

Ordinary Construction Case Study

Floor Renovation – Concrete Floor Over Wood Joists



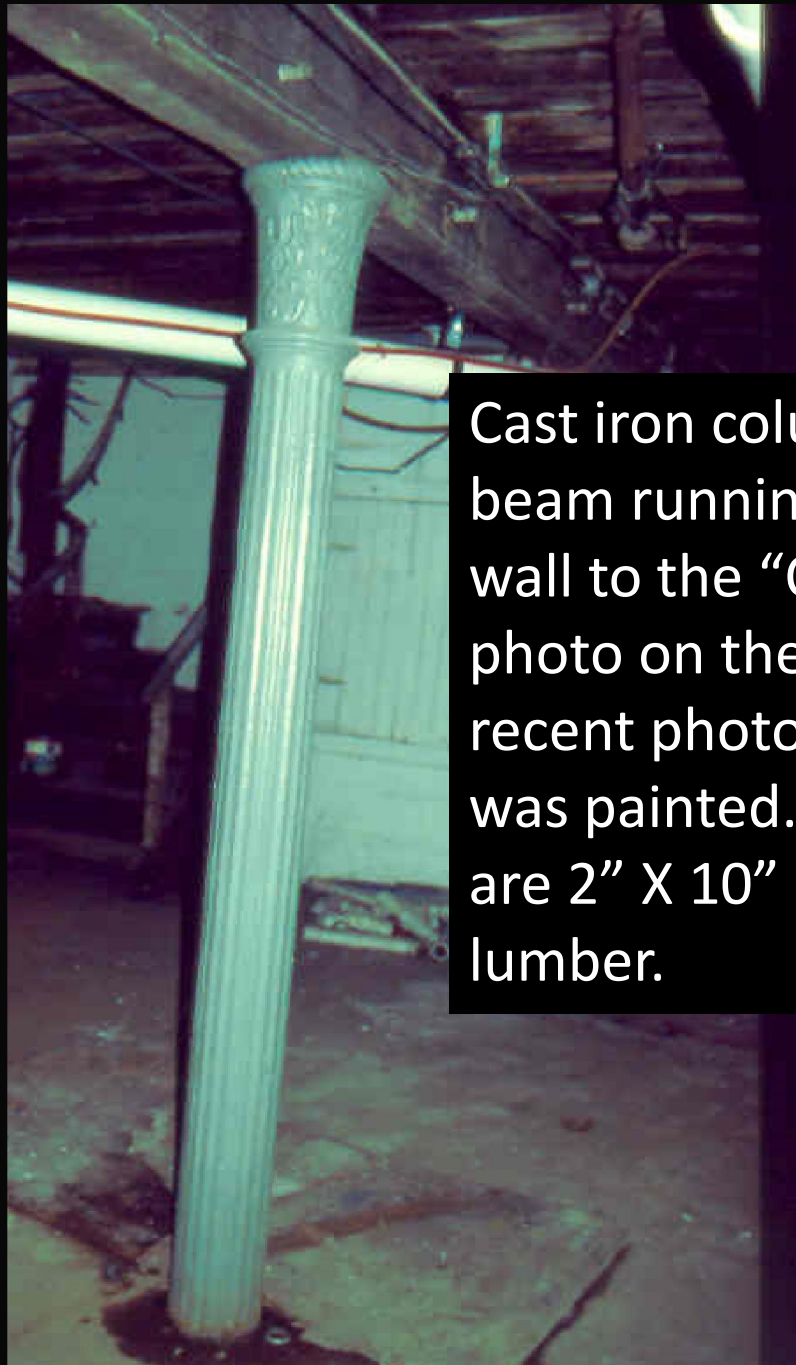
This building was constructed in 1911 of ordinary construction, has a full cellar. As with many buildings the structure was renovated over the life of the building. The following photos depict a renovation to part of the first floor that added significant dead load to the structure. The was building was occupied as a restaurant prior to being converted to a laundromat.

