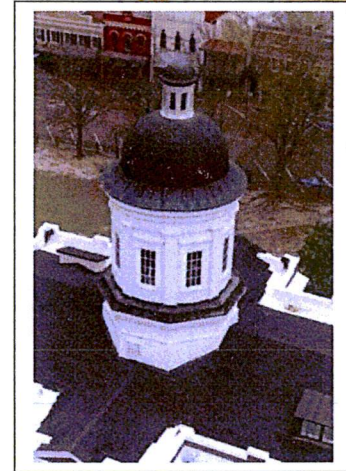


FIELD REPORT

Field Report No. 2

Date: May 6, 2016
Project: Madison County Courthouse
Preliminary Leak Investigation at Cupola
Canton, Mississippi
BSA No. 1208.2

Present: Craig Bjorgum – Belinda Stewart Architects, PA
Terance Bacon – Madison County



Purpose of Site Visit: Further Investigation of Cupola to identify locations of water intrusion.

In coordination with Mr. Danny Lee, Belinda Stewart Architects, PA performed a second investigation of the Madison County Courthouse Cupola on May 6, 2016 to further investigate and identify points of water intrusion at the cupola. Mr. Terance Brown of Madison County accompanied me with the visit and was able to point out areas he had observed water intrusion during a rain event. Buckets have been placed in various location around and within the base of the cupola as well as in the Courtroom to collect water getting into the building. Investigation included observations of interior and exterior of Cupola.

Observations and Findings are as follows:

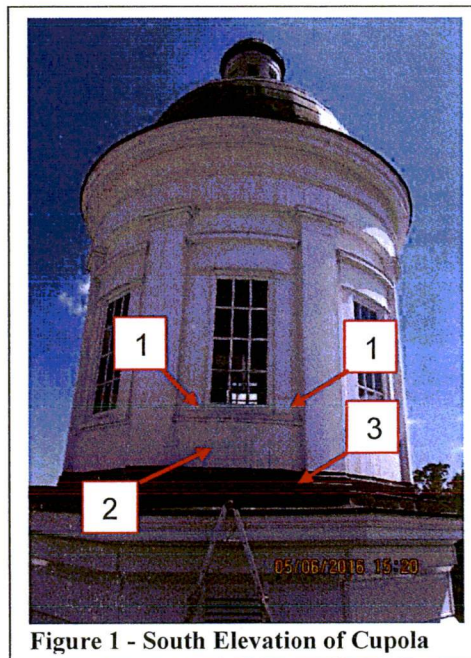
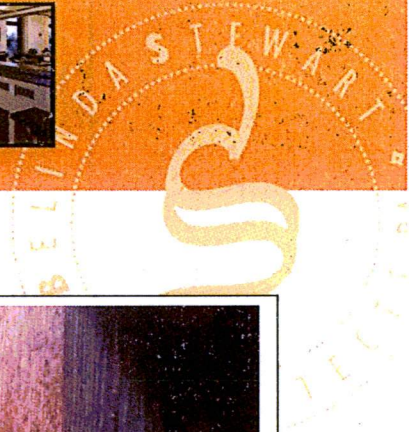
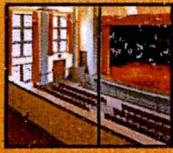


