



125 HOPE STREET, BRISTOL, RHODE ISLAND
STRUCTURAL INSPECTION, JANUARY 16, 2025



Prepared for:

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EXECUTIVE SUMMARY

It is our professional opinion that the existing buildings are in generally poor condition and have numerous issues which will need to be addressed to maintain the serviceability of the structures. Please refer to the section OBSERVED STRUCTURAL DEFICIENCIES, POTENTIAL PROBLEM AREAS for descriptions and recommendations.

Furthermore, due to the fact that the existing structure is out of compliance with flood resistant construction provisions of the building code, we believe that a complete reconstruction of the building (including raising the structure up by at least 18") would be required in order to comply with the appropriate provisions. Given the poor condition of the structural framing, foundations, and connections, such a reconstruction is likely to be challenging and impractical.

INTRODUCTION

At your request, this office has conducted a structural inspection of the buildings located at 125 Hope Street in Bristol, Rhode Island. This inspection included a visual inspection of the accessible areas of the building's interior and exterior. The following is a report of our findings and recommendations.

STANDARD OF CARE AND USE OF REPORT

Please note that the results of this inspection are limited to cursory visual observations of the accessible areas only. While we have reviewed the areas of interest, portions of the structural framing are concealed by architectural finishes, soil, or was otherwise inaccessible, and therefore unforeseen damage or conditions may be present. The findings of this report represent our professional opinion based on the information available to us at this time.

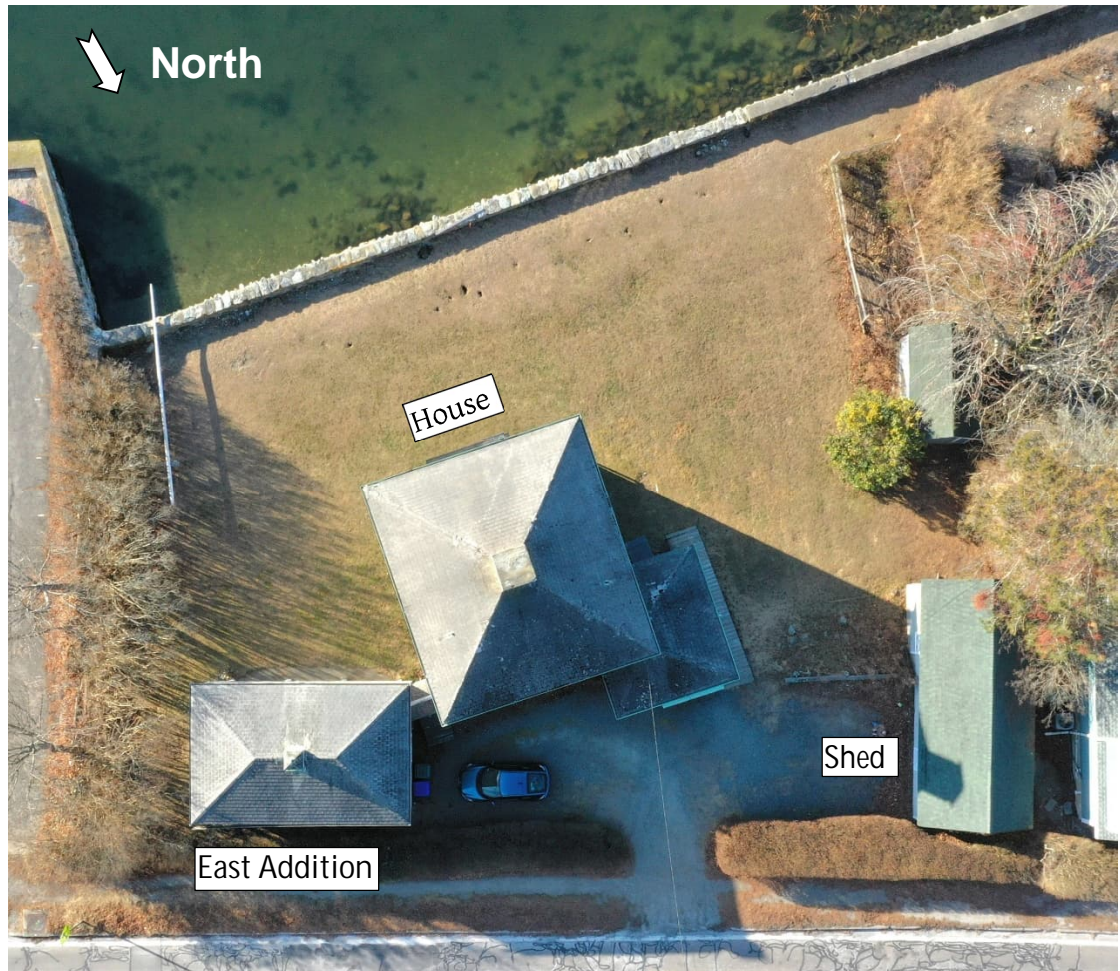
We understand that this report is intended for your use to determine the current structural condition of the existing building. In any budgeting, adequate contingency for hidden or unforeseen conditions that are not identified or are worse than described herein must be carried.

