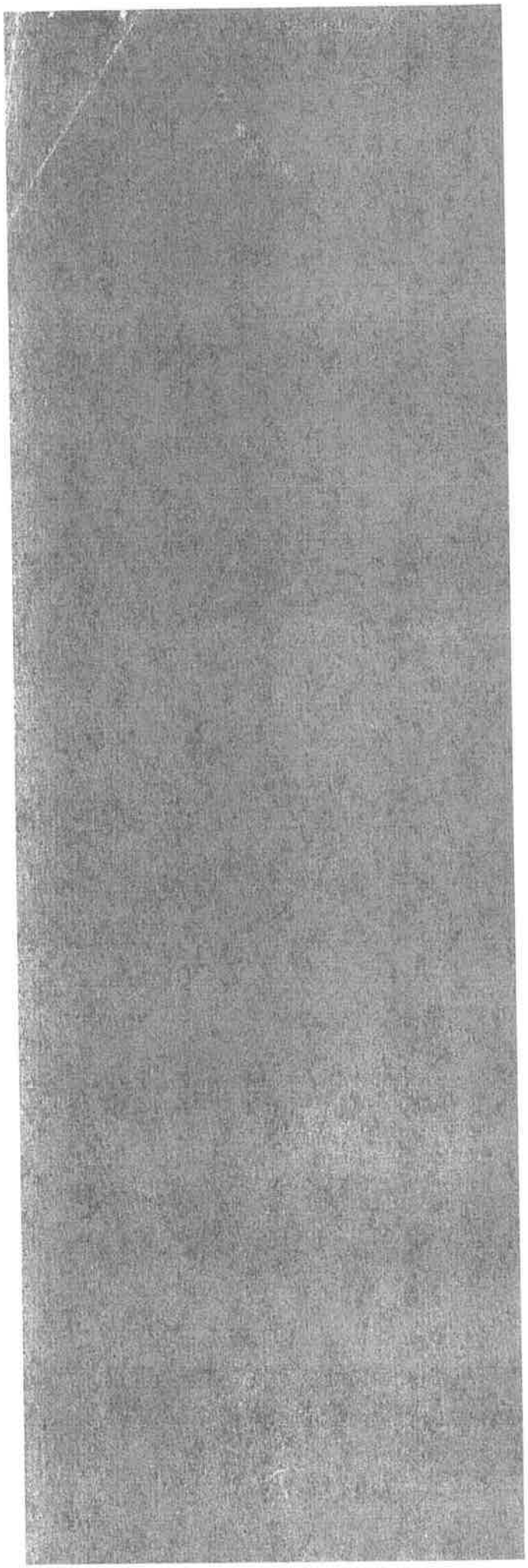

Thornton Tomasetti

14 Lincoln Place Cinema Building, Madison, NJ

Structural Review

Thornton Tomasetti Project No. F19022.00

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Table of Contents

1.0 Introduction

Madison Movie Development LLC ("Owner") has submitted an application to the Borough of Madison Planning Board to demolish the existing structure located at 14 Lincoln Place in Madison, New Jersey, and construct a new building. The existing building was previously used as a commercial movie theater. The proposed building includes three stories of residential apartments above street level retail/theater space and underground parking.

Prior to submitting the above-mentioned application, the Owner retained Persimmon Engineering, LLC ("Persimmon") to assess the condition of the existing structure and evaluate the feasibility of reusing the existing building for the proposed mixed use. Persimmon reported its findings in a written report dated May 4, 2018.

The Owner recently retained Thornton Tomasetti ("TT") to provide a second opinion on: 1) the condition of the existing structure; 2) the general scope of structural work/repairs that would be required to restore the building if it were to remain a movie theater; and 3) the feasibility of altering the existing building structure for the proposed mixed use of residential apartments, street level retail/theater space and underground parking. TT has reviewed available pertinent documents and relevant sections of the New Jersey Uniform Construction Code, visually surveyed the condition of the existing structure, and evaluated findings. This report summarizes TT's review and findings.

2.0 Building Description

Consistent with drawings prepared for the proposed building by Gertler & Wente Architects LLP, in this report, TT refers to the front elevation of the building along Lincoln Place as the *south* elevation, the two side elevations as the *east* and *west* elevations, and the back elevation as the *north* elevation.

Existing Building

As drawings of the existing building's original construction were not available for review, TT has determined the following information regarding the existing building based upon visual observation on site, review of site/contextual study drawings prepared by Gertler & Wente Architects dated December 19, 2017, and review of site plans prepared by Bowman Consulting dated October 22, 2018:

- The building is approximately 68' wide by 136' deep from front to back. The front portion of the building (approximately 25% of the full 136' depth) has a flat roof approximately 24' above street level with a parapet that rises a few feet above that. The balance of the building has a sloped roof with a ridgeline at approximately 42' above street level.

