



**State of Oklahoma  
Office of Management and Enterprise Services  
Division of Capital Assets Management  
Construction and Properties**

**Addendum**

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This addendum forms a part of the contract document and modifies the original request for proposals as noted below. Please acknowledge receipt of this addendum in the space provided on the submittal form. Failure to do so may subject the Offeror to disqualification.

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**Date of Issue: November 13, 2014**

**Addendum Number: One (1)**

**CAP Project Number: 15039DB Solicitation**

**Project Name: Oklahoma Capitol Restoration - Exterior Rehabilitation**

**TO ALL OFFERORS OF CONCERN:**

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**"Attachment 1 - Owner's Project Team Investigation" to RFP. Report from WJE dated November 7, 2014; 5 pages.**

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**ALL OTHER DOCUMENTS ARE TO REMAIN THE SAME AND INTACT.**

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David Mihm  
Project Manager



ENGINEERS  
ARCHITECTS  
MATERIALS SCIENTISTS

ATTACHMENT 1

**Wiss, Janney, Elstner Associates, Inc.**  
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Chicago, Illinois 60603  
312.372.0555 tel | 312.372.0873 fax  
www.wje.com

Via E-mail: duane@massarch.com

November 7, 2014

Mr. Duane Mass  
Mass Architects, Inc.  
18 West Park Place  
Oklahoma City, Oklahoma 73103

Re: **Oklahoma State Capitol**  
Exterior Wall Investigation Findings  
WJE No. 2014.3319

Dear Mr. Mass:

Wiss, Janney, Elstner Associates, Inc. (WJE) is presently providing professional services to Mass Architects, Inc. (MAI) to perform an investigation of the exterior walls at the Oklahoma State Capitol (Capitol) in Oklahoma City, Oklahoma. MAI is serving as technical representative to the Office of Management and Enterprise Services (OMES) that will be in charge of overseeing planned exterior repairs and interior renovations to the Capitol.

We met with you and OMES on November 3, 2014, to discuss findings from our investigation. A detailed report that presents our findings, conclusions, and general recommendations for repair is forthcoming. Based on observations to date and discussions during our November 3, 2014, meeting, this letter summarizes findings from our investigation and presents our recommendations for implementing long-term repairs and maintenance for the exterior walls of the Capitol.

## Background

The Capitol was designed by the architectural firm of Layton and Smith, and construction began on July 20, 1914. The building was completed in 1919. The Capitol dome was included in the original conceptual designs but not constructed until 2001. The building is predominantly cruciform in plan with wings that project east, west, north, and south from the center of the building. The north and south wings each have gabled roofs and pediments, and an entrance portico exists at the south wing of the building and the east and west wings contain the legislative chambers. The overall plan dimensions are approximately 434 feet in the east-west direction and approximately 304 feet in the north-south direction. The five-story original structure is a reinforced concrete building frame and the exterior walls are clad with Indiana limestone and brick masonry backup. The main roof level is approximately 75 feet above grade, and the top of the dome is approximately 210 feet above grade. Windows have painted steel frames and ornamental cast iron spandrels.

The dome structure is steel-framed and clad with cast stone. It was designed and constructed under a design-build contract and completed in 2002.

The project delivery method for the Capitol restoration project will be design-build. A request for proposal (RFP) was issued to pre-qualified design-build teams on November 4, 2014. It is our understanding that the

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schedule for exterior wall repairs will be accelerated compared to the schedule for interior renovations, and, therefore, the general recommendations presented in this letter is offered to assist you in identifying the types, extent, and locations of exterior wall distress that should be repaired.

## **Investigative Findings**

The goal of our investigation was to gather the necessary information to develop a scope of work for the restoration of the exterior walls of the building including:

- Limestone, granite, and other masonry cladding
- Windows and exterior doors
- Decorative exterior metalwork

We understand that MAI is addressing the copper and built-up roofing systems.