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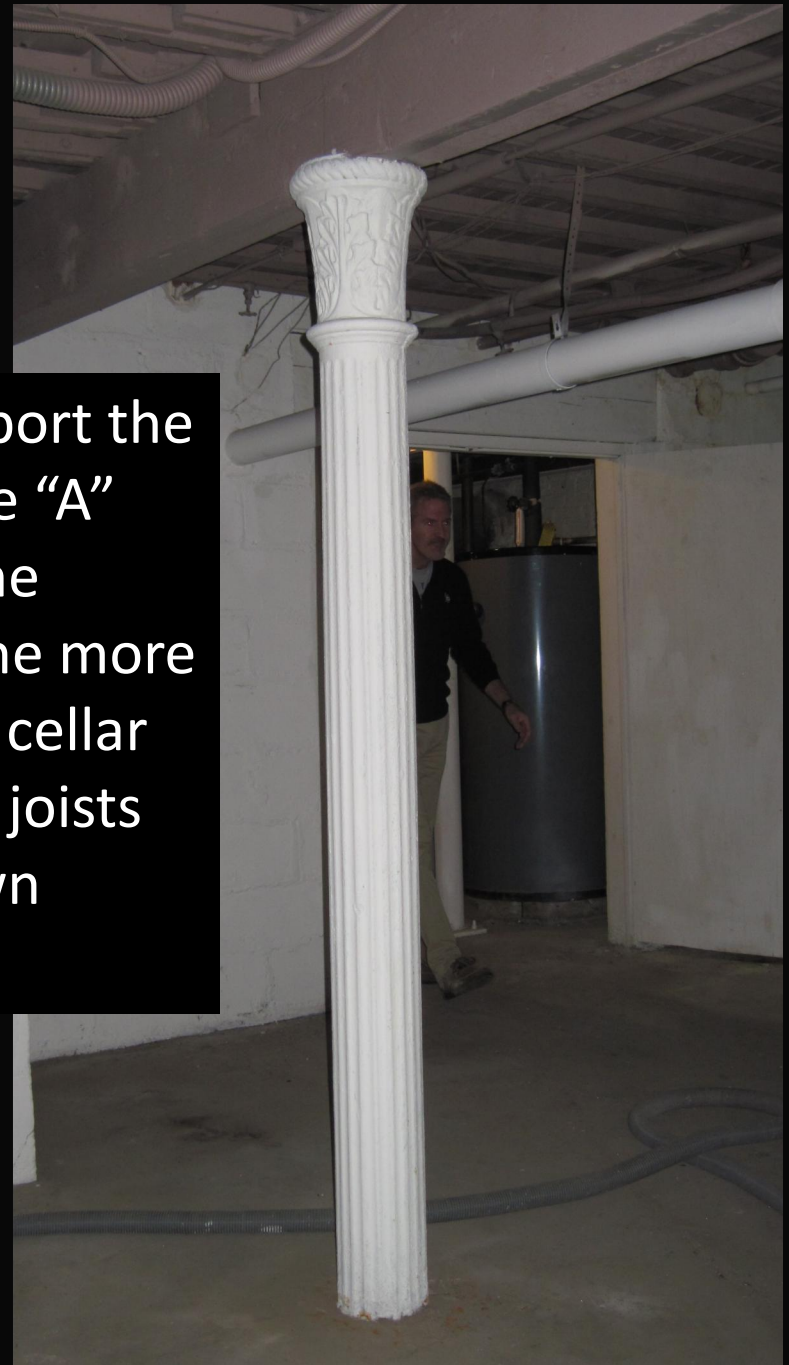
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The building has a flat roof. The load bearing walls are the “B” and “D” walls. The floor joists and roof rafters span the “B” and “D” exterior bearing walls. There are column and beam assemblies that run from the “A” wall to the “C” wall, the column and beam assemblies support the floors. The photos will depict conditions that were photographed over the period of several years.



Cast iron columns support the beam running from the "A" wall to the "C" wall. The photo on the right is the more recent photo after the cellar was painted. The floor joists are 2" X 10" rough sawn lumber.





This photo depicts the condition of the first floor at the rear 1/2 to 1/3 of the floor area. Notice the floor joist are not visible to the full vertical dimension of the floor joists. There is also evidence of water damage to the floor joists and sub-flooring.



This is a later photo of the first floor at the rear 1/2 to 1/3 of the floor area. Notice furring strips nailed to the sides of each floor joist near the bottom of each joist.



The photo on the right is the later photo, take note of the subflooring material, the subflooring material was removed from the original floor, cut into 14" to 14.5" lengths and placed on top of the furring strips between each floor joist.

