

**STONE AND INSTALLATION ASSESSMENT
AND RESTORATION PROPOSAL:**

Restoring a Millard Sheet's Classic to its Original Grandeur

Ahmanson Bank & Trust (First Bank)
9145 Wilshire Boulevard, Beverly Hills, CA 90210

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From:

James Paley, CTI, MSI, SSI, SCFI, SMCTC
PALEY Stone & Tile Forensics
1701 E. Edinger Avenue, Suite C14
Santa Ana, CA 92705

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ABSTRACT:

An iconic Beverly Hills building suffers from years of exposure, neglect, and improper maintenance and repair. In 2013 the current property owners began to research the steps required to restore the historic structure, contracting with various firms specializing in architecture, maintenance and restoration, and installation. Prior to moving forward with this restoration project, the “team” determined that the marble slab vertical veneer/concrete masonry anchoring and installation *system* needed to be evaluated for its structural integrity, and proceeded to remove a slab on the north wall to inspect the *system*. The team concluded that the *system* has failed adding safety, material, and installation concerns to the challenges of the restoration project. Therefore, with the team’s assistance, and the consideration of multiple industry sources, James Paley, principal of PALEY Stone & Tile Forensics, conducted an assessment and preliminary restoration and/or repair proposal for the marble and granite veneer, and the granite porte cochere steps with landings. The results of this analysis indicate that all of the vertical slabs require removal, evaluation and documentation, and re-installation only if they can be restored to the building’s historical character and aesthetics, and exhibit the necessary structural integrity. In addition, the vertical veneer/concrete masonry anchoring and installation system needs updating to meet building codes to account for slab expansion and contraction, and seismic considerations. If the slabs do not meet re-installation requirements, then in-kind slabs should replace those failed or unacceptable slabs.

INTRODUCTION:

If Millard Sheets, one of Southern California’s shining sons, were standing on the street opposite the Ahmanson Bank & Trust (currently First Bank) at 9145 Wilshire Boulevard and looking northward, he would be sorely disappointed. One of his creations is in severe disarray and disrepair. The once pristine white marble and gray granite slabs, and fired-ceramic gold tiles—of secondary importance to this study—have been randomly replaced with wood, floated over with plaster, stained from repeated exposure to the elements and pollution, and finally painted to mask the dingy, worn surfaces. What’s worse, substandard repairs intended to rectify issues of water migrating behind the stone veneer, chipping from settling, and cracking from lost bond and movement, were ineffectual causing further damage and decay. The team evaluated the appearance, condition, and soundness of the slabs (and tiles) to determine the extent of degradation, and removed one marble slab to investigate the structural integrity between the veneer and masonry back-up. Marble slab removal revealed the anchoring and installation system is failing and the stacked slabs are compressing one on top of the other. In addition, an examination of the exposed installation system confirmed that any previous repair attempts were unsuccessful, as the technicians neglected to account for settling and movement. In addition, even though the ceramic tile responded positively to a paint removal test revealing its shimmering golden face, any attempts to restore the snow white marble were unsuccessful due to permanent staining. Besides the architect, three different companies within the dimension stone industry—forensic, installation, and restoration—agreed that extensive restoration is required to return Sheet’s iconic Ahmanson Bank & Trust to its original grandeur.

METHODOLOGY:

This natural stone and installation assessment and preliminary restoration proposal included the review and study of historical building standards, dimension stone industry guidelines and installation standards, input from the parties involved, and analysis with photographic documentation of the current appearance and condition of the building for the purpose of presenting a plan for the Ahmanson Bank & Trust's marble and granite slab vertical veneer and porte cochere restoration. The following processes were followed for the purpose of writing this document:

- A. Evaluated and documented the building's appearance and condition, and what past maintenance and/or repair methods were performed.
- B. Researched multiple reports and evaluations of the building, including studies of historical significance and accounts of conversations between Mr. Ahmanson and Mr. Millard.
- C. Reviewed historical preservation industry guidelines and standards outlined by the Department of Interior, standards from the International Building Code (IBC) and the Marble Institute of America (MIA), and James Crowley's Architectural Plans for Exterior Building Improvements.

NATURAL STONE AND INSTALLATION ASSESSMENT AND RESTORATION PROPOSAL:

The Ahmanson Bank & Trust project consists of examining various components: 1) the concerns and issues with the natural stone and installation; 2) the type, characteristics, and performance of the natural stone; and 3) the restoration process and future preservation needs.

