GENERAL FEASIBILITY ASSESSMENT

FOR THE

RELOCATION OF THE EXISTING RESIDENTIAL STRUCTURE

AT

603 MINORCA AVENUE
CORAL GABLES, FLORIDA

SEPTEMBER 30, 2020

PREPARED BY:

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DOUGLAS WOOD ASSOCIATES, INC.
STRUCTURAL ENGINEERS

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INTRODUCTION

General
As requested by the owner, we have conducted a preliminary assessment of the feasibility of relocating the existing residential structure currently located at 603 Minorca Avenue in Coral Gables, Florida.

Scope of Proposed Project
This investigation includes only an assessment of the general feasibility of relocating the existing residence.

At this time, the owner proposes to relocate the existing residence a short distance to the east on the existing site.

It is also intended to remove the non-original addition at the rear (north) of the residence (rear entry, storage, bathroom and garage) and the west side entry steps (non-original).

Future renovations and additions are not addressed in this report.

Existing Structural Systems

Primary structural systems for the original portion of the residence generally consist of the following:

- Wood roof sheathing and framing,
- Wood stud bearing walls with stucco finish,
- Interior wood stud bearing partitions (supporting ceilings),
- Wood floor sheathing on wood joists and wood beams on interior wood posts,
- Oolitic limestone stem-walls, and
- Foundations.

Primary structural systems do not include roofing or other waterproofing systems, doors, windows, decorative elements, fixtures, non-bearing partitions, equipment, and architectural finishes.

Roofing, insect infestations (including termites and other wood-destroying insects), mechanical, plumbing and electrical systems, environmental issues (including radon, mold and ground contamination) and hazardous materials (including lead paint and asbestos) are not included in the scope of this structural assessment.

METHODOLOGY AND LIMITATIONS

Our investigation of existing structural system composition was by visual observation:

- Since architectural finishes remain in place throughout the interior and exterior of the residence, direct observation of structural materials was very limited. Since the residence is currently occupied, and since no asbestos report was made available to us, we did not disturb existing materials. Observation of structural materials was possible, however, in the attic and in the crawl space below the floor.
- Where structural members could not be or were not directly observed, a sampling of members was observed, or observations were directed at secondary signs of structural distress such as cracking, bulging, staining and deflections. An exhaustive member by member inspection was not part of this study's scope. Therefore, it must be recognized that at future times, deteriorated or distressed structural components that were not directly observed or specifically reported during this investigation, are likely to be found.

Calculations have not been performed to verify the adequacy of the design and construction of the existing structural systems for this residence. Douglas Wood Associates assumes no responsibility for the structural design or construction of this 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.

We have assumed that the existing structural systems were properly designed, permitted, constructed and approved in accordance with the building code and general design and construction practices in effect at the time of construction. Also, while we performed observations of the existing structural systems, our observations were limited to what could be readily observed in the existing buildings.

At the time of this writing, no significant exploration (removal of existing building materials) within the occupied residence has been authorized or conducted. The owner conducted some soil excavation and provided photographs in a few locations around the base of the limestone stem-wall.

No testing of existing materials has been conducted relative to this investigation.

GENERAL DISCUSSION

According to the Miami-Dade County Property Appraiser's website, this residence was originally constructed in 1926 (although it is reported that it was constructed earlier than 1926). In general, this building might be considered to have withstood the "test of time" and therefore, to have had structural systems that were generally considered adequate for their intended purposes. However, it must be recognized that the standards, methods, products and practices of the time this building and its subsequent renovations and additions were constructed vary considerably from those of today. Therefore, it should be assumed that there are many aspects of the existing structural systems which do not conform to today's standards, practices and codes. Of course, over time, structural deterioration can also significantly diminish the capacities of existing structural systems.

It also should be recognized that standards of structural engineering practice for older buildings were generally much lower than those of today. Resistance to design gravity loads, live-load deflection and high wind forces in older buildings are often significantly deficient relative to current standards.

While this building may have survived hurricane force winds, it should be noted that the effects of wind on a building may vary greatly depending on wind direction and wind exposure (which, as a function of the building's surroundings, can substantially change over time). Wind speed is, of course, the prime determinant of wind pressures. Wind pressure at a minimal category 5 hurricane is four times the wind pressure at a minimal category 1 hurricane. Of course, structural deterioration is also progressive. Therefore, a building's performance in one hurricane may be very different from its performance in another hurricane.