- The front portion of the building with the flat roof has a partial basement, 1st floor lobby and adjacent concessions/support space for the movie theaters, and a 2nd floor with office space and mechanical/projector rooms. The exterior walls and some interior walls of this part of the building are masonry bearing walls, constructed of hollow terra cotta tiles, supported by concrete foundations; the exterior walls are faced with an exterior brick veneer. The 1st floor is constructed of a reinforced concrete floor slab supported by steel beams and concrete foundation walls at the basement space. Outside of the basement area, the floor slab presumably is supported

directly by the ground. The 2nd floor and flat roof are constructed of wood floor framing supported by the masonry bearing walls.

- The main part of the building with the sloped roof houses four movie theaters, two on either side of a central corridor that extends from the lobby towards the back of the building. A narrow mezzanine is constructed above the central corridor between the theaters, likely supported by terra cotta bearing walls. The building exterior walls are masonry bearing walls supported by concrete foundations. These walls are constructed of hollow terra cotta tiles, faced with an exterior brick veneer, intermittently strengthened by exterior brick piers. The floor generally slopes/steps downward from front to back of each theater, with part of the floor construction above street level and part below. The floor is constructed of reinforced concrete slabs, supported at crawl spaces by steel beams, steel posts and concrete foundations. At areas without crawl spaces, the slab presumably is supported directly by the ground. The theater ceilings are suspended from the sloped roof, which is constructed of wood framing that spans approximately 17' to steel roof trusses or masonry gable end walls. The steel roof trusses span the full 68' width of the building and are supported by the above mentioned brick piers at the east and west exterior walls. The Persimmon report documents with photos probes that were made to verify that there are no steel columns embedded in the brick piers. There is an accessible unconditioned space above the theater ceilings, in the truss space below the sloped roof.

- As is indicated in the above paragraphs, the entire building is clad in a brick veneer. Steel lintels support the masonry above windows and doors. The flat roof has an EPDM or similar rubber roofing membrane. The sloped roof has asphalt shingles.

Proposed Building

The following information regarding the proposed building is based upon review of architectural drawings prepared by Gertler & Wente Architects, issued for planning board review on January 3, 2019, and review of site plans prepared by Bowman Consulting dated October 22, 2018:

- The proposed building is approximately the same width and depth front to back as the existing building. Comparing height, the proposed building is taller with a main roof approximately 44' above street level, and front and back setback roof terraces approximately 34' above street level. The main roof and the roof terraces are flat and have parapets that rise a few feet higher than the roof levels.

- The proposed building has a full basement for parking, a 1st floor with high ceiling for retail/theater use, and 2nd through 4th floors for residential apartments.

- Like the existing building, the proposed building is clad in a brick veneer. However, it has significantly more windows to suit its proposed use.

3.0 Summary and Evaluation of Observed Conditions

TT visited the site on February 1, 2019 to visually observe accessible areas of the building interior and exterior, including the lobby and support space, partial 2nd floor, theaters, mezzanine between theaters,

partial basement, crawl spaces, roof truss space, exterior walls and roofs. In general, TT observed the conditions of concern noted in the Persimmon report as well as some additional conditions. Following is a summary and evaluation of observed conditions of concern:

1. *Sagging/Cracked Roof Joists on Sloped Roof*: The wood roof joists that span to the steel roof trusses are significantly deflected, and in some instances are cracked. Refer to Photo 1.

   Evaluation:

   The joists appear to be sagging as a result of short term and long term (creep) deflections under the weight of the roof structure and plaster ceiling suspended from the joists. These 2x10 joists span 17', which is unusually long for this joist size. TT structurally analyzed the joists and found that they would be significantly overstressed when carrying code prescribed snow loads.

2. *Rotted/Warped Floor Boards at 2nd Floor*: During the walkthrough, TT found sections of the 2nd floor with warped or rotted floor boards, some of which noticeably displace under a person's weight.

   Evaluation:

   Water stains and failures in the interior finishes indicate that the roof and/or exterior walls have leaked. Rotted floor sections and the overall poor condition of the 2nd floor space suggest that leaks may have been left unchecked for sustained periods of time. The overhead flat roof structure is concealed and could not be easily inspected. However, considering the evidence of leaks and the ill effect on the floor boards below, it is likely that sections of the wood roof structure are compromised as well. The rotted/warped floor boards, and any similar conditions on the flat roof structure, are a safety hazard.

3. *Structurally Cracked Section of East Exterior Wall and Supporting Concrete Foundation*: A large section of the east exterior wall has a number of structural diagonal cracks from bottom to top of the wall, including through the brick piers that support the roof trusses, and through the concrete foundation itself. Refer to Photos 2 – 4, and 10.

   Evaluation:

   The configuration and size of these structural cracks indicate that a portion of the supporting wall foundation has settled. The observed cracking and settlement have structurally compromised: 1) a substantial section of the east wall, which laterally stabilizes the building; and 2) a brick pier that supports a roof truss.

4. *Structurally Cracked Section of East Side of Interior Bearing Wall*: A large section of the interior bearing wall below the south gable of the sloped roof is structurally cracked near the east side. Refer to Photos 5 – 6.

