The same issues exist relative to the masonry. The mortar at the joints in the stone water table is missing and the fifteen courses of brick masonry above the water table have extremely soft mortar joints that can be attributed to high water levels during flooding events and possibly rising damp. In addition to the soft mortar the lower five courses of brick have moss and lichen growth which is contributing to the deterioration of both brick and mortar.

The semi-circular window sash at each bay are divided into four sections (see diagram), and as on the north elevation approximately 50% of the glazing compound has become brittle and cracked which will lead to future deterioration of the window components if not corrected. The only rot noticed on these windows was at the western
end of the eastern window (W108), the bottom rail at this end needs to be replaced. It was also interesting to note that the wood sills for these windows (WT106, WT107, WT108), which appear to be replacements (ca. 1976), do not have a drip edge cut into the underneath side which would help to keep water from running back under the sill and to the building.

**East Elevation**

The east elevation measures 22’-3” in length, and is divided into two bays. An in-swinging casement window is located in the center of each recessed bay. The windows are divided into two sash with each sash having twelve lights which are 9/11. The window sill on the north end (W110) has a combination of rot and insect damage at the right end. The end returns of both window sills have separated from the brick and have left gaps for water to penetrate into the end grain and accelerate deterioration and rotting. The window on the south end (W109) has rotted at the bottom rail and it is suspected that the rot has also effected the bottom of the side rails and the pins holding the sash together. The pins holding the bottom and side rails together on the north window are also loose; a closer look at this sash may also reveal deterioration that will require additional replacement. As was also noted on the window sills of the south elevation, the sills do not have a drip edge cut into the underneath side which would help prevent water from rolling under the sills and to the wall.

This elevation had a stack of cut wood piled 1-1/2'-2’ high adjacent to the masonry. This does not allow for the masonry to dry out properly and is a breeding ground for wood boring insects.

The mortar joints of the stone water table have deteriorated as have the fifteen course of brick masonry above the water table. Here again water from past flooding has taken its toll. The end walls of this elevation extend up above the roof line and form a crenelated gable wall that is capped by stone. The corbeled brick at the eave line of the north and south elevation carry around this elevation in a brick band which falls about four courses above the brick arches. The area above the band to the stone cap acts, for the most part, as a parapet wall and the mortar is in very poor condition. The joints for the stone cap are also in poor condition, and the cap stone itself may need to be removed and reset.

*John Brown Fort / Flood - Storm Recovery Project / Condition Assessment Report and Preservation Repairs / February 1998*
West Elevation

The west elevation mirrors the east except for the window configuration. The windows in the two bays on this elevation are the semi-circular ones that are typical of those found on the north and south elevations with a blank recessed brick panel below.

The deteriorated joints in the stone water table, and the ten-fifteen courses of brick masonry above the water table are similar to those found at all the other elevations. The lower two to three courses of brick have moss and lichen growth that allows for excessive moisture to be trapped within the soft brick. A marble marker located in the pilaster to the north side of this elevation shows signs of minor vandalism with a mark of "H". The four iron pins holding the slab in place have started to rust and are just beginning to stain the stone. The crenelated gable wall shows the same signs of deterioration as the east elevation, and is in poor condition. The cap stone joints are also in poor condition, and here again, the stone may need to be removed and reset.

The wood sash in both bays appears to be in good condition except for one piece of glass that is broken on the north window (WT104). The glazing compound around the glass is cracked and brittle on approximately 50% of both windows (WT104/WT105).

Roof and Cupola

The roof is covered with slate and is a uniform 9” width with an exposure of 6” - 6-1/2” to the weather. Due to the uniform gray coloration it is possible that the source of the slate may be from the Buckingham-Virginia Slate Corporation in Arvonia, Virginia. The schedule of their standard roofing sizes indicates that with a 6 1/2” exposure and a 9” width, the length of the slate would be 16”. The standard thickness of 3/16” also conforms to that which is on the building. The ridge is overlapped to the north approximately 2”. There are several broken or split slate but the overall condition of this roof is very good.

The gutters and downspouts are located on the eave lines of the north and south elevations. The lead coated copper gutter is a half round that is 6” wide that was fabricated in short sections of 1’-8” and soldered together. The high point of the gutter is at the center of the building and slopes down to both east and west ends to a 3” diameter lead coated copper downspout. The gutter is supported by nine mild steel gutter pins that are driven into the brick joints at the corbeled eave line. The gutter itself is quite wavy but it appears that it is sloped properly. It was not water tested so it is unclear as to the water tightness of the joints. The downspout is also constructed in short sections of 2’-4”
and is also quite wavy; three straps hold the gutter tight against the structure with a wood block at the base to hold it out from the water table.

The woodwork on the cupola shows the most signs of distress. The most noticeable locations for rot are highlighted with a black fungal mold; this includes the crenelated trim at the upper roof and the railings at the lower portion of the cupola. At some point in the last twenty years it appears that the 1” x trim boards which cover the corner posts were cut approximately 2’ above the metal deck and replaced on all four columns. The joints have opened up and it now presents a place for water to be caught. The trim at the top of the column on the south east corner was either built with a slight slope or it has settled. The joints on the majority of trim have opened and allow for moisture penetration and eventual rot. The flat seam roof at the lower deck appears to be in good condition except for a small separation at one seam towards the center. The upper roof could not be accessed with the lift and was not investigated at this time. The tongue and groove siding that forms the base of the cupola is rotting through at the bottom boards that are adjacent to the roof surface; it appears that there may not be enough space between the roof slate and the bottom boards and when snow and ice builds up at this point it gets trapped and wicks into the wood. It will also be necessary to look at the flashing details at this area to ensure that it is properly flashed.

**Interior**

The structure is divided into two rooms on the interior, with the dividing wall between the spaces being constructed of brick. The two bays containing the pairs of doors open into the larger space while the smaller space, on the east end, is accessed through the single door with the sidelights.
The floor in both areas is brick, laid in a basket weave pattern, in what appears to be a sand setting bed.

The wood members of the roof structure are exposed to the space below and appear to be in very good condition. The slight green tint to the members implies that the wood maybe pressure treated. There was no obvious signs of any roof leaks.

The two pairs of doors into the large space are missing small diagonal pieces at the base of the doors. The wood nailing block on the west end of the brick pier to the center bay has pulled away from the masonry. The single door and sidelights have not withstood the flooding and insect infestation as well, and the lower portion of the door and frames are in poor condition, as are portions of the frame and stops for the sidelights.
V. PRESERVATION TREATMENT RECOMMENDATIONS
V. PRESERVATION TREATMENT RECOMMENDATIONS

Site

Provide universal access at the north elevation entry. Minor regrading and the addition of five to ten inches of additional fill can be installed to provide an earthen “ramp” to entry level by raising the ground level. This will also provide additional positive drainage at the north elevation of the building. A slope of between 1:10 and 1:12 is recommended by CABO/ANSI A117.1-1992; accessible and usable buildings and facilities; (a slope of 1:6 is permissible for a run up to 2 feet). Regrade to achieve the lowest possible slope, a 1:12 to 1:20 is the preferable range for exterior grading, see preservation brief # 36.

Site drainage will be improved with minor regrading at all elevations to create positive drainage. Other options for improving site drainage include extending the downspout ground leaders so the discharge is more than 18” from the base of the building.

Masonry

The dressed stone water table, at grade level, should be excavated to the bottom of the stone and the joints raked out and repointed. The 1976 construction drawings indicate that the water table was built on top of a concrete block foundation wall that should be just below the existing grade level. The stone itself appears to be approximately one foot in depth and the existing grade should be approximately 6” to 1’-0” above the bottom of the stone.

