

# **KELLER ENGINEERING, INC.**

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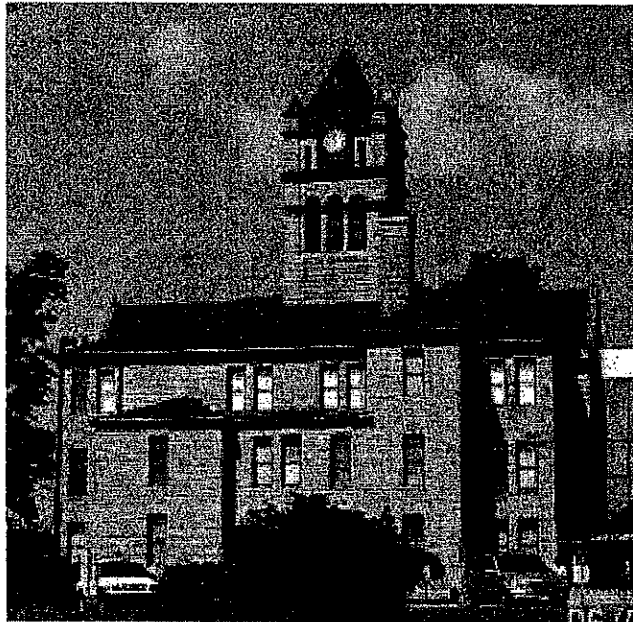
June 8, 2009

David Dickey  
Maintenance Superintendent  
County of Cass  
120 N. Broadway – Suite 116  
Cassopolis, Michigan 49031

**RE: 1899 CASS COUNTY COURTHOUSE  
ENGINEER'S PROJECT #0906-102**

Dear Mr. Dickey:

On Thursday, June 4, 2009, Rick D. Keller P.E. met with David Dickey at the 1899 Cass County Courthouse in Cassopolis, Michigan. The purpose of the meeting was to determine the source of water soaking through the south and west basement walls of the building and to make recommendations to correct the problems. Mr. Dickey provided Mr. Keller with excerpts from a report by Kingscott Architects and from a bid by Slatile Roofing and Restoration. Mr. Keller has reviewed these documents in preparation for this report.



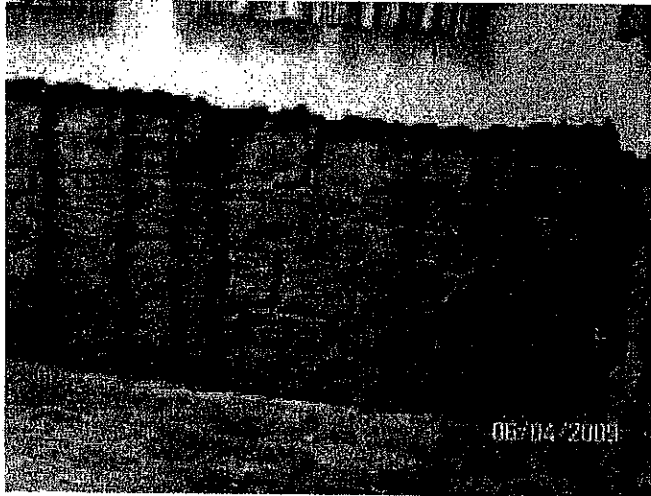
The original courthouse has been vacated with the addition of new space attached to the north side of the original building. The building has gone unheated or conditioned the last few years to save money. Cass County would like to preserve the building and find alternate uses for it.

The courthouse is a three story limestone structure with a stone foundation situated at the top of a hill in the center of Cassopolis. The ground around the building slopes up to the west where only the upper two floors are above grade.

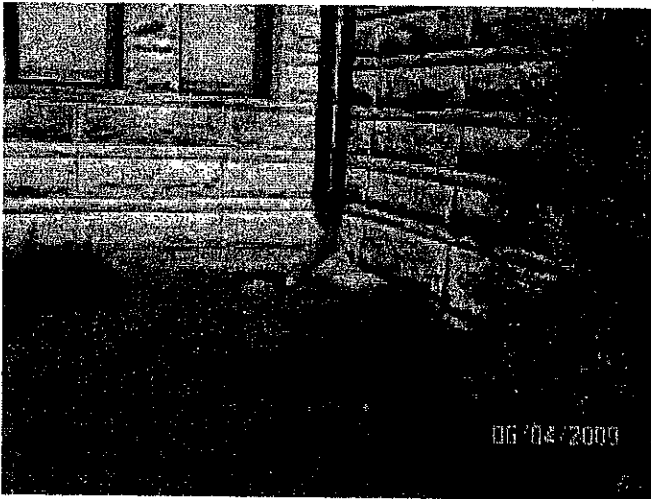
## 1899 CASS COUNTY COURTHOUSE

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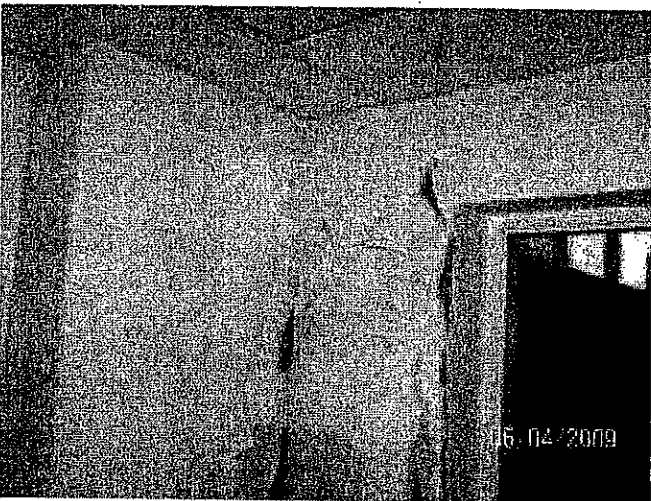
The foundation walls on the south and west are deteriorating due to water seeping through them. This process is leaching out minerals in the stone and mortar resulting in the loss of much of the strength of the mortar and damaging the interior finishes. Maintenance personnel have removed a portion of the interior finishes to expose the original foundation wall for inspection and repair.