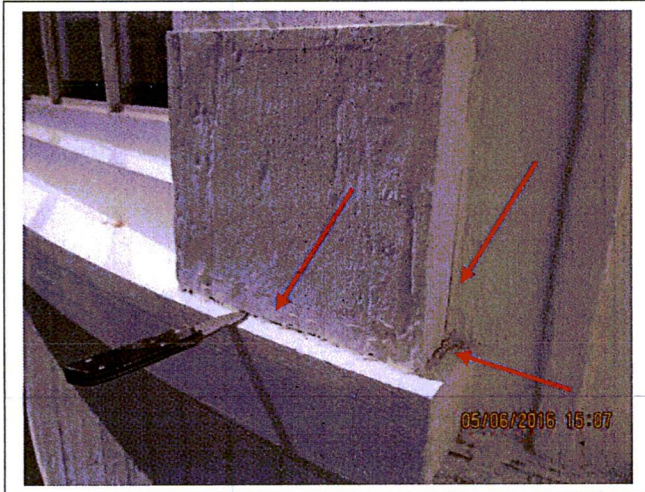
Figure 1 - South Elevation of Cupola

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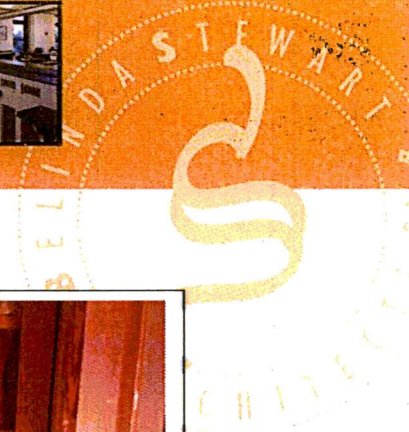
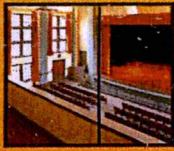
1 - WINDOW SILLS



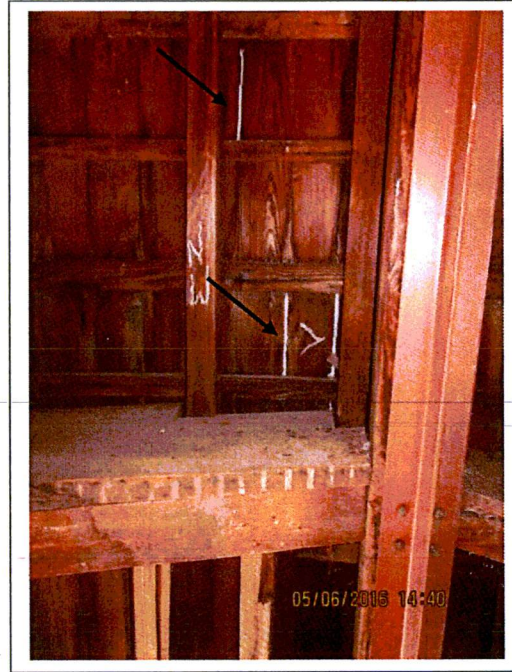
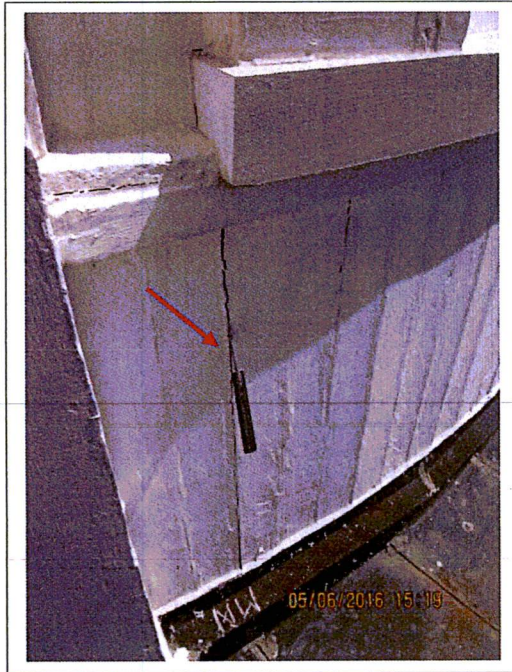
Findings:

1. Sealant: The sealant at the base of the vertical wood trim at the both sides of the South Facing Window has failed and separated, leaving open paths for water to the interior especially during significant heavy and blowing rain conditions.
2. Due to water leaking at the sill for an extended period of time, the interior wood sill at the South Window has severely rotted (completely through) and has become loose from other wood supporting vertical members.
3. The South Window Sill also has a slight "crown" at the center diverting water to the base of the trim at either side.