The first fifteen courses of brick should have the mortar joints raked out and repointed around the entire perimeter of all the walls both on the interior and the exterior. The soft mortar can be easily removed by hand tools. It is recommended that the replacement mortar be a mix that is more water resistant than the existing material.

The brick joints on the east and west end walls should be raked out and repointed from the brick band to the stone cap on the exterior and from the roof line to the stone cap on the interior. Here again it is recommended, that since this area is more susceptible to freeze thaw cycles, that a more durable mortar mix be utilized than what is currently in place.
The stone forming the cap of the walls on the east and west elevations should be removed and reset. It is also recommended that the center chimney feature on these elevations be provided with a mortar wash that is slightly sloped, as not to be seen from the ground, to help facilitate water run off at these areas. Another approach would be to cap the chimneys with a sheet metal hood.

The marble inset on the north end of the west elevation should be cleaned of the rust stains that are forming due to the erosion of the steel pins that help to keep it in place. A poltice may need to be used to lift the graffiti stain. The steel pins should be removed and replaced with a non staining material such as stainless steel.

Windows

The semi-circular windows on the north, south, and west elevations are for the most part in good condition. While only two broken panes of glass need to be replaced, one the west elevation (WT104) and one on the north (WT102), the glazing compound for a large percentage of the windows is beginning to crack and peel. While this may not present an immediate problem, it is recommended that while the other work on the structure is being accomplished the deteriorated compound be removed and replaced to ensure long term durability of the window components.

It is estimated that this repair work is needed over 30% - 40% of the existing window area. The western most half of the bottom rail at the east window on the south elevation (WT108) is rotted and needs repair. If this cannot be removed easily, it is recommended that epoxy repairs be done in place. A similar condition exists on the two end bottom rails of the center window on the north elevation (WT102); this may also be a window to repair in place. It is also recommended that the wood sills of all semi-circular windows on the south and west elevations have a drip edge cut into the underneath side of the sill (kerf cut).

The casement windows on the east elevation (W109/W110) should both be removed and repaired. The most serious work is the replacement of the wood sill on the north end of this elevation. The sash itself, on both windows, needs repair to the bottom rails, and all pin joints should be verified and reglued or replaced as necessary. As with the semi-circular windows, the casement window sills need to have a drip edge cut on the underneath side. It is also recommended that approximately 30% of the window panes be reset with new glazing compound.
The interface between the wood frames and trim on the windows and the brick masonry were filled with mortar. While some of the mortar has withstood the test of time, a number of areas have failed allowing water to penetrate behind the trim to the frame. A decision needs to be made as to the benefit of replacing these intersecting planes with a sealant rather than mortar.

Doors

The two pairs of double sheave doors at the center (D102) and west (D103) bays are in relatively good condition. The center doors are missing two small diagonal boards at the lower corners where the doors intersect when in a closed position. It is recommended that these boards be replaced. While not noted on the field notes it would be wise to run some additional material for similar replacement on the other door. A nailing block, which is located the left hand side of the interior, for this center door, has pulled loose from the brick and needs to be reset. The left hand leaf of the door will need to be removed to relieve the pressure on the frame while this work is accomplished.

The single door (D101) and sidelights (DSL1/DSL2) are in poor condition. It is recommended that the entire unit be removed for repairs. This recommendation is based on the fact that the frame on the east end of this opening is rotted up to a height of 8'-2" and repairs need to be made to the door frame, door, flat panels below the lights, the bottom rails of the sidelights, and the window stops.

Roof

The slate roof is in very good condition. It appears that there are less than a dozen broken slate that will need to be replaced. It is recommended that the broken slate be removed and replaced. Further investigation is necessary to determine the flashing details at the intersection of the slate roof and the base of the cupola. The flat metal seam roof that covers the cupola could not be accessed but if the floor deck of the cupola is an indicator of condition, it is probably in good condition. The flat metal seam roof that covers the floor deck may have one small seam in the center that needs to be cleaned and resoldered.

It is recommended that the 6" half round gutters on both the north and south elevations be replaced with lead coated copper that is fabricated in longer sections. It is also recommended that additional gutter brackets be placed on both elevations to provide additional support to the gutter. The 3" diameter downspouts should also be replaced with lead coated copper in longer lengths.
Cupola

The appearance of the cupola, from ground level, would lead one to believe that this feature is in relatively good condition, but a closer inspection indicates that 75%-80% of the millwork needs to be replaced. The railings on all the elevations need to removed and replaced. The trim boards facing the columns have been repaired and all the joints have opened at the repairs; it is recommended that all of the 1” x trim boards on all four columns be removed and replaced for the full length of the columns. The horizontal siding boards, between the floor and roof, have started to rot at the bottom; it is recommended that all of these boards as well as the corner boards at this area be removed and replaced. The crenelated wood trim at the roof level could not be accessed, but signs of mold on the surface indicates that these features need attention; it is recommended that the crenelated trim boards be removed and replaced.

The only areas of the cupola that do not appear to need attention are the decorative brackets, the cornice they are attached to, and the underneath side of the roof. It is assumed that the structure of the cupola will be in good condition when the trim is removed but this will need to be verified when the work is being accomplished. The other area of concern that needs to be investigated, when the trim boards on the columns are being removed, is the top of the south-west column, which appears to be tilting inward. A decision on what is causing the problem and a recommendation will need to be determined in the field.
VI. PRIORITIZED TREATMENT RECOMMENDATIONS
VI. PRIORITIZED TREATMENT RECOMMENDATIONS / WORK TASK LIST

1. Doors and Windows (including painting)
   
   A.) D101, DSL1, and DSL2: remove door, sidelight and frame; replace all deteriorated wood and replace.
   
   B.) Windows at east elevation, W109 and W110, remove sash and repair, remove and replace sill on W110.
   
   C.) Windows at north elevation, WT101, WT102 and WT103.
   
   D.) Windows at south and west elevations.
   
   E.) Doors D102 and D103.

2. Masonry
   
   A.) Rake and repoint stone water table.
   
   B.) Rake and repoint brick.
   
   1.) Base repairs.
   
   2.) Gable end parapet repairs (includes stone coping).
   
   3.) All other repairs (chimney, marble inset).

3. Site Work
   
   A.) Regrade at north elevation to provide accessibility.
   
   B.) Regrade at south elevation to create positive drainage.
   
   C.) Regrade at east and west elevations to create positive drainage.
4. Millwork at Cupola

A.) Remove and replace all deteriorated millwork (includes painting).

5. Roof Repairs

A.) Remove and repair broken slate.
B.) Flashing (cupola).
C.) Remove and replace gutters and downspouts.
D.) Joint Sealers
E.) Gutter Hangers
VII. BUDGET ESTIMATE
# SUMMARY OF COSTS

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<thead>
<tr>
<th>ITEM</th>
<th>TOTAL COST</th>
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<tbody>
<tr>
<td>Div. 1: General Requirements</td>
<td>$12,525.00</td>
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<tr>
<td>Div. 2: Site Work</td>
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<td>Div. 3: Concrete</td>
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<td>Div. 4: Masonry</td>
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<td>Div. 12: Furnishings</td>
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Grand Total Div. 1 - 16 $47,195.00
## CLASSS “B” COST ESTIMATE