Please note that all dimensions of the existing structure given herein are approximate and based on measurements or estimates of representative members. Dimensions can and will vary and must be considered as "+/-" in all cases (whether or not the "+/-" symbol is indicated).

DOCUMENTS AVAILABLE

No documents were available for review at the time of authoring this report.

KEY PLAN



Overall aerial plan photo of 125 Hope Street taken by WSP with a drone. North is oriented approximately down on the page.

ACTIONS TAKEN

We took the following actions to complete this investigation:

- On Thursday, January 16, 2025, Mr. Robert Bowen, from this office, performed a walk-around tour of the accessible interior and exterior portions of the building and made visual observations of the existing structure and its condition. Mr. Bowen also operated a small un-manned aerial system ("drone") to photograph the building exterior.
- Prepared this written summary of findings and recommendations.
- Discussed with and reviewed by David J. Odeh.

EXISTING BUILDINGS DESCRIPTIONS

The property located at 125 Hope Street in Bristol, RI, has three building structures; the house, east addition (consisting of finished living space that is connected to the house via small hallway, and has a triple-bay garage below) and a shed. The house and shed were built in 1930, and the east addition was built in the 1950's. The buildings are all wood-framed structures with wood plank decking and sheathing. Foundations appear to be reinforced, cast-in-place concrete and/or field stone with a cast-in-place concrete outer layer. No distinct lateral force resistance system was observed. The house is approximately 28 feet wide, 30 feet long, and has two floors with a full basement. The northwest corner of the house was a one car garage, but it has been converted to a laundry room, and has a crawlspace below, and is approximately 11 feet wide and 16 feet long. The east addition is approximately 18 feet wide, 29 feet long, and has one floor with a loft space above, and a full garage below. The shed is a single level with a partial loft space and is approximately 15 feet wide and 30 feet long.

The house roof framing is 2x8 wood rafters spaced 16" on center, and the floor framing is 2x10 wood joists spaced 16" on center. The shed roof framing is 2x6 wood rafters spaced 30" on center, with a partial loft space that is framed with 2x6 wood joists spaced 30" on center. The east addition roof framing was not accessible, but the main floor framing is 2x10 wood joists spaced 16" on center.



Overall aerial photo of 125 Hope Street taken by WSP with a drone looking approximately north.

OBSERVED STRUCTURAL DEFICIENCIES, POTENTIAL PROBLEM AREAS, AND COMMENTS

The following structural deficiencies and potential problem areas are examples of visually apparent deficiencies observed by WSP during our walk-through inspection of the existing buildings.



1. Openings in east addition roof.
 - Comments and recommendations: The east addition roof has gaps and/or missing components which may allow weather to infiltrate the building envelope which may cause deterioration to the structural system and/or interior finishes. It is recommended that the deficiencies be repaired by a qualified contractor to ensure weather-tightness of the building envelope and structural integrity of the building.



2. Detached gutter on east addition.
 - o Comments and recommendations: The gutter along the north side of the east addition has detached at the east end. This is a sign of potential deterioration along roof eave and/or top of wall and may be allowing weather to infiltrate the building envelope which may cause deterioration to the structural system and/or interior finishes. Additionally, if the gutter were to fall from the building it may cause damage to property or injure people. It is recommended that the deficiencies be repaired by a qualified contractor to ensure weather-tightness of the building envelope and structural integrity of the building.



3. Insufficient anchorage of east addition wall.
 - o Comments and recommendations: The east addition wall sill plate which supports the floor joists and exterior walls above is not properly anchored to the concrete foundation wall. The anchor appears to be partially contacting the sill plate at the edge, rather than being centered upon the sill plate. The purpose of the anchors is to prevent uplift of the building walls, such as when experiencing lateral loads (wind and/or seismic) or buoyancy due to flooding. This is a structural hazard and it is recommended that appropriate anchorage be designed by a Structural Engineer and installed by a qualified contractor.