EXISTING SITE CONDITIONS RELATIVE TO STRUCTURAL ISSUES

Environmental Influences

Hurricanes

All of South Florida is vulnerable to hurricanes, and most all older buildings in South Florida, including this building, have been subjected to hurricane-force winds. Past performance, however, cannot be considered a reliable predictor of future performance. Obviously of course, deterioration is progressive, and structural systems may weaken over time. Wind direction and the effects of surrounding trees and nearby construction are also significant factors.

Flooding

Floods are possible in many locations throughout South Florida. According to FEMA's Flood Map Service Center website, this residence appears to be located within a FEMA Flood Zone X-0.2% Annual Chance Flood Hazard. Therefore, there are no specific mandated flood design criteria for this site.

GENERAL BUILDING CODE ISSUES RELATIVE TO RELOCATION

Relocation

Specific building code requirements relative to relocation of existing buildings are contained in Chapter 13 of the Florida Building Code – Existing Building 2017. The language relative to relocation of existing buildings in the 2020 edition of the Code (effective February 1, 2021) is identical to the 2017 edition.

According to the Code (referenced above), existing residences may be relocated without requirement for compliance with current Code requirements, provided (structural requirements only listed below):

- *The building or structure is structurally sound and in occupiable condition for its intended use:*
  - Comment: The Code does not define "structurally sound" or "occupiable condition." Therefore, these phrases may be subject to the interpretation of the Building Official. The Florida Building Code – Existing Building 2017 defines "dangerous" as:
    - *1. The building or structure has collapsed, has partially collapsed, has moved off its foundations, or lacks the necessary support of the ground.*
    - *2. There exists a significant risk of collapse, detachment or dislodgement of any portion, member, appurtenance or ornamentation of the building or structure under service loads.*
- *The occupancy use classification …is not changed…*
  - Comment: To our knowledge, the owner does not intend to (nor does current zoning allow) a change to the occupancy use category.
- *The building is not substantially remodeled;*
  - Comment: Future repairs, renovations and additions are subject to other Building Code requirements.
- *Foundation plans are sealed by a professional engineer or architect…*

Section 1303.2 of the Florida Building Code – Existing Building 2017/2020 states that the new foundations shall comply with current Code requirements. It further states:

- *The connection of the relocated building to the foundation shall comply with…*current Code.

GENERAL BUILDING CODE ISSUES RELATIVE TO FUTURE REPAIRS, RENOVATIONS AND ADDITIONS

Plans for future repairs, renovations and additions have not been presented to us, and they are not within the scope of this investigation and report. The following, therefore, is only a general discussion of Building Code requirements relative to repairs, renovations and additions. For this discussion, we refer to Appendix J of the Florida Building Code – Residential 2017. The 2020 version of the Florida Building Code is scheduled to become effective on February 1, 2021. There are no changes relative to structural systems between the 2017 and 2020 editions of Appendix J.

At this time, the Building Code will generally allow straight forward minor repairs to structural members, without requirement for a specific investigation of the adequacy of the existing members. Any members or systems of members which are found to be significantly damaged or deteriorated would need to be repaired.

Any future change to a structural member or any significant change in applied loads to a structural member would require compliance with current Building Code requirements for that particular member and for any affected members.

All new structural members and systems would need to comply with current Building Code requirements.

If it were determined through specific and appropriate investigation and evaluation that a structural member or system were “dangerous” (as defined in Appendix J, of the Florida Building Code – Residential, 2017/2020), it would be required to correct the dangerous condition. Appendix J defines “dangerous” as any member whose stress is more 150% of the stress allowed in the current Florida Building Code – Residential.

Proposed alterations are considered to be “extensive alterations” when the “work area” exceeds 50% of the total floor area, of the residence. The definition of “work area” in Appendix J of the Florida Building Code – Residential 2017/2020 is:

- *That portion of a building affected by any renovation, alteration or reconstruction work as initially intended by the owner and indicated as such in the permit…*

This definition is somewhat ambiguous and subject to interpretation by the Building Official. The Building Official should be consulted where there is any question of interpretation relative to the determination of “extensive alteration.” Additions are not considered in the determination of “extensive alterations,” except to the extent they effect existing structural members/systems.

