

CBL 033 JO17

Class Acts Property Management -- Attn: Mr. Bill Simpson, re: 8 Alder Street, Portland, ME

Jan 20, 2012

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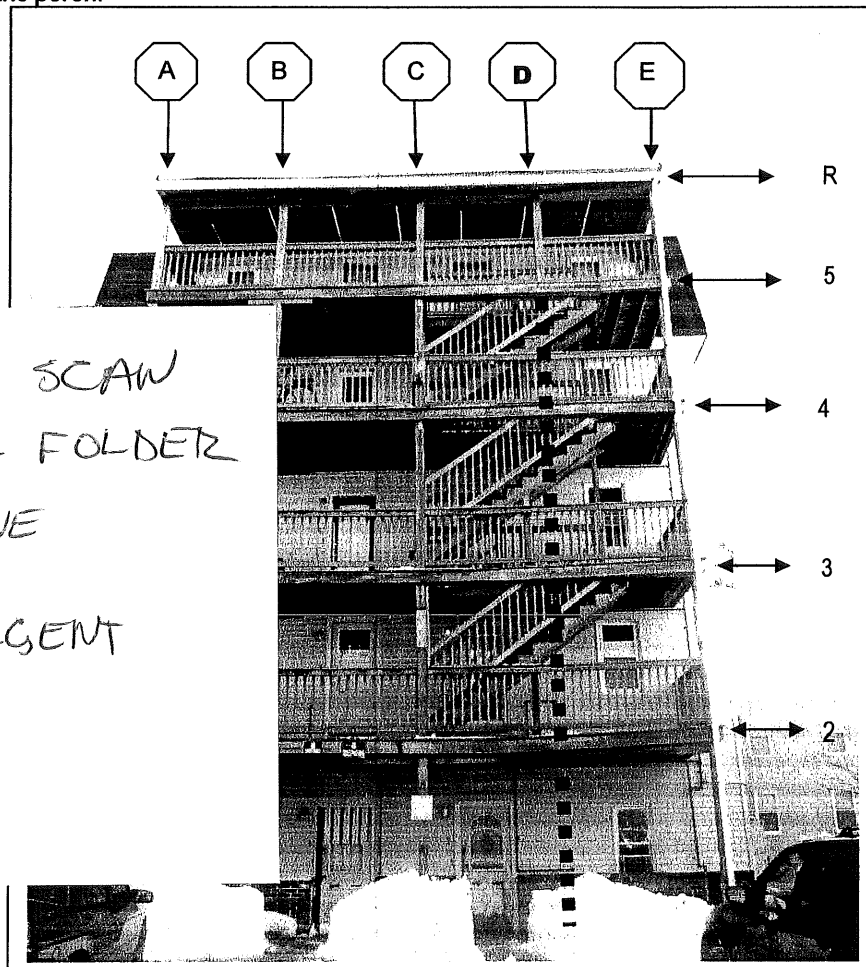
### LIMITATIONS

Given the preliminary nature of this structural inspection, it will not be possible to examine every fastener and connection on the porch and stair. The inspection scope did not include a comprehensive structural evaluation or analysis of the existing structure, and it did not include a full inspection for the requirements of NFPA 101, the Life Safety Code that governs egress in Maine. No drawings were available to review, and no existing materials were tested. The inspection was limited to observations made from visible framing. We did not access roof framing because it was concealed by a porch ceiling. Steel splice plates obscured some of the post-to-post connections. Time constraints limited our observations to approximately 15 minutes at each level, and railings obscured full access to all exterior framing. In an older building such as this, rot or insect infestation may occur in areas that are not visible or readily accessible. You may find rot in the future if you perform any repairs or renovations to the building. This is typical for any older building framed with wood.

### OBSERVATIONS AND EVALUATION

For purposes of this report, the primary structural grid of this porch and stairwell is shown below.

The most obvious deficiency in this structure is the lack of a continuous post from roof to ground at column line "D". A new post should be installed along this line as soon as snow has melted and the ground thaws. Installing this post and lightly jacking up the framing in this area will ultimately improve the strength and durability of the porch.



PLEASE SCAN  
INTO CBL FOLDER  
IN G. DRIVE

NOT URGENT

### Exterior Site, Site Grading, Post Bases, and Posts

Overall, the grading on the site slopes downhill away from the foundation of the building, allowing water to drain away from the building. A downspout drains water from the upper roof to the base of the stair (Photo #2). At the time of the inspection, the downspout was icing over, causing ice to build up on the bottommost stairs. Roof runoff and site shade in this area may promote conditions favoring framing rot and fastener corrosion, since the area likely remains damp, holds winter snows, and is treated with the city's sand/salt mixture. You discussed that you planned to re-roof the area above the downspout to redirect water from that downspout and eliminate the ice problem.

Plowed and shoveled snow piles, frozen in place, covered the post bases so that they were mostly hidden.

LEVEL	A	B	C	D	E	
BASE	not visible	not visible	not visible	not present	not visible	
G-2				not present		
2 TO 3	stl splice plates		stl splice plates	not present	stl splice plates	
3 TO 4		wood lap splice		not present		
4 TO 5	stl splice plates	horiz. splice below L5	stl splice plates	not present	stl splice plates	
5 TO R						

### Stair Stringers

Typically, the stair stringers are pressure-treated 2 x 6 members with attached triangular darts. One stringer supports each side of the stair. The stringer span is marginal considering that there are only two stringers. Supplemental 2 x 4 and 4 x 4 posts support the stairs near their midspan.

