Report

for the

2009 Structural Review

of the

1001 West Broadway Avenue Building

presented to

The City of Minneapolis
Department of Community Planning
& Economic Development

February 11, 2009

BCG Project Number R739-09-1

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Mr. Steve Maki
City of Minneapolis
Department of Community Planning & Economic Development
105 5th Avenue South, Suite 200
Minneapolis, MN 55401

RE: 2009 Structural Review of the
1001 West Broadway Avenue Building
Minneapolis, Minnesota
BCG Project No. R739-09-1

Dear Mr. Maki:

This report presents the results of the review of the building at 1001 West Broadway Avenue, Minneapolis, Minnesota. Our professional service was performed in accordance with our proposal P08211 authorized on December 22, 2008, with CPED contract number C-26214.

It has been a pleasure to provide these building consulting services to you on this project. If you have any questions on the report, please contact Matt Figus at 612-789-6696, extension 25, or Keith at 612-789-6696, extension 13.

Sincerely,
Buildings Consulting Group, Inc.

This is to certify that this study or report was prepared by me or under my direct supervision, and that I am a fully registered engineer under the laws of the state of Minnesota.

Matthew T. Figus, P.E.
Structural Engineer

Keith A. Pashina, P.E.
Principal Engineer

Date: February 11, 2009 Reg. No. 17134

Buildings Consulting Group, Inc.

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2009 Structural Review of the 1001 West Broadway Avenue Building

EXECUTIVE SUMMARY

The 1001 West Broadway Avenue Building is a three story building with one story additions to the south side. It has been vacant for the past several years. The intent of this review was to identify building components that require repair to maintain the safety and stability of the structure.

Several components of the building are distressed and unstable. We recommend that these components be addressed to remove potential safety hazards. These components include:

- The stucco at the west face over 1005 West Broadway Avenue
- The top few feet of the chimney over 1005 West Broadway Avenue.
- Loose brick at the parapet along Dupont Avenue.
- Isolated fields of loose brick on the Dupont Ave. elevation.

We recommend budgeting $27,000 for these structural stabilization measures to remove immediate potential safety hazards, and maintain the stability of the building. We recommend that these stabilization measures be made this year.

If the building is not renovated in the next 2 or 3 years, additional review is recomemmended to observe the stability of the building components. Past deferred maintenance, aging, and weathering has likely allowed new distress to occur at an accelerated pace. New distress can, and should be expected to occur in the next few years until the building is either demolished or renovated.

INTRODUCTION

Buildings Consulting Group, Inc. (BCG) was retained by the Department of Community Planning and Economic Development of the City of Minneapolis (CPED) to perform engineering services for the 1001 West Broadway Avenue Building. The intent of this review was to identify building components that require repair to maintain the safety and stability of the structure.

This review generally included:

- Visual observations of accessible structural components
- Identification of concern issues and repair priorities in each area.
- Cost estimates for correction of the structural stability conditions.
- Providing a written report summarizing our observations and recommendations

BUILDING DESCRIPTION

The 1001 West Broadway Avenue Building is constructed of a structural wood frame over a full basement, and is thought to have been built in the early 1900s. The original building was 3 stories in height above grade with a flat roof, and 1 story below grade. There were a additions at the rear (south) of the building, each 1 story in height with flat roofs.

Image 1, thumbnail.

The above grade structural walls of the original building appeared to be constructed of rough-sawn 2x4 studs. Floors were constructed of rough-sawn 2x14 joists. The roof and ceiling constructions were separate; each was rough sawn 2x8 joists. The interior finishes were plaster on wood lath, and tongue-in-groove wood flooring. The exterior sheathing was tongue-in-groove. At the north and east elevations the exterior siding was comprised of brick masonry cladding. At the south and west elevations the exterior siding was comprised of stucco on metal lath over clapboard siding.

Access to the low roofs of the additions was via a window at the west end of the 2nd floor onto the adjacent building's roof (1005 West Broadway Avenue.).

