Report on Preliminary Investigation
Assessment, Findings and Recommendations
Based on December 2019 Site Visit
Museo Hemingway

Presented to
The Finca Vigía Foundation
Board of Directors

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Prepared by
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DATES OF VISIT
12/16/2019–12/18/2019
Executive Summary of Top Concerns
(listed in priority sequence)

1. **Life-safety issues** exist at the kitchen stair, Tower roof, and Tower stair railing. The necessary repairs will be relatively simple. The issue at the roof of the Tower is tricky due to difficulty of access to make the repair. All these items are addressed in proposed work, within the cost estimate for “Other Interior and Exterior Items.”

2. **Termite damage is severe** at 5 wood windows in the dining room where failure will result in a dangerous and devastating collapse of masonry and roofing. Of the 47 windows at the main house, 17 are critically damaged. Window recommendation options priced in the cost estimate address the most critical windows.

3. Roof and gutter failures have allowed water inside walls, facilitating insect attack and fungal decay. Conditions of a recent repair show signs of failure. *The roof has 5–10 years of life remaining*, assuming constant Cuban maintenance. Successful resolution will require full replacement of roof and drainage systems.

4. All windows and doors exhibit damage due to failure of paint coatings, and all exterior surfaces need to be cleaned and painted to keep a weathertight enclosure. This necessary work is addressed in the cost options presented.

5. **The floor structure at Mary’s bedroom** has damage of unknown cause, resulting in large cracks in this section of the house. The problem has been analyzed in the past by Cuban engineers. Additional diagnostic investigation is needed to understand the problem before a solution can be implemented.
**Background**

Preservation of Ernest Hemingway’s legacy in Cuba, primarily embodied in the collections held at Museo Hemingway, is the top priority. The main house is a time capsule of Hemingway’s life, filled with artifacts from 22 years of occupancy, 1939–1961.

Under the guidance of the Finca Figía Foundation, US Technical Team members began collaboration with Cuban colleagues through the Consejo Nacional de Patrimonio Cultural (CNPC) in 2005 providing professional advice, design, conservation and project management support. Almost thirteen years have passed since the Cuban managers completed a restoration of Hemingway’s residence in 2007, which was the third major overhaul of the house. The US Technical Team assisted in an advisory capacity in that effort, collaborating where invited.

Today the Foundation’s relationship with CNPC is strong due to the great achievements attained on construction of the new Restoration Center. Thus the technical team was invited to investigate and provide recommendations for a fresh restoration of the main house, currently suffering from roof leaks and termite damage.

The University of Texas at San Antonio (UTSA) and The Christman Company (TCC) are engaged as volunteers in this preliminary phase, providing services without fees.

Next steps will be determined by The Finca Vigía Foundation based on findings presented herein. The US Technical Team stands ready to pursue additional steps in the process, pending approvals and direction.

**Acknowledgements**

The US Technical Team supports efforts of the Finca Vigía Foundation in preservation of Ernest Hemingway’s legacy in Cuba. William Dupont has been with the project since 2005, leading the US Technical Team of specialists on behalf of the Finca Vigía Foundation.

The following technical team members, in addition to Ron Staley and William Dupont, have made multiple site visits investigating conditions at the main house, and their work informs this current report: Mary Werner DeNadai, Michael Henry, Henry Moss, Walter Newman, Patricia O’Donnell, Robert Silman (d. 2018) and Bob Vila. Measured architectural drawings prepared in 2008 by Mary Werner DeNadai and John Milner, with support from their staff.
back at the office in Chadds Ford, PA, were especially useful in assessment of conditions. A full list of all US Technical Team members can be viewed on the Finca Vigía Foundation’s website, [https://fincafoundation.org/about-us/staff-and-technical-team/](https://fincafoundation.org/about-us/staff-and-technical-team/). Of course, nothing would be accomplished without the perseverance, dedication and talent of the many wonderful colleagues in Cuba who work to preserve Hemingway’s legacy in Cuba.