Some improved structural support near the midspan and ends of the stringers will typically be required at all levels. Better midspan support can be achieved after the posts at line "D" are installed, because the stair will likely need to be jacked and resupported at their top landings throughout the structure. Specific deficiencies are noted below at the various levels:

1 to 2	No significant deficiencies observed, beyond what has been discussed above.
2 to 3	Observed a significant split in the end of the 2 x 6 at the top of the stringer, where a lag bolt is fastened into the stringer's end grain (Photo #3). This is a significant concern that will need to be addressed as soon as possible with temporary shoring.
3 to 4	Similar split as described in previous stringer, but not as damaged. Will need an alternate detail to support the top of the stringer as soon as possible.
4 to 5	Observed a yellow steel angle bracket lengthwise (Photo #4). Conditions are part of a larger structural problem in this area that will need to be addressed as soon as possible.

### Stair and Porch Railings and Handrails

Overall, porch railings and handrails are in fair condition, but some structural strengthening will be needed. Porch railings consist of 2 x 4 top and bottom stringers to attach the balusters, and the rail consists of a 5/4" x 6" flatwise cap. Balusters measure 1 3/8" square and are spaced at less than four inches on center. Stair railings are similar, but the top cap measures 5/4" x 4", and some of the handrails are 1 x 3 members. The railing systems themselves do not have intermediate base blocks to help stiffen the system. Many of the balusters are somewhat loose and susceptible to twisting as the wood has shrunk over the years. Other specific concerns are described below:

1 to 2 rails	Bottom-most rail is split and broken (Photo #5). Needs to be replaced. Also suggest adding a rail on other side of stair.
Railings Level 2	Railing attachment to posts is insufficient and should be strengthened, typical throughout porch (Photo #6) in approximately eight locations per level.
2 to 3 rails	
Railings Level 3	Porch rail connections are a concern where they tie into the steel mending plates (Photo #7). This happens in approximately four locations on this level.
3 to 4 rails	
Railings Level 4	Similar problems as Level 2 railings.
4 to 5 rails	
Railings Level 5	Similar problems as Level 2 railings.

### Stair Treads and Risers and Porch Floor Boards

Stair treads consist of 2x12 boards spanning approximately 30" between stringers. Pressure-treated plywood comprises the stair risers. Porch floor boards typically measure 5/4" x 6", supported at 16" on center by joists.

Overall, the stair treads, stair risers, and porch floor boards are in good condition. Some nails in the floor boards have pulled up as the wood has shrunk and shifted. Other specific areas of concern include:

Treads/Risers1 to 2	
Floorboards Level 2	One board near the stair base leading to Level 3 is broken and should be replaced. Various lifted fasteners.
Trds/Ris 2 to 3	
Floorboards Level 3	Various lifted fasteners. Suggest renailing all fasteners after jacking and adding column.
Trds/Ris 3 to 4	
Floorboards Level 4	Various lifted fasteners. Suggest renailing all fasteners after jacking and adding column.
Trds/Ris 4 to 5	
Floorboards Level 5	Various lifted fasteners. Suggest renailing all fasteners after jacking and adding column.

### Floor Joists and Girders

Overall, the floor joists and girders are 2 x 8 pressure-treated framing, with the exception of supplemental 4 x 6 framing near the outside line of the structure (Photo #8).

Joists and Girders Level 2	
Joists and Girders Level 3	
Joists and Girders Level 4	There is significant concern about the stair header at this level (Photo #9, Photo #10). The header girder and surrounding joist framing has pulled away from the outside girder. This framing deficiency needs to be addressed immediately.
Joists and Girders Level 5	

#### Ledgers

Ledgers consist of 2 x 8 pressure-treated members. Overall, the ledgers appear to be in good condition. However, we cannot tell if the ledgers frame solidly into wall structure or simply into sheathing boards. You mentioned that the building consisted largely of masonry, because it was a multistory plumbing warehouse. We were not able to view direct evidence of the building's wall system behind the vinyl siding. When we were on site, we discussed the fact that the nail locations at the fifth level did not correspond with sensible locations for wood studs, and that you should investigate this further from inside the building, using a stud finder to see if the visible nails correspond with stud locations.

Ledgers Level 2	
Ledgers Level 3	3/8" lag bolts, 16" on center, with nut and washer (Photo #12)
Ledgers Level 4	1/4" all-thread with galvanized nails at 24" on center (#12)
Ledgers Level 5 (Roof not visible)	Nails only, at 24" on center (Photo #12).

### **Fasteners**

Overall, the fasteners consist of a mixture of galvanized and bright steel lag bolts, structural bolts, nails, and screws. As the deck was built in the last 8 years, it is possible that the pressure treating material used consists of Alkaline Copper Quaternary (ACQ), which is an extremely corrosive product that reduces the lifespan of steel fasteners. Because of this, you should check the condition of the fasteners regularly to ensure that there has not been corrosive failure.