Recommendations: In the short term, all sealant at base of the vertical wood trim (Both sides of Sill) at the South Window should be removed, joints cleaned out and new sealant installed to minimize water intrusion into the Courtroom space. Due to limited lifespan/effectiveness of sealants, the removal and replacement of all existing exterior sealant at windows around the Cupola and replacement/repair of damaged/rotted wood window support sills and surrounding wood members should be included in the work scope of a Cupola Restoration/Repair Project.



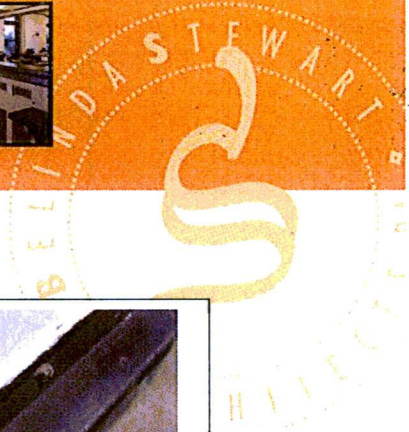
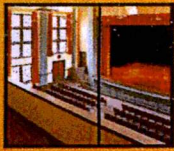
2 - VERTICAL WOOD SIDING JOINTS



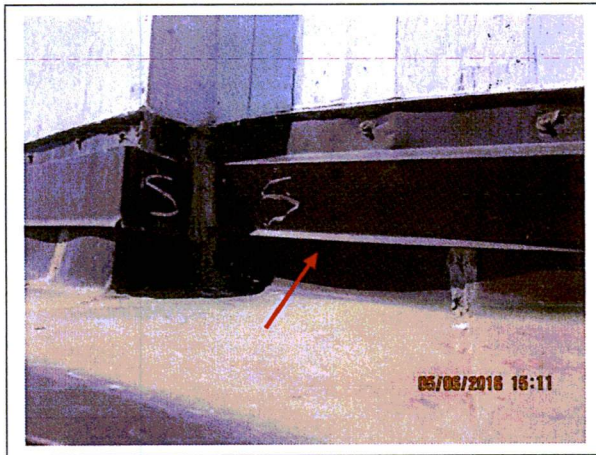
Findings:

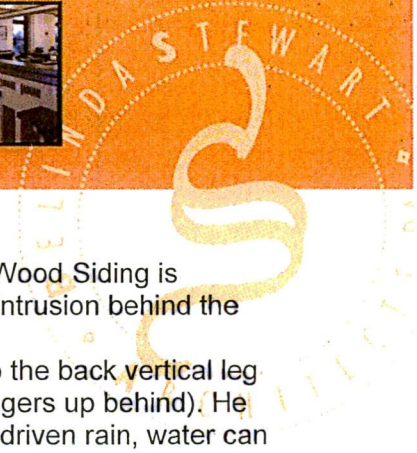
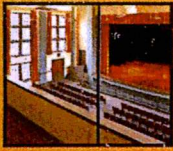
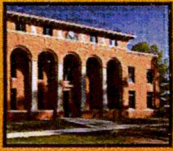
1. Several of the vertical tongue and groove siding boards have separated, leaving open joints. Daylight could be seen from the interior of the cupola in some locations and there are water stains on the backsides of most boards. Some attempts in the past to fill the joints with sealant was observed.

Recommendations: In the short term, all vertical siding should be examined, open joints identified and sealed at the exterior face. As part of a Restoration/Repair Project, all vertical tongue and groove siding should be removed and deteriorated boards discarded. Any existing boards in good condition should be salvaged, restored to a well-maintained condition and reinstalled. New exterior grade tongue and groove wood siding boards, matching the existing exactly, should be used for replacement where required. A continuous sealant bead of sealant should be installed in the groove of each board. Damaged/deteriorated interior support framing boards should also be carefully examined, identified and replaced as required. All perimeter joints should then be appropriately sealed. The application of primer and exterior grade elastomeric paint/coating will protect the wood and allow for some movement capabilities. Options for the replacement of the wood siding may also be considered to either limit or eliminate the joints all together. Any alternative material considered will require careful attention to detail in order to retain the look and character of the cupola as well as the approval by MDAH.