A. NATURAL STONE INFORMATION:

1. The primary stone is a snow white Italian, Lasa Bianco-type marble, which is a calcium carbonate-based rock (Ostashay, p.3). Marble experiences metamorphism from exposure to water, heat, and pressure. It may be re-crystallized limestone and forms below the surface where mineral-enriched water leeches into cracks, fissures, veins, and voids, creating various colored and variegated stones. Most metamorphic marbles develop at higher pressure creating denser and less porous stone with smaller crystalline structures. Yet, completely homogenous marble materials are uncommon. According to the *MIA Manual: Stone Testing*, petrographic analysis is required to determine the classification of various rocks (p.4-1).
2. The secondary stone is an Italian, Blanco Sardo-type granite. It is composed of black, gray, silver, and white-colored, multi-faceted minerals, such as quartz, orthoclase and plagioclase feldspar. Granite (a term used in the stone industry to describe igneous rocks) is formed during volcanic activity. Depending on the situation, the stone may cool slowly or quickly below or above the crust. The combination of different minerals creates stone with distinct crystalline structures, and these minerals, due to how they formed, are not perfectly melded together. Depending on the distribution of light, the angle, and the condition of the stone, some facets can appear less reflective and less colorful. These structures affect granite's ability to withstand various stresses, natural or manmade, and break along geometrical planes (cleavage) related to their structures.

3. A stone's density and porosity can affect its color, texture and finish variations. Environmental and geological factors, such as mineral composition and metamorphism, cooling periods following eruptions, intrusions by other minerals over time, ground movement, and exposure to organic materials can significantly influence stone over time. Depending on these factors, stone can vary visually and tactilely from one tile to another. Water sensitive minerals may oxidize and stain; and cracks, fissures, veins and voids may degrade, fracture and become structurally compromised. Last, heat created from building pressure and surrounding volcanic activity causes additional metamorphism. The one point to remember is that these processes occur over tens to hundreds of millions of years and have a high degree of variability. Stone is further impacted by other factors, such as exposure to the elements and pollutants, infrequent or improper maintenance, seismic movement, etc.
4. Rarely is stone defective. If a stone's integrity is compromised during any part of quarrying, storage, transportation, or fabrication, it usually culled prior to installation. Major cracks, permanent stains, significant chips, broken pieces, and excessive use of strengthening agents like epoxies indicate durability issues. We might consider certain nuances sub-standard, but they are common and expected within the processes of its formation. If stone for homes is rated less desirable, two factors are usually in mind: esthetics, and supply and demand. According to the *MIA Manual*, stone is a product of nature...industry classifications of stone have no reference to merit or value, especially in situations when stone is purchased based on aesthetic requirements and expectations (pgs.3-1, 7-16).
5. Since a primary concern with the material involves preserving the historical character of the building and the need to find replacement stone is high, it is critical to review pertinent information provided by the *MIA Manual* regarding Stone Selection. It is essential that the *Specifying Authority*—the architect—who recommends the stone to the End-User—the building owner—what can be expected from the material aesthetically and behaviorally. Similarly, samples must be provided for approval and testing. Unless specified in writing by the Specifying Authority, samples are not an exact match of the material. The *MIA Manual: Stone Selection* module clearly outlines information critical for the stone selection process:
 - a. “Each block [from the quarry] is different; [therefore,] each slab is different. Uniformity of material...is a term of relative value...when making a selection” (p.3-1).
 - b. “Expectations as to final appearance must be realistic. Unless a choice is made and marked on an actual slab, variation from a submitted sample is a certainty” (p.3-2).
 - c. When designing natural stone to attain a particular arrangement or appearance, “panels [and slabs] require that the material be hand selected” (p.3-3).
 - d. In order to achieve a particular arrangement, the Specifier should request additional samples to ensure the material meets the End-Users aesthetic requirements (p.3-7).
 - e. Refer to www.granix.com/products/marble/calacatta-lasa/ examples of Lasa-Bianco marble, and www.granix.com/products/granite/luna-pearl/ for examples of the Luna Pearl granite. Suppliers tend to change names of materials for marketing reasons. Therefore, sourcing samples from multiple suppliers is recommended.