<b>Steel Plates on Columns</b>	<b>We suggest removing steel plates to properly clean and recoat them prior to reattaching them to the columns. Refer to Photo 13</b>
<b>Single Screws at Balusters</b>	<b>Suggest adding screws to existing balusters after all the lifting and jacking is complete on the porch. Many of these screws have slightly loosened over the years as the deck sagged and the wood shrunk. Refer to Photo 14</b>
<b>Corroded Simpson Brackets at Stairs</b>	<b>Corroded Simpson Brackets near the stairwells should be replaced in kind, or, if not practical, with an alternate hanger system. Refer to Photo 15</b>
<b>Small angle bolted connection at exterior beam lines</b>	<b>The two-inch wide angles with a single bolt providing outsider girder support should be replaced with a wider galvanized angle that has holes field drilled into it for four timberlok screws into the column and two timberlok screws into the girder. Refer to Photo 16</b>

### **Roof Framing**

A dropped ceiling obscured the roof framing, and we were unable to observe it. We did not observe any significant water damage in the wood ceiling. Significant damage or staining would suggest water infiltration from above, but there does not appear to be a concern.

## **RECOMMENDATIONS**

You wished to know what structural repairs would be necessary. While a complete understanding of what repairs will be needed may not be known without a much more extensive investigation, the following items should be addressed:

### **Immediate (within the next 8 weeks):**

- 0.1 Repair bottom handrail and provide sand bucket at frozen downspout;
- 0.2 Provide temporary shoring and supplemental framing under 3<sup>rd</sup> and 4<sup>th</sup> floor stair headers. It is important not to create shoring that will complicate future jacking of porch framing;
- 0.3 Improve anchorage of handrail leading up from first landing to the second floor;

### **Priority One (within the next year):**

- 1.1 Further assess the post bases after snow leaves to check base condition and anchorage;
- 1.2 Install supplemental post and sonotube at line "D" and jack deck as required at all levels;
- 1.3 Strengthen all splices in columns using Timberlok Screws or by removing, cleaning, and recoating corroded steel splice plates;
- 1.4 After jacking structure near line D, resupport stair stringers at headers and improve support near midspan of each stringer;
- 1.5 Improve anchorage of all railings to posts using Simpson L50 clip angles (at horizontal caps), Simpson A35 angles (2x4 baluster stringer attachments) and base blocks near railing midspans;
- 1.6 Improve handrail anchorage and install additional, graspable handrails;
- 1.7 Re-drive all decking nails where heads have become proud of decking;
- 1.8 Sister headers at stair heads and bases (exact connections to be determined);
- 1.9 Further investigate ledger support system where it ties into existing building;
- 1.10 Fill all joist hanger small round holes with galvanized joist hanger nails, and replace corroded hangers as determined by engineer;
- 1.11 Strengthen perimeter girders as determined by engineer at specific locations. This could be as simple as adding Timberlok Screws to improve load sharing between individual girder plies, or as complicated as removing and replacing girders in areas that now have supplemental, corroding steel angles installed;
- 1.12 Install additional screws in railing balusters after structural improvements are complete;
- 1.13 Improve perimeter beam connections that currently rely on narrow steel angle ledgers. Exact detail to be determined by Engineer.
- 1.14 Redirect Roof Downspout at base of stairs, to keep ice buildup away from stairs.

### **Priority Two (within 5 years):**

- 2.1 Monitor condition of deck components

### **Priority Three (within 6-10 years):**

- 3.1 Rebuild Entire Porch and stairs in more durable wood materials according to current code requirements.

## CONCLUSION

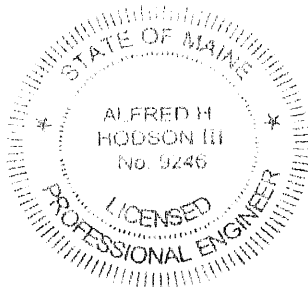
There are some legitimate structural concerns with the porch and stair framing. Many of the concerns are fairly straightforward and should be able to be addressed in a cost-effective manner.

There are a few items that will require more engineering design time; specifically related to the condition of the stair support near the upper floors (See Photo #9 and Photo #10). I have listed these items in the report as needing to be addressed in the next eight weeks, if not immediately. In the meantime, you should install some temporary support under the stair in question as soon as possible, and you should monitor the condition of the ice buildup on the lower stairs, removing the ice and/or coating with sand as necessary.

Additionally we recommend that you address the Priority One items (listed above) within the next year and that you address the Priority Two and Priority Three recommendations described in our report.

Now that I have discussed my primary concerns on site with you, I look forward to seeing the immediate repairs addressed, and the other repairs dealt with as soon as the weather cooperates. Please feel free to call with any additional questions.

Sincerely,



20 January 2012

A handwritten signature in cursive script that reads "Alfred H. Hodson III, P.E.".

Alfred H. Hodson III, P.E.

AHH/ah  
encl:

