STRUCTURAL ASSESSMENT REPORT
FOR
HISTORIC MONROE STATION STABILIZATION

BIG CYPRESS NATIONAL PRESERVE
50910 Tamiami Trail East
Ochopee, FL, 33943

September 19, 2008

BICY Contract No. C5120085452

A REPORT WHICH (1) ASSESSES THE EXISTING STRUCTURAL CONDITIONS OF HISTORIC MONROE STATION. (2) MAKES PRELIMINARY RECOMMENDATIONS FOR NEW STRUCTURAL REINFORCEMENT REQUIREMENTS INTENDED TO STABILIZE THE HISTORIC BUILDING, AND (3) PRELIMINARILY ASCERTAINS THE BUILDING'S SALVAGEABLE HISTORIC FABRIC TO ENSURE THAT ANY NEW STRUCTURAL REINFORCEMENT INTRODUCED WITHIN THE BUILDING IS APPROPRIATELY WEAVED INTO THE EXISTING HISTORIC FABRIC OF THE BUILDING.

Prepared for U.S. National Park Service
Big Cypress National Preserve (BICY)

by

SIXTO ARCHITECT, INC.
with
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PART I: INTRODUCTION

Objective

The purpose of this Report is to provide the National Park Service (NPS) Big Cypress National Preserve (BICY) with a professional Architect-Engineer's (AE) recommendation for structural reinforcement requirements for the stabilization of Monroe Station within the context of the existing building's historic fabric and in accordance with The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings. The concluding recommendation is based on the following three tasks performed by the AE and which are documented in the following pages of this Report:

1. Assess the existing structural conditions of historic Monroe Station;
2. Make preliminary recommendations for new structural reinforcement requirements intended to stabilize the building;
3. Preliminarily ascertain the building's salvageable historic fabric (historical material) to ensure that any new structural reinforcement introduced within the building is appropriately weaved into the existing historic fabric of the building.

Background

Sixto Architects entered into a Project Agreement with BICY on August 2008 to provide services for the Monroe Station Stabilization Phase II. Prior to Sixto Architects involvement in Phase II, a Phase I Report titled Final Report to *Rehabilitate the Historic Structure at Monroe Station* had been issued by (NPS) Historic Preservation Training Center (HPTC). In this Report, the BICY's **Preferred Design Solution** is stated to be as follows:

"Remove the existing two-story south side addition and remaining single story east side shed addition and associated porches from the original 12' x 24' two-story Monroe Station building and rehabilitate the original building and surrounding landscape to reflect the 1928 -1934 Period of Significance as designated in Section 8 of the National Register of Historic Places Registration Form."

Shortly after the issue of the Phase I Report, BICY and HPTC determined that the aforementioned Design Guidelines were to be amended based on discussions with representatives of BICY, HPTC, the Florida State Historic Preservation Office, Florida Department of Transportation (DOT), and Florida DOT contractor PBS&J. The original Design Guidelines were revised and formally approved by BICY, and were reissued as the **Preferred Design Solution with Design Guidelines as Amended 02/14/08.**

In readiness of Phase II, NPS prioritized the tasks from the **Preferred Design Solution with Design Guidelines as Amended 02/14/08,** with the objective to "complete as much work as possible towards the physical rehabilitation of the historic

Monroe Station structure within the parameters of the available Phase II funding as defined by the **Preferred Design Solution with Design Guidelines as Amended 02/14/08**". The NPS provided the **Prioritized Recommendations for Rehabilitation Treatment "**with the initial goal that the original building will be structurally restored and placed in 'mothball' status. Any work not completed under Phase II of this project will be addressed as a future project as additional funding becomes available."

Scope of Work

With the task of providing permit-ready construction documents to stabilize Monroe Station, but also with the goal of providing a design to NPS which shows the ultimate project objectives, Sixto Architects has been retained to provide design drawings which include a site plan showing all future buildings, parking, as well as preliminary floor plans and building elevations of the new restroom building and new hunter's check station.

The scope of work to be provided by Sixto Architects is divided into the following phases:

Investigation and Analysis Phase (current phase, or "this Report")

The objective in this current phase is to conduct on-site investigations of the existing historic building to assess the structural framing method and to determine if the structural engineers proposal for incisive in place structural reinforcing are acceptable within The Secretary of the Interior's Standards for the Treatment of Historic Properties.

Design Phase

Provide Architectural Design Drawings which will include: Site Plan, Demolition Floor Plans and Elevations, Floor Plans, Building Elevations, Building Sections. Provide a Preliminary building rehabilitation written description, Meetings, and coordination of the preliminary structural engineers input with architectural design.

Construction Document Phase (Option 1: Without the need to dismantle)

Documentation of existing historic fabric along with architectural and structural engineering Construction Documents, including necessary drawings to rehabilitate the existing historic building as described in the **Prioritized Recommendations For Rehabilitation Treatment** of the **Monroe Station Stabilization Phase II Scope of Work.** The scope of work includes: In-depth and detailed documentation in-stu of each readily visible historic building element as described in Sections 1.2.2 through 1.2.5 of the **Prioritized Recommendations For Rehabilitation Treatment**; architectural Site Plan, and construction documentation of specific historic fabric to be repaired, altered, rehabilitated or preserved; technical or "permit ready" architectural floor plans, building elevations, building sections, ceiling plans, and detailed drawings; structural drawings (i.e. foundation plans, structural schedules, etc.); technical architectural and structural specifications.