   Evaluation:

   The size of these structural cracks and proximity to the settled section of the east exterior wall suggest that this section of wall may have been damaged by foundation settlement as well. The

observed cracking has structurally compromised the end section of this wall, which laterally stabilizes the building and provides vertical support for the roof.

5. *Out of Plane Displacement and Cracking of Exterior Walls*: TT and Persimmon observed a number of locations where the exterior walls have displaced outward at their tops as evidenced by the walls separating from perpendicular walls. Refer to Photos 7 – 8. Locations were also observed where the exterior walls/piers have horizontal cracks. Refer to Photo 9.

   Evaluation:

   The observed displacements indicate that the walls are not adequately anchored at their tops to resist out of plane forces. The observed horizontal cracks may be an indication that the walls are bowing outward between horizontal anchor points at the foundation and roof. These displacements and cracks have structurally compromised the exterior walls, which laterally stabilize the building and provide vertical support for the roof.

6. *Weather Deterioration on Exterior Walls*: The exterior walls exhibit significant deterioration resulting from exposure to the weather, including corroded steel lintels above doors and windows, spalled bricks and deteriorated mortar joints at numerous locations throughout, failed masonry coating throughout, and cracks and spalls throughout much of the concrete foundations that support the exterior masonry walls. Examples of these deteriorated conditions can be seen in a number of the photographs included in Appendix A and the Persimmon report.

   Evaluation:

   The exterior walls are in poor condition, and should be repaired to prevent additional water penetration and deterioration.

4.0 Structural Work Required to Continue Using Building

If the subject building were to be used as a commercial movie theater, the following work should be carried out to address the conditions of concern summarized in Section 3.0:

1. *Sagging/Cracked Roof Joists on Sloped Roof*: The significantly deflected and overstressed joists on the sloped roof are structurally deficient and should be removed and replaced. This would also require removing and replacing the roof sheathing and shingles, and temporarily supporting the suspended plaster ceiling.

2. *Rotted/Warped Floor Boards at 2nd Floor*: The 2nd floor should be carefully inspected to find floor sections with rotted/warped floor boards. The flat roof structure should also be investigated for structural compromise, and the roof membrane should be investigated for active leaks. Any rotted/warped roof or floor structure should be selectively removed and replaced, and any leaks should be corrected.

3. *Structurally Cracked Section of East Exterior Wall*: The soil under the wall's foundation should be investigated with test pits and soil borings to determine whether the wall is at risk of continuing settlement. If necessary, the foundation should be stabilized with soil grouting, mini piles or

other suitable means. Regardless of whether foundation stabilization is required, the cracked masonry should be selectively removed and replaced.

4. *Structurally Cracked Section of East Side of Interior Bearing Wall*: The soil under the wall's foundation should be investigated with test pits and soil borings to determine whether the wall is at risk of continuing settlement. If necessary, the foundation should be stabilized with soil grouting, mini piles or other suitable means. Regardless of whether foundation stabilization is required, the cracked masonry should be selectively removed and replaced.

5. *Out of Plane Displacement and Cracking of Exterior Walls*: The out of plane displacement and cracking should be investigated and stabilized as required by adding anchors to better tie the walls back to the roof structure and perpendicular walls, and by reinforcing the brick piers to better resist out of plane forces.

6. *Weather Deterioration on Exterior Walls*: The exterior masonry walls are in poor condition and require a large scope of repairs, including: 1) removing and repairing spalled/delaminated concrete at the wall foundations; 2) removing and replacing corroded steel lintels; 3) completely removing the failed existing masonry coating, removing loose materials from the masonry joints and face brick; and 4) applying appropriate products and a new masonry coating throughout to restore and protect the exterior face of masonry.

5.0 Structural Work Required to Alter Building for Proposed Mix Use

Following is a summary of the work that would be required to convert the subject building to the proposed mixed use:

1. The proposed building has a full basement, is taller than the existing building, and has floor/roof levels that are at different elevations than the existing building. To make room for the proposed underground parking level, and to support the proposed elevated floors and roof, most or all of the existing structure inside of the existing building exterior walls would need to be removed, including sloping/stepped ground level slab, interior bearing walls, second floor framing, flat roof, steel roof trusses and sloped roof. The exterior walls would need to be temporarily braced until they can be tied to new structural construction.

2. The proposed building has significantly more windows than the existing building. To accommodate the increased number and changed locations of proposed windows, the exterior walls would need to be infilled where existing windows are not required, and a significant number of new window openings would need to be created by installing new lintels and cutting new openings. This would be a challenging operation to undertake on the unreinforced terra cotta and brick masonry.

3. The new building would impose different loads at the locations of the exterior walls compared to the original building. Considering the number of window openings that would need to be installed in the unreinforced exterior masonry walls, the ability of the exterior walls to support vertical and lateral loads would be very limited. It would be much more practical and economical to install new structural members that would be designed to support vertical and horizontal loads

required by code for the proposed building configuration than to attempt to reinforce the existing exterior walls (to be altered with more windows) to carry the proposed loads.