Photos 1-16  
Simpson L-Series Cutsheets  
Timberlok Screws Cutsheets  
Invoice



**PHOTO**  
**#1**

0116 1721.jpg

8 Alder Street: View from Alder Street. Refer to enlarged photo in report for specific callout of framing grid.



**PHOTO**  
**#2**

0116 1723.jpg

8 Alder Street: Bottom stair with downspout and ice buildup.





**PHOTO**  
**#3**

0116 1727 jpg

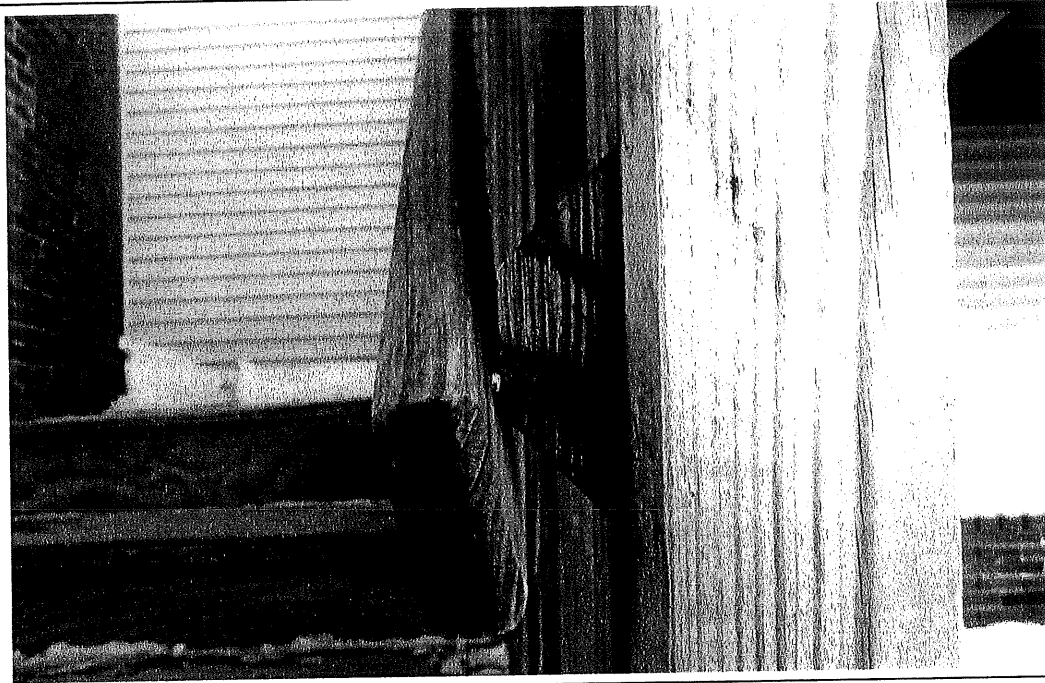
8 Alder Street: Fasteners from Bolted Steel hanger have split end grain of 2x6 stair stringer (arrow).



**PHOTO**  
**#4**

0116 1730 jpg

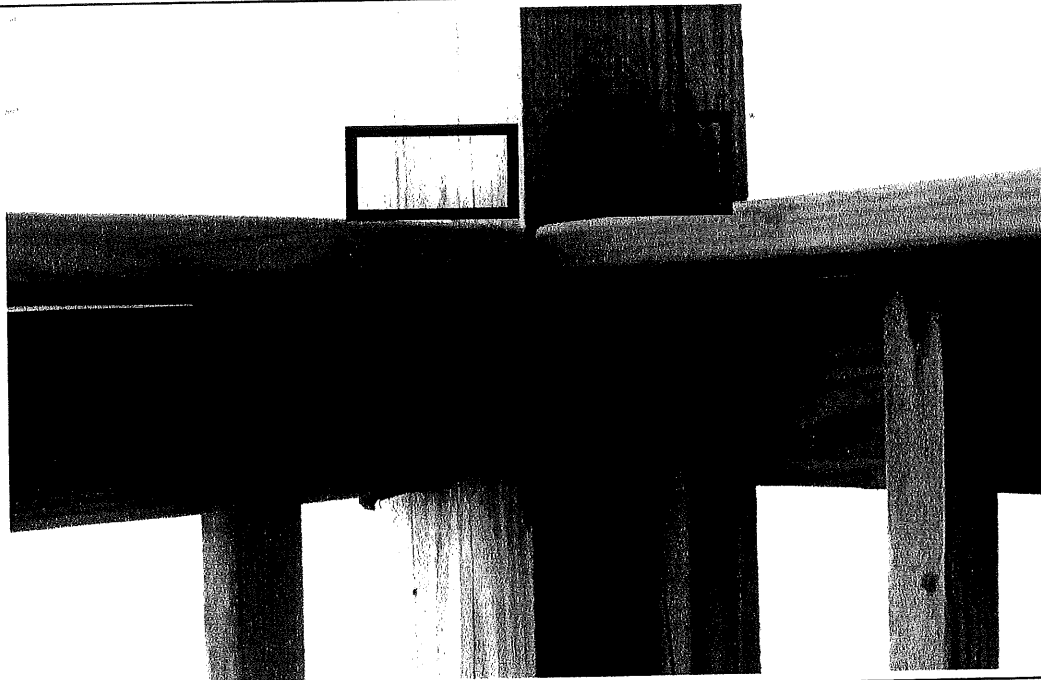
Steel bracket connection. This connection provides damage to end grain of stringer, and places bolts in top of angle in tension, which is not advisable. Also note severely corroded Simpson Bracket at top center of photo.