B. NATURAL STONE APPEARANCE AND CONDITION:

1. In many exterior commercial applications, property managers/owners opt to paint more porous and lighter colored marble surfaces as they soil and permanently stain due to exposure to the elements and pollutants over time.
2. In an attempt to conceal substandard stone repairs and modernize the appearance of the building, the previous occupants painted the stained and damaged stone and tile versus performing adequate and acceptable maintenance and repairs.
3. The marble, granite, and ceramic tile veneer were painted by past occupants. The white marble slabs and the porte cochere granite risers are covered with an off-white paint; whereas, the gold ceramic tiles are covered with gray paint. *Refer to photos #6, 10, 13, 18, 19, 44, 45, 50 – 54, 59, 62, 63, 83, 85 – 94.*
4. Other examples of degradation and weathering are apparent, especially on the horizontal surfaces of the granite porte cochere. Spalling and staining are extensive, and resulted from water exposure and migration and soluble salt deposition. *Refer to photos #59 – 66.*
5. Recent test samples involving paint removal on the porte cochere pillars revealed the original finish and presentation of the marble and ceramic tile. *Refer to photos #50 – 54.* The tile responded positively to the paint removal process; yet, permanent stains in the stone and surface pitting on the stone are prevalent.
 - a. Some paints may permanently etch and damage the surface of lighter colored and more porous marbles like Lasa Bianco-type marbles.
 - b. Soils and stains have embedded into the pores of the stone; restoration can only be accomplished with grinding and aggressive cleaning. *Refer to photos # 51 – 53.*
 - c. Examples of permanent staining on unpainted stone are visible behind the cement screens on the eastern side of the property. *Refer to photos #20, 23, 24, 40, 41.*
6. Other vertical surfaces were painted due to minor and major repairs, such as the numerous slabs with chipped edges and signage removal damage. Whole sections were replaced with wood panels, filled with resin or cement-based fillers, covered with plaster or Portland cement mortar, and replaced with painted concrete tile reproductions. *Refer to photos #8, 13 – 16, 19, 31, 37, 75, 81, 86 – 88, 91 – 93.*

C. NATURAL STONE INSTALLATION ISSUES: Various types of damage to the stone (and ceramic tile) indicate on-going movement issues, especially between the marble slab vertical veneer and concrete masonry back-up anchoring and installation system, and the granite at the base of the building and various areas of the porte cochere.

1. Installation system failure is apparent, as the stacked slabs have shifted downward further compressing the joint sealant and causing the edges of the slabs to chip. *Refer to photos #9, 11, 12, 16 – 19, 31, 32, 35, 43, 44, 68 – 71, 73, 74, 84, 86- 88, 91, 95 – 97.*

2. Installation system failure and the compounding weight transferred to the granite along the base of the building are causing the stone at the base to crack. *Refer to photos #72, 85, 97 (more areas are affected than photographed).*
3. As outlined in the *MIA Manual*, hysteresis occurs as some marbles increase in volume after each rise in temperature. If not accounted for in the architectural design process or the anchoring and installation system, marble panels will bow (warp), expand and contract (part of the movement process), and eventually result in permanent deformation (p.7-21).
 - a. This natural by-product of exposure to temperature changes causes failure of joint sealant and facilitates water migration into exposed joints.
 - b. Numerous examples of bowing, failed joint sealant, and water migration into the joints are evident. *Refer to photos #11 – 19, 30- 32, 35, 42, 44, 55, 56, 68 -71, 72, 74, 84, 86 - 91, 95 – 97.*
 - c. American Society of Testing and Materials International (ASTM) tests are required to determine the environmental suitability of various products. It is not clear if testing was performed (or even developed) in 1959 when specifying this stone for this exterior building application. A few tests relevant to this situation follows:
 - i. ASTM C97: Standard Test Method for Absorption and Bulk Specific Gravity of Dimension Stone.
 - ii. ASTM C170: Standard Test Method for Compressive Strength of Dimension Stone
 - iii. ASTM C1242: Standard Guide for Selection, Design, and Installation of Exterior Dimension Stone Anchors and Anchoring Systems.
4. Greg Mowat of Forensic Tile Consultants, San Diego CA; and Randy Severson of Carrara Marble Company of America, Inc., City of Industry CA; removed a marble slab on the north wall to inspect the structural soundness of the anchoring and installation **system**. *Refer to photo #6 (the slab is outlined in red), 7.*
 - a. For information regarding the inspection of the slab and **system**, refer to Mr. Mowat's *Exterior Anchored Veneer* report dated 11/10/2015. Observations of the **system** follows:
 - i. The gypsum-based plaster used for mechanical bonding has failed and released from the concrete masonry back-up resulting in slab movement and joint material failure.
 - ii. Plaster does not meet current building code requirements. Refer to the information provided below regarding *International Building Code* requirements.
 - iii. The slabs are 2 cm thick. Slabs of this thickness employing wire anchorage falls below industry guidelines due to an inability to support larger slabs for buildings exceeding 15' in height (*MIA Manual*, p.15-1, 3). The copper wire is degraded and unsupportive, causing the slabs to move and the edges of the slabs to crumble.

