Exhibit A

June 23, 2021

Craig S. Nuss
Penny J. Manship
Burg Simpson Eldredge Hersh & Jardine PC
8310 South Valley Highway, #270
Englewood, Colorado 80112

Project Number: 219061.00 (030)
Project Name: Gallery
Location: 3104-3127 North 71st Street
Scottsdale, Arizona 85251

Subject: Construction and Design Compliance Report

Dear Mr. Nuss and Ms. Manship:

PREAMBLE

Per your request, SBSA, LLC, A Charles Taylor Company (SBSA), conducted site observations, interior observations, exterior observations, intrusive examinations, and site measurements at the Gallery Townhomes site (Gallery) in Scottsdale, Arizona. The evaluation also consisted of file review as noted within this report. A record of site observation dates is contained in the attached Observation Drawing Set, Observation Photographs, and photograph log.

The purpose of this evaluation was to document the Construction and Design Compliance, including analysis of the design and construction components as necessary, to determine if the work was designed and constructed in conformance with the applicable code, regulations, technical criteria, site-specific plans, and recognized standard industry requirements. This report includes an evaluation of site civil systems, the stucco and roof systems, as well as additional miscellaneous issues as listed within.

SBSA conducted visual examinations and analysis of the provided file as necessary to determine the commonality of the construction practices used on this site. As well, the examination was conducted to determine the extent or likely extent of the manifestation of resultant damage caused by the inability of the systems to perform their intended function.

Field observations and testing were performed by Edward L. Fronapfel, MSCE, PE, Jerod B. Faris, MSCE, PE, Jeffrey J. Felderman, PE, Sameer S. Rampurawala, M.Eng., EI, and Peter E. Rabner, PE, under the responsible charge of Edward L. Fronapfel, MSCE, PE, D-IBFES, DFE, CBIE, CFCC,

CBCP, EDI, PTI1, HCR-R-I, F.NAFE, F.ASCE. This work consisted of surveying and recording on-site, as-built conditions that are objective in nature. These findings were recorded and transcribed in this report and the attached documents. If necessary, all individuals listed above will testify to the accuracy and objective criteria used for the evaluation of this site. The intrusive testing was conducted with representatives of the defendants on-site during the examinations.

This report is the result of a team effort. All of the work performed by SBSA relating to the project and this report was under the direction and responsible charge of Edward L. Fronapfel, MSCE, PE. The individual team members who contributed to this report were:

Structural	Sameer S. Rampurawala, M.Eng., EI
Civil	Dane M. Dasent, CFM, LEED AP
Building Envelope	Sameer S. Rampurawala, M.Eng., EI Shawn B. Peatrowsky, PE
Recommendations for Repair	Sameer S. Rampurawala, M.Eng., EI Dane M. Dasent, CFM, LEED AP
Direction and Review	Jeffrey J. Felderman, PE Edward L. Fronapfel, MSCE, PE

Edward L. Fronapfel, MSCE, PE, seals this report along with any attachments hereto as completed under his responsible charge.

This report is a summary of voluminous writings, recordings, photographs, and other documents, which cannot conveniently be produced by way of attachment. This report is a summary of those writings, recordings, photographs, and other documents, of which the originals are available for examination in the SBSA job file. To the extent assumptions were made relating to the contents of this report, not all such assumptions are stated within this report or in SBSA's job file. A description of such assumptions can only be identified if specific questions are directed at discrete issues because many of such assumptions are incorporated in SBSA's experience, training, education, and judgment.

This report is based on information provided and reviewed to date, and it is meant to provide engineering opinions regarding construction and engineering conditions as noted within this text. Should additional information be made available or unknown conditions discovered, SBSA retains the right to periodically revise and supplement this report accordingly.

As a part of this report, SBSA provides references, including quoted text and/or images, to substantiate our opinion. For clarity, SBSA italicizes quotes and, in the event that a quote includes already italicized text, that text will appear un-italicized. These italics are in no way intended to modify the intent of the quote but simply to aid the reader in discerning between text generated by SBSA and by outside sources. An original copy of all references is included as an attachment to this report.