**PHOTO**  
**#5**

0116 1722.jpg

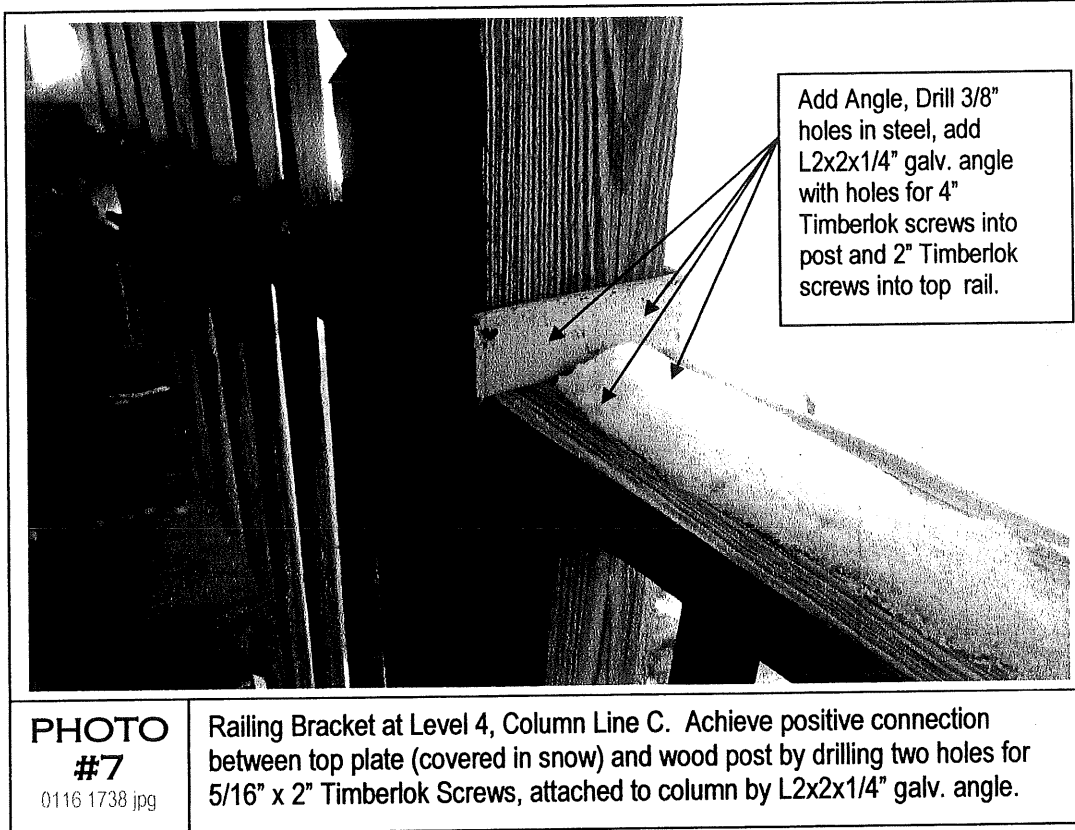
Bottom Stair. Extremely loose railing at base of stair. Fastening block has split. Top of railing is split at landing above. This should be repaired immediately. Also suggest a post-mounted handrail at other side of stair.