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<td><strong>Div. 1/General Provisions</strong></td>
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</table>
| Supervision                         | L.S. | 6,000|       | 6,000.
| Supplies                            | L.S. | 1,500|       | 1,500.
| Equipment                           | L.S. | 1,500|       | 1,500.
| Transportation                      | L.S. | 1,725|       | 1,725.
| Project Record of Treatment         | L.S. | 1,800|       | 1,800.
| **total**                           |      |      |       | **$12,525.** |
| **Div. 2/Site Work**                |      |      |       |       |
| Trench at water table               | 3 C.Y.| 800. |       | 800.  |
| Sod                                 | 100 S.F.| 2/S.F.| 200. | 400. |
| **total**                           |      |      |       | **$1,700.** |
| **Div. 4/Masonry**                  |      |      |       |       |
| Rake and repoint brick              | 1,200 S.F.| 250. | 5,800.| 6,050.|
| Rake and repoint stone              | 200 S.F.| 10.  | 400. | 410. |
| Remove and reset capstones          | 40 L.F.| 10.  | 1,600.| 1,610.|
| **total**                           |      |      |       | **$8,070.** |
| **Div. 5/Metals**                   |      |      |       |       |
| Gutter pins                         | 18EA.| 1,800.| 500. | 2,300.|
| **total**                           |      |      |       | **$2,300.** |
| **Div. 6/Wood and Plastic**         |      |      |       |       |
| Millwork at cupola                  | L.S. | 2,500.| 2,800.| 5,300.|
| **total**                           |      |      |       | **$5,300.** |

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*John Brown Fort / Flood - Storm Recovery Project / Condition Assessment Report and Preservation Repairs / February 1998*
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<th>qty.</th>
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VIII. PHOTOGRAPHS
(NOV. 1997)
Figure 1 - John Brown's Fort, north elevation.

Figure 2 - John Brown's Fort, south elevation.
Figure 3 - John Brown's Fort, east elevation.
Figure 5 - John Brown's Fort, dressed stone water table at north elevation. Note deteriorated mortar joints.

Figure 6 - John Brown's Fort, double sheave doors at center bay of north elevation.
Figure 7 - John Brown's Fort, typical detail of bottom rail at semi-circular window
Figure 8 - John Brown's Fort, rot at window sill of northern most window at east elevation.
Figure 9 - John Brown's Fort, door and sidelights at eastern bay of north elevation. Note gutter discharges at base of building.

Figure 10 - John Brown's Fort, detail at bottom of door and sidelight showing rot.
Figure 11 - John Brown's Fort, wood jamb of double doors at center bay. Note gap between wood and masonry.
Figure 12 - John Brown's Fort, interior elevation of jamb at center bay doors. Note wood nailing block pulling away from masonry.
Figure 13 - John Brown's Fort, interior of east end wall above roof. Note stone caps and lack of mortar wash on chimney features.

Figure 14 - John Brown's Fort, interior view of south-west corner of end wall. Note deteriorated mortar joints.
Figure 15 - John Brown's Fort, roof as viewed from south looking northeast. Note cap slate overhangs to the north.

Figure 16 - John Brown's Fort, plan view of slate roof with one broken slate shown in center. Note trim at base of cupola is tight to slate.
Figure 17 - John Brown's Fort, south elevation of cupola. Note top of column capital at front right slopes inward.

Figure 18 - John Brown's Fort, south elevation of cupola showing crenelated trim boards attached to roof by metal "L" brackets.
Figure 19 - John Brown's Fort, half round gutter on south elevation. Note how shape has flattened out and is wavy.

Figure 20 - John Brown's Fort, detail of gutter hanger and strap.
IX. APPENDIX A / FIELD NOTES
FORM DSC - 44

NATIONAL PARK SERVICE
WILLIAMSPORT PRESERVATION TRAINING CENTER

Park: JACEE
Area: JB BRT

Project Checked Pkg. Date
Feature Date

DESIGN PACKAGE
FRANZEN DWG? 6 LAST REFUR
- COLOR PARK FILES

1. CARPENTRY REPAIRS (INCL PAINTING)
2. HISTORIC REPAIRS
3. ROOF REPAIRS
4. CURB (CHANCES IN CURB)

1. CARPENTRY REPAIRS
A. REPAIR TWO LARGE DINGS (MINOR)
B. REPAIR/REPLACE ONE SHAPER DOOR (MAJOR)
C. REPAIRS TO WINDOWS@ GROUND LEVEL (MINOR)
D. INSPECT ARMED HEADERS - LOOK OR
E. PAINT EXTR WOOD TO MATCH?
- HSR? - WHAT IS COLOR BASED ON?

2 PR CAPEMENT W/DGS w/H/MOR REPAIRS
1 SILL REPAIRMENT + GYPSY SILL MAY BE SHOULDBE REPLACED - NO DRAIN A UNDERSIDE

1 SILL CAPEMENT: REPLACE NEW BOTH RAILS
MAYBE MATCH TO $770.20 AT NY MUNICIPAL
2 MEBEJRT REPAIRS

A. INSPECT EXIST/INTR WAUS
   DOCUMENT MALS NEEDING PAR-OUT/REPOINT
   MINOR BRAIR REPAIRS (SPALLED BRICK)

B. GABLE END WAUS "PARAPERS" - REPOINT COPING
   SPINES, POSSIBLY DEMOVE AND RELAY
   BEDDING MORTAR (IF LOOSE). SAVE HIST. CONC.
   PATCHES - REPOINT HEAD JOINS IN CORES

C. FOUNADN. - EXCAVATE BASE OF WAUS
   AND REPOINT BLUESONE SILLS

D. SITE DRAINAGE
   INSTALL SITE DRAINAGE (0.G.) AND GET INTO
   EXIST SYSTEM. MINOR REPLACING OF UPLAND.
   SITE ON SOUTH SIDE MAY BE NEEDED.
Note: This image contains a drawing and handwritten text. The drawing includes labeled parts such as "3rd floor head window," "existing in good shape; tube no dip leaks," and "2nd floor." Handwritten notes suggest actions like "check floors," "windows (2rd) painted shut," and "reflected below roof."
INTR BDR FLOOR -
REPL NG SOME AREAS SO DOORS
OPEN PROPERLY (minor).

DOUBLE DOORS - NEED BE ADDED TO ENHANCE/HEALTH BY
ADDED STRENGTH.

SINGLE DOOR - STRUCTURE DO NOT BE TRIMMED AND WORK FOR
ELEVATION - POSSIBLY OPEN AIRSTICE (REMOVE AND
DISMANTLE) OR REPLACE
-SHOULD HAVE FUTURE DAMAGE

OF PERFORM BLUEPRINTS SUM ALL AROUND.
### NATIONAL PARK SERVICE
WILLIAMSPORT PRESERVATION TRAINING CENTER

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**3. ROOF REPAIRS**

- **1. REPLACE BROKEN SLATES (30 MAX!)**
  - INSPECT FOR BETTER LOOK

- **2. RIDGE SLATES - WHAT IS PROPER DETAIL?**
  - NAILS AND COVERED BY ROOFING TAR/SEALANT

- **3. REPAIR/REPLACE EXISTING GUTTERS - POSSIBLY ADD A FEW MORE HANGERS (PD?)**
  - EXTEND DOWNSPOUT @ BASE - REGRADE SO THERE ARE NO PONDING BASED ON BUDG.*
4. CUPOLA

a. CONDUCT INSPECTION

b. REPAIR/REPLACE DECOMPOD WOOD (RAILINGS, APES)

c. REDISEIGN TO ADD VENTILATION - CURRENTLY NOT VENTED.

NOTE: SPECIFY PT 9 RWT RESISTANT SPECIES)

HORIZONTAL PLANKS - Cors of NIDOLAN on NORTH SIDE - ALSO B U D C IS MOSTLY SHADED IN SUMMER

VENTILATE BASE AND ROOF STRUCTURE OF CUPOLA

PROVIDE ACCESS FROM INTERIOR.

UNDERSIDE IS VENTILATED.

COLUMNS LOOK ORN ¼ BASE PLATES

ROOF STRUCTURE (HIPPED) MAY NEED REPAIR

A. Replacement of brick returns (4) and

upstairs's support metal floor and

roof - tiles look flat, however OK.

but they need UCS

paint & paint.
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NATIONAL PARK SERVICE  
WILLIAMSPORT PRESERVATION TRAINING CENTER  
Sheet 1  
of 1

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Possible roof match?