If the level of “extensive alteration” is achieved, the provisions for “reconstruction” will also apply.

Under an “extensive alteration,” “*The minimum design loads for the structure shall be the loads applicable at the time the building was constructed…”* Assuming that this residence was constructed in 1926 (as indicated in the County’s website), the applicable Code is the Coral Gables building ordinance of 1925. Our interpretation of

this requirement is that existing structural systems should be investigated, evaluated and enhanced as required to bring them into compliance with the loading requirements at the time the residence was constructed. Loading requirements in the 1925 building ordinance are not so much different than currently required design loads. However, given the vast differences between structural analysis and design practices between 1926 and 2020, an "extensive alteration" would likely require considerable enhancement of existing structural members. Such work would unavoidably affect existing architectural finishes throughout the residence. Therefore, compliance with this requirement would be expensive.

Numerous non-structural requirements apply to proposed repairs, renovations and alterations. This investigation considers only the structural issues.

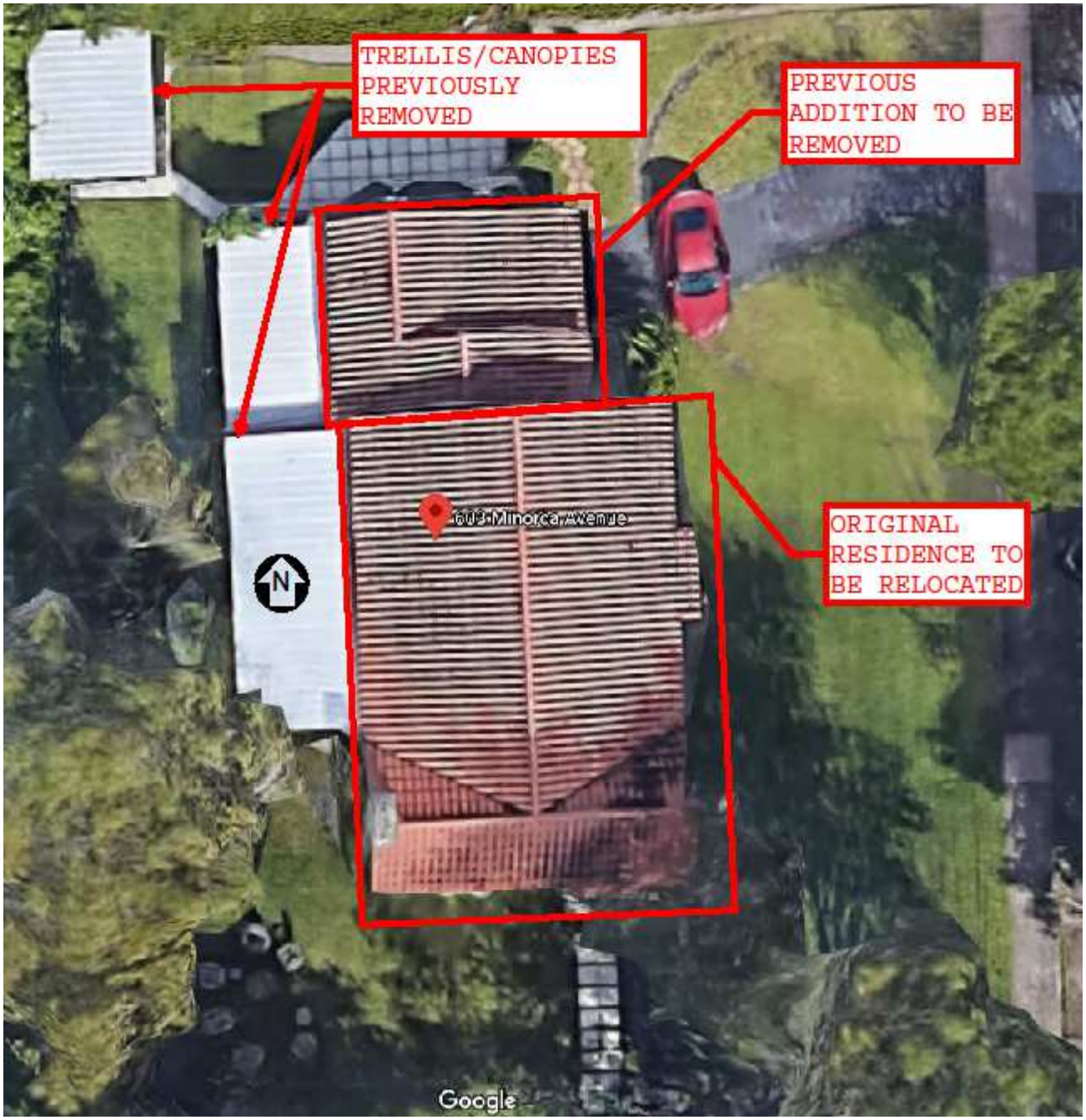
GENERAL BUILDING CODE ISSUES RELATIVE TO ADDITIONS

Proposed additions would need to comply with Chapter 11 of the Florida Building Code – Existing Building, 2017/2020.

Any existing structural members or systems which are significantly affected by the addition(s) would need to be made to comply with current Building Code requirements. Generally, any increase in the demand:capacity ratio of greater than 5% for gravity loads and 10% for wind loads would be considered to be significant.

GENERAL BUILDING INFORMATION

This residence is one story. The rear entry, restroom and garage were added. According to the Miami-Dade County Property Appraiser's website, this residence was originally constructed in 1926 (although it has been reported that it was constructed earlier than 1926).



GENERAL DESCRIPTION OF EXISTING STRUCTURAL SYSTEMS

Roof

Refer to Photographs Nos. 24 through 31 and to the aerial view on page 10.

The roof of the original residence is a sloped, wood framed roof with a gable at the north end. At the south end, the main gabled roof intersects a smaller gabled roof. The smaller section has gabled ends at the east and west sides of the residence. There is an oolitic limestone chimney at the west end gable. The roof sheathing generally consists of wood boards. The rafters are wood. There are a few vertical props along the ridge line (probably primarily for erection purposes). The ceiling joists span in the north-south direction, and they bear at the interior partitions and at the exterior walls. The rafters bear on wood plates/blocking at the exterior walls. Anchorages of the rafters to the plates/blocking and the plates/blocking to the wall studs are not known at this time.