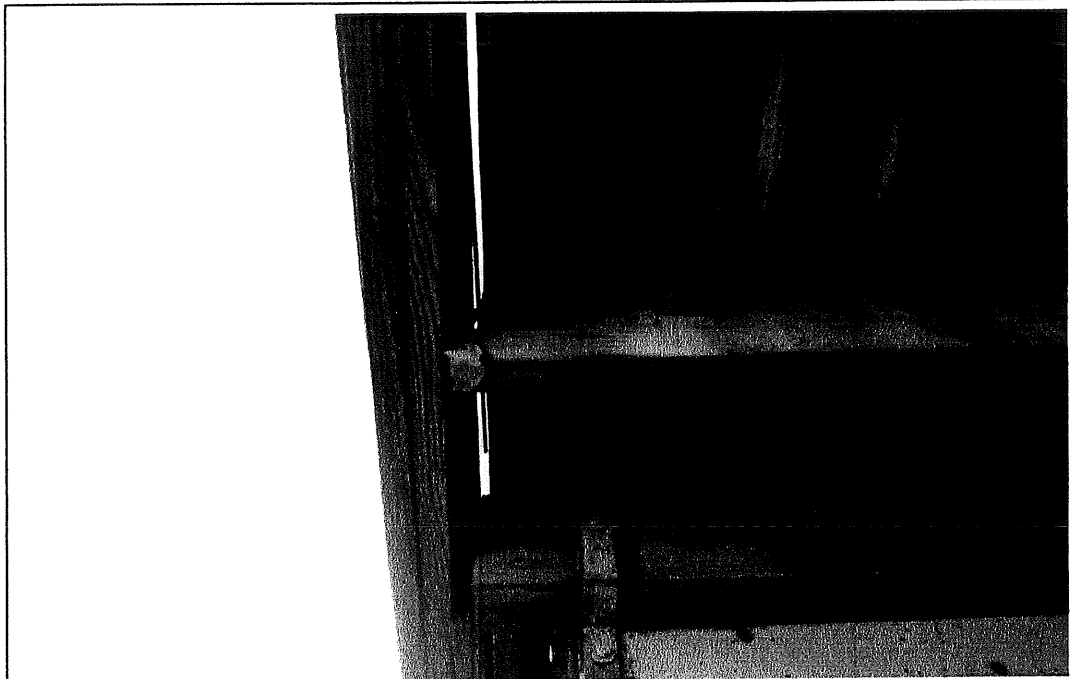


**PHOTO**  
**#6**

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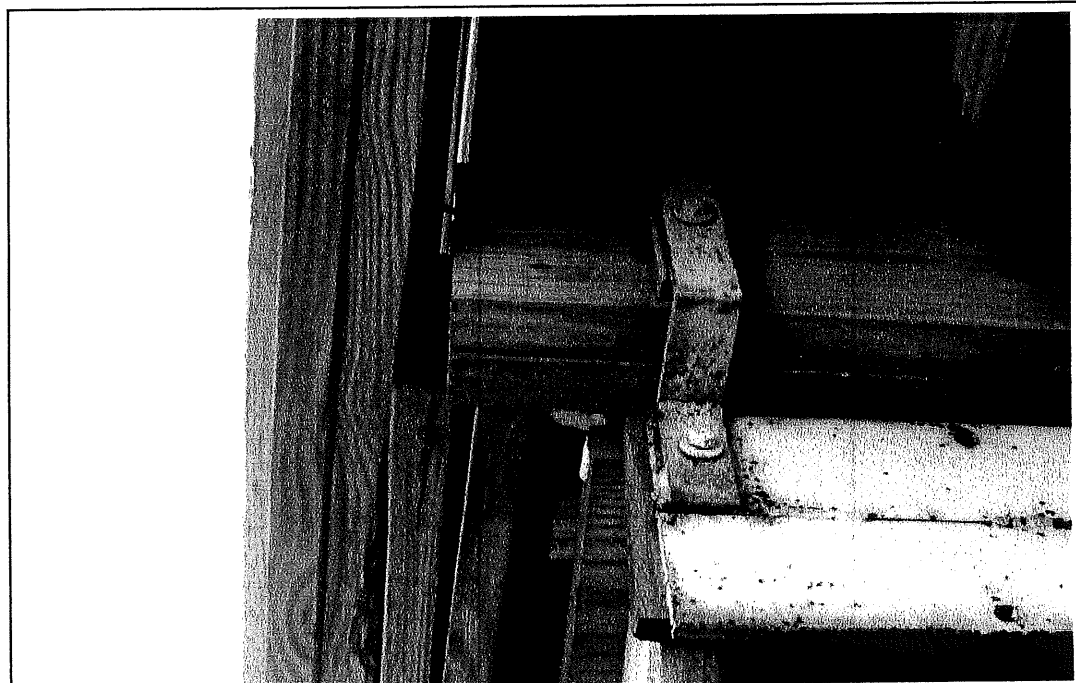
Typical corner post at line "A". Install Simpson L50Z brackets on top of rail, Simpson A23Z at sides from 2x4 into post. Move baluster at right to install Simpson A23Z.





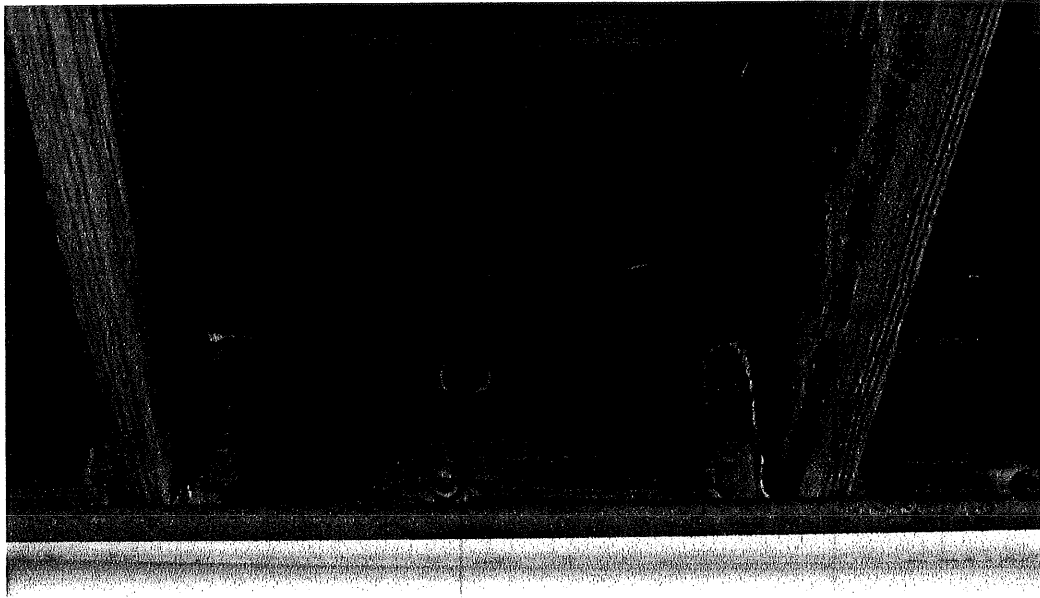
**PHOTO**  
**#9**  
0116 1750.jpg

8 Alder Street: View from third floor porch up to fourth floor stair header. Note separation between perimeter girder and ends of joist and stair header.