**Objectives of December 2019 visit**

Objectives were to conduct a preliminary field investigation to determine relative architectural and structural condition of the residence, including windows, doors, roof and other components. Consider conditions of the 1946 Tower, as well. Field-verify important measurements to assure the team has an accurate understanding of sizes and quantities for cost estimating purposes.
Summary of site visit

The December 2019 visit to Finca Vigía focused on the following:

- Reviewing the existing **wood window frames and sash** in the residence and Tower to understand their current condition including extent of deterioration or required repair, original or existing construction details of frames and sash, original or existing hardware operation and other factors related to the cost of their repair or replacement.

- Reviewing the existing exterior **wood doors and frames** to understand their current condition including extent of deterioration or required repair, original or existing construction details of frames and doors, original or existing hardware operation and other factors related to the cost of their repair or replacement.

- Reviewing the residence and Tower existing **roof system** including review of the existing **gutter system**, past water damage, use of the borescope (brought by the Technical Team) to look at locations in the roof attic space for water damage.

- Reviewing **cracks in the walls** of the residence.

- Assessing the condition of **other wood related construction** including the Tower’s exterior handrail, wood structure over the Terraza and similar structure at the Pool House area.

- Discussion with Cuban colleagues as to previous repairs, availability of local materials for repairs, and process to remove and replace windows.
Findings

- Within the last year, the residence roof system was repaired with the application of rolled asphalt roofing material applied in the integral gutter and over the parapet walls. The arrows in Figure 1 point to all the various areas where leaks were occurring. This effort has, it appears, eliminated the leaking locations, at least for now.

- The membrane flashing recently applied in the gutters will fail within 5–10 years, possibly sooner. Unfortunately, the membrane is adhered to existing terra-cotta tiles which routinely separate from the top of the parapet wall. Plus, the membrane is set on corroding sheet metal which expands and contracts. The application is currently sound, but it will not stay that way for very long. The gutters will need replacement soon.

- The roofing is composed of corrugated cement-fiber panels. The panels move slightly in wind and with normal thermal expansion/contraction. The movement is not cushioned by gaskets at attachment points. Holes through roof panels at attachment points have grown larger over time. Leaks will increase at attachment points. New roof panels are needed.

- Surface drainage at the patios around all sides of the house is good. There is no ponding of water near the house. Problems exist at the terraced hill stepping down to the northwest, but these issues do not impact the artifacts in the house.

- The existing construction utilizes internal rainwater conductor (RWC) pipes, inside of the masonry walls. Every one of them displays evidence of past water leakage, and the termite problems at wood windows correspond with RWC locations. The internal RWCs have long been a problem. Repairs and improvements can be made in the course of a roof/gutter project.
Figure 1: Arrows indicate five areas where leaks were occurring prior to application of a rolled asphalt membrane flashing. The intervention has, it appears, eliminated the leaks.

Figure 2: The team is inspecting roof membrane material that was recently inserted as a gutter liner. The material is adhered over the clay tiles atop the parapet of the masonry walls. These clay tiles are a continual maintenance concern because they tend to pop off, as can be seen in Figure 3.

Figure 3: The clay tiles are already missing at one location and immediately adjacent tiles are lifting up. This means the new membrane is already breached.
Figure 4: The roof deck shows signs of fastener deterioration and localized panel movement, which allows rainwater to leak through. Here the fasteners are destroying the ridge cap.

Figures 5 and 6: New asphalt roofing material used in the gutters, which appeared clean during this visit.

The left photo shows where a location of the integral gutter had rusted through. The new asphalt roofing gutter liner, which extends out over the patio, can be observed from the bottom. No sheet metal patch was installed prior to the gutter liner being installed. **This area will likely fail first.**

The right photo shows investigation of the internal rain conductor near the front door. It was clear and pipe surfaces looked in good shape.
Figure 7: Due to extensive water damage, the ceiling in the entire kitchen wing has been removed. The exposed framing demonstrates that even with extensive leakage damaging the drywall, the supporting roof structure does not show signs of excessive deterioration.

Figure 8: The UTSA roof inspection team.