Our investigation included the following tasks:

- Review of existing documents, including original drawings, specifications, and previous reports on the condition of the facade
- Preparation of survey sheets from original drawings to document existing conditions
- Non-intrusive (visual) survey of the building from grade, roof levels, and close-up via industrial rope access (difficult access techniques or DAT)
- Examination of concealed conditions at intrusive inspection openings made at both distressed and non-distressed areas of the facade
- On-site studies using field microscopy to understand the extent, pattern, and nature of discoloration, staining, and deterioration
- Cleaning trials on limestone facade areas and non-intrusive and intrusive techniques to study door and window materials and coatings
- Laboratory studies of limestone and mortar to assess existing conditions and assist us with developing long-term repairs

In general, considering the age of the Capitol, the exterior walls are in fair condition, and upon the completion of repairs and future on-going maintenance, we would expect many decades of continued service for the State of Oklahoma.

The distress conditions observed at the Capitol are typical for a building of this construction type and era. The most prevalent distress condition is the deterioration of existing mortar, including bond separation, cracking, and wash-out, that exists throughout both granite and limestone facades areas of the building. Corrosion of embedded mild steel anchors has caused additional cracking and spalls in the limestone cladding. Other cracks, particularly at the outside corners of the building, are likely the result of the unaccommodated movement of limestone cladding and brick masonry back-up.

Corrosion of the steel-framed windows on the main facades is related to deterioration of exterior coatings and moisture migration through the exterior walls and subsequent corrosion of concealed portions of the steel frame. Another contributing factor of the corrosion of the steel window frames is the lack of a thermal break between exposed interior and exterior metal surfaces, a condition that produces condensation within the frames. During our investigation, WJE removed a few imminent limestone spalls that posed an immediate risk to pedestrians on the north and south facades. There are a few conditions, such as exfoliation of limestone on the south facade frieze (portico), where existing distress necessitates maintaining the barriers and sidewalk

canopies that are presently in place to protect the public from potential falling hazards. The barriers and canopies should remain in place until such time that long-term repairs can be performed.

## **Recommended Treatments**

Based on our review of original documents, conditions observed during our investigation, and field and laboratory studies, long-term repairs should consist of the following.

### ***Limestone and Granite***

- Spalled limestone units should be replaced with new limestone to match the original panel size and thickness. For unusually large or thick panels, spalled areas may be repaired by installing limestone dutchman units.
- Cracked panels (limestone and granite) should be dealt with on a case-by-case basis.
  - Limestone panels with cracks that are wider than 1/16 inch should be removed and replaced with new limestone to match the original panel size and thickness. For unusually large or thick limestone or granite panels, cracks may be repaired by grinding the crack to a depth of 3/4 inch and installing backer rod and sealant. In some instances, supplemental stainless steel reinforcement should be installed to stabilize the cracked unit.
  - Panels with cracks that are between 1/16 inch wide and 0.010 inch wide should be ground out and backer rod and sealant installed.
  - Hairline cracks that are less than 0.010 inch wide may be left untreated.
- For limestone panels where significant exfoliation exists, the limestone unit should be replaced with new limestone to match the original panel size and thickness. Limestone units with surficial exfoliation may remain in service and be addressed by removing loose material.
- Displaced limestone should be evaluated further and be dealt with on a case-by-case basis.
  - Panels with cracks that are determined to be unsound should be pinned in place or removed and reinstalled or replaced.
  - Panels that are sound and intact may be left untreated provided that they are inspected as part of an ongoing maintenance program.
- Cracked or spalled limestone dutchman units should be removed and replaced. Existing dutchman units that are sound and intact need not be addressed and may remain in place indefinitely, provided that they are inspected regularly as part of an ongoing maintenance program.
- Iron inclusions are naturally occurring and generally do not adversely impact the performance of the stone and therefore need not be treated.
- Naturally occurring seams, whether they are filled or open, need not be treated. Special attention should be paid to differentiate between cracks and seams in limestone panels.

### ***Mortar***

Bond failure and mortar wash-out is pervasive throughout the entire building. The original mortar is consistent with the original project specifications and consists of portland cement, sand, and lime. The building was repointed in the 1980s, and that work included application of a cementitious coating at the outside surface of the joint. In many instances, the coating extends on to the surface of the adjacent limestone by as much as 1/4 inch. All existing mortar on the exterior walls of the building should be ground to a minimum depth of 1-1/2 inches and pointed with new mortar. We recommend that a trial repair be performed on the exterior wall of the building to evaluate mortar type and workmanship for future repairs. To accommodate anticipated thermal movement of the exterior cladding, we anticipate that selected vertical joints in the exterior wall will

need to be addressed by grinding joints continuously for the full height of the building and installing backer rod and sealant.