- b. According to Carrara Marble Company, the current anchoring system has not been employed for decades due to substandard performance. The specified method used for this type of installation is listed with International Building Code (IBC), Chapter 14, Sections 1405.6, 7, 10: Installation of Wall Coverings; and consistent with guidelines from the MIA Manual: Vertical Surfaces (p.15-1). For information regarding the IBC, refer to: publicecodes.cyberregs.com/icod/ibc/2012/icod_ibc_2012_14_sec005.htm.
 - i. Carrara is in agreement with Mr. Mowat that the condition of the stone render the slabs unsuitable for re-installation.
 - ii. Carrara has determined that the cost for selective demolition and restoration would be substantially higher than to provide new stone and install the veneer to meet current building codes. A suitable replacement is accessible.
5. The MIA Manual addresses various points regarding exterior stone veneer installation. First, joint widths greater than 3/8" for larger slabs are required to accommodate thermal expansion and differential movement between stone units. In addition, anchorage design should account for vertical loads (stone unit self weight) and lateral loads (wind and seismic forces) as required by governing building codes (p.15-1).
6. Other issues from exposure to elements, vehicular traffic, and inadequate and substandard repair and maintenance are evident on the landings (horizontal surfaces) of the porte cochere where the granite is severely cracked, tented, and stained. Complete stone replacement and structural re-construction are required due to the extent of damage and water migration into the substructure. *Refer to photos #42, 47 – 49, 59, 60, 62 – 66.*

DISCUSSION

Sometime in the early 1950s, Howard F. Ahmanson, Sr., father of the famed Home Savings & Loan, drove the streets of Wilshire Boulevard in Beverly Hills uninspired and unimpressed with its building architecture, especially when juxtaposed against the creativity and ingenuity of the community and the growing metropolis of Los Angeles. Ahmanson reached out to Millard Sheets, a well-known Pomona artist, who was given the artistic license to control the entire design, construction, and decoration process. When planning the restoration of a significant Southern California building representing the collaborative effort between two seemingly opposite leaders, a financial magnate and a national renowned artist, special care must be taken to maintain the historical integrity of the building and the intention of its benefactor and creator. In addition, the office of the Secretary of the Interior's Standards for Rehabilitation endeavors to ensure the long-term preservation of a property's significance. As outlined in The Standards for Rehabilitation (codified in 36 CFR 67), rehabilitation...is returning a property to a state of utility, through repair and alteration...which makes possible an efficient contemporary use while preserving those portions and features of a property which are significant to its historic, architectural and cultural values (p. v). Every effort must be taken to execute the following during a restoration project:

- A. Minimal change to the defining characteristics of the building.
- B. Avoid removal of historic materials or alterations that characterize a property.

- C. Recognize each property as a physical record of its time, place and use.
- D. Changes to the property over time have acquired historical significance in its own right.
- E. Preserve distinctive features, finishes, construction techniques or examples of craftsmanship.
- F. Avoid using chemical or physical treatments that cause damage to historical materials.
- G. Preserve and protect significant architectural resources that may be affected by the project.
- H. New construction shall not destroy historic materials that characterize the property (p. viii).

The marble slab vertical surfaces and granite bases throughout the property are the primary focus of this assessment and proposal, even though granite and tile in the porte cochere and elsewhere require replacement and significant structural repairs. Approximately one-hundred and seventy-five (175) marble slabs and granite bases are damaged, e.g. chipped, cracked, bowed, failed sealant, movement issues, substandard repairs, water damaged, etc. *Refer to the photos #6, 25, 83 (refer to the red arrows; due to the porte cochere and the screens, issues on the east could not be labeled with red arrows).*

Due to the condition and the method of installation, the marble slab and granite base are no longer structurally sound, as the slab inspection indicated that the adhesive mortar de-bonded from the concrete back-up and stone are degrading. In addition, the paint removal test demonstrated that the stone is permanently stained, unless aggressive grinding and chemical cleaning are performed, which would significantly change the appearance of the stone and building.