Figure 9: Asphalt roofing was used to cover leaks at the end wall, where past flashing has either corroded or was inadequate. While effective, this asphalt material has a very limited life of 5–10 years.
The structural imperfection at Mary’s bedroom has been discussed since 2005 and remains unresolved. Engineers have not expressed an imminent danger of collapse, but the problem will worsen over time. Repair could possibly require major disassembly to remove concrete with salts corroding the steel framing. A diagnostic engineer with expertise in early 20th century concrete and steel structures is recommended.

Wood balustrade and elements of railing at the kitchen stair appear to be unsound and in need of replacement. Visitors are not allowed in this zone, but the condition is a life-safety hazard to museum workers responsible for care and protection of the collections.

The concrete frame Tower built by Martha Gellhorn for Hemingway in the 1940s was built with metal rebar for reinforcement. Some pieces of rebar were set a little too close to the surface, resulting now in damage from oxide jacking—metal corrosion breaking apart the concrete. The condition is apparent at the edge of the roof in seven locations marked on the drawings. The potential for a chunk of concrete to drop from the roof edge is real and presents a hazardous condition to museum workers responsible for care and protection of the collections, as well as to visitors. Access for repairs will require special equipment.

Oxide jacking is also apparent at the underside of the patio deck, near the base of the Tower. Rebar is exposed and corroding at several locations in the slab. Repair now, before conditions worsen, would be a simple matter. (See Figures 10, 11 and 12.)

Metal oxidation/corrosion is a problem at the posts of the Tower stair’s railing, as well. The condition appears to be stable at this moment, but the metal will continue to weaken, the concrete will continue to break apart, and the stair railing will eventually fail. Repairs should be executed.

A small tree was observed growing out of the RWC pipe at the roof of the Tower. This indicates another potential trouble spot for metal oxidation, this time in the wall.
**Figure 10:** Oxide jacking of metal rebars in a crawl space under the patio adjacent to the Tower.

**Figures 11 and 12:** The Tower is in good condition overall but needs localized repairs where metal rebars have become exposed to air and moisture. The resulting corrosion process, called oxide jacking, slowly breaks apart the concrete.
- Condition assessment drawings attached to this report, including a schedule of windows and doors, describe conditions and offer treatment recommendations.

- Without exception, all window frames and sash need work. Generally, *all Finca windows have experienced some level of past intervention* with repair or replacement of frame or sash components. In this process some architectural detail has been lost from many if not all windows and door assemblies.

- Termite damage is extensive at some windows. *Windows with damaged wood are recommended for 100% replacement* rather than restoration/repair due to the context of working at the project site.

- Proper coatings of *paint*, in the correct historic color, are needed on all exterior walls, windows and doors. Prep work will require detergent cleaning with gentle brush or low-pressure power wash.

- Window *glazing putty is mostly failed* at all windows of the main house. A design solution is needed that is appropriate to the context of the project site, offering high longevity.

- *Tower windows are in much better condition*, as they are generally recessed from the outer wall surface or protected with the roof overhang. Interior screens need repair or replacement, hardware repaired.

- Uneven/misaligned and misfit items are not recommended for replacement unless damaged by termites. The patina of the architecture is an appropriate look for the historic site.

- Water appears to be capable of entering under doors or at door framing posts in several locations. Appropriate repairs will not be difficult to execute.

- Daylight protection provided by plant growth on the wood trellis near the front door is part of collections care strategy. The *wood rafters are deteriorated* and in need of replacement. The process will need to include support and protection for the living plant material during execution of the work.
Figures 13–17: Severe termite damage is readily apparent at multiple windows. Existing window sash in the residence are generally all in need of painting and fresh glazing putty to hold the glass in the wood frame.
For reference of certain window terminology, the following definitions are provided for the two major types of windows:

<table>
<thead>
<tr>
<th>Double-Hung Window</th>
<th>Casement Window</th>
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<td>Defined by Merriam-Webster as “a window that can be opened either by sliding the bottom half up or by sliding the top half down.”</td>
<td>Defined by Encyclopaedia Britannica as a window “with hinges or pivots at the upright side of the vertically hung sash, so that it opens outward or inward along its entire length in the manner of a door.”</td>
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- Most termite activity appears to have been limited to the frames where the roof leaked above. Sash and doors do not show termite activity. Fenestration conditions are detailed in the attached window and door schedules. Additional damage may exist that is concealed.