4. Floor joist in east addition has split.
 - Comments and recommendations: A floor joist in the east addition has split from its bottom edge to approximately halfway up its depth. This is a structural hazard as the load carrying capacity of the joist has been greatly reduced which can cause load to be redistributed to the adjacent joists which may overstress them. It is recommended that a repair be designed by a Structural Engineer and installed by a qualified contractor.



5. Mortar gaps at house chimney.
 - Comments and recommendations: The mortar joints of the brick columns which support the house chimney cap have significant deterioration. If the brick columns were to fail, the chimney cap could fall and possibly damage property or injure people. It is recommended that the mortar joints be repaired by a qualified mason.

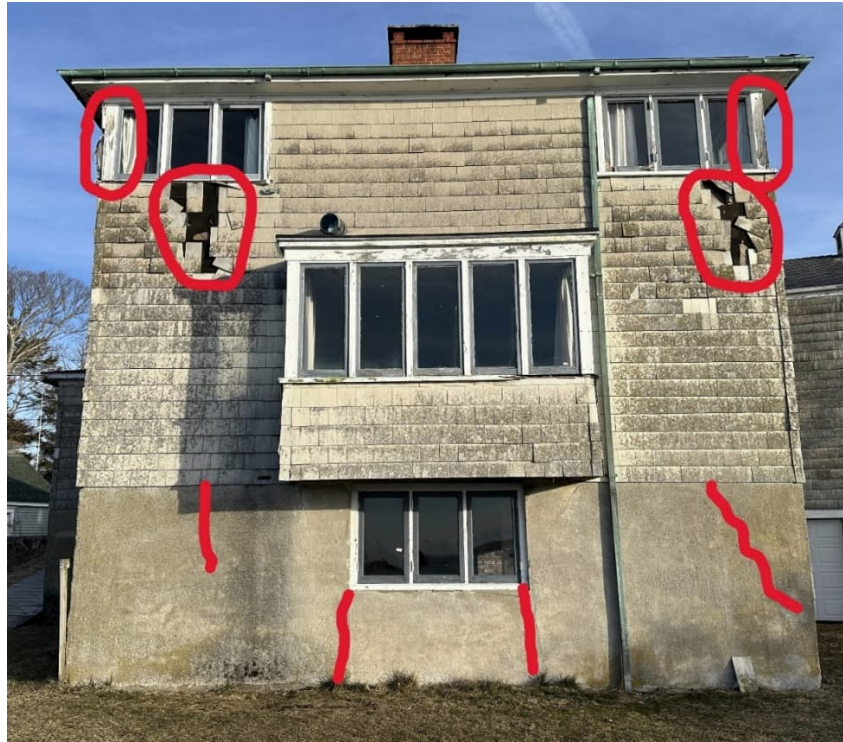


6. Holes in the roof and walls.

- Comments and recommendations: There are holes in the roof and exterior walls at various locations. These holes have been allowing weather to infiltrate the building envelope and have caused deterioration of the structural system. This is a structural hazard as failure of the roof or wall framing could allow collapse of the building. The roof framing is fully accessible; thus, it is recommended that a Structural Engineer be engaged to design appropriate repairs to be performed by a qualified contractor. The wall framing is not accessible; thus, the amount of deterioration is unknown. The exterior wall sheathing or interior finishes would need to be removed to determine the extent of the deterioration such that appropriate repairs can be designed and implemented.



This photo shows deterioration of the house roof framing due to holes in the roof.



7. Exterior wall deterioration.

- Comments and recommendations: The exterior walls are showing signs of deterioration and cracking at various locations. The paint on the corner columns has peeled away and the wood appears to be rotting. Failure of the corner columns could allow the walls to move outward and/or the roof framing to collapse. It is recommended that the columns be removed and replaced.
- Wall shingles are missing which has exposed the wood sheathing and allowed weather to infiltrate the building envelope which may have allowed deterioration within the walls. Deterioration of the walls could lead to their failure. The exterior wall sheathing or interior finishes would need to be removed to determine the extent of the deterioration such that appropriate repairs can be designed and implemented.
- The concrete foundation walls have cracks at various locations. The cracks may be due to settlement (there are several sinkholes in the backyard). The cracks do not currently appear to be a structural hazard. However, the cracks may allow weather to infiltrate into the wall which may lead to additional deterioration. It is recommended that the cracks be repaired by qualified personnel.
- The size and location of wall openings create a discontinuity in the lateral force resistance system from the roof to the foundation. Lateral forces were not a consideration when the house was constructed. It is recommended that a Structural Engineer be engaged to design an appropriate lateral force resistance system.