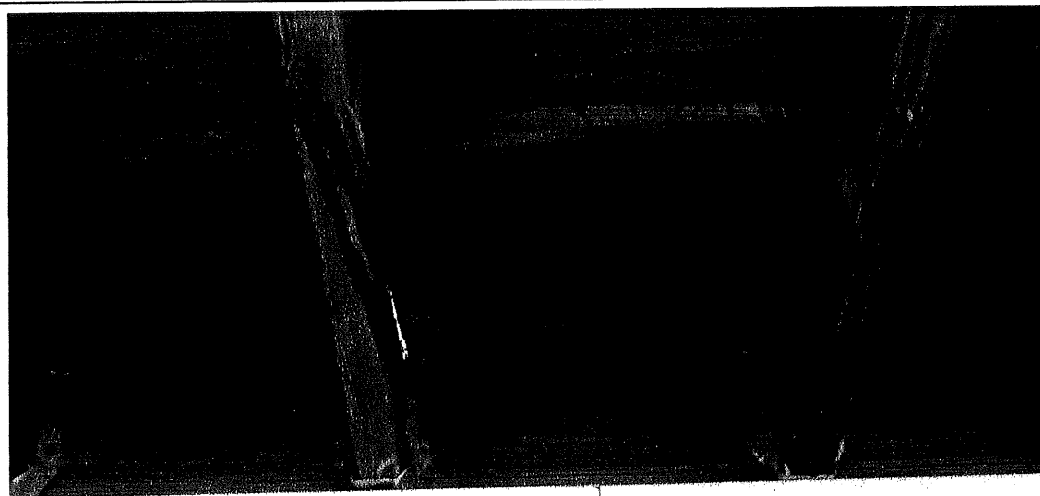
**PHOTO**  
**#10**  
0116 1749.jpg

8 Alder Street: Detail from Photo #9. Header nails have pulled downward away from perimeter girder. This repair needs immediate repair..



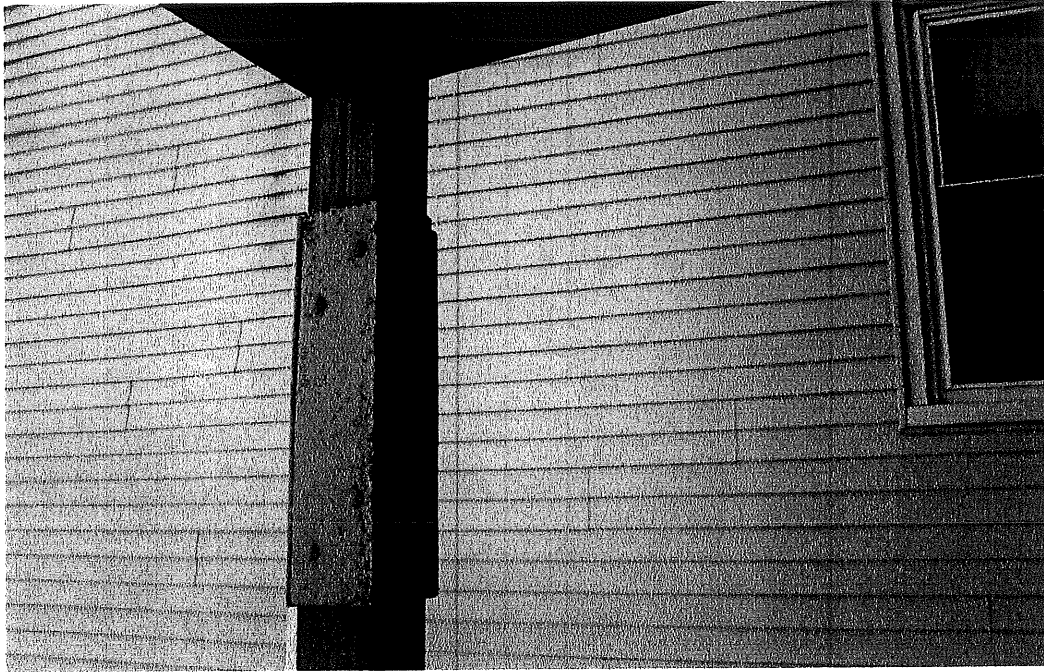
**PHOTO**  
**#11**  
0116 1726.jpg

8 Alder Street: Ledger at Level 3. Note galvanized threaded rod into building.



**PHOTO**  
**#12**  
0116 1752.jpg

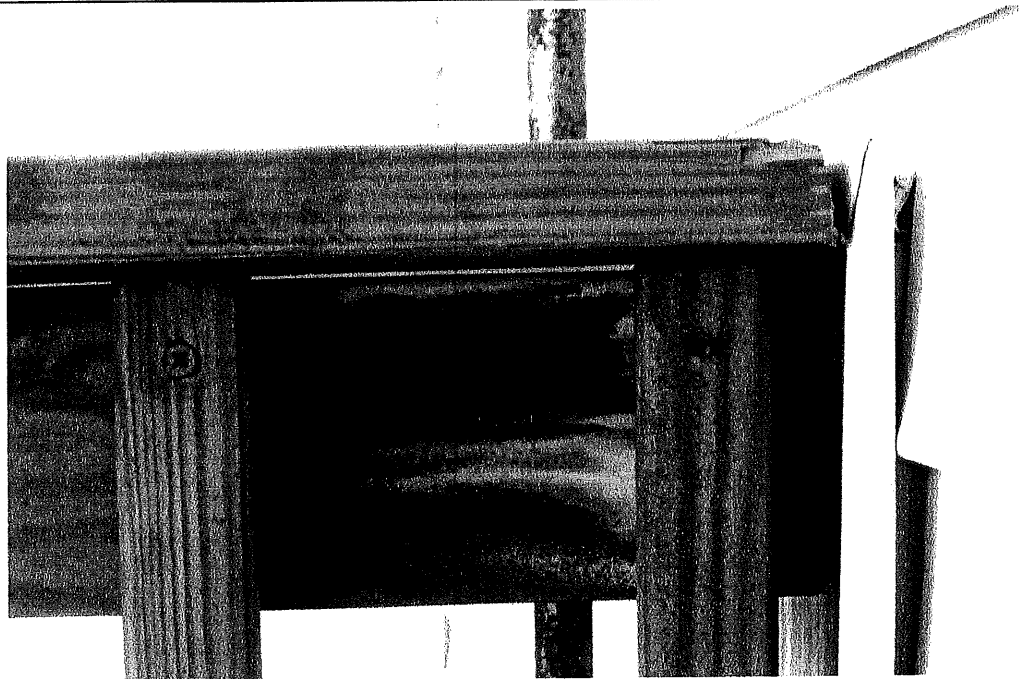
8 Alder Street. Level 4 ledger. Note that bolts are now single lag screws with no washer. In places, the screws are supplemented by galvanized nails.