Construction Document Phase (Option 2: With the need to dismantle)
Provide Architectural and structural engineering Construction Documents which include necessary drawings to rehabilitate the existing historic building as described in **Prioritized Recommendations For Rehabilitation Treatment** of the **Monroe Station Stabilization Phase II Scope of Work.** The scope of work is similar to the scope described in Option 1 above.

Bid Phase
Respond to Contractor's questions as required.

Construction Administration Phase
Review and process Contractor's monthly pay requisitions, respond to Contractor's written questions, review and take action on sub-contractor shop drawings, conduct once per week job site visits to ascertain the general progress and quality of the Work, and provide other services normally associated with the Construction Administration Phase.

PART II: STRUCTURAL REPORT

General

As requested by the National Park Service, Big Cypress National Preserve, representatives of Douglas Wood & Associates, Inc. (as a subconsultant to Sixto Architect, Inc.) have conducted a preliminary investigation of the present condition of the existing structural system for the Monroe Station located at 50910 Tamiami Trail, Collier County, Florida.

Scope of Investigation

Prior to the involvement of Douglas Wood & Associates, Inc. in this project, it was decided that it is desired to remove all later additions and restore the building to its original configuration. It was further decided that due to budgeting constraints, it is desired to exclude the original front canopy, windows and doors, and interior build-out from the initial construction phase. This original configuration (minus the front canopy) is illustrated in Figures 6.1 through 6.6. in "*Monroe Stabilization Phase II, Scope of Work*," prepared by the National Park Service, Big Cypress National Preserve. Copies of these drawings are included in Appendix A to this report for the convenience of the reader.

Accordingly, our investigation of the existing structural systems was limited to those which are desired to be retained. We did not give consideration to any of the systems which are proposed to be removed.

Purpose

The purpose of this preliminary investigation was to determine the general present condition of the existing structural systems and to determine reasonable concepts for restoration of the structural systems.

METHODOLOGY AND LIMITATIONS

These investigations were conducted using the following methods:

Visual Observation

Most information was gathered by visual observation. Where exposed, structural members were directly observed. In other areas (such as under the first floor, the second floor joists and attic), significantly limited visual access was gained through existing openings in existing finish materials. At one of the foundation piers, it was possible to scrape away some earth to locate a portion of the top of the existing footing below. Where direct visual access was not established, observations were limited to secondary signs of possible structural distress such as cracks, efflorescence, staining, deflections and deformations of existing finish systems.

Review of Existing Documents

The following documents relevant to these investigations were made available for reference by Douglas Wood & Associates, Inc. during this investigation:

1. "*Monroe Station Stabilization Phase II, Scope of Work (SOW)*"
   Prepared by the National Park Service, Big Cypress National Preserve

2. Set of HABS drawings, "*Monroe Station*"
   Prepared by the National Park Service
   Dated: 2007

3. "*Rehabilitate the Historic Structure at Monroe Station, Phase I – Final Report*"
   Prepared by the Historic Preservation Training Center of the National Park Service
   Dated: August, 2007

Sampling and Testing

No samples of existing materials were taken and tested during this preliminary investigation.

Some materials sampling and testing along with geotechnical exploration, sampling and testing will be appropriate, however, in the initial stages of the future construction documents phase.

Limitations

The following limitations to this investigation should be noted. Since this is a completed building, many of the structural members and their connections, and buried foundations and soils conditions cannot be directly observed. We did not remove existing finishes or other construction, nor did we perform excavations to gain visual access to existing structural members. Where structural elements could not be directly observed, a sampling of members was observed, or observations were directed at secondary signs of structural distress such as cracks, staining, efflorescence and deflections. Also, due to the constraints of time, investigations did not include exhaustive member-by-member and connection by connection inspection. At this time, only conceptual stage structural calculations have been performed to assist in determining concepts for restoration. This office assumes no responsibility for the structural design or construction of the existing building. The findings presented in this report do not imply any warranty on the performance or Building Code conformance of the existing structural systems.

It must be noted that this building is quite old and historical. The building codes, materials, products and practices at the time of the original construction

and of the subsequent additions and alterations vary considerably from those of today. This is true relative to both the design of wind resistance and for gravity loads. Therefore, it should be remembered that there are many aspects of the existing structural systems which do not conform to today's standards and codes. It should also be noted that while this building has probably experienced and withstood a number of hurricanes throughout its life, it has probably never been subject to upper-level category hurricane winds, such as were experienced during Hurricane Andrew in 1992 in southern Miami-Dade County.

Building Code Issues Relative to Proposed Restoration

At this time, it is intended for this project to comply with the requirements of the Florida Building Code 2007 – Existing Building. Since this restoration project will involve the entire floor area of the building, since proposed changes to the existing building (i.e. removal of multiple additions and addition of others) will significantly affect the performance of the remaining structural systems and since the proposed use of the building is different from its previous use, this project will be classified as an Alteration Level 3 in accordance with the Florida Building Code 2007 – Existing Building. Also, more than 30%of the existing structural area will be involved in the proposed work; therefore, it will be required to bring the building's structural systems into compliance with the strength requirements of the Florida Building Code 2007-Existing Building.