Need to inspect roof system on cupola.
TRANSON WINDOW NOMENCLATURE NTS

"WT 101"

SECTION "B"
SECTION "A"
SECTION "C"
SECTION "D"

EXAMPLE FOR CALLING OUT PIECES ON WINDOW TRANSOM IN REPAIRS AND RELOCATION
FIELD NOTES
HARPER'S FERRY NATIONAL HISTORICAL PARK
JOHN BROWN FORT
Date: Nov. 18, 97
Inspector: A.S. Donald \(\text{OBC-AR} \)

NORTH ELEVATION

- Dressed stone water table @ base is 5" to 10" above grade
  USG/ADA access would need to come from the north area adjacent to
  bldg. entrances would need to be adjusted to eliminate step up to
  finish flow level on interior

- mortar joints @ water table need to beaked out and repointed
  (3 joints @ east end could be sand)

- brick masonry is running bond with headers that vary from every 7th course
  to every 8th course, in some cases just running bond/headers that
  lack of consistancy is due to numerous disturbances and reconstructions

- 3" dia. downspouts @ each end with 3 straps holding downspout to
  wall. Downspout appears to be lead coated copper built in 2'-4" sections
  sections are loose and crooked.

- park maintenance showed up a little after 7:00 am and provided instructions
  for use of small bucket lift which was set up on the north elevation

- went up to cupola on center of roof
  - the 14x10 (7/8" x 9/4") trim boards surrounding the four columns
    have been cut 25" above the flat seam roof and the joint has pulled away allowing water to get into joint
  - railing has black mold spores on surface/peeling with knife
    blade indicates 90%+ needs replacement.
  - the flat seam (had coated copper roof/13 1/2" wide panels)
    looks relatively good, recommend resoldering joint running
    east-west @ center of roof
  - trim at the top of the columns is pulling apart at the
    corners/wood appears sound
FIELD NOTES
HARPERS FERRY NATIONAL HISTORICAL PARK
JOHN BROWN FORT
Date: Nov. 18, '97
Inspector: A.S. Donald, DSC-AR

NORTH ELEVATION

- Roof slate @ ridge line overlaps to north approx. 2''

- 4 broken slate noted to the east of cupola / 6th raw down from the ridge @ 3' out from cupola / slate looks pretty good on this elevation

- Railing @ cupola

- Top plate for railing
  
- Gutter is lead coated copper 6'' half round supported by 9 gutter pins driven into brick. High point in cattle slotted to bolt ends / gutter is in 20'' section's southwest end / each joint
NORTH ELEVATION

- east door/window
  - feminine damage @ left jamb (frame) 4 1/8" wide x 8' 2" high x 4 1/4" thick
  - bottom rail of east window rotted @ both corners above rail meets stile.
  - bond & bottom door is rotted @ bottom door is vertical wood x 1" thick on exterior and diagonal wood x 1 1/4" thick on interior *
  - jamb @ bottom of door opening rotted (feminine damage)

* vertical bonds 6 3/8" & 10 7/8" wide rotted @ base approx 11" from sill

- simple flat panels below windows facing door from exterior
- right panel 1 in the lower left jamb the wood is rotted @ the base and rot has started in the lower panel
SOUTH ELEVATION

- Need to take out and repoint west wall stone.
- Slight depression at west table needs to be filled in (reground) with thin transom stones taken next to stone wall table with thin rayon trim structure and set into lawn area.
- Cannon hand with header every 7th course.
- Need to clean off moss/vegetation from base 5 courses of brick.
- Lower 10-15 brick courses have soft mortar joints and need to be relaid cut and repointed.
- There are no drip edges cut into the wood sills of any of the windows in this elevation.
- The western most bottom rail of the eastern window is cut and needs to be replaced.
- 6" gutter is in 20" section with solid joint. High spot in middle with slope.
- Gutters at west quarter ends "1 square" gutters.
- Transoms are 3" thin lead cut at angles in 1-4" lengths to hold down transoms in place.
- Half elevation of window on south.
EAST ELEVATION

- wood is stacked up approx. 1' high along entire elevation. This leads to damp masonry and potential bleeding place for termites.
- the window in the north and has termite/nat damage on the sill. The interface between the wood sill and the brick is open and should be caulked to prevent water getting to the end grain of the sill.
- suggest replacing 8-12 panes of glass.
- the window in the south and has rot in the bottom rail of the sight. Sash anticipate that joints may be rotted.
- the wood pins in the north and window sash are pulling out indicating a problem at the lower joints (i.e. bottom rail & stile).
- missing mortar in brick bond above arches to top needs to be valued out and repointed.
- brick mortar 1st course from stone water table needs to be valued out and repointed.
FIELD NOTES
HARPERS FERRY NATIONAL HISTORICAL PARK
JOHN BROWN FORT
Date: Nov. 18, 77
Inspector: A.S. Davies

WEST ELEVATION

- Graffiti on 1918 stone (mark H) needs to be removed. Also need to look at remaing 4 steel pins holding stone in place instead of tying to rust and staining stone.
- Masonry from brick (note 3 courses of window arch) to top needs to be sealed but not repointed.
- Need to clean moss off lower 1.3 courses of brick just above water table stone.
- Need to take out and repoint joints at water table stone.
- 10-15 courses of brick above water table need to be sealed out and repointed. Suspect flood damage is heaviest at this point.
- Replace 1 broken window pane on south side of south window.
- Second pane up from bottom rail.
INTERIOR

- Roof sheathing from interior looks very good due to greasing. Sill of the window looks like pressure treated wood used in 1930's move.
- Also looks like pressure treated sill plates used for roof rafters.
- Brick floor laid in basket weave pattern.
- East side of interior used for milo, storage of materials.
- Minimal to no paint, droppings, spider webs minimal. Interior very clean.
- Windows stops on side windows need to be replaced. 1/2" x 2 1/2" tight, check damage.
X. **APPENDIX B / DRAWINGS**

C. Hats: Hot dipped galvanized or aluminum, of sufficient length and holding power, as recommended by the shingle manufacturer.

D. Lead Coated Copper (for use in flashing): Cold rolled copper, meeting requirements at ASTM D161, coated on both sides with not less than 3 pounds per 100 square feet and in accordance with ASTM D101, Type I, Class A.

EXECUTION:

A. Staging:
1. The entire surface of all tools, unless otherwise specified, and all other surfaces which come in contact with the roof shall be covered with tarp or hessian, in accordance with Paragraph 1 of the metal staging instructions.
2. The entire surface of all tools, unless otherwise specified, and all other surfaces which come in contact with the roof shall be covered with tarp or hessian, in accordance with Paragraph 1 of the metal staging instructions.
3. Staging shall be placed around all vertical surfaces.
4. Staging shall be placed around all vertical surfaces.
5. Upon completion, all staging shall be removed, cleaned, and the roof shall be swept free of all debris and every sight, and subject to the Contracting Officer's approval.

B. Cutting Felt:
1. On all surfaces to be covered with felt, lay felt in horizontal layers with joints laped over the edges at least 2 inches and well secured along laps and at ends, as necessary, to properly hold the felt in place and protect the structure until covered with the roof. All felt shall be preserved, unbleached, and unless otherwise specified.
2. Felt shall lay all joints at least 12 inches to form double thickness and shall be placed over metal flashing.

C. Flashing: Lead coated copper for use in flashing shall be secured in place over 30 square feet as shown on drawings.

GENERAL

Samples: Two 18-inch by 18-inch samples of each sheet metal material. Some patterns, such as color and thickness.