No safe access was present to the roof of the original building. A ladder was present at the east elevation bolted to the brick facade; however the connections to the brick facade appeared to be deteriorated. The original building had 4 chimneys clad with stucco. A wood cornice was present at the north elevation with a short return on the east elevation.

A full basement was present below grade at the original building. This was divided into east and west halves. Access to the west half was via a stairs located at the northeast corner of the west store, or a stairs to the middle addition. The west basement was unfinished with mortared limestone foundation walls. Access to the east half was via a floor hatch at the southeast of the store. The east basement was finished.

The middle addition was wood stud construction with a stucco facade. The rear addition was concrete masonry. There was not a basement below the additions.

The interior of the building was cluttered with materials including stacks of ladders, piles of carpet, stacked boxes of materials, and piles of debris; additionally, there were significant accumulations of animal wastes and several decayed animal carcasses.

BACKGROUND INFORMATION

Limited background information was available regarding the building. Verbal information provided by the CPED was limited but included that the building had been vacant for the past several years. The original building appears to have been constructed in about the early 1900s or earlier based upon the type of construction and materials observed.

REVIEW SUMMARY and DISCUSSION

We reviewed the project site on Friday, January 9, and on Tuesday, January 13, 2008. About three hours were spent on-site during each review. The weather was overcast and about 10°F during the first review, and about -15°F and sunny on the final review. Head lamps and handheld lights were used to aid our observations. Hand sketches, brief notes, and photographs were used to document our observations, which are summarized in the following paragraphs. Images referenced in the text are attached to the end of this report; a few images have been included with the text for clarity and to improve readability.

Foundation

Image 2, thumbnail.

Generally, the foundation walls appeared to have significant distress, but appeared to be currently stable. No horizontal cracking, deflection, or rotation was observed at either basement. There was no apparent foundation movement or differential settlement visible from inside the basement or sidewalk.

A concrete floor slab was present in each basement. There was no significant cracking or displacement of the concrete floor slab.

The foundation at the west half of the basement was viewable from the interior. It consisted of mortared limestone. The mortar at the lowest about 3' was deteriorated and had fallen out of the joints at the west half of the basement to a depth of a few inches. (See image 2.)

Image 3, thumbnail.

Most of the foundation wall at the east half of the basement was concealed by deteriorated finishes. However, there were a few voids in the foundation exterior visible at the exterior from the Dupont Avenue sidewalk that extended about a foot into the wall and downward. Staining on the wall finishes indicated the basement had been previously flooded to a depth of about 3'. (See image 3.)

Original Structure

Generally, the original wood structure appeared to have significant distress, but appeared to be currently stable. No actual or imminent partial collapse was observed.

Image 4, thumbnail.

Many of the interior wall and ceiling finishes displayed significant moisture damage, and large areas of wall and ceiling plaster had fallen, permitting observation of wall studs and floor joists. Where interior finishes remained there was significant diagonal cracking, indicating building movement. Movement and settling appeared to be greatest at the southwest quarter of the building. (See image 4.) Moisture damage was the most prevalent at the third floor than compared to the second, and uncommon at the first floor .

Some wood wall studs were observed to be decayed. Close investigation was performed at the southeast corner where significant deterioration was observed at a few corner studs. (See image 5.)

Image 5, thumbnail.

Where the interior side of the exterior sheathing was visible, it did not appear to be deteriorated. However, very little of the exterior wood sheathing was visible from the interior. The roof and wall sheathing appeared to be tongue-in-groove wood boards.

Image 6, thumbnail.

The roof construction was viewable at one location where the ceiling finish had fallen. (See image 6.) The roof structure was independent of the 3rd floor ceiling, each consisted of rough-sawn 2x8s spanning half the width of the building. Significant creep (permanent deflection over time) was present at the ceiling joists and slight bowing was observed at the roof joists. The roof sheathing appeared to be tongue-in-groove wood boards. Moisture staining was observed at the underside of the roof sheathing, and on most of the roof and ceiling joists. However, no joists seemed to be soft or decayed where accessible.