Therefore, removing slabs for the purpose of “restoration and re-installation” is unrealistic due to the appearance and condition of the stone, restoration costs, and the fact that individual stone slabs are beyond repair. Replacement of the stone will ensure the historical site is restored to its original grandeur and fulfill Mr. Ahmanson’s intention to create a functional work of art that will endure even longer than he expected. In addition, the installation will be brought up to code and be able to withstand the elements and seismic stress. The costs for replacement are more cost effective than restoration and repair and a prudent long-term investment.

CONCLUSION (NEXT STEPS)

- A. Develop project management template for planning and managing the restoration project.
- B. Proceed with James Crowley Architecture’s plans for Building Exterior Improvements.
- C. Source and approve multiple samples of marble and granite for aesthetic and in-kind consistency.
- D. Submit samples for appropriate ASTM testing to Smith-Emery Labs, 781 E. Washington Boulevard, Los Angeles, CA. Ensure stone is resistant to weathering and pollutants.
- E. Request from Carrara Marble Company of America an estimate for the purchase, fabrication, and installation of in-kind natural stone, and the repair of the porte cochere structure where needed.

- F. Install approved and tested slabs on a mock-up to test and verify effectiveness of anchorage and installation system, and joint sealant.
- G. Clean and seal stone upon completion of the installation, and develop maintenance program to ensure the appearance and condition of the stone and installation.

WORKS CITED

- A. Crowley, James. “First Bank: Building Exterior Improvements.” Woodland Hills, CA, 2014.
- B. The Marble Institute of America. “Dimension Stone Design Manual, Version 7.2.” Cleveland, Ohio: The Marble Institute of America, 2011.
- C. Mowat, Gregory I. “First Bank, 9145 Wilshire Boulevard, Beverly Hills, CA 90210: Exterior Anchored Veneer.” San Diego, CA, 2015.
- D. Ostashay, Jan. “Ahmanson Bank & Trust Building (currently First Bank) at 9145 Wilshire Boulevard, Beverly Hills, CA.” Long Beach, CA, 2014.
- E. United States Department of the Interior. *The Secretary of the Interior’s Standards for Rehabilitation*. “Illustrated Guidelines for Rehabilitating Historic Buildings.” Washington, DC: National Park Service, 1997.

PHOTO LOG: When viewing the photographs, it is important to note that they represent multiple points or issues.

Building overview: Photos #1 – 5

- 1. Main entrance, looking north
- 2. Millard Sheet’s mosaic, looking north
- 3. Porte cochere, looking west
- 4. Concrete screens, looking west
- 5. Secondary entrance, looking southwest

Secondary entrance overview, looking south: Photos #6 – 24.

- 6. Wall: issues marked with red arrows (\pm 75 slabs are damaged); slab inspection (red box)
- 7. Same (slab inspection): failed anchoring, plaster bonding to the concrete masonry back-up
- 8. Same: plywood replaced damaged slab

9. Same: chipped edge
 10. Same: repair, slab twice painted
 11. Same: failed sealant, slab movement, substandard repairs, water migration into joints
 12. Same: chipped edges, failed sealant, slab movement, substandard repairs, water damage
 13. Same: chipped edges, failed sealant, slab movement, substandard repairs, water damage
 14. Same: chipped edges, failed sealant, slab movement, substandard repairs, water damage
 15. Same: failed sealant, mortar/plaster repair, slab movement, substandard repairs, water damage
 16. Same: failed sealant, mortar/plaster repair
 17. Same: failed sealant, movement, water damage
 18. Same: chip repair, slab twice painted
 19. Same: chip repair, slab movement and twice painted, water damage
 20. Parking lot partition
 21. Same: damaged granite base
 22. Same: damaged marble cap
 23. Same: cracked marble cap, porosity differences between slabs, soiled and stained stone
 24. Same: cracked marble cap, porosity differences between slabs, soiled and stained stone
- Porte cochere, concrete screens, and wall overview, looking west: Photos #25 – 66**
25. Screen and wall overview (\pm 45 slabs are damaged)
 26. Same:
 27. Same: cracked plaster, possible structural damage
 28. Screen
 29. Screen: cracked plaster, possible structural damage
 30. Wall
 31. Same: chip repair, slab movement and twice painted