Bearing Walls

The exterior walls of this residence appear to be constructed of wood studs with an exterior stucco finish. The studs are not presently visible in any location throughout the residence. Therefore, none of the studs have been directly observed. The stud sizes, spacings and anchorages are not known at this time. The addition of studs (or not) adjacent to wall openings and the configuration of opening headers is not known at this time. It is also unknown at this time if there is wood board sheathing between the stucco and the studs.

The exterior wood stud walls and the wood floor framing bear on the exterior stone stem-walls. These stem-walls are constructed of unreinforced oolitic limestone rubble with mortar joints. There is an inconsistent parging of the interior (crawl space) side of the stem-walls.

Refer to Photographs Nos. 16 through 23. The floor and walls appear to have been “platform” framed. As such, it appears that the stone stem-walls were erected, the joists were placed (bearing on the stem-walls), a wood plate was set on the stem-walls where the joists are parallel to the exterior wall, and the wood sheathing placed. At this time, nothing is visible above the bottom of the floor sheathing. It is assumed that there is likely a single or double wood plate on top of the sheathing, on to which the studs bear.

Near the south end of the west exterior wall, there is a fireplace chimney constructed of oolitic limestone rubble with mortar joints (refer to Photographs Nos. 12 and 13).

Floors

Refer to Photographs 16 through 23.

The floors in the original residence are wood-framed, consisting of finish wood flooring on diagonal wood board sheathing on wood joists. The wood floor joists primarily span in the north-south direction and bear on interior wood beams and on/in the exterior

oolitic limestone stem-walls. The interior beams bear on interior wood posts and on/in the exterior stone stem-walls.

There is a concrete slab on fill at what was the original rear service entry.

Foundations

The following information is based on the owner's reported observations and on photographs provided by the owner. The owner performed shallow excavations in a few locations at the bases of the oolitic limestone shear-walls. It appears that the stem-walls bear on a continuous concrete/mortar leveling pad which, in turn, bears on the in-situ soil or rock. The leveling pad is a few to several inches thick and extends horizontally a few to several inches beyond the interior and exterior faces of the stem-walls. Such a pad, in lieu of a more substantial footing was not all that uncommon for very early South Florida buildings in areas of generally good bearing soil/rock. The writer did not observe signs of significant settlement in the exterior walls of the residence.