Building Additions

Image 7, thumbnail.

Generally, the two building additions appeared to be distressed, but currently stable. No actual or imminent partial collapse was observed. All additions were at the south (alley) side of the building.

The middle addition was of more recent wood construction, probably about 10 to 20 years in age. Significant moisture deterioration was observed at the underside of the roof at a few locations resulting in isolated rot of the sheathing and part of the joists. (See image 7.)

The southern-most addition was concrete masonry with a wood roof. Step cracking was observed at the concrete masonry at a few locations, and isolated moisture distress was observed at the underside of the roof.

Stucco Veneer on West and South Walls

Image 8, thumbnail.

Generally, the stucco facade at the west wall appeared to be unstable posing an immediate potential safety hazard. The facade on the west face had pulled several inches away from the building at many locations. (See image 8.)

The stucco veneer on the south wall did not display significant dislocation.

The stucco veneer at the west and south elevations had been installed over wood clapboard siding, and was generally dislocated away from the wall. Where the siding was accessible it was observed to be significantly distressed. (See image 9.) One layer of building paper was observed behind the stucco, and one layer of building paper was observed behind the clapboard. No obvious anchorage of the metal lath was observed.

Image 9, thumbnail.

The stucco at the south elevation did not display significant dislocation; however, it appears to be of the same construction and is probably susceptible to similar distress as the stucco at the west elevation.

The condition of the stucco veneer combined with the significant deterioration of the underlying clapboard siding may allow significant rainwater intrusion, resulting in further deterioration of the structurally supporting wood components.

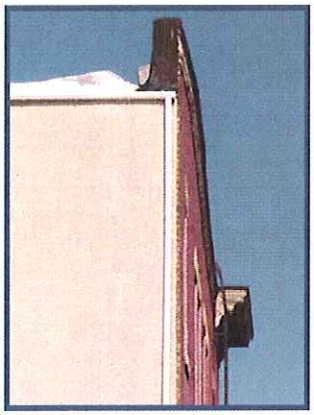

Image 10, thumbnail.

Image 11, thumbnail.

Image 12, thumbnail.

Brick Veneer and Parapet

Generally, the brick veneer at the east (Dupont Avenue side) displayed isolated areas of poorly bonded brick. The parapet appeared to be bowed outward and possibly unstable. The north (Broadway Avenue) elevation did not appear unstable; however, it did display widespread mortar joint deterioration.

The brick veneer appeared to be a single thickness; no lateral brick ties were observed. (Lateral brick ties are used to restrain the brick veneer against out of-plane-movement away from the backup wall.) However, no significant out-of-plane dislocation was observed relative to window frames or viewing along the plane of the wall. There was significant step cracking and mortar voids, mostly concentrated at the north and south ends of the east elevation. Less cracking and distress was observed on the north elevation.

The east wall parapet appeared to bow outward several inches and displayed a slight outward rotation at the top. Additionally, there was brick and mortar cracking in the brick parapet. (See image 10.)

One area of the brick facade above the east face of the east store front was reviewed up close using a ladder. (See image 11.) There was a step crack displaying about ¼" of movement at this location. The brick below the step crack were loose. The mortar below and to the right of the step crack was generally deteriorated to a typical depth of about 1½".

Wood Cornice and Chimneys

The wood cornice and the 4 chimneys appeared to be distressed and aged, but currently stable.

The wood cornice is on the north elevation and at the roof parapet. The cornice was constructed of wood and was significantly weathered. However, no dislocated or significantly distressed structural components were observed.

The four brick chimneys were observed from ground and appeared to be brick with a stucco coating. Some of the stucco had deteriorated and spalled. The chimneys were set back from the roof edge by about 1'.

Chimney of 1005 West Broadway Avenue Building

The top few feet of the chimney appears to be very deteriorated and unstable.