- Generally, much of the hardware remains. The majority of the ropes for the double-hung counter weights are broken and not operable. These can be repaired. Few sash locks at the meeting rail exist, or those that do are not operable.

- Existing window sash in the residence are all in need of painting and fresh glazing putty (holds in the glass in the wood frame). In addition, numerous window sash were observed to have failing joints at corners, allowing moisture and rain to enter.
Figure 18 (above): The double-hung sash was built with a wide gap at the meeting rail, allowing air infiltration at all windows of this type. There is no hardware to lock the windows shut, either. The horizontal rails of the two sash sheet should meet tightly in the middle when the sash are in the closed position, and the typical latch pulls the two sash a little tighter together. This sub-standard construction suggests all the double-hung sash may be replacements from the 1960s restoration effort, or else Hemingway lived with poorly made units. The mystery is deepened by an anomaly. The glass lights in several double-hung window sash have the ‘wavy’ imperfections characteristic of the older glass manufacturing process, a time when one would have expected double-hung window sash to have been made properly.

Figure 19 (above): The counterweights of the lower sash are mostly disconnected because the sash cords have parted, so the open sash must be pinned in place with a throw bolt latch.
Figure 20: Numerous window sash have failed joinery at the corners, thereby allowing moisture and wind driven rain to enter.

Figure 21: Image demonstrates the level of quality/craftsmanship employed to apply glazing compound and painting.

Figures 22 (left) and 23: Replacement sash fabricated in Cuba in the past several years are unfortunately already showing signs of failure where the muntins attach to the rails. Our Cuban colleagues shared that three double-hung windows on the north side of the residence had been “replicated” in the past several years. We were told the process is time consuming, taking approximately one year to obtain the dimensional lumber and fabricate each window. The detailing of the window does not represent this historic construction in the muntin bars or frame perimeter bead detail. As shown in the blue circles superimposed over the images, the left sash is replicated using a radius where the horizontal and vertical muntins meet. The historic detail is a clean right angle connection.
Figure 24: Replicated casement window in the kitchen area. Even in the closed condition, daylight comes through the perimeter, which should be tightly closed. This condition was observed on multiple casement and pivot windows.

Figure 25: Previous cutting of the lower rail has been so extensive, the connecting structure (mortise and tenon connection) has been compromised.

Figures 26 and 27: Potential Hazardous Materials. Given the Finca’s age and materials traditionally used in wood window construction and maintenance, some hazardous materials (by US OSHA classification) could be expected to be encountered. With Cuban approval, the Technical Team safely removed several small samples of window putty and paint coating to be examined by a licensed testing agency in the US. This is very common to abate such materials in restoration practices in the US. This background information and documentation will be important for any future US team craft trainer/worker who would subsequently join the Team. Lead-based paint is common for this age on interior and exterior finishes. Glazing putty commonly contains asbestos fiber. Testing is underway.
Doors and frames

- Review of the existing exterior wood doors and frames was performed to understand their current condition including extent of deterioration or required repair, original or existing construction details of frames and doors, original or existing hardware operation and other factors related to the cost of their repair or replacement.

- Many exterior door frames appear to have been replaced at some previous time. They are solid in construction and show few signs of rot. Screen doors shown in early Hemingway photographs have all been removed. No sign of their attachment to the existing frames was observed.

- Most door leaves appear to be original mortise and tenon fabrication with a similar muntin construction to the double-hung windows. The basic doors are in good condition with need for glazing putty repair (at sidelights and transom windows) and paint. Deterioration is less than the double-hung windows likely due to the detailing of the doors not being flush with the outside wall. This recess helps protect the exterior surface from as much weather.

- Hardware is in various stages of disrepair and security typically is provided by a contemporary crossbar (an old method of placing a bar across the doors inside at night). Glass appears to be non-tempered, a requirement in the US at exit doors.

Figures 28 and 29:
Much of the door hardware appears to be original to the residence based upon matching units in adjacent interior rooms and age of the screws.
Figures 30 and 31: Typical recess of double “French” doors. Security ropes could be improved beyond the fabric strips utilized currently. Some hardware is of bronze (very good quality) while other hardware is rusting steel or iron. Prior work overpainted the hardware, making it less likely to operate correctly.