As the reader can imagine, this will require substantial structural repair and enhancement. It should be noted, however, that Douglas Wood and Associates, Inc. has successfully engineered a number of quite similar restorations of wood-framed buildings, including the Richmond Inn at the Charles Dearing Estate in Miami-Dade County, the Dice House at Continental Park in Miami-Dade County, Old Miami High School in the City of Miami, and the Seybold Canal House (not constructed) in Miami and the Belleview Biltmore Hotel and Resort (currently in design) in Bellaire, Florida. The conceptual strategies for satisfying the requirements of the Building Code will be discussed later in this report.

EXISTING SITE CONDITIONS RELATIVE TO STRUCTURAL ISSUES

Environmental Influences

Hurricanes

All of South Florida is vulnerable to hurricanes, and Monroe Station has, undoubtedly, been subject to hurricane-force winds on a number of occasions. Past performance, however, can not be considered a predictor of future performance. Obviously of course, deterioration is progressive, and structural systems may weaken over time. Also of importance, is the unlikelihood that, despite its age, Monroe Station has ever experienced winds associated with an

upper-level category storm, such as categories 4 and 5 on the Saffir-Simpson Scale.

Flooding
Floods are possible in virtually all of the Everglades and coastal regions of South Florida. This preliminary investigation has not included determination of the existing floor elevation, nor determination of a design flood elevation. As a historic building, it may be possible to waive aspects of FEMA flood requirements, even though the proposed scope of work will qualify as an Alteration Level 3 under the Florida Building Code 2007 – Existing Building. This issue will require additional investigation during the construction documents phase.

Humidity
Humidity is high in South Florida. Generally, ambient humidity will not significantly accelerate structural deterioration. However, the introduction of air-conditioning systems can cause deleterious conditions. Generally, such conditions occur when the interior spaces are kept quite cool. The cool air in turn cools the enclosing construction. If insulation is inadequate (which is almost always the case in older construction) the warm sides of surfaces can cool sufficiently to condense small amounts of moisture out of the warm humid air. This can be particularly problematic in exterior wall cavities (where outside air may enter through unsealed construction), crawl spaces and attics. Small amounts of moisture may in some cases actually be drawn through enclosing construction due to the humidity difference between inside and outside spaces. This can cause efflorescence of plaster and other conditions.

Conditions on cooled surfaces exposed to warm humid air can cause enough moisture to support fungal growth in wood (rot).

Of course, climate control is needed for human comfort. From the viewpoint of the preservation of structural materials in buildings, however, air conditioning is generally counterproductive. To minimize its detrimental effects, future air conditioning should be used only to the extent necessary. If it is necessary to provide significantly lower interior humidity levels (perhaps for the storage and display of historic materials), a reheat system should be considered to prevent cooling of exterior surfaces to the point of condensation. Attic and crawl space insulations should be provided and adequate ventilation should be maintained.

GENERAL DESCRIPTION OF EXISTING BUILDING STRUCTURAL SYSTEMS

General
The existing building is a two-story wood-framed building with a hip roof and wood siding. A number of additions to the original structure are existing, but it is intended to

remove them, and they are not included in this investigation (Refer to Photographs No.'s A91 through A96). This investigation is limited to the structural systems which remain extant from the original construction. The rear one-story section of the original construction and the exterior west side stair no longer exist. The east and south walls of the original construction at the first floor have also been previously removed and replaced with wood columns along the former south wall and wood beams below the second floor along the former east and south walls.

Roof

The existing roof is generally constructed as follows:

Sheathing (Refer to Photographs No.'s A37, A38, A42, A43 and A45)
Existing roof sheathing consists of 1x6 tongue-and-groove pine boards installed perpendicular to the roof rafters. As is usually the case in older buildings, it appears that several of the original tongue-and-groove boards were previously replaced with pine boards, without tongues and grooves.

Rafters (Refer to Photographs No.'s A36 through A47)
The roof is generally constructed of 2x4 (1 5/8" x 3 ½" actual) rafters at approximately 24" o.c. The rafters generally bear on a 1x tongue-and-groove board, which bears on the cantilevered ends of the ceiling joists (at the eave edge) (Refer to Photographs No. A38 through A40 and A43). There are vertical 1x6 boards between the ceiling joists and the rafters approximately below the ridge (Refer to Photographs No.'s A42, A44 and A46) and at approximately half the distance from the front (north) wall and the ridge (Refer to Photographs No.'s A36, A40 and A41). These vertical boards may have been installed primarily for erection purposes.

The hip rafters are also 2x4's (Refer to Photograph No. A42). The roof of the rear addition was extended over the original roof (Refer to Photographs No.'s A94 through A96). This roof framing, however, does not appear in the original attic. Therefore, it appears that the added roof framing will be easily removable.

Ceiling Joists
The existing ceiling joists are also 2x4 (1 5/8" x 3 ½" actual) at approximately 24" o.c. Generally, the ceiling joists are oriented in the north-south direction, and as previously stated, the rafters align with them and bear on their cantilevered ends through a 1x plate (Refer to Photographs No.'s A38 through A40 and A43).