3. See Conditions:
1. Determine that surfaces are smooth and clean to extent required for sheet metal:
2. Correct or repair defective surfaces to the Contracting Officer. Verify registers, ins, and surfaces to receive sheet metal and are free of defects.
3. Before commencing work, verify shapes and dimensions of surfaces to be covered. Do not begin work until surface construction, including all projections, is installed.

DETAILS

Sheet Metal: Lead coated copper. ASTM D161, Type I, Class A, soft or semi-soft copper, with or without lacquer, with or without lacquer, with or without lacquer.

Fasteners: Screws, FS FE-5-127, self-tapping sheet metal type, or equal.

SECTION

A. Installation:
1. General: Install work on outside walls, or in the case of roof installations, shall be performed in accordance with the manufacturer's instructions.
2. Reglets: Reglets shall be installed in accurate locations, straight, in-line, and with proper joints.
3. Flashing: Clean and dry metal prior to sealing; seal with either asphalt or lead. Apply asphalt or lead straps at 12-inch intervals.
4. Root Counterflashing: Overlap base flashing 4 inches minimum. Install metal edge tight against base flashing; lap top sheet joints 3 inches minimum; apply asphalt. Rivet, clip, or screw, with or without latex joints with solid or sealant.
5. Base Flashing: Extend flashing from 2 inches above top edge of base sheet to 1/4 inch above butt edge of covering edge of sheet. Extend up vertical surface 8 inches minimum and onto roof 6 inches minimum. Install flashing under each shingle course, secure top edge of flashing by nailing to structure. At chimneys, hatches, and skylights, extend up vertical surface 8 inches minimum and onto roof 6 inches minimum. Seal top with latex sealant; metal and ordinary lap cornsers.

GUTTERS AND DOWNSPOUTS

1. GENERAL:
A. The work of this section consists of installing gutters and downspouts of a historic design.
B. See Section 951/8, Brought into 19th Century for related work.

2. MATERIALS:
A. Gutters and downspouts to be copper cold rolled, sheet, 24 inches per square foot. Length of gutter sections, 144 inches.
B. Washers - Neoprene.
C. Flats for copper - Approved commercial brand. No acid.
D. Screws for copper - ASTM D532, 50 percent lead and 50 percent black tin.
E. Leader head screws - 14 gauge copper wire mesh, 1/8" by 1/8". Install per drawing.

3. EXECUTION:
A. Installation: In accordance with manufacturer's instructions and recommendations and Doane architectural sheet metal specifications, hangers and fasteners, as shown on drawings. Support and anchor each unit as shown with lines and grades accurate and true to alignment and location.
B. Sealing: Wire or paper to be sealed. Use metal ducts to enclose sheet and sheet completely through full width of same. Seal shall now a minimum of 1 inch of metal under hair. Seal in the position when possible. Snaps on slope closer than 60 degrees, seal a second time.
C. Neoprene washers: To be installed so that none of the mild steel gutter brackets, downspout brackets come in contact with copper.

FINISH HARDWARE

1. GENERAL:
A. All hardware used on the building to be trimmed and replaced with the originals now in storage and reproductions of missing hardware.
B. Final hardware selection will be made by the architect.

2. MATERIALS:
A. Historic cast iron strap hangers and brackets now in storage by the park will be used on all doors.
B. 3" cast iron butt hinges will be used on all casement windows in the Guard Room.

3. EXECUTION:
Install all hardware as directed by project supervisor.

SEALANTS

1. GENERAL:
A. Descriptions: The work of this section consists of providing sealants around exterior openings.
B. Quality Assurance: Standards, Sectional Specifications (FS) and manufacturers' print recommendations.

2. MATERIALS:
SEALANT: FS 71-5-211, Type 11, and FS 71-5-210, Type 21, Sutamite DC-X, one part polyurethane base synthetic rubber or Sutamite DC-X, two part polyurethane base synthetic rubber, manufactured by Packer Chemical Corporation, 200-400 West Sadaflyy Pittsburg, Pennsylvania 19140, of approved quality. Colors shall match adjacent materials, as approved.

3. EXECUTION:
1. Application: In joints, apply with hand tooling or air pressure gun using proper tip nozzle. Joints up to 1/2 inch wide, same as with. In joints 2 1/2 inch and wider, depth, 1/2 inch minimum. Tool joint surface to compact compound into joint using complete contact with surface to be sealed and a wetter joint. Remove excess materials leaving joint smooth and even.

---

PREPARED: W.L. BARLOW
DESIGNED: W.L. BARLOW
CHECKED: W.L. BARLOW

DRAWN: W.L. BARLOW
CHECKED NOV. 1970

III.

SPECIFICATIONS - JOHN BROWN'S FORT

[Handwritten notes and annotations]
1. GENERAL

A. Description: The work at this section consists of laying in the present assembly opening between the guard and engine room, the repair of brick around the rusted trusses and repointing of the interior units.

B. Product handling: Store mortar materials in a dry place under cover to prevent damage, permitting air circulation.

2. MATERIALS

A. Historic arch: Sound, hard, or chips with true edges, without existing in size, shape, and general appearance.

B. Mortar: 1 measure of white portland cement; 1/3 measure of high plasticity lime; 7 measures of washed sand, mean exterior of existing.

C. Roofing:

1. Preparation of interior units: Remove foreign material, loose mortar, and stones; rate all joints to sound surface; flash fade out joints and voids with excess mortar where void remains.

2. Fixing mortar for painting: Note existing mortar by taking an unsounded sample from a joint within existing wall. Excavate the outer from the aggregate used. Mix all materials by volume, dry or can be handled, in a mechanical mixer until thoroughly combined. Just prior to painting, mix into the dry mix only enough water to make mortar workable. Use mortar within 20 minutes after adding water. Temperature is 90 degrees F., use within 2 hours; discard any remaining mortar. Excluding within these limits will be permitted as necessary to maintain workability. Use no frozen admixtures or extraneous chemicals.

3. Painting brick joints: Daub surface of joints for bonding of new mortar to existing. Apply mortar, coated slightly, into the joint under sufficient pressure to assure a tight joint. Brick joints to be treated as shown on drawings.

MOTTLED IRON - 19TH CENTURY

1. GENERAL

A. Use steel items used to simulate 19th century wrought iron work shall be quality produced and approved.

B. Fabricate all steel items as per full size details.

C. Prior to beginning construction, submit samples of steel items. Samples shall be returned for use in work.

2. MATERIALS

A. Site steel: Low carbon, general purpose, unalloyed material, suitable for forming and welding, complying with AISI B-1902 for not rolled bars. Borderless, treated with phosphoric acid and proper catalyst not exceeding 100 mg per pound of steel, complying with the spirit resistant base for paints, 20CP DP.

B. Paint: Rust-Oleum X-80 Red Primer and Rust-Oleum No. 412, First Black by Rust-Oleum Corporation, P. O. Box 22, Elyria, Ohio 44035 or approved equal.

C. EXHIBITION

A. All work, currently fireproofed, insulated, or hammer bonded to provide desired design and effect, shall be substantially trimmed together. Fireproofed, insulated, or hammer bonded steel shall be protected as previously described.

B. Painting: Clean all exposed surfaces of rust, dirt, oil, and grease. Apply 1 coat of primer, and 2 finish coats of test paint. Follow container directions and apply paint evenly without runs, blisters, sands, or other defective burning.

CARPENTRY AND MILLWORK

1. GENERAL

A. Scenarios: American Institute of Timber Construction (AITC), Architectural Repertory Institute (ARI), Federal Housing Administration (FHA), and manufacturers' printed recommendations.

B. Product handling: Store lumber and millwork, where directed, all the ground, with protective covers. Do not expose wood to extreme changes of temperature and humidity.