The chimney at the west face of the building appears to be on the 1005 West Broadway Avenue property. However, this chimney is also attached to the west face of the building. The top few feet have significantly deteriorated with large voids, and the lower part displayed significant cracking and mortar deterioration.

CONCLUSIONS and RECOMMENDATIONS

The foundation and framing of the original building and additions appear to be stable, with significant isolated distress. However, the brick facade and stucco facades display areas of isolated potential instability for which we recommend repairs to temporarily stabilize the structure.

We recommend the following stabilization repairs due to the risk of falling debris onto public sidewalks and streets or the adjacent occupied building to the west. As a minimum, loose material should be removed. However, the stabilization repairs described below will aid future restoration of the building.

Stabilization repairs or debris removal should be performed in 2009. All repairs listed below present a similar risk of falling and are recommended to be addressed in a similar time period.

We recommend budgeting $27,000 for temporary stabilization repairs.

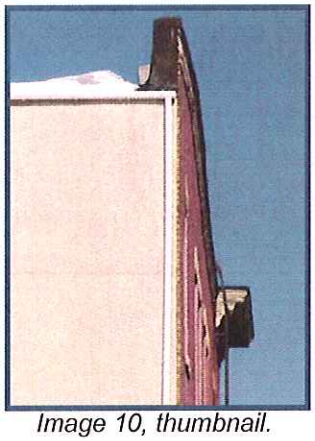

Image 10, thumbnail.

1. Brick Masonry Wall Repairs

   A budget of about $10,000 should be established for this repair.

   A. The brick parapet along the east wall (see image 10) appeared to be dislocated, and bowed outwards.
   B. Isolated large areas of distressed brick veneer were also observed below the parapet.
   C. As part of the repair, further investigation should be performed to verify the significance of the outward bowing and loose brick. An aerial lift can be used for access, and the condition of the backup wood wall studs and lateral wall ties should be verified.
   D. Assuming the backup wall construction and wall ties are in adequate condition, the brick veneer should be temporarily stabilized by:

      1. Adding additional lateral wall ties on the east elevation brick veneer.
      2. Installing steel fence netting, anchored by the additional lateral wall ties, to restrain any loose brick or mortar.
      3. At the roof parapet, installing additional EPDM flashing as necessary to temporarily tie-in to the existing roof membrane.

   E. Alternately, brick masonry could be temporarily removed and the brick salvaged and stored for reuse. Temporary protection would be needed to protect the exposed wood backup. Removal of the brick without replacing the brick would be very noticeable on the street side of this building. the parapet should be braced or removed to eliminate a hazard to the adjacent sidewalk and street.
   F. Modifications to the roofing at this location may be required to maintain the water-tight condition of the roof.

Image 11, thumbnail.

2. Stucco Removal and Temporary Repair:

   A budget of about $13,000 should be established for this repair.

Image 8, thumbnail.

   A. The stucco at the west face (see image 8) is generally unstable and should be removed to eliminate a potential safety hazard to the sidewalk on Broadway in front of the 1005 West Broadway Avenue building. Loose stucco also poses a potential hazard to the roof of the adjacent 1005 building.
   B. Similar loose stucco is likely present on the south elevation.
   C. The stucco should be removed and legally disposed of on the west and south walls.
   D. We assumed the underlying wood siding is deteriorated, and would need to be temporarily protected with building paper and battens. Alternatively, the wood siding could be covered with vinyl or metal siding.

Image 12, thumbnail.

3. West Wall Chimney Removal and Protection

   A budget of about $4,000 should be established for this repair.

   A. The top few feet of the west chimney brick (see image 12) should be removed to eliminate a potential hazard to the adjacent 1005 building and its occupants.
   B. The brick should be salvaged and stored on-site for future use when the building is renovated.
   C. A sheet metal cap should be installed over the shortened chimney.
   D. This repair has assumed the chimney is no longer used for heating. If the the chimney is used for heating, more extensive repairs or installation of a metal flue would be required.