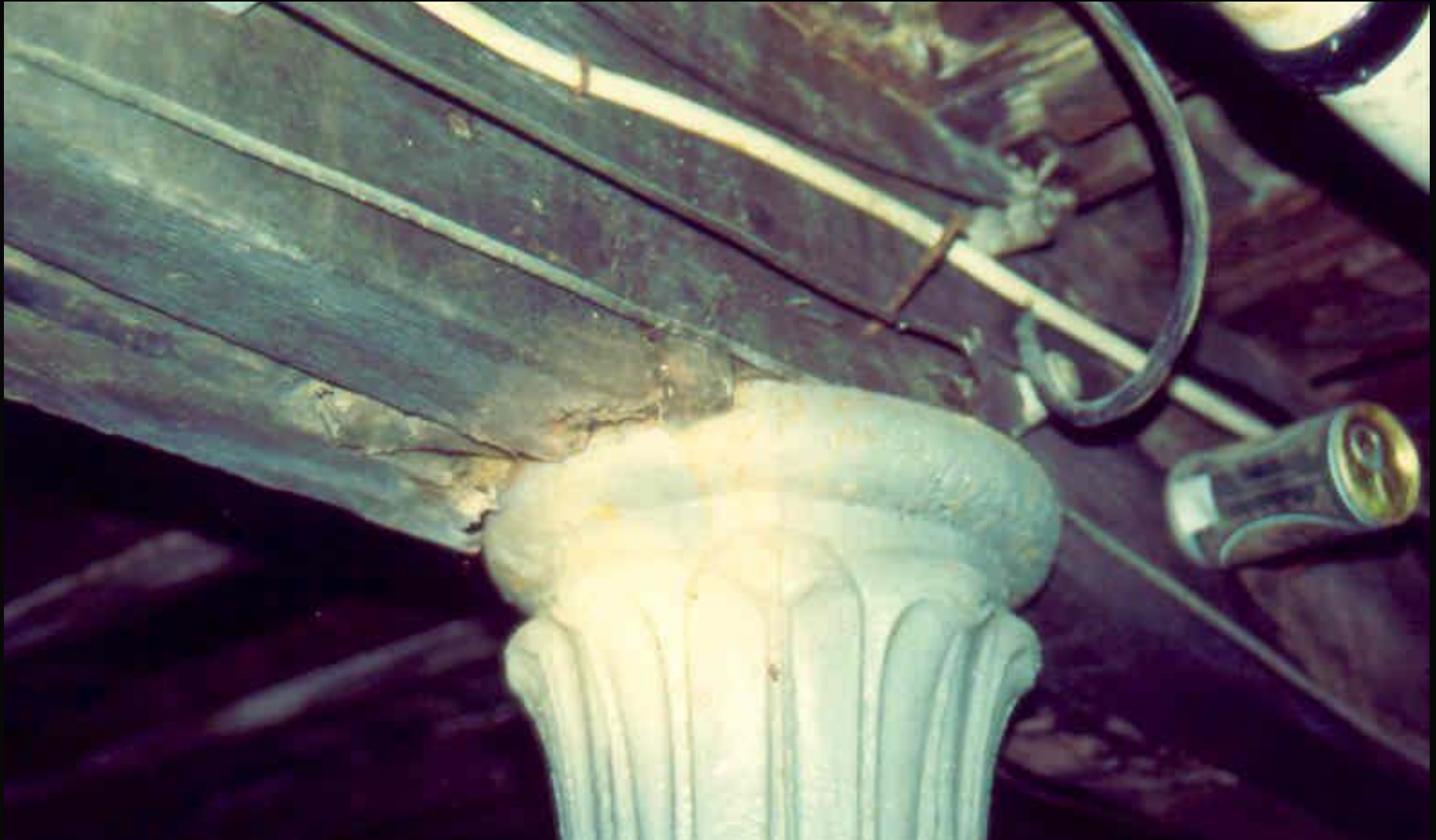
A concrete floor was poured over the altered wood floor filling the spaces between each floor joist with concrete.



The added dead load of the concrete floor has caused the wood beam to crush down over the tops of the cast iron columns.

