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633 Napoleon Street
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March 1, 2023

DASE # 2560-15

RE: Prospect Building Inspection

This report presents the findings of Diviney & Associates Structural Engineers' visual structural survey of the Johnstown Housing Authority, Prospect homes located at 341 Gray Ave, Johnstown, Pennsylvania. On Thursday February 15, 2023, the first of several surveys was conducted of the interior and exterior of the residences. This survey was limited to the exposed areas of the structure only. Visual observations were made by walking the interior and exterior of the residences.

The scope of our contract is to determine any observable structural issues including the foundations and framing. There are known issues with sloping floors, settlement, and ceiling finishes falling. This report will focus on the ceiling issues.

Analysis or calculations to determine framing or foundation capacities is not part of the scope of this investigation.

General Observations

The subject properties are multi-family, one and two-story residences with a below grade crawl space. There are 18 units with 4 to 8 residences per unit totaling 110 residences. One of the residences is the housing office. The walls, floor and roof are conventional wood framing. The original roof appears to have been flat and at some point, wood trusses were installed to create a gable roof. Second floor framing bears on the exterior walls and an interior bearing wall. The floor framing over the crawl space spans from the exterior foundation walls to a wood beam at the center of the building. The wood beam is supported on masonry piers. In the laundry room, previously a boiler room, the top 4 to 6 inches of the floor joists have been removed and a concrete slab has been poured on top. This concrete pad is most likely to support a boiler. The foundation walls are concrete masonry blocks. The exterior is clad in brick and vinyl siding.

Based on our initial survey, several areas of structural concern were noted. The issues appear to occur in all the units and residences.

1. Floor framing has severe slope towards the exterior wall.
2. Cracking in the walls at the stairs to the second floor
3. Evidence of major historic settlement.
4. Floor framing failure in the laundry rooms.
5. Drywall and plaster ceiling falling from the second floor and roof framing.

All the noted issues are not necessarily related to each other. Items 1 through 3 may influence one another, however items 4 and 5 are separate conditions.

This preliminary report will address item 5, Drywall and plaster ceiling falling from the second floor and roof framing.

Ceiling Observations

The existing ceiling on both the first and second floors consist of surfaced 4 sides, 2x framing spanning from the exterior walls to an interior bearing wall. The interior bearing wall is located over or near the steel beam in the crawl space. The wood framing is extremely dry. The ceiling finish appears to be 1/4" to 3/8" gypsum wall board with 1/4" to 3/8" of cement plaster topping. The cement plaster feels heavier than the gypsum wall board. The gypsum wall board is attached to the wood framing with flat head nails. The nails seem relatively short with some penetrating the wood framing about 1/2". Some of the ceiling finish has collapsed due to both nail pull through and nail withdrawal. Nail pull through is when the nail shank remains in the framing member and the supported material, in this case gypsum wall board, pulls over the head of the nail. Nail withdrawal is when the nail pulls out of the framing member. The collapsed ceilings have occurred in the first and second floor ceilings. Some of the residences inspected have had the ceiling repaired. In residences that have not yet collapsed or been repaired, cracking can be seen in the ceilings in the same areas collapse has occurred. It appears all the ceilings in the residences are exhibiting the same behavior and are most likely destined for collapse.

Conclusion and Recommendations

After a review of the property and based on our visual inspection and exploration of the subject ceiling construction, it appears the ceilings that have not yet been repaired will most likely collapse at some point. All of the units and residences are exhibiting similar cracking in the ceilings. The collapse and ceiling cracking is most likely due to weakening of the bond between the gypsum wall board and nail heads and the nails to the wood framing. Vibrations due to wind and foot traffic can also cause fatigue on the connections causing cracking and potential collapse.

Two recommendations are suggested however, these may not be the only solutions.

1. Remove the existing ceilings and install and finish new gypsum wall board using properly spaced fasteners such as dry wall screws and glue.
2. Install 1" x 3" wood lath strips spaced at 16" on center over the existing ceiling construction. Install and finish new gypsum wall board using properly spaced fasteners such as dry wall screws and glue. If this option is selected, the existing first and second floor ceiling framing should be analyzed to determine if the framing can support the additional loading.

After completing additional inspections, items 1 through 4 in the general observations will be addressed.

The above opinions were rendered with a reasonable degree of engineering certainty. This report does not express or imply any warranty of the structure but only addresses the condition of the portion which was readily accessible and observable at the time of review.

Respectfully,

Randal S. Diviney PE
President





Typical ceiling crack in living room.



Typical ceiling crack in kitchen.



Typical ceiling crack in bedroom.



Typical ceiling crack in bedroom.



Joists showing nail pull over and nail withdrawal.



Joists showing nail pull over and nail withdrawal.