Based on our review, there are several other building components that show distress, but do not need stabilization repairs at this time. These building components include:

1. The wood frame (including wall studs, joists, floor boards, and sheathing) of the original building.
2. Cornice on the north elevation.
3. Fire escape on west elevation.
4. Roof access ladder on the east elevation.
5. Foundation walls.
6. Building additions.

All of the building components display significant distress that will need to be addressed as part of a future rehabilitation plan.

If the building is not renovated in the next 2 or 3 years, additional review is recommended to observe the stability of the building components. Past deferred maintenance, aging, and weathering has likely allowed new distress to occur at an accelerated pace. New distress can, and should be expected to occur in the next few years until the building is either demolished or renovated.

ADDITIONAL CONCERNS

To maintain the building and prevent further deterioration, rainwater and pests are recommended to be kept out of the building.

Several windows were broken permitting birds and rain to enter. We recommend these windows be temporarily covered to repel most rainwater and large pests.

Before rehabilitation of the building, the existing debris, including many cans of paint and bird feces, may require significant hazardous materials clean-up.

Inside the building, anyone accessing the building before it is repaired should also be aware of potential falling hazards from loose overhead plaster ceilings. Additionally, the animal feces and particulate debris result in dust which may present a respiratory hazard.

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Referenced Photographs

Image 1

An overall view of the north and east elevations of the building. The brick veneer cladding and wood cornice is visible, as well as the two store fronts. Also visible is the east wall of the middle addition at the south of the building. A bus stop is present on Broadway in front of the east storefront.

Image 2

The mortar has generally deteriorated at the lower few feet of the foundation wall. However, this type of foundation wall could be 2' to 3' thick which allows for significant systemic deterioration without resulting in structural instability.

Buildings Consulting Group, Inc.

Image 3

Damage to interior finishes, probably resulting from flooding.

Image 4

Significant diagonal cracking of the interior plaster was observed indicating settlement or shifting of the building. Additional, several door frames were observed to be out-of-square. The amount of cracking and differential settlement was greater at the southwest of the building.

Referenced Photos

Buildings Consulting Group, Inc.

Image 5

The debris in the image is a piece of wood stud removed by hand from the southeast corner of the 3rd floor. Only isolated areas of interior finish were absent which means there may be more areas where primary structural components (such as studs and joists) have deteriorated, but are concealed.

Image 6

This interior view of the roof and ceiling was taken by climbing onto a pile of debris. There were signs of past moisture intrusion, but the weather was below freezing and no liquid moisture was observed. Additionally, no joists appeared to be failed.

Referenced Photos

Buildings Consulting Group, Inc.

Image 7

There was significant isolated decay of the wood at the underside of the roof at the middle addition. The weather was below freezing and no liquid moisture was observed.

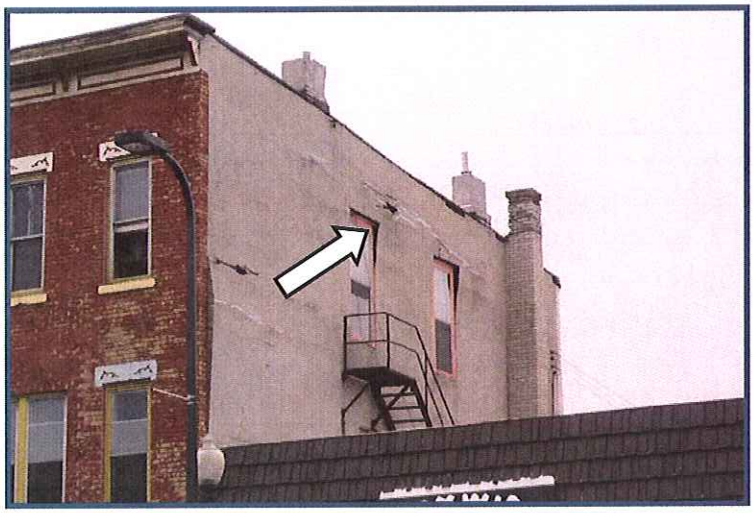

Image 8

The stucco on the west face was generally peeling off the building.