Figures 32 and 33: At several door frames the interface between the wood frame and masonry is very large and likely allows moisture and access for insects into the residence.
**Borescope investigation**  
The Technical Team was authorized to bring into Cuba a basic optical borescope to inspect hidden areas without demolition. *It was utilized to investigate the attic space to observe the older roof layer that was concealed when Hemingway added a newer roof.* Both roofs were rebuilt new in 2006–07. Observations were conducted from a hole made in the guest bedroom (with Finca staff approval). While 100% observation was not possible, this basic observation exposed good condition to the substructure.

**Tower roof**  
The Tower roof system is covered by a quarry tile walk surface. That surface appears in good condition. The underlying roofing membrane is unknown. No signs of water leakage is apparent in the space below.

The steel circular stair from the third level up to the roof, not used for public access, is corroded. The steel plate steps and several of the railings are in an advanced state of rust as demonstrated in Figure 36 at right.
Figure 37: A typical rafter embedded in the masonry wall. This location is at risk for rot. However, conditions observed appeared dry and solid.

Figure 38: The typical underside of the wood roof deck. No signs of water damage were observed.

Figure 39: Dark areas that appear to simply be missing the white coating applied to the underside masonry and wood.

Figure 40: Where the roof deck meets the masonry, there does appear to have some minor moisture staining.

Figure 41: A pile of rat poison placed by the exterminator on the ceiling above Hemingway’s bedroom, through the gable end vent. The two end vents have no screen on the backside so mice, birds, bats or other insects and animals could have relatively free access to this space.

Figure 42: One of two vents in the gable end wall.
Other wood-related construction

Figures 43 and 44: Both pergolas at the residence and the pool deck are in state of failure with the unit in front of the residence in the most deteriorated condition.

Figure 45: The wood railing system that is attached to the exterior stair to the kitchen is in poor condition and a life-safety threat.

Figure 46: The wood railing cap to the Tower’s exterior stairs is rotted and not attached securely.
The team members discussed the various aspects of the windows and doors at the Finca. The following points were understood:

- The existing windows and doors **do not protect the collection during a hurricane.** Storm protection is a desired level of assistance.

- The **collection’s protection is a higher priority than attempting to keep historic fabric** of existing frames or glass if more protection can be achieved.

- **Termites** have and will continue to be an issue. The museum at one time was able to have regular chemical treatments, however this has not occurred for some time.

- **Maintenance will continue to be an issue.** Cubans may be open to alternative materials if it means less maintenance.

- **Getting materials to the site**—be it lumber to repair or replace windows or doors, needed paint or glazing putty—**remains a challenge** and likely will not improve any time soon.

- For the Cuban construction team, at this time, to obtain materials and manufacture a SINGLE replacement window takes **approximately one year.**
Recommendations & Budget Cost Estimates

The following recommendations and budget cost estimates were developed to assist the Board in developing next steps for the project. These recommendations and estimates presented by the US Technical Team are based upon observations of this trip plus past observations and knowledge of various construction-related issues observed at the Finca over the Team’s 15 years of successful experience working in the unique context of the Cuban construction industry at a remote job site.

**Assumptions** Based upon the needs of this potential phase of the project, the recommendation basis and major assumptions include the following:

- The protection and **preservation of the Hemingway collection is the highest priority** (vs. the building’s remaining historic fabric).

- Due to available resources, the level of maintenance or repair available at the Finca is not likely to improve in the foreseeable future.

- Construction products and systems common in the US markets are often unfamiliar to the Cuban labor force. Restoration carpentry skills have dissipated over recent decades.

- Capacity of local utilities and infrastructure is generally low. **Electricity and water supply systems are unreliable.** Expectations for pace of work progress must be tempered accordingly.

- The existing window units offer **little, if any, protection from a major storm event.** This includes wind driven rain or impact protection. Improvement to minimize this risk is desired.

- Many of the existing window units, due to ill-fitting sash and frames or deterioration, allow **easy access for insects into the residence** and therefore are a threat to the collection. Improvement to minimize this risk is desired.