At the east and west ends of the attic, the ceiling joists are oriented in the east-west direction. In these areas, the rafters do not align with the ceiling joists (Refer to Photographs No.'s A45 and A47). These ceiling joists also extend only approximately 16 inches inward from the east and west exterior walls,

where they are nailed to one north-south ceiling joist (Refer to Photographs No.'s A45 and A47).

The second floor ceiling material is a thin, flimsy wood panel.

Second Floor

The second floor is primarily constructed of wood finish flooring (no sheathing layer) on 2x8 (1 5/8" x 7 ½" actual) wood joists at approximately 16" o.c. At the front (north) wall, there is a 1x4 ribbon nailed to and set in notches in the wall studs(Refer to Photographs No.'s A2, A3, A5, A10, A11, A12 and A24). The second floor joists bear on this ribbon and generally are also nailed to the wall studs, the east and west walls, ledgers are nailed to the wall studs.

First Floor (Refer to Photographs No.'s A29 through A35 and A85 through A90)

The first floor is primarily constructed of wood finish flooring (no sheathing layer) on 3x8 (3" x 7 3/4" actual) wood joists at approximately 16" o.c. These joists bear on wood beams at the front (north) wall (Refer to Photographs No.'s A35, A85 through A87 and A90) and at what was the rear (south) wall (Refer to Photographs No.'s A29 and A32).

The wood beams (under all four original building walls bear on 16 inch (nominal) square by approximately two feet high piers constructed of concrete-filled, concrete column blocks (Refer to Photographs No.'s B85, B86 and B88 through 90). The bottoms of the wood beams are notched at the piers.

Bearing Walls

The four exterior bearing walls of the original construction at the second floor remain. Only the front (north) and west walls remain on the first floor. Originally, the walls were balloon-framed (i.e. the wood wall studs were continuous from the first floor to roof) (Refer to Photograph No. A24). Of course, however, rather than starting at the first floor level, the studs above the two large wall openings on the front (north) side of the building at the first floor, bear on the lintels above these openings (Refer to Photograph No. A5, original lintel is upper horizontal member, while the lower one appears to be a later in-fill). There are double studs at the jambs of the original wall openings on the front (north) side of the first floor (Refer to Photographs No.'s A5 through A7, A10, A12 and A27, original jamb is at the end of the original lintel).

As previously stated, the original east and south walls of the first floor were removed and replaced with wood columns and beams. There have also been several changes to wall openings (a consequently to the original wall studs) in the front (north) and west walls of the original construction (Refer to Photographs No.'s A2 through A12, A14, A20, A25 and A26 through A28).

There is no wall sheathing. The exterior siding boards are fastened directly to the wall studs. There are a number of original 2x4 diagonal braces in the original walls (Refer to Photographs No.'s 1 through A3, A12, A13, A22, A25 and A35 at the first floor and

Photographs No.'s A49 through A51, BA62 through A64, A66 through A68, A70, A76 through A78, BA0, A82 and A83).

Foundations

The foundations primarily consist of 16-inch x 16-inch, concrete-filled, concrete column blocks, approximately 2 ft. tall. Based on what was revealed by scraping earth away from the side of one of the piers, it appears that the piers bear on shallow concrete footings of approximately 28 inches x 28 inches square (thickness was not confirmed).

It appears that these piers are of a more modern construction, and this is consistent with the reported relocation of the building to accommodate widening of the highway in 1957.

GENERAL EXISTING CONDITIONS, SPECIFIC ISSUES, OBSERVATIONS, EVALUATIONS AND CONCEPTUAL PHASE STRATEGIES FOR REHABILITATION

Roofs

1) The Florida Building Code allows a diaphragm shear value of 300 lbs./ft. for tongue-and-groove sheathing. Our preliminary calculations indicate that this value may be exceeded under current design wind requirements. Therefore, it may be necessary to install a layer of plywood above the existing sheathing. Normally, the Code would require a 5/8-inch thick plywood for roof sheathing, but since the 1x6 existing sheathing will remain, we believe that a ½-inch thick plywood may be justifiable.

2) The existing 2x4 roof rafters at 24 inches o.c. are inadequate for current Building Code design requirements. To meet current requirements it will probably be necessary to sister 2x6 rafters to the existing rafters.

3) The cantilevered ceiling joists will also need to be enhanced to meet current requirements. As with the rafters, it may be possible to enhance them with sistered 2x6's.

4) The interior ends of the cantilevered ceiling joists at the east and west ends of the hip roof are inadequately supported at their interior ends. These joists support the loads (gravity and wind) from the ends of the rafters, and the joists are supported at the exterior wall. These opposing forces are balanced by the reactions at the interior ends of these joists. Unfortunately, they are connected to only one 2x4 ceiling joist. This joist, particularly the one toward the eastern end of the roof, has deformed considerably upward

(Refer to Photographs No.'s B45 and B47) and the roof has deflected downward. The roof will need to be realigned, and these joists will need to be appropriately enhanced.