Deteriorated clapboard siding was behind the stucco. The total weight of this 2 story stucco facade at this elevation is estimated to be about 3 to 4 tons.

The arrow indicates the location of Image 9.

Referenced Photos

Buildings Consulting Group, Inc.

Image 9

Close-up of upper right corner of north window at third floor of west wall.

No restraint was observed to restrain the stucco on the face of the building. The gap between the stucco and the building face was several inches in some areas. The exposed lath displayed surface corrosion.

The clapboard siding behind the stucco was observed to be deteriorated with voids. A single layer of building paper was observed behind the clapboard siding.

Referenced Photos

Buildings Consulting Group, Inc.

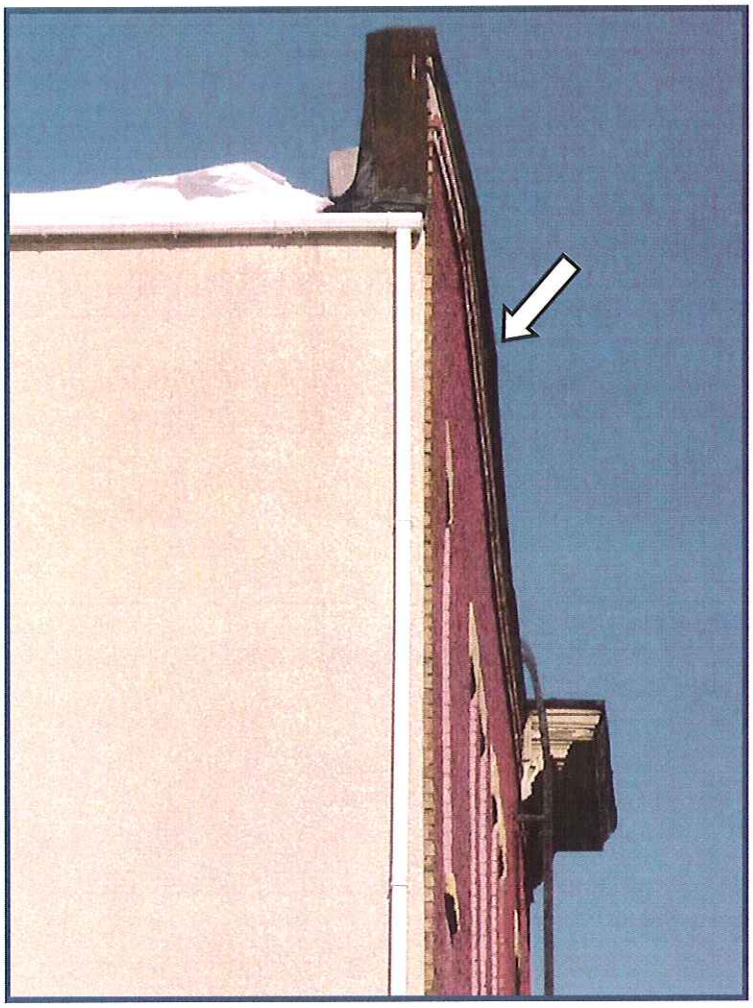

Image 10

The parapet along Dupont displayed outward bowing. The roof was not accessible, so the cause of this bowing, and the severity and significance is undetermined. However, this bowing can be assumed to be significant.

Referenced Photos

Buildings Consulting Group, Inc.