32. Same: bowing, failed sealant, slab movement, water damage
33. Same: bowing (corner seam), soiled and stained stone
34. Same: soiled and stained stone, water damage
35. Same: bowing, failed sealant, soiled and stained stone, water damage
36. Same: failed sealant and waterproofing, water damage
37. Same: water damage
38. Same
39. Same: cracked stone
40. Same: soiled and stained stone, water damage
41. Same: soiled and stained stone, water damage
42. Porte cochere: looking west
43. Same: chipped stone, degraded stone, slab movement, repair twice painted
44. Same: bowing, failed sealant, water damage
45. Same: demoed tile
46. Same: plaster degradation
47. Same: cracked curb and landing, soiled and stained stone, substandard repairs
48. Same: cracked curb and landing, soiled and stained stone, substandard repairs
49. Same: cracked curb and landing, soiled and stained stone, water damage
50. Same: cleaning test samples (white marble and gold tile)
51. Same: stained stone
52. Same: stained stone, surface pitting
53. Same: stained stone, surface pitting
54. Same: successful paint removal
55. Same: bowing

- 56. Same: bowing (close-up)
- 57. Same: bowing
- 58. Same: bowing (close-up)
- 59. Porte cochere: looking east
- 60. Same: cracked base, painted riser, soiled and stained stone
- 61. Same: spalling, soiled and stained stone, water damage
- 62. Same: cracked base, painted riser, soiled and stained stone
- 63. Same: cracked base, painted riser, soiled and stained stone, tenting, water damage
- 64. Same
- 65. Same: cracked base, soiled and stained stone, tenting, water damage
- 66. Same: cracked base, soiled and stained stone, tenting, water damage

Main entrance overview, looking north: Photos #67 – 98

- 67. Same
- 68. Same: chipped stone, degraded stone, slab movement, repair twice painted, substandard repairs
- 69. Same: chipped stone, degraded stone, slab movement, repair twice painted, substandard repairs
- 70. Same: chipped stone, degraded stone, slab movement, repair twice painted, substandard repairs
- 71. Same: chipped stone, degraded stone, slab movement, repair twice painted, substandard repairs
- 72. Same: cracked base
- 73. Same: chipped stone, degraded stone, slab movement, repair twice painted, substandard repairs
- 74. Same: chipped stone, degraded stone, slab movement, repair twice painted, substandard repairs
- 75. Same: cracked tile extending up wall
- 76. Same: cracked tile extending up wall
- 77. Same: bowing, failed sealant, soiled and stained stone
- 78. Same: missing mosaic

79. Same: mosaic
80. Same: bowing, failed sealant, soiled and stained stone
81. Same: tile movement
82. Same: tile bowing, water damage
83. Wall: issues marked with red arrows (\pm 55 slabs are damaged)
84. Same
85. Same: replaced base, repairs, stone twice painted
86. Same: chip repair, failed sealant, slab movement and twice painted, substandard repairs
87. Same: chip repair, failed sealant, slab movement and twice painted, substandard repairs
88. Same: chip repair, failed sealant, slab movement and twice painted, substandard repairs
89. Same: bowing, failed sealant
90. Same: bowing, failed sealant
91. Same: chip repair, failed sealant, slab movement and twice painted
92. Same: replaced tile, plywood replaced damaged slab, substandard repairs
93. Same: replaced tile, plywood replaced damaged slab, substandard repairs
94. Same: replaced tile, plywood replaced damaged slab, substandard repairs
95. Same: bowing, water damage
96. Same: bowing, water damage
97. Same: bowing, cracked base, water damage
98. Same: cracked base

This document is based on information gathered during the inspection and from the documentation provided. A reservation is made to amend this document after submission, if new facts, which may justify a change, become available.

We appreciate the opportunity to be of service to you. Should you have any questions or need other assistance, please don't hesitate to call.

Respectfully submitted,

James W. Paley
PALEY Stone & Tile Forensics

ICRI Slab Moisture Testing Technician – Grade 1: ASTM F710, F1869, F2170, F2659.
Ardex MC Moisture Control Systems and Designer Floors Training Seminar, Ardex Americas.
Historical Preservation Certificate – (Campbell Center, Mt. Carroll, IL).
Accredited Sealer Applicator: CA 130510P2235 (Dry Treat Products).
Certified Sealer Applicator (Aquamix/Custom Building Products).
Ceramic Tile Inspector – (CTI – Clean Trust/IICRC).
Stone, Masonry, & Ceramic Tile Cleaning (SMCTC – Clean Trust/IICRC).
Marble & Stone Inspector (MSI – IICRC, National Training Center for Stone and Masonry).
Substrate Subfloor Inspector (SSI – Clean Trust/IICRC).
Floor Care Technician (FCT – Clean Trust/IICRC).
Teacher Credentials, Vanguard University of Southern California, Costa Mesa, CA.
Bachelor of Arts, Warner Pacific College/Columbia Christian College: Portland, OR.

Encl.: Photographs 1 – 98