5) All roof and ceiling framing connections are inadequate relative to current Building Code requirements. All connections will need to be enhanced with appropriate nails and galvanized steel connection devices. Generally, combinations of nails and manufactured clips and straps can be made to suffice for most connections. Additional wood blocking will also most likely be required in many areas.

6) Of course, any deteriorated existing structural members (rotted or insect-damaged) should be replaced.

Second Floor

1) The existing second floor joists (size and spacing) are generally adequate, if the second floor is designed as an office space. If it is to become assembly or storage, however, it may be necessary to enhance the existing joists with sistered wood joists.

2) As previously stated, there is no floor sheathing on the second floor. To meet current Building Code requirements, it will be necessary to remove the existing wood finish flooring, add 3/4-inch plywood sheathing and replace the finish floor.

3) Of course, any deteriorated structural lumber will need to be replaced.

4) To meet current requirements, all connections of the second floor joists to the north and south exterior walls (and ledgers to the east and west walls) will need to be enhanced with appropriate combinations of additional nails and/or manufactured, galvanized steel connecting devices (clips and straps).

First Floor

1) The size and spacing of the existing first floor joists is adequate for the design load of an assembly space. There are, however, some deteriorated wood joists which will need to be replaced or spliced with new lumber.

2) As with the second floor, there is no sheathing, and ¾-inch plywood would be necessary to meet current Building Code requirements.

3) The main floor beams around the perimeter of the original building are deteriorated in several areas (Refer to Photographs No.'s A32, A35, A85 through A87 and A90). These beams are also generally significantly inadequately sized for the current Building Code requirements. Also, the

beam in the location of the original east wall (now supporting the later wood column) is tilted out of plumb (Refer to Photographs No.'s A17 and A33).

All of these beams will require improvement. If it is decided that the present appearance of a masonry enclosure wall below the floor is acceptable (along most of the front, presumably, there will need to be a step up to the building, and possibly a ramp or raised grading for ADA compliance), the most cost effective solution would be a continuous concrete wall footing and concrete or masonry stem wall to provide continuous support to the undersized wood beam. Of course, deteriorated portions of the existing beams will need to be replaced.

4) Any deteriorated structural lumber will need to be replaced.

5) Connections of the joists to the supporting beams will need to be enhanced.

Bearing Walls (Second Floor)

1) Most of the original studs in the original exterior walls on the second floor remain in place, and most of these are largely in serviceable condition (Refer to Photographs No.'s A48 through A84). Some studs have been previously cut to modify wall openings (Refer to Photographs No.'s A65, A68, and A71 through A73).

2) The second floor wall studs are not, however, adequately sized and spaced to meet current Building Code requirements, and it will be necessary to add many more studs all around. This is required to resist direct wind pressures perpendicular to the walls and to resist tension and compression forces due to the need for the walls to act as shearwalls to transfer lateral wind loads to the horizontal diaphragms and to the ground.

   Multiple studs will be required throughout, with greater concentrations at the corners and adjacent to window and door openings.

3) All connections of the studs to the roof, to the second floor and to the first floor studs will need to be enhanced.

4) On the south side (where a later addition has made this an interior wall), the siding was replaced with flat tongue-and-groove boards. Some of the original siding is deteriorated. Of course, deteriorated siding and the flat boards on the south side will need to be replaced.

5) The existing (and future replacement siding) will not provide adequate lateral stability, nor will they provide adequate impact resistance in accordance with current Building Code requirements. Therefore, plywood sheathing will need to be added between the studs and the siding.

Bearing Walls (First Floor)

1) As previously stated, the rear, one-story area of the original construction was completely removed. Also, the east and south walls of the main area were also completely removed (replaced by wood columns) (Refer to Photographs No.'s A18 through A21). Therefore, the only remaining walls are the north and west walls of the main area. Unfortunately, almost all of the remaining original studs are significantly deteriorated and/or have been cut or notched to accommodate later construction (Refer to Photographs No.'s A1 through A14, A22, A23, A25 through A28, A34 and A35).

   Consequently, there is very little original wall stud material which is useable.

   Also, as discussed relative to the second floor, the original stud size and spacing is inadequate relative to current Building Code requirements. The framing around the two large openings at the front (north) side of the first floor is particularly inadequate for gravity loads, wind uplift, local wind pressures applied perpendicular to walls and as part of the overall lateral wind resisting system. As the reader can see in Figure 6.1 in "*Monroe Stabilization Phase II, Scope of Work*," (Refer to Appendix A), there is very little wall area on the north side of the first floor. This results in highly concentrated loads in these areas (bending and axial stresses when wind flow is in the north-south direction and tension/compression stresses, combined with bending stresses when wind flow is in the east-west direction). Therefore, significant structural enhancements around the openings will be required. Analysis and design of these systems is not included in the scope of this preliminary investigation but will follow in the construction documents phase. At this time, we suspect that the introduction of structural steel members (within the present wall thickness) will be appropriate.

2) Unfortunately, almost all of the historical wall siding from the original first floor has been removed or is severely deteriorated (Refer to Photographs No.'s A1 through A9, A11 through A14, A22, A25 through A28, A34, A35, A85 through A87 and A90 through A96). It is possible that some of the historical wood siding which was removed (from removal of the east and south walls of the main portion and from the removal of the rear, one-story area) was re-used in the later additions. Further investigation would be necessary to determine if this is the case, and if so, if it is in adequate condition for re-use.