SPECIFIC NOTED OBSERVATIONS AND EVALUATIONS

Roof

1. In general, the existing roof sheathing boards appear to be in serviceable condition. Refer to Photographs Nos. 24, 26, 29, 30, and 31.

2. In general, the existing roof rafters appear to be in serviceable condition. Refer to Photographs Nos. 24 through 31.

Bearing Walls

1. There are some previously sealed stucco cracks. These appear to be normal for this type of construction.

2. There is some damage to the exterior stucco, and there are numerous abandoned anchors in the exterior wall where a previous trellis/canopy was removed from the west side of the residence. Refer to Photographs Nos. 11 and 15. Repairs should be made to prevent water infiltration.

Floors

1. There are some areas of a white color on areas of the underside of the wood floor sheathing and floor joists. These areas may be mortar spatterings or other substances, but some might also be fungus. Refer to Photographs Nos. 16, 17, 19, 20 and 21. Testing by an appropriate laboratory could be accomplished. Areas of fungus (if extent) should be cleaned. Over-cooling of the living space above should be avoided so as not to encourage condensation and the consequent moisture.

2. At the end of at least one floor joist, where it bears in the stone stem-wall, there appears to be some rot. Refer to Photograph No. 22 (third joist from left). It should be assumed that this condition exists in other locations, and that repairs will be appropriate.

GENERAL FEASIBILITY OF RELOCATION

Based on the limited investigations described above, it appears that relocation of this residence is feasible.

To accomplish the relocation, it will be necessary for the owner to employ a well-experienced building mover. The design of the relocation process, materials and equipment will be provided by the building mover.

It will be necessary to design and construct a new foundation system, conforming to current Building Code requirements, for the residence in the proposed location. Since there is an overlap between the building's current location and its proposed location, it will likely be appropriate to elevate and relocate the building, set it on temporary cribbing above its proposed location, and construct the new foundation system under the temporarily elevated building.

It may be determined that it is more practical to elevate and relocate the wood-framed portion of the residence separately from the oolitic limestone stem-walls. If this is the case, the existing stem-walls would be carefully divided into segments (separated along existing mortar joints). The wall segments would be as large as is practical for lifting and moving. When the new foundation system is ready, the existing stem-wall segments would be installed on it. If it is determined to continue using the existing stem-walls as structural bearing elements, appropriate reinforcing rods would be installed in an appropriate grout/adhesive in drilled vertical holes through the stone and into epoxy adhesive in the new concrete foundation system. These rods would also be anchored to the wood structure when it is lowered on to the stem-walls. Alternatively, it may be possible to construct new concrete stem-walls on the interior sides of the historic stone stem-walls and provide a continuous, cantilevered, hidden, corrosion-resistant steel plate to support the wood-framed walls from the new concrete stem-walls.

APPENDIX A

PHOTOGRAPHS

PHOTOGRAPH NO. 1

PHOTOGRAPH NO. 2

PHOTOGRAPH NO. 3

PHOTOGRAPH NO. 4

PHOTOGRAPH NO. 5

PHOTOGRAPH NO. 6

PHOTOGRAPH NO. 7

PHOTOGRAPH NO. 8

PHOTOGRAPH NO. 9

PHOTOGRAPH NO. 10

PHOTOGRAPH NO. 11

PHOTOGRAPH NO. 12

PHOTOGRAPH NO. 13

PHOTOGRAPH NO. 14

PHOTOGRAPH NO. 15

PHOTOGRAPH NO. 16

PHOTOGRAPH NO. 17

PHOTOGRAPH NO. 18

PHOTOGRAPH NO. 19

PHOTOGRAPH NO. 20

PHOTOGRAPH NO. 21

PHOTOGRAPH NO. 22

PHOTOGRAPH NO. 23

PHOTOGRAPH NO. 24

PHOTOGRAPH NO. 25

PHOTOGRAPH NO. 26

PHOTOGRAPH NO. 27

PHOTOGRAPH NO. 28

PHOTOGRAPH NO. 29

PHOTOGRAPH NO. 30

PHOTOGRAPH NO. 31