8. Foundation wall cracks with exposed rusting reinforcement.
 - o Comments and recommendations: The foundation walls below the northwest corner of the house bump-out (former garage, current laundry room) has large horizontal cracks and exposed rusting reinforcement. There also appears to have been previous repairs performed at the wall corner and over the crawlspace doorway opening. The cracks may be due to lateral forces, settlement, and/or building expansion/contraction from changes in temperature and humidity. The cracks may allow weather to infiltrate the wall and cause further damage. The exposed rusting reinforcement will expand and cause further cracking of the wall, thus, exposing more reinforcement and continuing the cycle. It is recommended that the cracks and exposed rusting reinforcement be repaired by qualified personnel using high-performance repair materials.



9. Slab cracks and deflection, efflorescence at previous repair.
- Comments and recommendations: In the crawlspace below the northwest corner of the house bump-out (former garage, current laundry room), the slab overhead has some longitudinal cracks and is visibly deflected. This is a structural hazard as the cracks and deflection are an indication that the slab may be failing. It is recommended that a Structural Engineer be engaged to design shoring to support the slab.
 - Efflorescence is visible around the edge of a previous wall repair. Efflorescence is a sign of water infiltration into the building envelope which may lead to damage of the wall. It is recommended that a Building Envelope Specialist be engaged to determine the source of the water infiltration and the associated repairs.



10. Spalled foundation wall, exposed rusting reinforcement.

- Comments and recommendations: The foundation wall adjacent to the main entrance stairs has large areas of spalling, some cracks and exposed rusting reinforcement. The spalling may be due to previous cracks that allowed weather to infiltrate the wall causing expansion of the concrete. The current cracks may allow weather to infiltrate the wall and cause further damage. The exposed rusting reinforcement will expand and cause further cracking of the wall, thus, exposing more reinforcement and continuing the cycle. It is recommended that the cracks and exposed rusting reinforcement be repaired by qualified personnel using high-performance repair materials.



11. Deteriorated stairs.

- Comments and recommendations: The exterior stairs to the hallway between the house and east addition have deteriorated and are failing. The stairs are in a hazardous condition and should be replaced. Where the stair connected to the house appears to also be deteriorating and should be investigated further.



12. Peeling paint and efflorescence at interior foundation walls.

- Comments and recommendations: The interior foundation walls have various areas of peeling paint and efflorescence. Efflorescence is a sign of water infiltration into the building envelope which may lead to damage of the wall. It is recommended that a Building Envelope Specialist be engaged to determine the source of the water infiltration and the associated repairs.



13. Efflorescence at fireplace in basement.

- Comments and recommendations: The fireplace in the basement is showing signs of efflorescence and deterioration. Efflorescence is a sign of water infiltration into the building envelope which may lead to damage of the wall. It is recommended that a Building Envelope Specialist be engaged to determine the source of the water infiltration and the associated repairs. It is also recommended that the brick be repaired and/or replaced by a qualified mason.



14. Gaps and deterioration at windows.

- Comments and recommendations: Gaps and deterioration was observed at most of the windows. The gaps allow weather to infiltrate the building envelope which can cause the deterioration. The deterioration of the window frames and sills may allow weather to get into the wall cavity which may allow deterioration of the wall structure. It is recommended that further investigation into the wall cavity be performed to determine its condition.



15. Wall and ceiling cracks at house corners.
- Comments and recommendations: The walls and ceilings are cracked at each of the house corners. The cracks are due to movement of the building. The exterior corner columns and walls are showing signs of deterioration which may be allowing the walls to displace. Please refer to comment D.7 for additional information.



16. Interior wall finish buckling.

- Comments and recommendations: A portion of plaster on an interior wall of the house has detached and buckled outward. This is an indication that the wall behind the plaster may have moved. It is recommended that further investigation of the wall, requiring removal of the plaster, be performed to determine the structural stability of the wall.



17. Staining on laundry room ceiling.

- Comments and recommendations: There are stains on the laundry room ceiling which indicate the infiltration of water. Prolonged water infiltration may cause deterioration to the roof elements, structural system, and interior finishes. Further investigation is required to determine the cause of the water infiltration and if there is damage to the structure.