### ***Staining***

In our opinion, a silicone-based penetrating sealer was applied to the exterior surface of the limestone walls as part of the 1980s repointing project. It is also our opinion that the silicone-based penetrating sealer has caused mottled orange and brown stains to develop at various locations on the limestone exterior walls of the building, particularly above the granite base course and below the cornice. Field trials performed by WJE during our investigation using chemical techniques were unsuccessful at removing the orange and brown stains.

Dark staining at the upper levels of the limestone facade (parapet walls and dome platform) generally consist of biological growth. Field trials performed by WJE during our investigation were moderately successful at removing some, but not all, of the stains. We anticipate at this time that the cleaning treatment will consist of water misting and the application of biocide, which is considered to be gentlest effective method for removing biological growth that minimizes long-term damage to the face of the limestone panels.

### ***Brick Masonry***

Long-term repairs for limestone-clad brick masonry parapet walls should address each of the following identified deficiencies:

- Corrosion of existing concealed mild steel anchorages for the parapet wall ashlar and limestone cornice
- Connectivity between the existing limestone and brick masonry back-up
- Water intrusion: the back face of the exterior parapet walls is coated with multiple layers of paint.
- Permeability: originally designed as a mass masonry wall, any treatment to limit water migration through the exterior wall should also allow the exterior wall to “breathe.”

In addition, existing loose-laid steel lintels above masonry openings for clerestory windows in the house and senate chambers should be removed and replaced with non-corrosive or corrosion-resistant steel lintels.

### ***Windows***

We recommend that the existing steel window frames and sash be replaced with thermally broken aluminum-framed windows and insulating glass (IG) units. The window replacements should match the original frames in profile and exterior vertical plane location. All cast iron spandrel panels and perimeter ornament should remain in place and be restored. The new aluminum windows should be isolated from direct contact with the existing cast iron.

### ***Concrete Lightwell Walls***

The lightwell walls consist of tile-faced reinforced concrete. The inside (tiled) face of the concrete walls have been previously coated, and the tile and coating are in poor condition. The exterior lightwell concrete walls should be rebuilt. The below grade areas of the building exterior walls are generally clad with granite; however, there are a few areas where the concrete foundation wall is exposed, and additional repairs may be necessary to exposed concrete.

### ***Cast Stone***

Cracks exist in cast stone units predominantly at the lowest (base) level of the dome. The observed distress is a combination of crazing (spider-web cracking) that is likely limited to the outer surface of affected units and

vertically oriented cracks at other units that are generally full height and full depth of the unit where they exist. Additional investigation is necessary to determine the cause of distress and recommend treatment(s).

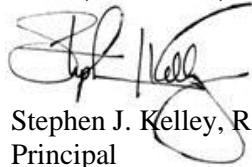
## Closing

The recommended repairs are generally consistent with the *Secretary of Interior's Standards for the Treatment of Historic Properties*; recommended repairs are designed to limit the impact to the building's historic fabric with particular sensitivity for all character-defining features on the primary and secondary public facades, and historic material shall be retained and repaired in-situ whenever possible. Replacement of historic materials is recommended for specific areas of the facade due to significant levels of deterioration that necessitate such action. Recommended cleaning techniques are based on using the gentlest means acceptable and only after successful field trials and preconstruction mock-ups are performed.

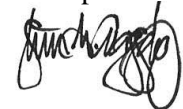
WJE has extensive experience in the repair and restoration of existing buildings including condition assessment, forensics, and construction quality assurance for all types of building enclosures. We appreciate the opportunity to work with you on this historic and challenging project. We anticipate that questions may arise during your review of our proposed approach to repair and restore the exterior walls of the Capitol and we would welcome the opportunity to discuss these with you.

Sincerely,

**WISS, JANNEY, ELSTNER ASSOCIATES, INC.**



Stephen J. Kelley, RA, SE  
Principal



Steven G. Naggatz, AIA  
Project Manager

SGN:kmm