6.0 Conclusions

In its current condition, portions of the existing building are significantly deteriorated and/or structurally compromised. If the building were to be restored for its prior use as a commercial movie theater, the significant scope of structural work outlined in Section 4.0 would be required to address the conditions of concern summarized in Section 3.0.

For the reasons outlined in Section 5.0, the configuration and construction of the existing building structure are not suitable for conversion to the proposed mixed use facility. To construct the proposed mixed use structure, the majority of the existing structure would need to be removed, and portions of the original structure that may be salvageable would be insufficient to support the code loads required for the proposed structure. It would be much more practical and economical to install new structural members that would be designed to support the required code loads than to attempt to reinforce any salvageable parts of the existing structure.

* * * * *

The opinions expressed in this report are provided within a reasonable degree of engineering certainty. Thornton Tomasetti reserves the right to amend its report should additional pertinent information become available.

Respectfully submitted,

Wayne A. Hostetler, P.E.
Principal

Date: February 8, 2019

APPENDIX A

PHOTOGRAPHS

Photo 1: Roof Joists on Sloped Roof: Note significant deflection (typical), and cracked joist at arrow.

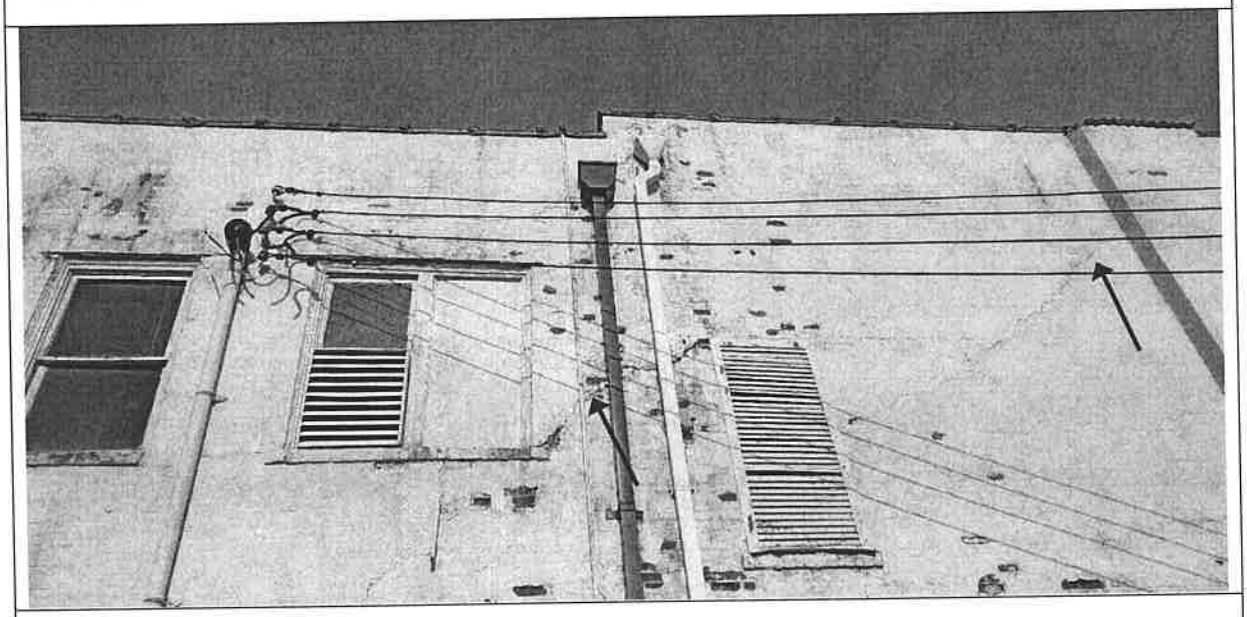

Photo 2: East Exterior Wall: Note significant structural diagonal cracks.