**PHOTO  
#13**

0116 1725.jpg

Column Reinforcement Plates. These plates are beginning to corrode and they likely trap moisture behind them. Repair or replace in the next year.

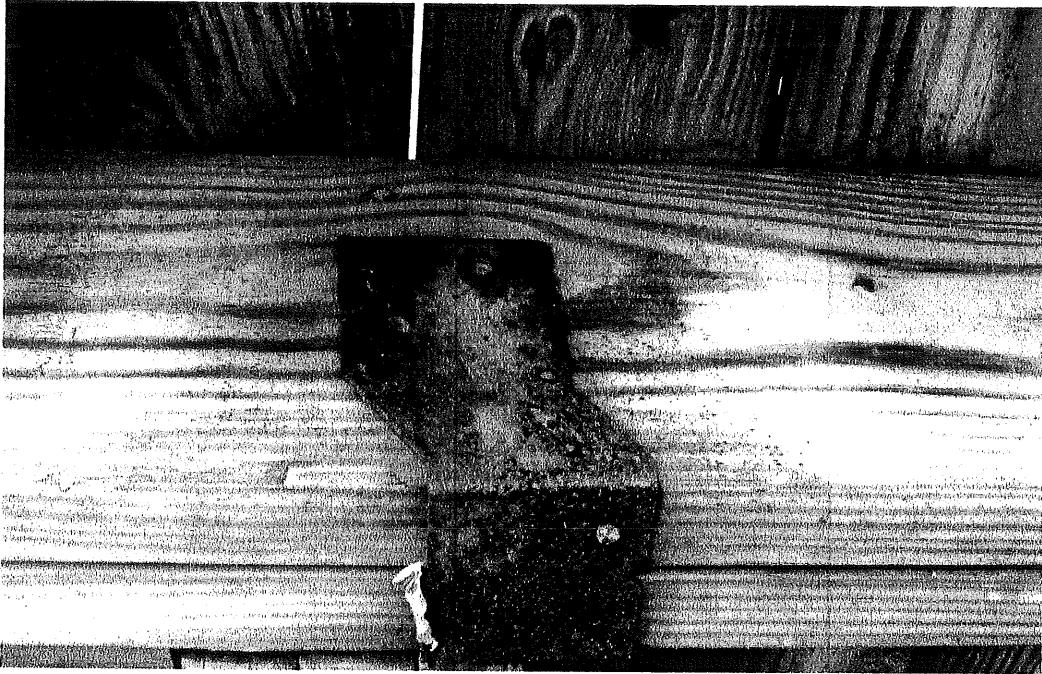


**PHOTO  
#14**

0116 1759.jpg

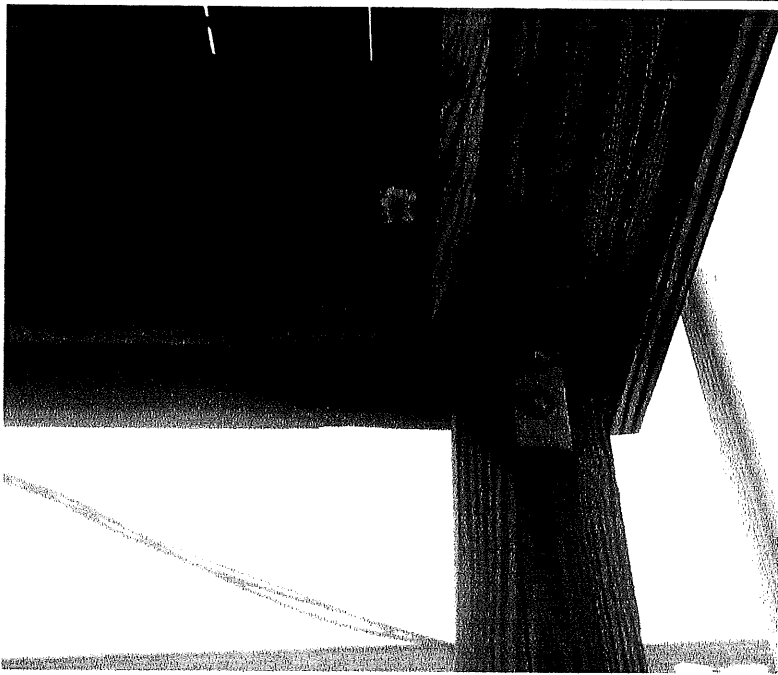
Level 5 railing attachment to building near column line A. Install Simpson L30Z anchor between 2x4 and top plate here to anchor top plate. Add screws to balusters at each baluster throughout porch, typical.





**PHOTO**  
**#15**  
0116 1732.jpg

Corroded Simpson Bracket at Inside of stair header. Remove and Replace.



**PHOTO**  
**#16**  
0116 1754.jpg

Supplemental Steel Angle Bracket at column Line E. Remove and replace with galvanized steel angle L3x3x1/4" with four 3/8" dia. holes for Timberlok Screws 1" from outside faces of the post.