2. MATERIALS

A. Wood: AAS, free from Greene, heart rot, or other imperfections affecting strength, durability, and appearance. Material content not to exceed 10 percent for yard lumber and 15 percent for finish lumber. Lumber 2 inches thick and less, hewn, clear. For exposed work, hand selected.

B. Glazing: All glass, storm windows, and exterior doors to be made from standard sizes of glass, to be of uniform shape and size. Insulation should be attached to the inside of the frame. All hardware to be of standard size and shape, with correct latches and catches for safety purposes. Insulation should be of the best quality available.

D. MATERIALS

A. Wood: All wood for exterior use to be Douglas fir.

B. Exterior finish: All exposed wood components. C. Select or Quality white pine or yellow-poplar color of defects.

C. Exterior millwork: Door and window trim, sashes, and other millwork to be of the standard size of pine or yellow-poplar color of defects.

D. Treatment:

1. Lumber: 100 parts for exterior use to be Primed Bond shall be pressure-impregnated with the specified treatments for treatment, of builders' company, Inc., with ordinary CCA wood preservative and shall meet the treatment ORGANIZATION.

2. Organized pressure-treated lumber shall conform to ASP Standard LP-3 or LP-2 and meet a wood preservative treatment.

3. Organized pressure-treated lumber which is to be painted or varnished shall be blued-out or air-aged to an average moisture content of 10% or less before painting. From all field data with preservative.

E. Building Paper: 35 pound asphalt saturated felt.

F. Roofing: Millboard - tiles, shingles, slates, and slate and wood framing and millwork.

G. Fixtures: Set with drawn edge up.

H. Roofing: Use standard roofing materials, with standard roof pitch and built-up roof. Use exposed surfaces, not finishing nails to receive putty.

I. Siding: Painted millwork: White wood millwork, with painted millwork, free from defects. Siding millwork of course or rectangular sections. Insulated millwork will be in pieces without warping, splitting, or peeling of joints.

J. Exterior Millwork: Immediately prior to millwork after installation. Use wood material or millwork, if millwork is to be exposed or underlaid with millwork.

K. Frames: No millwork permitted.

L. Exterior: Use connected nailing where possible. Horizontal siding, long lengths with and joints made at 45 degrees only at the corner. Vertical siding, long lengths, and joints made at 45 degrees only at the corner. Horizontal siding, long lengths with and joints made at 45 degrees only at the corner. Vertical siding, long lengths with and joints made at 45 degrees only at the corner. Horizontal siding, long lengths with and joints made at 45 degrees only at the corner. Vertical siding, long lengths with and joints made at 45 degrees only at the corner. Vertical siding, long lengths with and joints made at 45 degrees only at the corner.

GLASS

JOB CONDITIONS

Field Measurements: Determine exact size of glass by field measurements of items to be installed. Responsibility of glass sizes rests with the Contractor. Sizes, if indicated, are approximate, and shall be used for estimate only.

MATERIALS

Glass: Shall be of the quality, type and treatment as supplied and to match existing glass in place.

Glazing Compound: Pacer 6-262, as manufactured by Pacer Chemical Corporation or equivalent quality.

Glazing Points: Standard galvanized points.

EXECUTION

2-1 GENERAL: Before glazing, check openings to assure they are square, plumb, and in true plane. Maintain uniform face and edge clearances.

2-2 PREPARATION: Thoroughly clean all surfaces prior to glazing operations.

2-3 INSTALLATION: Perform all glazing at the site. Wood shall be primed before glazing. Oak or fir glass shall be set and all glass firmly with galvanized glass net. Cut excess putty to sight line of the month leaving a continuous smooth sloping surface retaining neatly at corners. Follow recommendations of First Glass Glazing Specification.

2-4 CLEANING AND ACCEPTANCE: After glazing, remove all foreign material from the surface of glass and wood. Upon completion of construction operations, remove all Putty, CHIP, or other excessive joint glass and replace using proper materia1s and technique.

PAINTING & OTHER FINISHING

1. GENERAL

A. Submit complete list of materials proposed to be used for the work

B. Prepare at the job site 12-inch by 12-inch samples of paint colors proposed for use. Samples shall have paint applied to some surface material as will be used in the work.

C. Deliver sample containers with labels legible and intact.

D. Store more directed and protect materials from damage.

E. Protect all paint finished work or other finishes and surfaces not to be painted, a damp sheet of cousin to protect adjacent areas.

F. Determine surfaces to which painting or other finishing are to be applied on uneven, smooth, round, clean, dry, and free from defects affecting primer application. Check or report defective surfaces to Contracting Officer.

G. Do not apply finish material when temperature is below 50 degrees F. Do not apply exterior oil base materials in damp, rainy weather. Do not apply paint on surfaces in direct sunlight. Do not apply finishes in spaces where dust is being generated which would affect the finish.

H. Take necessary precautions to keep fire hazard at a minimum; remove from the area all oil tanks, and other combustibles not in covered metal containers.

MATERIALS

A. Paint and Finishes Products: Highest quality standard brand, as distributed by a nationally known manufacturer. Paint products shall be from manufacturer, shall be nontoxic, safe, or the product in the container shall be broken up readily with water to a smooth consistency, and shall have easy application properties, other painting materials such as primers, undercoats, wallatings, mica's, and others shall be the highest quality of an approved manufacturer.

B. Fitting Compounds: Use only high quality, nonhardening materials which have been proved. Use putty for wood, paint compound for window frame, and mastic compound or concrete block, and patching plastic or speckling compound for plaster.

C. Colors: Match color samples submitted and approved.

D. Materials List:


EXECUTION

A. GENERAL REQUIREMENTS:

1. Lightly sand woodwork to receive a clear finish prior to applying finishes.

2. Remove and protect hardware, accessories, device plates, lighting fixtures, factory finished work, and similar items or provide ample in-place protection. Upon completion of each space, entirely replace all removed items. Use only skillful mechanics for removal, replacement, and protection.

3. Remove doors to finish tops and bottoms.

B. Surface Preparation:

1. Wood: Sandpaper to a smooth and even surface, then dust off. After priming coat has dried, apply finishing to surfaces to be painted, including all knots, pits, and sound lapped after scraping and sanding. After priming coat has dried, putty all nail holes, cracks, open joints, and other defects with putty. Putty shall be selected to match stain or paint.

2. Painted Surfaces: Remove dirt and grime with mineral spirits. Remove rust, soft scale, and decorative paint from sound surface, using scraper, swab, or wire brush, as necessary. Touch up all spots and damaged shop coats with rust inhibitive primer.

3. Application: Sponge coat of smooth coat prior to proceeding with the coat.

1. Apply material evenly without runs, sags, or other defects. Run each coat into the material being coated at an average rate of coverage recommended. Cover surfaces completely to provide uniform color and appearance. Leave moldings, trim, ornamentals, edges, and other details clean and true to details without access points in corners of depressions. Make edges of paint joining other materials or colors sharply clean and clean, and without overlap.

2. Painted and Stained Work: Removes exterior oil-base finish material if contracted. Prior to or as soon as installation, prime reuse siding, faces, edges, contours, and grooves, exterior work. Touch up scoured and sanded pieces on shop or factory applied prime coats.

3. Drying Time: Minimum as recommended. Do not apply succeeding coats until the undercoat is thoroughly dry.

4. Sanding: Lightly sand between coats to ensure that surface finish is smooth to the touch. Exterior stained siding, Butt and weather, and rough-sawn material need not be sanded.

B. Cleaning: Remove all paint, stain, or other finish material where it has splatted or splotched.

C. Samples of Paint Colors: Samples shown are based on the Russell Classifying Systems for paint color by Russell Color Company, Inc., Baltimore, Maryland.