3 - COPPER CLAD CUPOLA BASE AND FLASHINGS





Findings:

1. The sealant at the top of the Copper Counter Flashing to the Vertical Wood Siding is deteriorated and failed in some locations allowing for a point of water intrusion behind the flashing.
2. The vertical counter flashing leg in some locations is not pulled tight to the back vertical leg of the ledge cover/flashing leaving a large gap (large enough to get fingers up behind). The back leg of the horizontal ledge flashing is only 2-3" high. With a wind driven rain, water can be blown in up behind the counter flashing, over the vertical leg of the ledger flashing and into the building.
3. The copper ledger flashing is in fair to poor condition with very limited to no slope to shed water as observed by the water stains and residue. The soldered joints in the copper ledge flashing are in poor condition and with the standing/ponding water, failed joints will allow water into the building.
4. The wood decking and support framing members at several locations around the cupola, at the underside of the stepped ledge, are water stained and severely rotted/deteriorated or in very poor condition due to leaking over time.

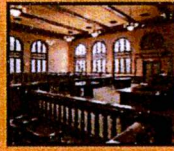
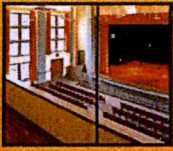
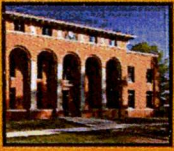
Recommendations: Based on our observations of both the interior conditions of the copper ledge, all existing copper flashings and horizontal decking should be removed. Even though most areas and conditions can be observed from the interior allowing for the generation of a good work scope for the repairs and restoration, a more thorough investigation needs to be conducted of the framing members and surrounding conditions once the copper and decking is removed. All rotted and deteriorated wood framing must be repaired/replace/reinforced as required. New wood decking, tapered to slope and shed water, is needed to eliminate standing water. The installation of a self-adhering waterproof membrane flashing material over the new wood decking should also be installed. Properly installed metal ledge covers and counter flashings, seamed, properly lapped, anchored and sealed will ensure watertight conditions. The counter flashing over the vertical leg of the ledge cover flashing needs to be installed in a manner as to avoid a sealant dependent joint at the top and all vertical legs of flashings must extend high enough to prevent migration of wind driven rains up over the top.

We also recommend a review of all copper by a copper restoration/repair craftsman to help determine if all or some copper components can be salvaged, restored, modified and reinstalled in a manner to provide watertight conditions.

Although copper is the preferred metal for the replacement of any or all components, a galvanized prefinished bronze colored metal may be a less expensive option. Careful detailing and installation to ensure watertight joints along with approval from Mississippi Department of Archives and History (MDAH) will be required in going with a pre-finished galvanized metal.

SUMMARY AND CONCLUSION

From discussions with County Staff and our observations of both the interior and exterior of the Cupola, the failure/separation of sealant joints, open joints in the vertical wood siding and the copper flashings and ledge are primary areas which should be addressed to prevent water intrusion into the cupola and spaces below. Although small cracks and open joints may seem insignificant, building envelope experiments and data has shown these types of conditions can allow significant amounts of water into the building especially during heavy wind driven rain conditions. The installation of sealant at window sills and surrounding trim as well as the open cracks/joints at the



exterior of the vertical siding should be carried out as a “temporary” fix immediately to stop water intrusion and further damage to the interior of the building. A specific cupola restoration/repair project should then be defined and carried out to address remaining items found and noted in this report as suspect to the water intrusion. Consultation with a structural engineer may be required to further inspect and evaluate the existing framing members and building components. With the extent of scaffolding for vertical access to perform repairs and restoration noted in this report, the County may consider a complete restoration of the Cupola including any necessary repairs on the copper clad roof, wood siding and trim, sealant replacement and new paint to protect the Cupola and the beauty of the courthouse for years to come.

If you should have any questions, please do not hesitate to contact our office.

Field Report Prepared By: Craig E. Bjorgum, AIA