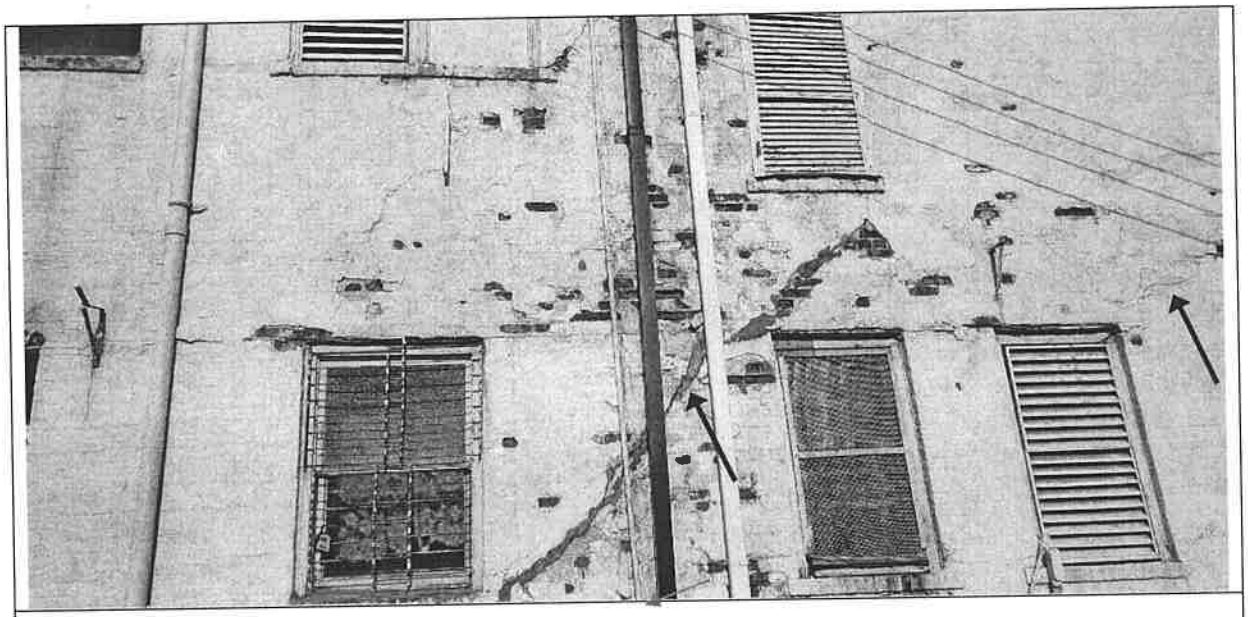

Photo 3: East Exterior Wall: Note significant structural diagonal cracks.

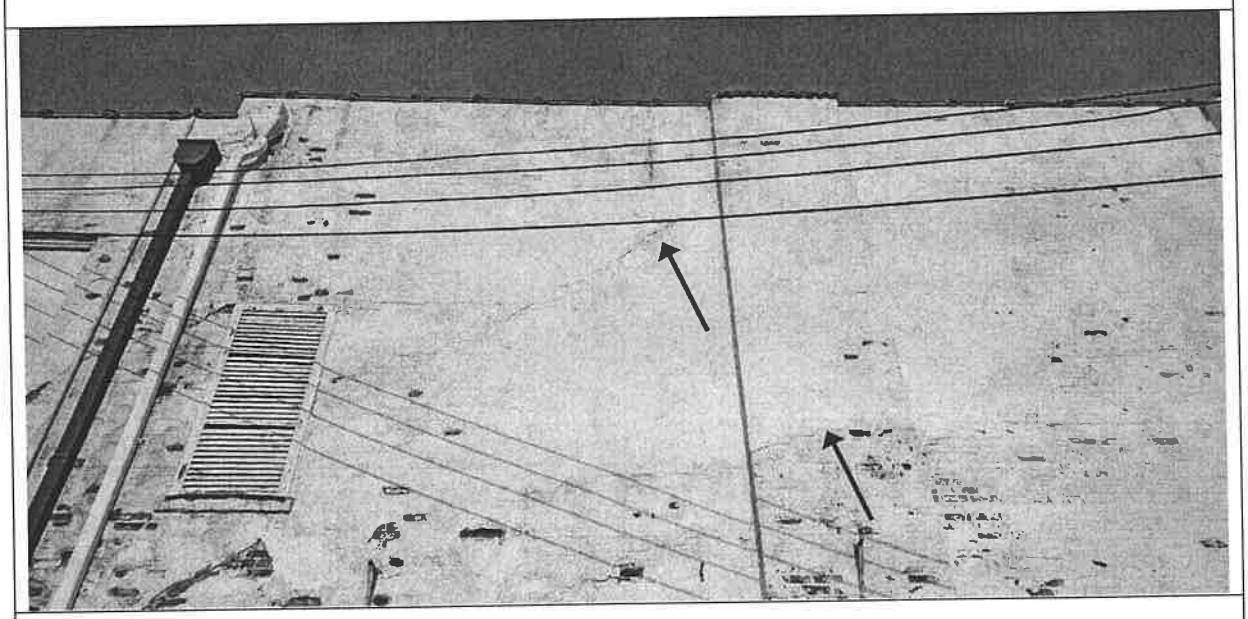

Photo 4: East Exterior Wall: Note significant structural diagonal cracks.

Photo 3: East End of Interior Bearing Wall below South Gable: Note significant structural cracks.