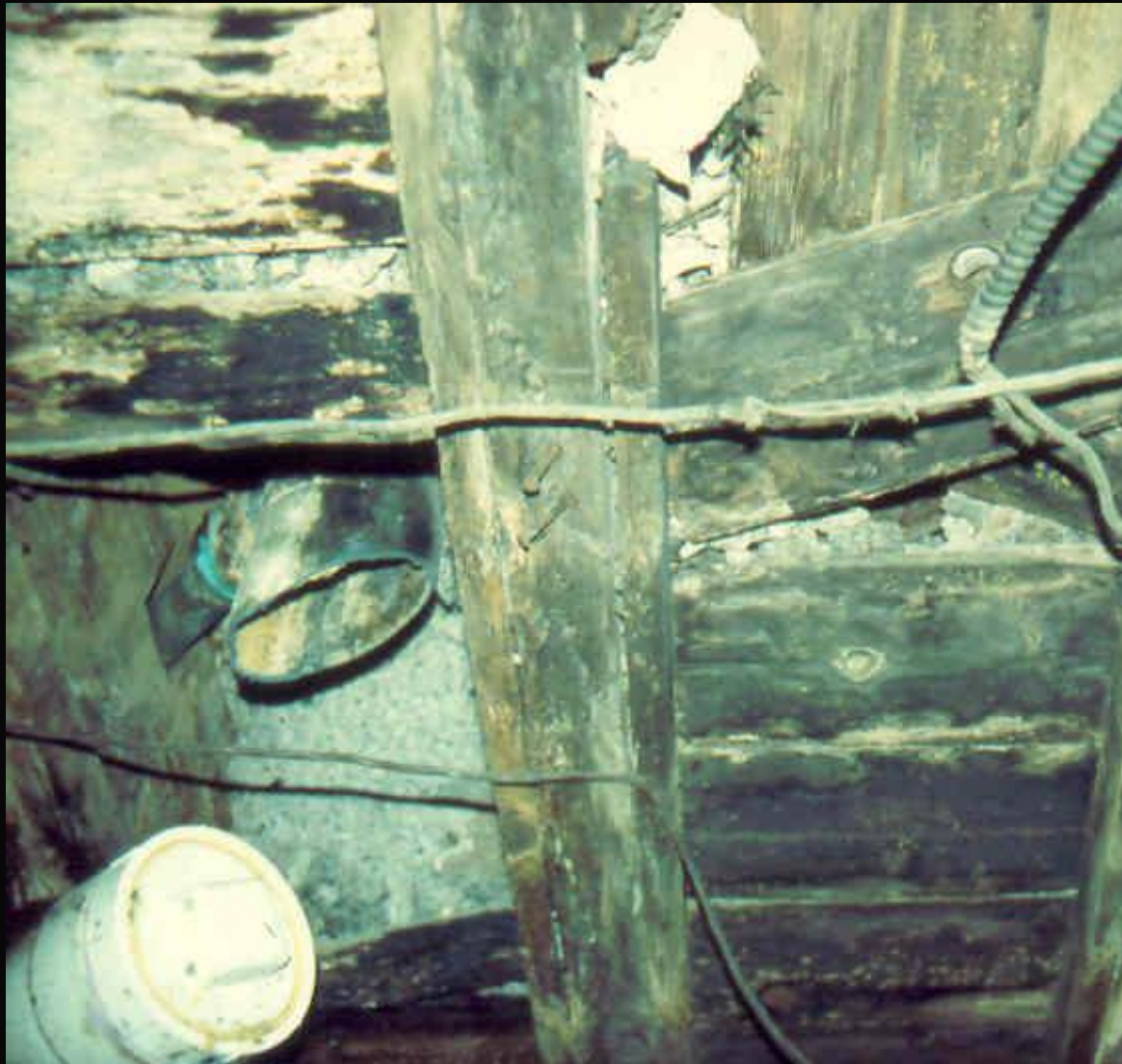


Another photo of the wood beam crushing down over the tops of one of the cast iron columns. Deterioration of the wood likely from water damage is also visible in this photograph.





Additional photos of the wood beam crushing down over the tops of the cast iron columns. This condition existed at several column/beam connection through out the cellar.



The concrete poured over the wood joist floor is obvious in this photo where the plumbing DWV pipe passed through the floor.

This photo depicts the finished floor looking at the top of the concrete slab poured over the wood floor joists.



The alteration that added the concrete floor over the wood joists was accomplished by removing the finished and sub flooring from the area of the first floor. Wood furring strips were attached at or near the bottoms of each floor joist. The original subfloor was cut to fit between the floor joist bearing on the furring strips. The concrete was poured over the floor. This alteration added significant dead load to the structure.



The concrete was 4" to 5" inches in thickness poured over the wood joists.

It is believed the alteration to the floor system may have been accomplished when the building was renovated for occupancy as a restaurant which is depicted in the old photo below. Firefighters and fire officers should be aware of alterations such as depicted in these slides, this alteration greatly impacts the structural integrity of the building when being attacked by fire and creates both strategic and tactical challenges.



This building was the subject of Fire Engineering's Training Minutes which can be found at the link below:

<https://www.youtube.com/watch?v=yMTyZTWKH0Y>

Thank you for taking the time to view this short presentation. Questions regarding this presentation can be addressed to:

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Know your buildings ... stay safe!!