- **Ultraviolet protection film,** previously installed and in cases in a state of failure, should be included in the window and door restoration process.
The budget numbers assume:

- Project approvals, fundraising and final design in 2020 with major material procurement and shipment(s) starting in 2021. Some options would extend into 2022.

- As further detailed in item descriptions below, the Foundation’s role is budgeted to be the provider of materials with technical training. On site installation labor will primarily be by Cuban trades.

- Allowances for “Soft Costs” for architect services, management time, Foundation administration, team travel and lodging have been included.

- Reasonable market pricing and scope contingency has been included in the budget.

Window restoration options

The Technical Team has developed three options related to intervention on the wood windows.

**Window Option 1**

**Replace Most Critical Windows**

- General Scope: Provide custom shop fabricated sash and frames of high-quality mahogany wood, prefinished with laminated safety glass, custom fabricated storm (hurricane) protection panel. This addresses approximately 17 window units. Material is included to repair existing exterior doors.

- Pros: Addresses most deteriorated units quickly. **Least costly option.**

- Cons: Deterioration of remaining windows is likely to continue. Does not address roof leak potential. **Collection is at risk from weather events**—from driven rain and even more so with extreme weather event such as a tropical storm or hurricane. Provides no materials to correct issues with remaining windows.

- Schedule to Implement: Assumes 12 months for Foundation approval/funding, another 12 months to fabricate and deliver. **2022 completion.**

- Estimated Cost to Foundation: $626,000.
Window Option 2
Replace Most Windows/Restore Doors and Tower Windows

- General Scope: Provide custom shop fabricated sash and frames of high-quality mahogany wood, prefinished with laminated safety glass, custom fabricated storm (hurricane) protection panel for most of the residence’s windows. Material is included to restore existing exterior doors, fan, arch top and Tower windows. **All windows to have hurricane protection.**

- Pros: Maximum potential for long-term repair and potential for control of the outcome with maximum US fabrication and minimal on-site labor. Allows the Finca to **have best possible weather and UV protection** with laminated glass and engineered safety panel system. Corrects for poor fitting existing windows, which allow weather into the residence. Cuban labor could be overseen to properly install. **Missing historic details could be reestablished.** Details may be able to **minimize future deterioration from roof leaks.** Maximizes protection from hurricanes.

- Cons: **Loss of historic building fabric.** May need to implement partial shipment to allow safety of materials from leaving the site. Does not address roof leak potential.

- Schedule to Implement: Assumes 12 months for Foundation approval/funding, another 24 months to fabricate and deliver an estimated three shipments. **2023 completion** for shipment of material.

- Estimated Cost to Foundation - **$1,242,000.**

Window Option 3
Replace Critical Windows/Establish Cuban Restoration Shop for Balance of Windows

- General Scope: Provide custom shop fabricated sash and frames of high-quality mahogany wood, prefinished with laminated safety glass, custom fabricated storm (hurricane) protection panel for critical 17 window units. **Establish a Cuban-based restoration shop to be overseen by US workers** to implement comprehensive restoration of existing wood windows and doors.

- Pros: Addresses most deteriorated units quickly. **Local Cuban labor is less expensive** than US training crews.
Cons: This would require a dedicated space with controlled environment and reliable electricity for abatement and finishing. The availability of Cuban resources who could be trained to the required high level of craftsmanship to implement this option is questionable given past observation of simple paint and finish standards. Duration for Cuban team to implement the comprehensive restoration of 50 windows is extreme uncertainly. Does not address roof leak potential. The ability to modify and improve the existing sash, say with a laminated safety glass for improved hurricane protection, would be less likely with this in-Cuba shop.