   As with the second floor, plywood sheathing would be necessary to meet current Building Code requirements for lateral wind resistance and impact resistance.

3) Since only a very small number of the original wall studs on the first floor are in serviceable condition, and since the east and south walls were completely removed, it appears that the likely strategy for the restoration of the first floor walls will be as follows:

   a) Install a shoring and bracing system to support the existing second floor and roof in its entirety. The design of this system will need to be coordinated with the structural design of the restored first floor and the enhanced foundation system.

   b) Remove the existing first floor wall siding and studs.

   c) Reconstruct the first floor walls. The resulting structure will be essentially platform-framed rather than balloon-framed.

   Also, please refer to the discussion of foundation enhancements and the discussion of potential alternate strategies, below.

Foundations

1) The existing foundations are significantly inadequate to resist overturning of the building due to lateral and uplift pressures from wind in accordance with the current Building Code. The foundation system will be enhanced. It should be noted that the historical record, and visual observation indicate that the existing piers and foundations probably date to 1957.

   Further analysis and design (included in the scope of later phases) will be required. However, we believe that it may be possible to enhance the existing foundation systems as follows:

   a) Shore and brace the existing second floor and roof as previously discussed.

   b) Shore the first floor wood joists and the perimeter wood beams.

   c) Remove and replace deteriorated portions of the perimeter wood beams.

   d) Remove the existing footings at the corners of the building and replace them with larger footings, and recreate the piers.

   e) Epoxy dowel into the remaining existing footings and construct new continuous footings and stemwalls to provide continuous support for the perimeter beams.

2) Of course, new footings (and stemwalls, if appropriate) would be constructed for the rear one-story area and the exterior stair.

Alternate Strategies

1) Since the existing walls of the first floor are almost entirely unusable, since the existing footings and piers do not appear to date from the intended "Period of Significance" and since the record indicates that the building was previously relocated, we suggest that the following alternate strategy may be appropriate:

   a) Construct a new foundation system in a location adjacent to the existing.

   b) Shore and brace the existing second floor and roof (by a building moving contractor).

   c) Relocate the existing floor framing from the first floor (less any significantly deteriorated wood members) to the new foundation system.

   d) Construct the first floor walls (re-using all existing historical materials which are in serviceable condition). The design of these walls will need to be coordinated with the temporary relocation supports for the second floor and roof.

   e) Relocate the existing second floor and roof on to the first floor walls.

   f) Complete the remaining construction.

   g) Remove the currently existing foundations and piers.

In our opinion, restoration of the Monroe Station using this alternate strategy will be less costly than restoring it in its exact present location.

2) As the reader can no doubt discern, meeting the current Building Code requirements for wind pressures is perhaps the most difficult aspect in the restoration of wood-framed historic buildings.

   At least one building official in South Florida has recognized this difficulty and has allowed the design of restorations for historic buildings to be accomplished using a design wind speed of 90 mph (3-second gust, as used in ASCE 7-02/05). The usual design wind speed in South Florida is 140 mph or 146 mph, which corresponds to a mid-category 3 hurricane (Saffir-Simpson Scale). The 90 mph (3-second gust) corresponds to the minimum category 1 hurricane. Use of a 90 mph deign wind speed instead of a 140 mph design wind speed results in nearly a 60% reduction in design wind pressures. Where a 90 mph design wind speed has been used, the building official required a covenant from the owner that the building would

be evacuated upon issuance of a hurricane warning by the National Hurricane Center.

Unfortunately, this alternate design approach is not in accordance with the Florida Building Code. If such an approach is contemplated, all parties would need to agree to its use, and the owners would need to indemnify the design professionals and contractor.

PART III: ARCHITECTURAL REPORT

On Sept 5, 2008 representatives from Sixto Architects visited the site of historic Monroe Station with the intention of assessing the existing historic fabric and to coordinate with the structural engineer in order to evaluate which structural reinforcement methods best work within the context of the existing historic fabric of the building. Representatives of Douglas Wood & Associates, Sixto Architect's structural engineering consultant, were also present at the site on this date.

During the visit, the existing historic portions of the interior first and second floors, as well as the exterior elevations were examined and documented with photographs and written observations. Appendix B to this Report summarizes in photographs some of these observations.

In general, it appears that much of the existing historic fabric of the building is compromised beyond repair. Notwithstanding, through a careful process of rehabilitation and in some cases reconstruction, the original historic building's volume and massing is salvageable, as well as its original graceful building proportions.

This section is not intended as an all inclusive observation of the existing historic fabric. It is given as a broad overview to coordinate with the structural engineers findings. Further investigation will follow in the subsequent phases. Following is a floor by floor, elevation by elevation description of Sixto's preliminary findings:

Interior First Floor - Floor, Ceiling and Stud Wall Characteristics

The finish flooring is comprised of the original wood boards that appear in poor condition. The flooring has areas of water damage and areas where there is no flooring existing; these areas are covered in plywood. The existing ceiling is comprised of 1' x 1' acoustical tile, and not original. There are no original wall finishes remaining. The historic east and south walls no longer exist, therefore no original siding exists. There are wood columns and beams where these walls stood. The north and west walls remain, the existing door and window openings on these walls have been altered and no longer reflect the historic photograph. There are no remaining historic windows and doors. All the existing siding on the north elevation has been severely damaged by weather and insects and is beyond repair. Approximately 75% of the existing siding on the west elevation appears to be beyond repair.
See Photos # B12 - B19 on Appendix B.