Since the building is situated on top of a hill, all of the water affecting its foundations comes from the roof and lawn areas on the property. We noted areas where the ground against the building is flat, or slopes toward the building. Also, many of the downspouts are piped into the ground where apparently they discharge water near the building.

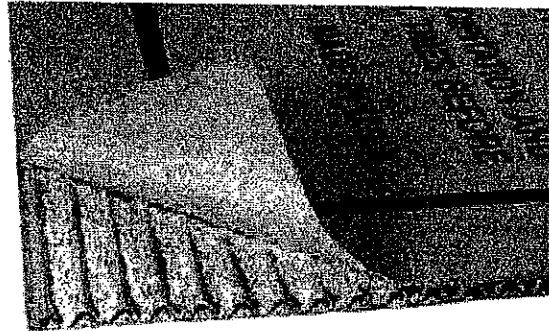


Many of the downspouts are also damaged from ice, which has split their seams allowing water to flow down the face of the building. The plaster inside the building near these leaking downspouts is damaged higher on the walls indicating that water is soaking into the walls from these damaged downspouts. We recommend that the gutters and downspouts be repaired and that the underground drainage system should be redone to get the water away from the building. From a building preservation stand point, it would be preferable if the roof drainage system could discharge to the east where it will flow away from the building to the



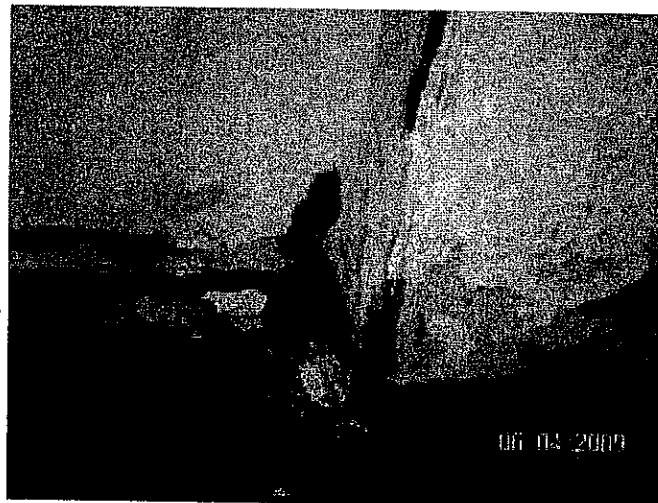
city's storm drainage system. A buried drain system could be installed around the perimeter of the building when the ground is put back following the tuck point and waterproofing operations along the west and south walls.

Both the Kingscott report and the Slatile proposal recommend installing bentonite waterproofing on the outside of the foundation walls. We concur with this recommendation. This is an excellent product for waterproofing basement walls; however, since the walls are built from stone, they are very rough and uneven. Although the bentonite will conform to the shape of the wall, we recommend that the walls should be tuck pointed on both the inside and outside to restore their strength, and to reduce the uneven exterior surface for the bentonite. This product comes in the form of cardboard panels with the bentonite in the cores of the cardboard. As the ground is backfilled over the product, it could compress and tear the cardboard unless the surface is relatively smooth. Therefore, in our opinion, the tuck pointing will help prepare the surface of the wall for the bentonite.



The Kingscott report discussed several areas where the walls should be caulked and windows should be sealed to reduce water infiltration into the walls. We did not perform a detailed inspection of the building, therefore we cannot comment on those wall and window leaks. It appeared that the building had been tuck pointed and the mortar joints appeared to be in good condition. Mr. Dickey said the last restoration took place before he started working for the county in 1995.

We concur with the Kingscott report regarding their intention to prevent water from penetrating into the masonry because of the permeable nature of the stone and mortar. If the masonry is moist, it becomes susceptible to freeze/thaw during the winter. Moist masonry walls also increase the humidity within the building, which damages finishes and promotes the growth of mold. The high humidity in the building also results in the deterioration of the plaster and lath, which regularly fall



from the ceilings and walls.

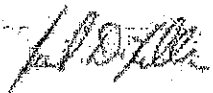
Therefore, if points of water intrusion can be identified in either the roof or the walls, they should be corrected. The Kingscott report indicated that the roofing shingles are more than 30 years old. Thirty years is typically the full life span of even high quality asphalt shingles. Therefore, we expect that a roof replacement should be included in the restoration.

Mr. Dickey gave Mr. Keller a tour of the building, which indicated that it is largely made up of small rooms with interior load-bearing walls. These load-bearing walls should be identified prior to any renovation project to assist the architects in determining which walls should remain in the renovation. Since the building is attached to the county building, it would seem to be ideal for private office or government uses. Typically lawyers, engineers and surveyors find close access to government facilities with their records to be beneficial. The layout of the floors appears to be ideal for apartment use as well.

We would be happy to assist Cass County or any of its consultants or contractors in the restoration of this building. We have many years of experience with similar structures and it would be a pleasure to help with the preservation of this great landmark and historical structure within your community.

If you have any questions, please call.

Sincerely,



Rick D. Keller P. E.