- If the existing sash and frames were to be restored in Cuba, assuming available resources, the typical steps involved are very detailed and a challenge to provide even in the U.S. market. The steps could include:
  - Detailed field survey
  - Final scope definition
  - Develop temporary security and protection plan/system while units are removed for repair
  - Develop detailed restoration procedures manual in Spanish
  - Remove existing sash and frame components
  - Abate any hazardous materials
  - Fabricate cutting tools to match historic wood profiles
  - Fabricate missing wood moldings, dimensional lumber, etc.
  - Locate and secure a weather safe restoration shop space near Finca site with adequate power to run millwork and refinishing equipment estimated at 4,000 sf.
  - Procure, ship and set up millwork and finishing equipment in Cuba (obtain related government shipping approvals)
  - Ship repair wood and pre-milled lumber along with epoxy fillers, paint, termite treatment, fasteners and replacement hardware and related spare parts (obtain related government shipping approvals)
  - Fabricate and ship new replacement glass material (obtain related government shipping approvals)
  - Fabricate new frames, correctly historically detailed, where termite damage has destroyed existing frames
  - Remove existing glass from remaining sash
  - Strip old finishes and consolidate wood
  - Implement wood repair and replacement of select components
  - Prime and first coat paint frames and sash
  - Reinstall glass into sash with new glazing putty
  - Let glazing putty cure to firm (approximately 1 week.)
  - Apply final coat of finish
  - Install new or restored hardware
- Reassemble sash into frames
- Install frames into original masonry opening(s)
- Final assembly and adjustment (e.g. counterweight adjustments, shimming in the masonry opening)

- Schedule to Implement: Assumes 12 months for Foundation approval/funding, another 30 months to fabricate and deliver, set up and implement restoration shop. **2021–2023 completion**, but highly dependent upon Cuban work forces.

- Estimated Cost to Foundation - **$1,520,000.**

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**Roof replacement option**

- General Scope: Provide new fiber cement corrugated panels for residence roof. Provide custom fabricated stainless steel or other corrosion-resistant metal gutter and flashing system. All new stainless-steel fasteners, downspout connectors, etc. **Assumes the removal of the existing system and installation of the new will be by Cuban labor with Technical Team supervision.**

- Pros: **Does not change the look of the existing system.** Corrects for lack of expansion joints and poor flashing detailing of existing gutter and roof system. Eliminates corrosion of existing system.

- Cons: **May require the Finca to be empty** for a period of time while the work is ongoing.

- Schedule to Implement: Assumes 12 months for Foundation approval/funding, another 12 months to fabricate and deliver. Installation should be approximately a month.

- Estimated Cost to Foundation: **$583,000.**
Other interior and exterior items

- General Scope: This is a group of items considered important to the needs of the Finca and includes masonry cleaning systems, paint or other masonry coatings for inside and outside the residence and Tower for walls and ceiling surfaces. It includes exterior wood and metal railing systems at the Tower and near the front entrance. It includes the spiral stair replacement at the top of the Tower. Included in this scope is the replacement wood trellis structure in front of the residence, which shades the patio area. All labor is assumed by the Cuban workforce. Additional paint, epoxy, glazing compound, extra glass, hardware and wood stock shipped for Cuban trades to restore balance of windows.

- Pros: This will help keep moisture out of the inside of the Finca and eliminate current mold growth on the facility. Local Cuban labor is less expensive than US training crews.

- Cons: Oversight should be assumed for proper surface cleaning and preparation before new coatings are applied. Duration for Cuban team to implement the restoration of 50 windows is an extreme uncertainly.

- Schedule to Implement: Assumes 12 months for Foundation approval/funding, another 12 months to fabricate and deliver. Work completion not possible to predict.

- Estimated Cost to Foundation: $733,000.
Next steps
(pending FV Board approval)

- US Technical Team completes a **full field investigation** to develop detailed fabrication and construction material needs. The team will observe any changes to conditions that may have occurred since the December 2019 visit.

- Establish a written **preservation philosophy** approved by all collaborators.

- US Technical Team develops/oversees detailed construction and shop fabrication drawings. Proposed fabricator of the replacement windows will visit the site to review field conditions and get additional measurements for proper fitment. Roof technician will be engaged for roofing work, if pursued at this time.

- Finca Vigía Foundation **approves updated budget.**

- **TCC procures materials** delivered to a storage yard.

- US Technical Team develops shipping manifests for single or multiple shipments of materials, and then TCC arranges for **shipping of all materials** to Cuba.

- US Technical Team **meets shipment(s) in Cuba.** Team members review installation by Cuban trades. Limited training can be provided, if necessary.