1. Exterior Beams and Frames: White, 2.95-6-2.

2. Window Frames onzw.: White, 2.95-6-2.


5. Interior Trim: 2.95-6-2.


PARTIAL RESTORATION

SPECIFICATIONS — JOHN BROWN’S FORT
1. Rake and repoint water table.
2. Rake and repoint masonry wall.
3. Reset stone coping.
4. Regrade for ADA access.
5. Remove and repair door, sidelights and frame.
6. Remove and repair sash.
7. Remove and replace sill.
8. Regrade for positive drainage.
9. Remove and replace deteriorated millwork.
10. Remove and replace gutters and downspouts.
11. Add additional gutter brackets.
12. Remove and replace broken slate.
13. Repair door.
14. Remove and replace broken glazing.
15. Repair windows.
CONNECTIONS.

STEEL HEEL CONNECTIONS

ISOMETRIC DRAWING

REPLACE KAPERS COMBINED AS REQUIRED.

NEW 4 IN PURLIN (OVER GUARD RAIL ONLY)

REPLACE ROOF SHEETING AS REQUIRED.

REMOVE REMAINING COPULA SPACE & STEPS AND REBUILD COPULA FRAME TO DETAILS SEE SHT 10211.

REPLACE ALL LOWER TRUSS COORD.

DETAILED TRUSS HEEL

SCALE = 3" = 1'-0"

REPLACE WING POST ON TRUSS BE.

NEW STATE ROOF

NEW COPULA GUTTERS AND DOWNSPOUTS.

ROOF FRAMING PLAN

SCALE: 1/4" = 1' - 0"

NOTE: ALL DIMENSIONS GIVEN ARE ACTUAL.

SECTION

SCALE: 3/4" = 1'-0"

Note: Disassemble the existing trusses with care. Examine truss joints, observe methods of doweling and fastening. The architect shall be present at this time, and will determine if any revisions to drawings shown above to truss connections, and fastening details, be necessary.
XI. APPENDIX C / PROJECT AGREEMENT
Memorandum

To: Superintendent, Harpers Ferry National Historical Park

From: Superintendent, Historic Preservation Training Center

Ref.: Flood/ Storm Recovery Project; Design Assistance @ PKG 110 and John Brown Fort Repairs

Subject: Transmittal of FINAL Project Agreement

Enclosed is the FINAL Project Agreement for the referenced project. Comments received from the Peter Oessauer and Tim Fox have been incorporated into this document. Changes are in italics to differentiate them from the original text.

We have included Option 1, a full scale mock-up of the approved replacement hardware as per Mr. Dessauer's suggestion. This increases the Project Total by $1600 from $12500 to $14100. See Section IX. Project Cost Estimate/ Budget for further details.

Please review this final Project Agreement and upon your approval sign and return the original cover sheet only to this office; this indicates final park approval of the Project Agreement. HPTC will distribute copies of the approved cover sheet to all project team members. Based on your approval please initiate a transfer of funds ($14100) to the Historic Preservation Training Center.

If we can provide further Information or assistance regarding this project please do not hesitate to contact Tom Vitanza, Project Historical Architect at (301) 663-8206, extension 135.

Thank you for your attention to this matter.

H. Thomas McGrath, Jr.

Enclosure: Final Project Agreement

cc: (all w/c encl.)
HAPE, Tim Fox, Chief of Maintenance
HAPE, Bob Willhide, Maintenance Foreman
HAPE, Peter Dessauer, Park Architect
NCR, Rebecca Stevens, Regional Historical Architect (FYI)
FINAL PROJECT AGREEMENT

HARPERS FERRY NATIONAL HISTORICAL PARK
Harpers Ferry, West Virginia
National Capitol Region, National Park Service

FLOOD / STORM RECOVERY PROJECT: DESIGN ASSISTANCE AT
PKG 110 BUILDINGS AND JOHN BROWN FORT REPAIRS
1997

Recommended: ___________________________ 5/21/97
Superintendent, Historic Preservation Training Center

Approved: _______________________________ 5/21/97
Superintendent, Harpers Ferry National Historical Park

Prepared by:
Thomas A. Vitanza
Historic Architecture Team Leader
Historic Preservation Training Center
4801 A Urbana Pike
Frederick, Maryland 21704
I. PROJECT DESCRIPTION

The HPTC Historic Architecture Preservation Team has been requested to provide Harpers Ferry National Historical Park with preservation design assistance for two specific projects. Both projects are located in historic lower town which was ravaged recently by two 100 year floods in January 1996 and September 1996. As a result, the John Brown Fort, Building 63, is part of the HAFE Flood/Storm Recovery Program and needed repairs are funded.

The first task is to provide updated preservation assistance with the exterior doors at the museum complex located in Buildings 9, 10, 11, and 12 and their respective annexes. The focus will be on the main egress doors, secondary exiting doors, and basement level doors.

The second task is to provide general preservation maintenance and flood/ storm recovery repair recommendations, drawings, and specifications for the John Brown Fort. All work to be accomplished by NPS preservation/maintenance employees.

II. STRUCTURE DESCRIPTION

Task 1. Buildings 9, 10, 11, and 12 and their respective annexes.
Task 2. John Brown Fort, Building 63.

III. PROJECT SCOPE

Task 1. Upgrade existing hardware, doors, door frames, and sills at museum complex in Buildings 9, 10, 11, and 12 and their respective annexes. The project focus will be on the first floor of the complex; priorities are the main egress doors followed by the secondary exiting doors. Basement doors will be the third priority.

Update to include research into replacement of exiting hardware with more traditional yet functional hardware; panic hardware to remain, door swings will not be changed. Research and recommendations into appropriate wood species for door and door frame components. HPTC will develop a door schedule to document existing conditions and to make treatment recommendations.

Specific information will be provided for all hardware recommendations, samples will be provided where possible. Drawings will be provided for door and frame design as required.

Option 1. HPTC will arrange for a full scale mock-up of the approved replacement hardware system as a demonstration on a door chosen by the park. HPTC will arrange
for vendor to supply and install demonstration hardware, and replace with original or replacement hardware if not accepted by the park. NOTE, this option not included in base price for project; if park wishes HPTC to carry out this option add Option 1 amount to project total for final project amount. See Project Estimate, Section IX.

Task 2. Provide preservation recommendations for the John Brown Fort, Building 63. As a result of the past two floods serious fabric deterioration has been noticed. Repairs are to be designed so that work may be accomplished using in-house NPS preservation/maintenance employees.

HPTC will provide an overall condition assessment report and will provide recommended treatment statements with drawings and specifications, as appropriate. HPTC will provide base line drawings for work using existing HABS drawings as base sheets, and will provide annotated photo-based report with treatment recommendations for park use.

IV. DATA COLLECTION

The development of this Project Agreement is based on numerous site meetings and telephone conversations with park management and staff in addition to background material. The following reports, correspondence, meetings, and site visits have been used to provide historical and/or project related background information for this project, and to assist in the preparation of this Project Agreement.