Interior Second Floor - Floor, Ceiling and Stud Wall Characteristics

The historic finish flooring appears to be in better condition than on the first floor. It appears to be salvageable although there are areas where there are missing or broken floor planks. The existing ceiling is not original and comprised of gypsum drywall with wood furring strips running below the drywall. The original walls remain. The north and west walls retain the original window openings visible in the historic photograph. There are three existing windows on the north wall that may be original, the fourth opening is covered in plywood and not visible. The west wall has an existing window which appears to be original. The south wall has an area which appears to be

original framing for a window, but has been covered by tongue and groove siding, indicating that the remaining south side siding (on the interior of the non-historic addition) is not original. There are no original wall finishes remaining. On both the north and west elevations approximately 80% of the existing siding appears to be in good condition. On the east elevation approximately 20% of the existing siding appears to be in good condition. On the south elevation approximately 90% of the existing siding appears to be in good condition, although this siding is not original. An accessible area of the attic showed that the exterior historic building's soffit is made of 3.5 inch wood planks; these may be original to the structure. Closer examination is required. See Photos # B20 - B31 on Appendix B.

East Façade Characteristics

The second floor is the only historic portion visible. It is comprised of painted 5" high wood siding that shows signs of damage from weather and termites, (this is typical for all facades). Only the top board of the structure shows a joint line in the area of the addition, indicating that it is possibly original. Closer examination is required. The existing soffit is painted plywood and not original to the building. The wood trim under the soffit is not original to the building (see note under North Façade Characteristics). There are no decorative roof brackets existing. There is one opening in a portion of the historic structure and it has been covered in plywood exposing only a portion of a louver. The northeast corner of the second floor has an existing section of batter board which may be original. Closer examination is required.
See photos # B1 - B2 on Appendix B.

North Façade Characteristics

Both the historic first and second floors are visible. The original decorative roof brackets are still in place (the brackets were labeled 1-10, from east to west). Bracket #2 appears to have the original rounded bottom portion missing. Closer examination is required. The existing soffit between brackets 1 - 8 and 9 &10 is painted plywood and not original to the building. Between brackets 8 & 9 the soffit appears to be wood planks. Closer examination is required to determine if it is original to the building. The wood trim under the soffit appears to be original. A miter cut at the northeast and northwest corners indicates a continuation into the east and west facades, although the trim is not present on these two facades, (the historic photo substantiates the trim continued on the west facade). On the lower northeast portion of the second floor siding, a joint line between the original historic structure and the shed addition is visible. This indicates the siding at this point may be original. This area also shows an approximately 2' x 2' patch on the siding. The batter boards on the northeast and northwest corners are existing on the second floor only. These may be original. There are also existing concrete steps and planters, which are not original. There are areas of vinyl siding patches on the first floor portion which are not original. All the openings have been covered in plywood.
See photos # B3 - B9 on Appendix B.

West Façade Characteristics

The original historic second floor and partial first floor are visible. The historic first floor shed area does not exist. None of the original decorative wood brackets are existing. The existing soffit is painted plywood and not original to the building. The wood trim under the soffit is not original to the building (see note under North Façade Characteristics). The batter board along the northwest corner of the second floor is probably original. There is no joint line visible on the siding between the original historic building and the addition, indicating that the siding is not original. Closer examination is required. All openings have been covered in plywood. There is an existing concrete planter, which is not original to the building. Vinyl siding patches, as well as plumbing and electrical lines are visible, these are not part of the original structure.

See photos # B10 - B11 on Appendix B.

South Façade Characteristics

None of the original historic building is visible. Refer to description of Interior First Floor, and Interior Second Floor for observations.

PART IV: AE RECOMMENDATION/CONCLUSION

In our opinion, rehabilitation of the historic Monroe Station is possible using the structural methods described in this report. While significant reconstruction of the first floor structural wall frame will be required, it is possible to integrate the structural reinforcement requirements described in this report while respecting much of the existing historic fabric of the building. We do not recommend dismantling the existing wall and floor framing and crating, nor do we recommend removal of the existing roof structure as one unit. Given the existing weak structural conditions of the building and other structural reinforcement requirement needs, a more sensitive approach in terms of historic rehabilitation techniques would be to maintain as much of the existing second floor and roof as-is within the context of the required structural reinforcement. We also believe this approach is the most cost effective solution.