18. Laundry room concrete floor slab and wall cracks.

- Comments and recommendations: Cracks in the laundry room concrete floor slab and wall were observed. The cracks are most likely due to building movement and/or settlement. It is recommended that the cracks be repaired using high-performance materials by qualified personnel.



19. Deterioration and vegetation at shed exterior.

- Comments and recommendations: Deterioration of the exterior wood and attached vegetation on the shed was observed at various locations. It is recommended that the deteriorated parts be replaced in-kind and the vegetation be removed as it can create openings in the building envelope which may allow water and air infiltration that could cause damage to the structure and/or exterior of the shed.



20. Shed foundation wall cracks.

- Comments and recommendations: The shed foundation wall has cracks at various locations. The cracks may be due to lateral forces, settlement, and/or building expansion/contraction from changes in temperature and humidity. The cracks may allow weather to infiltrate the wall and cause further damage. It is recommended that the cracks be repaired by qualified personnel using high-performance repair materials.



21. Shed roof framing connections potentially insufficient for uplift.
- Comments and recommendations: The shed roof framing appears to be connected to the perimeter beam by a single nail which is potentially insufficient to resist design wind uplift forces. It is recommended that joist hurricane straps be installed to connect the joist to the perimeter beam.



22. No sill anchors.

- Comments and recommendations: The shed sill plate does not appear to be anchored to the foundation wall. The purpose of the sill plate anchors is to prevent uplift of the building walls and columns, such as when experiencing lateral loads (wind and/or seismic). This is a structural hazard, and it is recommended that appropriate anchorage be designed by a Structural Engineer and installed by a qualified contractor.

STRUCTURAL ANALYSIS

Based on our review of the possible project scope of work provided by the Architect, we understand that the potential renovations to the building may include one or more of the following scope items:

- Reconstruction or replacement of the buildings. In either case the intent would be to conform to modern building codes due to the extent of work.

Note that only preliminary plans were provided as part of this report, so all findings are preliminary and subject to revision based on the final architectural program.

BUILDING CODE REQUIREMENTS

Structural analysis of the existing buildings is governed by the current Rhode Island State building Code (RISBC-2) for One and Two Family Dwellings as amended. The code is based on the International Residential Code 2018 (IRC 2018) and its referenced standards. Referenced code sections below refer to the IRC2018 and relevant provisions.

Proposed Alterations:

Should the work proceed as a renovation of the existing building, we recommend that the governing provisions of the code would be Appendix J (non-mandatory) "Existing Buildings and Structures". Per AJ501.4 Structural, the building may be evaluated for the minimum design loads applicable at the time of the original construction, and structural elements found to be unsound or dangerous "shall be made to comply with the applicable requirements of this code."

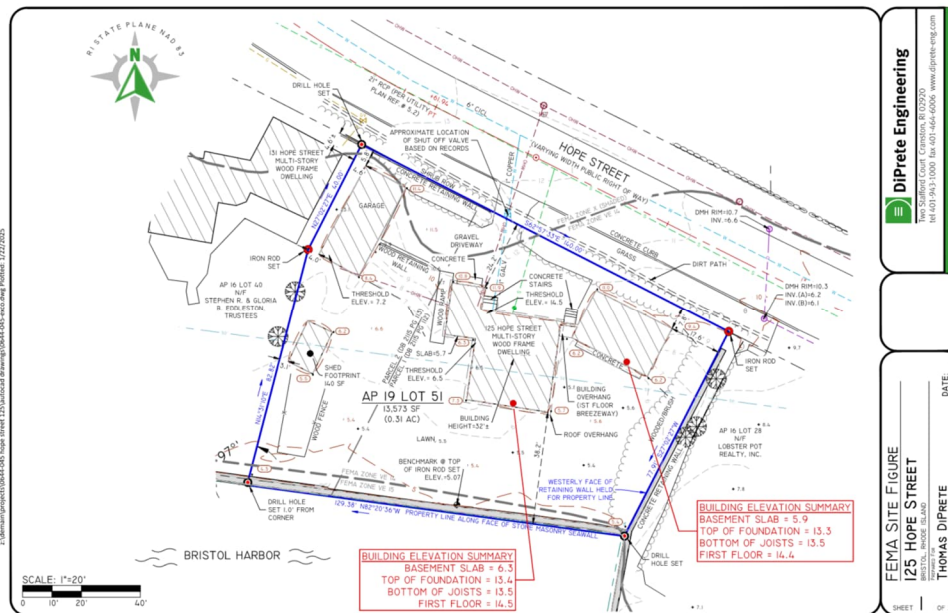
It is our professional opinion that there are several areas of significant structural damage in the building as described above. The most important area of concern is the lateral force resisting system of the structure (exterior walls, floors and roofs). For example, deficiency D.6 suggests that the exterior wall boards (which provide lateral stability) are in very poor condition in critical areas of the building. Also, deficiency D.21 shows inadequate anchorage of the roof framing in some areas for wind uplift forces. Given the location of the house with direct exposure to the waterfront, even the original design of the building is not in compliance with the wind loading provisions of the current IRC – thus repair of the deficiencies should be designed to upgrade the entire structure to meet modern hurricane resistant standards per RISBC-2.