Oct. 9, 1996 From: HAFE Architect, To: NCA Chief of Maintenance Subject: Design Assistance Request for PKG. 110 Doors, Bldg. 48, and John Brown Fort

Oct. 28, 1997 From: HAFE Superintendent, To: NCA Chief of Maintenance Subject: FY97 Project Reporting System - Compliance

Oct. 29, 1996 From: Superintendent HPTC, To: Superintendent HAFE Subject: HPTC Interest in Park Preservation Projects

Nov. 6, 1996 From: HAFE Superintendent, To: Chief, WPTC Subject: Storm/ Recovery Program 1997-98; Three Additional HAFE Design Projects for HPTC During 1997

Nov. 6, 1996 From: HAFE Architect, To: HPTC, NCR Mailing List Subject: Three New HAFE Design Projects for HPTC 1997
Nov. 14, 1996  On-site meeting with HAFE, HPTC and NCR Team Members
   Subject: Tour of flood/ storm damaged historic structures

Dec. 16, 1996  From: HAFE Architect, To: HAFE, HPTC Mailing List
   Subject: Request Confirmation and Schedule

Jan. 13, 1997  From: HAFE Architect, To: HPTC
   Subject: HPTC Design and Construction Work at HAFE in 1997

Jan. 21, 1997  On-site Meeting: HAFE Superintendent, Architect, HPTC Architect
   Team Leader
   Subject: Preliminary scope of project, schedule, and estimates

March 4, 1997  From: HPTC Architecture Team Leader, To: HAFE Architect/
   Superintendent
   Subject: HPTC Project Update for Flood/ Storm Recovery Projects

March 19, 1997  On-site Meeting: HAFE, DSC, and HPTC Architects, Roofing
   Manufacturer representative
   Subject: Team coordination, evaluation of existing structures

March 26-7, 1997  Site work by HPTC Project Historical Architect & Team Leader
   Subject: Preliminary assessment of John Brown Fort

April 7, 1997  From: HPTC Architecture Team Leader, To: HAFE Architect/
   Superintendent
   Subject: Status of HPTC Projects for HAFE, No. 2

April 7, 1997  On-site meeting: Superintendent, Assistant Superintendent HPTC,
   HAFE Park Architect
   Subject: Update HPTC Project Schedules for FY97 and FY98

April 9, 1997  From: HAFE Architect, To: HPTC, HAFE, DSC, and NCR Project
   Mailing List
   Subject: HPTC Project Schedule Update Request

May 6, 1997  On-site meeting; HPTC Architect Team Leader & HAFE
   Maintenance Foreman
   Subject: Inspection of PKG. 110 doorways, meet with Chief of
   Maintenance
V. COMPLIANCE

1. National Historic Preservation Act: Minimal historic building fabric will be disturbed as a result of this project, therefore no NHPA Section 106/110 compliance activities will be required for the design phase of the project. As per 10/28/96 memo, park has blanket compliance authority from the West Virginia State Historic Preservation Office to proceed with work on flood & storm damage projects throughout the park with documentation to be submitted later.

Compliance beyond that required for the National Historic Preservation Act, including all federal, state, regional and local compliance requirements and permits for this work is the responsibility of the park and shall be secured and furnished to the HPTC prior to commencement of work.


2. Building Code and Life Safety Guidelines: HPTC treatment recommendations and project related design work complies with the following recommended guidelines as applies to the work undertaken by the scope of work identified in this Project Agreement:

- Uniform Federal Accessibility Standards, 1991
- Americans with Disabilities Act Accessibility Guidelines

3. Project Related:

Task 1. No changes will be made to the exiting (panic) hardware and egress capacity of the museum complex. This project will have no impact on building code or life safety related issues. The NFPA Life Safety Code and Handbook will be used as the basis for evaluation of all door hardware criterion. Recommendations for reconstruction of existing doors and door frames will not impact other code related exiting requirements.

Task 2. The scope of this project, flood/ storm recovery repairs and preservation maintenance, will not impact any life safety or building code related issues.
VI. PROJECT COORDINATION

The success of any project depends on the timely coordination and completion of all necessary actions as outlined for each of the following parties to this Project Agreement, Task 1 and Task 2.

HPTC

Prepare Project Agreement including cost estimate and schedule.

Schedule and conduct project related meetings and review sessions as required to successfully complete project.

Coordinate field work, fabric investigation, documentation, etc., and phasing of the development of project documents, and meet as necessary with HAFE Park Architect and HAFE Maintenance.

Review all existing documentation including investigative and historical reports, correspondence, etc. for project development.

Designate a project architect/supervisor to be primary point of contact with HAFE on project related issues.

Provide project supervision, team, materials, supplies, equipment, travel and transportation for all work performed by HPTC.

Provide project staff for duration of project to complete scope of work according to project schedule. Notify park management if slippage in project schedule becomes apparent, revise project schedule accordingly with park input.

Provide project products as specified in Section VII.

HAFE

Provide transfer of project funds to HPTC upon approval of Project Agreement.

Provide treatment and use decisions in a timely manner, and respond to all inquiries by HPTC staff for determination of design issues.

Designate a single project manager/administrative contact to coordinate the park response to issues of treatment and use, review comments, etc. and with responsibility to communicate with HPTC and to act as liaison.
Provide copies of/ access to all known park files, reports, archives, library materials which may have a bearing on the outcome of this project.

Provide technical and review input and comments in a timely manner.

Provide keyed access to park structures as affected by this project.

Provide any necessary compliance documents prior to the start of work.

NCR

Provide professional support from Regional and system support office cultural resources staff for technical, compliance, and code related issues.

VII. PRODUCTS

Products to be furnished by the HPTC to HAFE as a result of the approval of this Project Agreement are listed below. All design and treatment recommendations will be prepared for implementation by NPS based preservation/maintenance employees.

Task 1. Door Schedule and written report will address treatment recommendations for the improvement of the operation and maintenance of subject doors. Report will include brief condition assessment, inventory, and treatment recommendations for improving operability and maintenance. Drawings and specifications (including technical information regarding manufacturers, products, warranties, etc.) will be provided.

Task 2. Base line drawings to document treatment recommendations; HPTC will use existing HABS and HAFE drawings as base sheets for presentation of treatment recommendations. Annotated photo-based report with condition assessment, inventory, and treatment recommendations will supplement the drawings and include specifications and details as required for implementation of the work.

Four copies of each document will be provided to the park. Any original photographs and negatives will be transmitted to the park at the completion of the project. Any original mylar drawing sheets will be transmitted to the National Capital Region, Stewardship and Partnerships, Division of Land Use Coordination Records Office, Room 208, 1100 Ohio Drive, SW, Washington, D.C. 20242, (202) 619-7124.

NOTE: Any Changes, Modifications, or Amendments to the approved Project Agreement will be documented through the use of the HPTC Design Change Approval Form, Appendix 1.
VIII. 1997 Project Schedule

- As per agreement of April 7, 1997
- Project Agreement by end of May 1997
- Transfer of funds upon park approval of Project Agreement
- Task 1: Project priority items completed by mid June 1997, secondary items to follow in July 1997
- Task 2: Project products completed by end of July 1997

IX. Project Cost Estimate / Budget

- Task 1: Including work to date, additional field work, hardware research, preparation of schedule and recommendations $4000
- Task 2: Including work to date, additional field work, preparation of treatment recommendations presentation $3600
- Travel and Transportation $300
- Reprographics and Copying $1500
- Sub Total $9400
- HPTC Overhead $3100
- Project Total $12500
- Option: (Overhead included) $1600

*Project Total With Option 1 Added* $14100

NOTE: HPTC salaries are calculated on a pay period basis. The hourly rate for each occupation is determined by combining the direct hourly pay rate plus benefits with a prorated amount for the indirect costs of annual and sick leave, holidays, and training. The number of pay periods is based upon an estimate of the total number of hours required for each team member to complete the required project tasks. As this is based on previous project experience with an approved scope of work this should be considered a Class B estimate.

X. Project Participants

HAFE Peter Dessauer, Park Architect, Project Manager
Tim Fox, Chief of Maintenance
Gayleen Boyd, Funding Point of Contact
XI. TRAINING OBJECTIVES

No formal training objectives have been developed as it is anticipated this project will be completed by HPTC senior staff. If interns or coop students become available during the course of this project training objectives will be developed. All work will be under direct supervision of Maryland Registered Architect.

XII. APPENDICES

A. HPTC Design Change Approval Form

End of Document

TAVitanza:tav:05/12/97:a:WP5.1/2:frsp97pa.dpa
TAVitanza:tav:05/21/97:a:WP5.1/2:frsp97pa.fpa