APPENDIX A

PHOTOGRAPH NO. A1

PHOTOGRAPH NO. A2

APPENDIX A

PHOTOGRAPH NO. A3

PHOTOGRAPH NO. A4

APPENDIX A

PHOTOGRAPH NO. A5

PHOTOGRAPH NO. A6

APPENDIX A

PHOTOGRAPH NO. A7

PHOTOGRAPH NO. A8

APPENDIX A

PHOTOGRAPH NO. A9

PHOTOGRAPH NO. A10

APPENDIX A

PHOTOGRAPH NO. A11

PHOTOGRAPH NO. A12

APPENDIX A

PHOTOGRAPH NO. A13

PHOTOGRAPH NO. A14

APPENDIX A

PHOTOGRAPH NO. A15

PHOTOGRAPH NO. A16

APPENDIX A

PHOTOGRAPH NO. A17

PHOTOGRAPH NO. A18

APPENDIX A

PHOTOGRAPH NO. A19

PHOTOGRAPH NO. A20

APPENDIX A

PHOTOGRAPH NO. A21

PHOTOGRAPH NO. A22

APPENDIX A

PHOTOGRAPH NO. A23

APPENDIX A

PHOTOGRAPH NO. A24

APPENDIX A

PHOTOGRAPH NO. A25

PHOTOGRAPH NO. A26

APPENDIX A

PHOTOGRAPH NO. A27

PHOTOGRAPH NO. A28

APPENDIX A

PHOTOGRAPH NO. A29

PHOTOGRAPH NO. A30

APPENDIX A

PHOTOGRAPH NO. A31

PHOTOGRAPH NO. A32

APPENDIX A

PHOTOGRAPH NO. A33

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APPENDIX A

PHOTOGRAPH NO. A35

PHOTOGRAPH NO. A36

APPENDIX A

PHOTOGRAPH NO. A37

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APPENDIX A

PHOTOGRAPH NO. A39

PHOTOGRAPH NO. A40

APPENDIX A

PHOTOGRAPH NO. A41

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APPENDIX A

PHOTOGRAPH NO. A43

PHOTOGRAPH NO. A44

APPENDIX A

PHOTOGRAPH NO. A45

PHOTOGRAPH NO. A46

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PHOTOGRAPH NO. A88

PHOTOGRAPH NO. A89

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PHOTOGRAPH NO. A92

APPENDIX A

PHOTOGRAPH NO. A93

APPENDIX A

PHOTOGRAPH NO. A94

PHOTOGRAPH NO. A95

APPENDIX A

PHOTOGRAPH NO. A96

APPENDIX B

B1. Existing east side of structure. View of historic structure and non-historic additions.

B2. Existing east side of structure. View of NE corner of historic structure (second floor) and non-historic addition (first floor).

B3. Existing north side of structure. View of historic two story structure and non-historic one story addition.

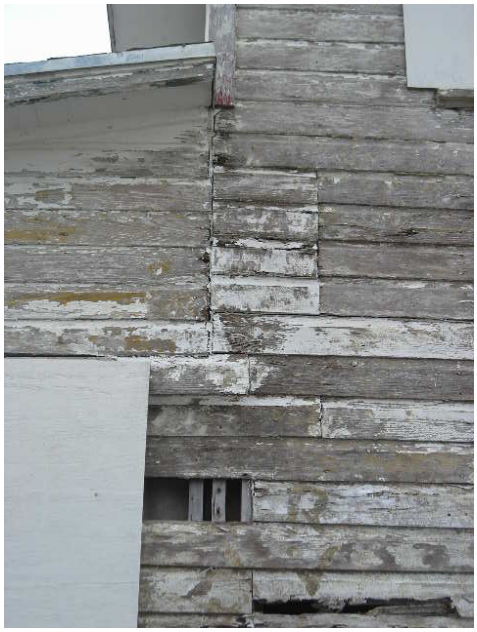
B4. Existing north side of historic structure. Partial view of second floor northeast corner.

APPENDIX B

B5. Existing north side of historic structure. Partial view of second floor northwest corner of structure.

B6. Existing detail of historic second floor northeast corner.

B7. Existing detail of second floor northwest corner.



B8. Existing detail of north wall.

APPENDIX B

B9. Existing view of north wall detail.

B10. Existing view of west side of historic structure.

B11. Existing west side of structure. Partial view of historic structure and non-historic addition.

APPENDIX B

B12. Partial interior view of north wall, NW corner, first floor.

B13. Partial existing interior view of north wall, First Floor.

B14. Partial interior view of north wall, first floor.

B15. Partial interior view of north wall, NE corner of historic building, first floor.

APPENDIX B

B16. Partial interior view looking east, first floor.

B17. Partial interior view looking southwest, first floor.

B18. Partial interior view looking south, first floor.

B19. Partial interior view looking west, first floor.

APPENDIX B

B20. Partial interior view looking north, NW corner, second floor.

B21. Partial interior view looking north, second floor.

B22. Partial interior view looking north, second floor.

B23. Partial interior view looking north, near NE corner, second floor.

APPENDIX B

B24. Partial interior view looking east, near NE corner, second floor.

B25. Partial interior view looking east, near SE corner, second floor.

B26. Partial interior view looking south, near SE corner, second floor.

B27. Partial interior view looking south, second floor.

APPENDIX B

B28. Partial interior view looking south, second floor.

B29. Partial interior view looking south, near SW corner, second floor.

B30. Partial interior view looking west, near SW corner, second floor.

B31. Partial interior view looking west, near NW corner, second floor.