Additionally, the existing floor construction in the east addition appears to be inadequately designed for the minimum floor loads required for a residential occupancy, and would likely require reconstruction or reinforcement to meet this requirement.

Flood Resistant Construction

Should the proposed work on the site be deemed to comprise a “substantial improvement” per R105.3.1.1, the buildings would need to be upgraded to comply with the provisions of section R322 “Flood-Resistant Construction”.

We are in receipt of survey results from DiPrete Engineering dated January 22, 2025 that indicate that “the site is located within a *Special Flood Hazard Area VE wave velocity zone*, Base Flood Elevation = 14.0”. According to this report, the bottom of the lowest horizontal structural members are located at elevation 13.5 at both buildings.



According to section R322 of the building code, the following are some of the key provisions would be applicable to this construction on this site (NOTE: only significant structural provisions are indicated in this report - a full analysis of all provisions, including architectural and mechanical systems requirements, would be required as part of any design for the proposed project):

- R322.1.2 Structural systems must be designed, connected and anchored to resist flotation, collapse or permanent lateral movement due to structural loads and stresses from flooding equal to the design flood elevation. COMMENT: Due to the observed deficiencies in the building structure and connections described above, it is our opinion that the existing structure would require significant structural upgrade to meet this requirement.

- R322.1.3 Flood Resistant construction – buildings and structures are required to be constructed using methods to minimize flood damage. COMMENT: The condition and type of materials used in the existing structure would require replacement or reconstruction in our opinion to meet this requirement.
- R322.3.2 (1) The bottom of the lowest horizontal members supporting the lowest floor must be elevated to be at or above the base flood elevation plus one foot (or design flood elevation chosen for the project, whichever is higher). COMMENT: According to the survey report referenced above, the bottom of the existing floor joists are located 18” below the required elevation per this provision of the code. Therefore, in order to comply with this provision, the owner would require a variance or physically raise the building by at least 18” to comply. Given the state of the existing structure, it is our professional opinion that raising the building would be difficult and likely impractical given the condition of the structure.
- R322.3.3 Buildings and structures must be supported on pilings or columns and anchored thereto. The space below the elevated building must be either free of obstruction, or enclosed with breakaway walls as per R322.3.5. Shallow foundations (such as footings) must be engineered for adequate protection from scour and erosion. COMMENT: The existing support walls and foundations do not appear to comply with this provision. Complete reconstruction of the support structure below the floors would be required in order to comply with this requirement.
- R322.3.5 Walls and partitions enclosing areas below the design flood elevation must be designed either as breakaway walls, or (as permitted, only for enclosure of egress stairs) engineered for flood loading. COMMENT: The existing support walls are not designed as breakaway walls and would require reconstruction in order to comply with this requirement.
- R322.3.6 Enclosed areas below the design flood elevation may be used solely for parking of vehicles, building access, or storage.

CONCLUSION

In conclusion, it is our professional opinion that the existing buildings are in generally poor condition and have numerous issues which will need to be addressed to maintain the serviceability of the structures. Please refer to the section Observed Building Deficiencies and Potential Problem Areas for descriptions and recommendations.

Furthermore, due to the fact that the existing structure is out of compliance with flood resistant construction provisions of the building code, we believe that a complete reconstruction of the building (including raising the structure up by at least 18") would be required in order to comply with the appropriate provisions. Given the poor condition of the structural framing, foundations, and connections, such a reconstruction is likely to be challenging and impractical.

We trust that this report meets your needs at the present time. If we can answer any questions or provide you with additional information, please do not hesitate to contact us.

Sincerely,

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