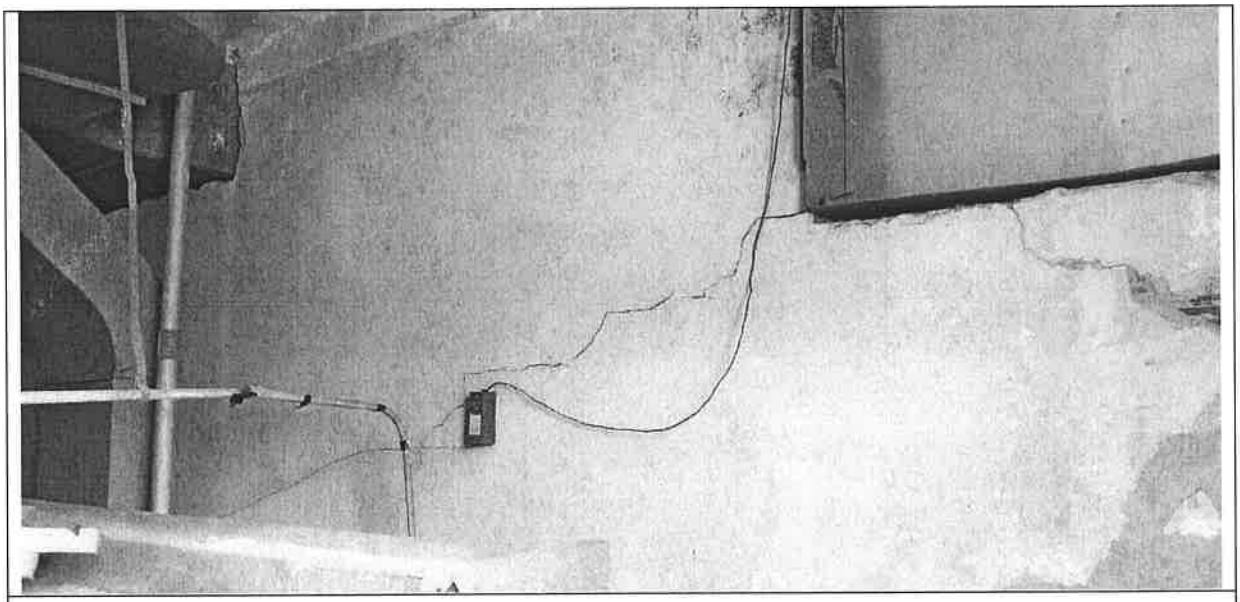

Photo 6: East End of Interior Bearing Wall below South Gable: Note significant structural cracks.

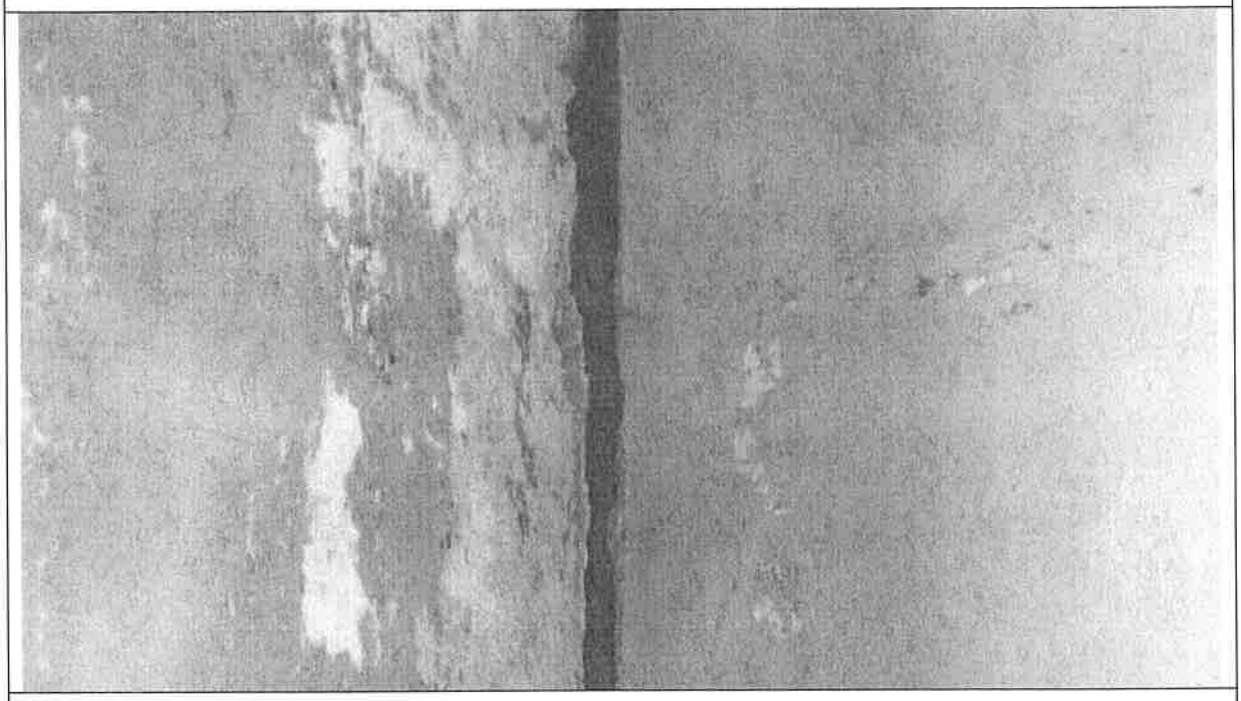

Photo 7: End of Interior Bearing Wall at Face of East Exterior Wall – Note separation indicative of out of plane wall displacement.

