

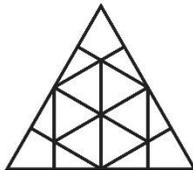
# Bristol Structural Letter

Prepared for the MV Commission



May 20, 2022

1133 Main St. Tisbury  
Parcel ID: 29-B-12



MARTHA'S VINEYARD  
ENGINEERING & DESIGN

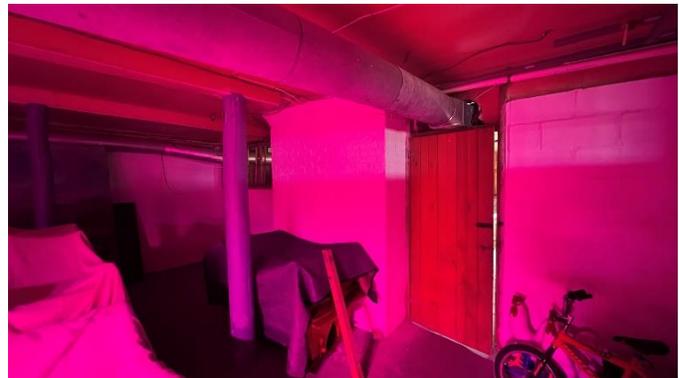


The purpose of this letter is to inform the Commissioners about the existing condition and to layout the reasons why demolition is the best option for the existing single family dwelling at 1133 Main St. Tisbury.

## Condition of Existing Building

### Foundation/Basement

The foundation consists of partial CMU (concrete masonry units) foundation walls with 2x6 exterior studs extending to the bottom of the 1<sup>st</sup> level deck, slender unreinforced CIP (cast in place) piers/ cedar tree trunks supporting the carrying sticks/ point loads from above, full height CMU block foundation in a few locations, and new CIP foundation below the recent addition toward the north. Below slab insulation and footing depth/size is unknown. The current HVAC system that runs in the basement is uninsulated and has considerable energy loss.



*Interior of basement showing uninsulated duct work, CMU walls and tree trunk support posts*

There are no "hurricane holdowns" or lateral support systems visible in the basement or throughout the home, common for this era of construction.

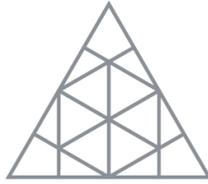
### 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> Levels

The existing building consists of under-framed floor joists that far exceed their span ratings under current building codes; the 1<sup>st</sup> and 2<sup>nd</sup> floor framing were built using 2x8 full sawn joists spanning more than 16'-0" and the 3<sup>rd</sup> level joists were built using 2x6 full sawn joists spanning more than 13'-6". Under current code requirements the maximum spans for 2x8 and 2x6 full sawn joists are 14'-6" and 11'-6" respectively; it should be noted that the joists were analyzed under uniform floor loading only, no additional point loads such as bearing walls or loads from roof supports were considered. If additional loads were applied to the spans of the joists their load carrying capabilities would be greatly reduced.



*Interior of basement showing slender CIP support posts and CMU foundation walls beyond*

The existing stair tower, shown from the exterior in the cover photo, is showing significant signs of deflection and settlement, from the 1<sup>st</sup> level to the 3<sup>rd</sup> level the treads and risers are pulling away from the exterior wall which supports them; if this stair was original to the house, in my experience, it is under framed and needs full replacement to fix the associated issue(s).



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As this home was most likely built in the late 1800s (est. 1890), this home predates indoor plumbing, HVAC, and electricity (MEP). As homes were retrofitted with these new technologies joists and other structural members were cut or notched to accommodate the new conduit and/ or wires. In my experience, dealing with homes of this age, new MEP layouts were never installed with any real thought and the structural members were indiscriminately cut to provide chase areas.



*3<sup>rd</sup> level: large humps and dips are visible throughout the upper and lower levels of the home*



*1" thick 3<sup>rd</sup> level interior wall showing exposed wire runs*



*Staircase showing signs of separation from support wall*



*View in storage room on 3<sup>rd</sup> level showing house wrap hiding rigid insulation and undersized rafters*

The upper level (3<sup>rd</sup> floor) shows significant signs of deflection and over stressed floor framing which could be caused by either excessive roof loads or MEP penetrations in the existing joists/structure. For example, current code compliant P traps require a minimum of 8" between top of sub floor to bottom of joist to fit the assembly and piping; a complete removal and reframe would be necessary throughout the entire 3<sup>rd</sup> level to allow for this retrofit.

The existing roof framing consists of 2x6 full sawn rafters, well below the necessary depth for code compliant R-values, even with the use of exterior



SIPs as the additional weight would be too much for the existing rafters to support. Additionally, the 3<sup>rd</sup> level interior walls consist of solid boards (no 2x studs or top/ bottom plates) so there is no room to hide the MEPs behind the sheetrock; all wires, switches and plumbing are exposed and could pose a safety concern.

### **Narrative regarding demolition**

Demolition is deemed necessary for several reasons; they include economic, logistical, safety and material costs.

- The existing building would need to be lifted off its existing foundation at a monumental financial cost to the owners
- The building would need to be lifted far above its current elevation to allow for equipment/excavators to dig/install a new foundation and would be exposed to the elements which is a huge liability and safety concern due to high winds from the Vineyard Sound.
- The necessary re-framing to bring the entire building up to energy and structural code requirements would be extensive and costly:
  - New frost protected foundation and interior footings as well as new support posts
  - 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> level deck framing would need to be completely removed and reframed with i-joists or deep 2x joists to properly span between supports
  - All existing exterior walls are sheathed with diagonal boards with insufficient nailing patterns, new sheathing and code-compliant nailing would need to be added to increase the shear strength and lateral support capabilities
  - New roof framing and structural ridges would be necessary to both transfer the loading away from the insufficiently supported interior walls and undersized joists, and to increase the R-value whether with spray foam or SIPs.
  - The number/ degree of renovations that have occurred to the building over its 125+ year lifetime has rendered it structurally insufficient to withstand current storm events and snow loads.
- To preserve and enhance the historic appearance of the home, demolition and a complete rebuild is the most viable option; the project will take less time and less money to rebuild rather than to heavily renovate.

Thank you for your consideration and essential service to our community.

Sincerely



Casey Decker, PE  
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