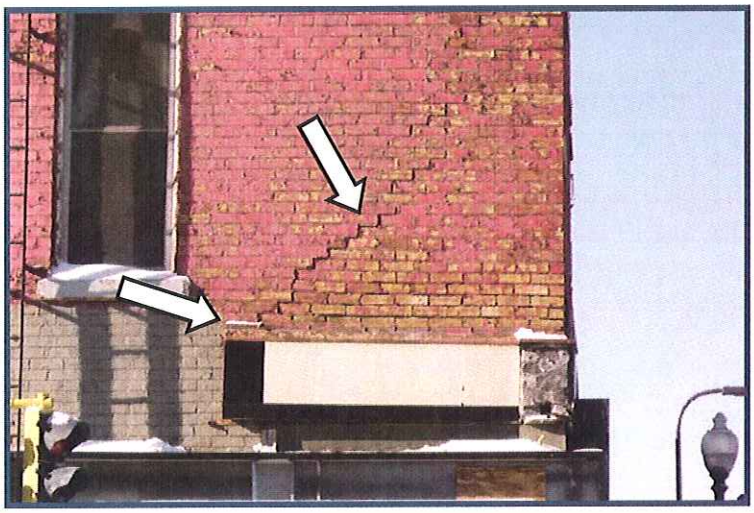

Image 11

The area of brick to the right and below the crack is very deteriorated with soft mortar, large mortar voids, and loose brick.

Referenced Photos

Buildings Consulting Group, Inc.

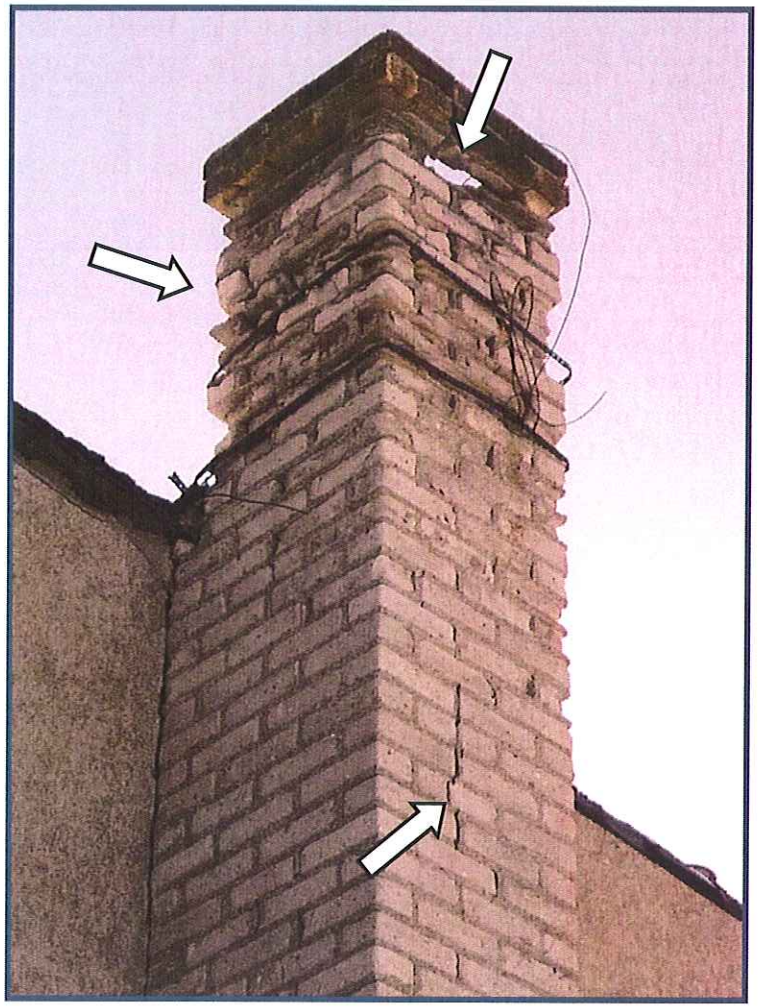

Image 12

The chimney attached to the west face of the building appears to belong to the 1005 W. Broadway Ave. property. The top few feet of this chimney is significantly deteriorated including missing brick, crumbling and cracking mortar.

The top few feet of this chimney appears to be wrapped with strapping which may be an ad hoc stabilization measure, or may have been for an antenna which is no longer present, or other purpose.