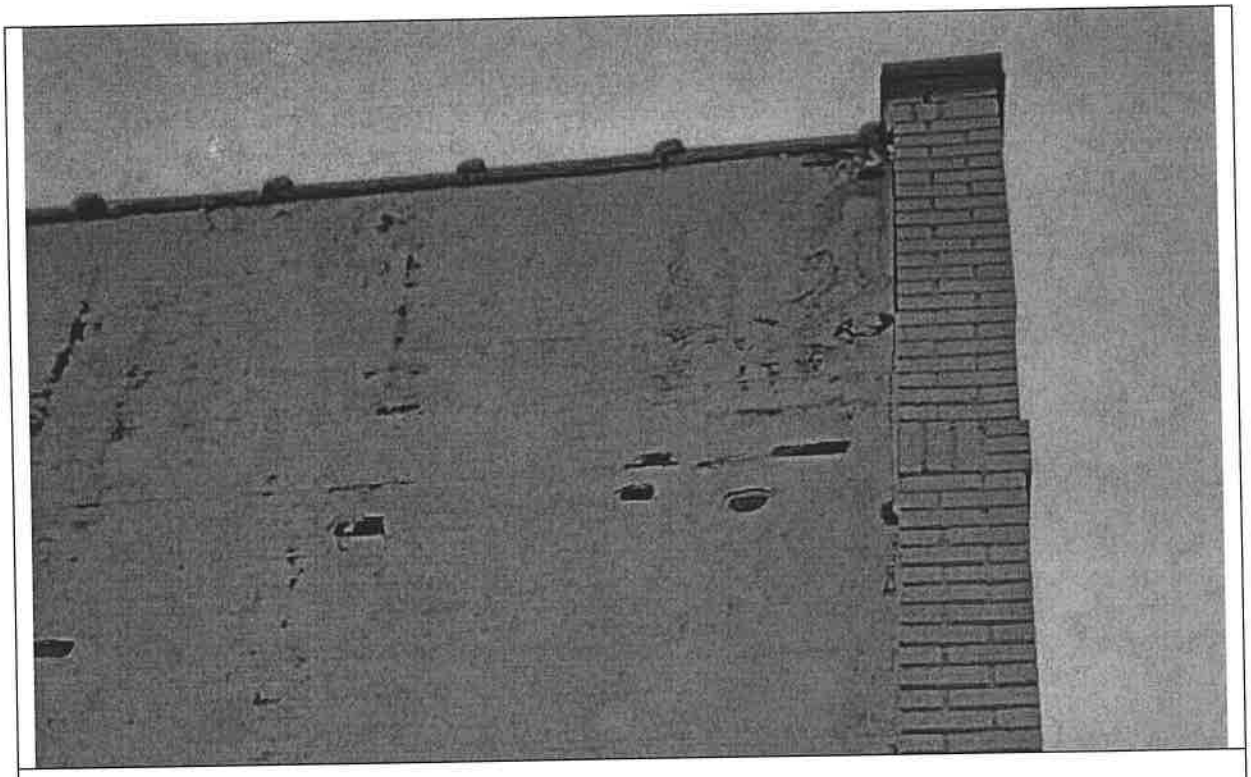

Photo 8: West End of South Exterior Wall: Note separation indicative of out of plane wall displacement.

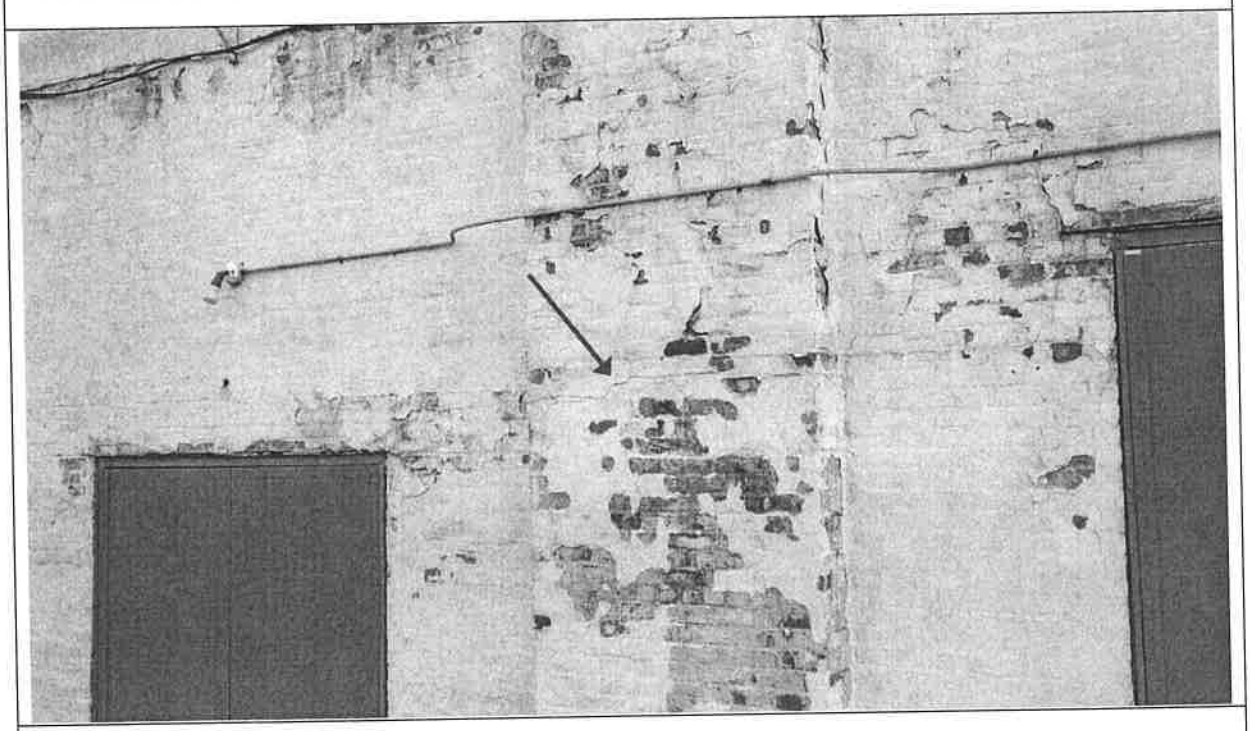

Photo 9: Brick Pier on West Exterior Wall: Note horizontal crack.

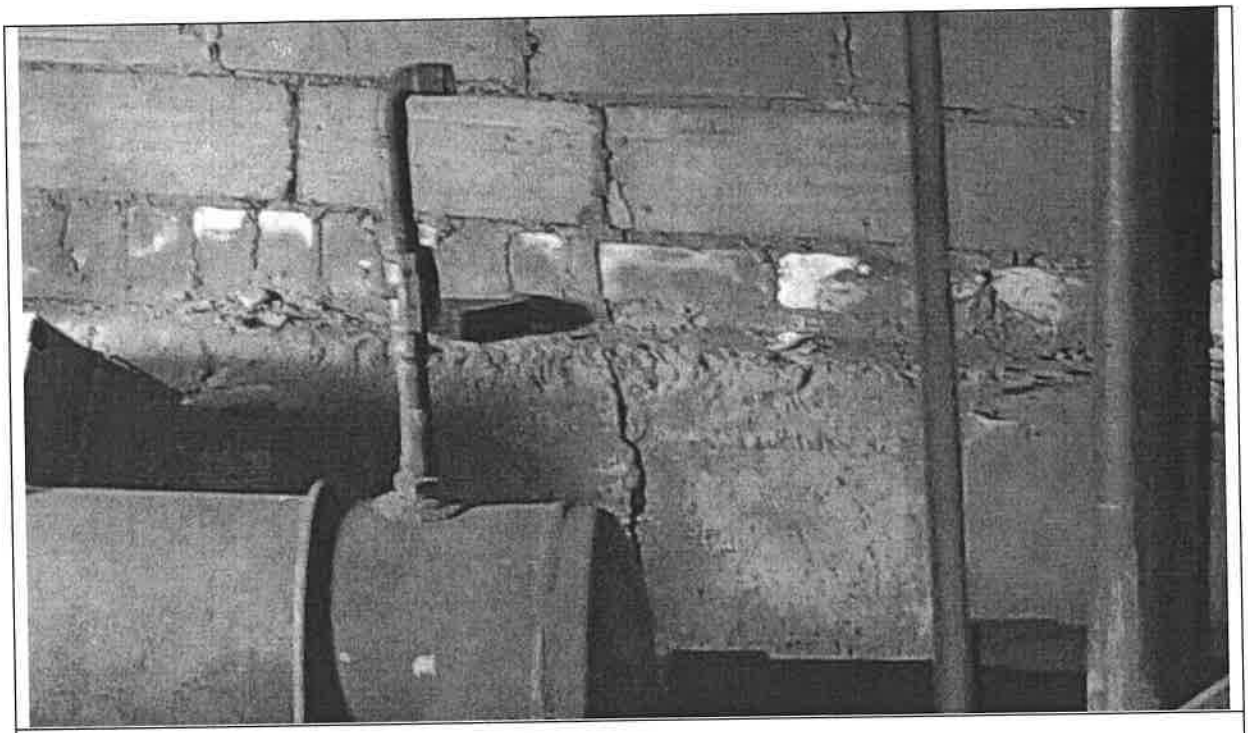

Photo 10: Inside face of concrete foundation for East Exterior Wall: Note large vertical crack in concrete foundation propagates into terra cotta masonry.