STANDARD OF CARE

When assessing the standard of care for a project, SBSA assesses the parties based on their relative responsibility on the project. Based on our education and experience and based, in part, on common contract language used throughout the industry, SBSA relies upon the following:

The standard of care for any construction professional(s), such as any developer/builder, designer, general contractor, and subcontractor, among others, and the related services performed by each will be: (1) the care and skill ordinarily used by members of the respective profession under the same or similar circumstances at the same time and in the same location; and (2) the project-specific standards as required by contract, the project documents, and/or by local rules and regulations as detailed below.

The term "standard," as used within this report, shall be the minimum guidelines necessary as called for in the project documents, codes, industry standards, standard settings, and testing agencies. Adherence to this standard ensures that a minimum level of quality has been provided the construction of the project to meet the needs of each product, the incorporation of the products, and the level of quality anticipated by the project documents.

When a developer is involved, then responsibility for both the design and construction of the project rests with the developer. The developer is, thus, responsible for the acts of the designers, contractors, and subcontractors. The design team is responsible for design of the project in accordance with the applicable codes, site requirements, industry standards, and product manufacturer guidelines. The construction team is responsible for construction of the project in accordance with the applicable codes, plans, specifications, and product manufacturer installation guidelines.

The 2012 International Residential Codes with City of Scottsdale amendments and jurisdictional standards do not include all standards as prescriptive adoptions necessary for the design and construction of the site and buildings. The building codes, manufacturer standards and guidelines, and industry guidelines allow the use of alternates either in full or in part to supplement the code. Further, the building codes adopt and reference many standards pursuant to specific manufacturer products and applications. In addition to these guidelines, architects, engineers, and construction professionals must always be alert to conditions that are unique to each project that require design and construction quality.

City of Scottsdale, Arizona, "City Of Scottsdale Amendments To The International Residential Code For One- And Two-Family Dwellings, 2012 Edition, Ordinance 4060," issued date December 4, 2012, Section 31-32(b) "Amendments," states the following:

- *"The International Residential Code for One- and Two- Family Dwellings, 2012 Edition, adopted by Scottsdale Revised Code Section 31-31(2) is amended in the following respects:*

  Chapter 1 – Administration ***is deleted*** *in its entirety and replaced with the following:*

  Chapter One – Administration of the International Building Code, 2012 Edition, as adopted per Scottsdale Revised Code Sec. 31-31 and amended by Scottsdale Revised Code Sec. 31-32 shall also apply to the Residential Code of the City of Scottsdale."

City of Scottsdale, Arizona, "City Of Scottsdale Amendments To The International Building Code, 2012 Edition, Ordinance 4059," issued date December 4, 2012, Section 31-32(a) "Amendments," Chapter 1 "Scope and Administration," Part 1 "Scope And Application," Section 101 "General," states the following:

- *"**[A]101.3 Intent**. The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations."*

City of Scottsdale, Arizona, "City Of Scottsdale Amendments To The International Building Code, 2012 Edition, Ordinance 4059," issued date December 4, 2012, Section 31-32(a) "Amendments," Chapter 1 "Scope and Administration," Part 1 "Scope And Application," Section 102 "Applicability," states the following:

- *"**[A]102.1 General**. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable. Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.*
- *"**[A]102.2 Other laws**. The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law."*
- *"**[A]102.4 Referenced codes and standards**. The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Section 102.4.1 and 102.4.3.*

  [A] 102.4.1 Conflicts.
  Where conflicts occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

  [A] 102.4.2 Provisions in referenced codes and standards.
  Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code or the International Codes listed in Section 101.4, the provisions of this code or the International Codes listed in Section 101.4, as applicable, shall take precedence over the provisions in the referenced code or standard."

City of Scottsdale, Arizona, "City Of Scottsdale Amendments To The International Building Code, 2012 Edition, Ordinance 4059," issued date December 4, 2012, Section 31-32(a) "Amendments," Chapter 1 "Scope and Administration," Part 2 "Administration And Enforcement," Section 105 "Permits," states the following:

- *"**[A]105.4 Validity of permit**. The issuance or granting of a permit shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a permit based on construction documents and other data shall not prevent the building official from requiring the correction of errors in the construction documents and other data. The building official is also authorized to prevent occupancy or use of a structure where in violation of this code or of any other ordinances of this jurisdiction."*

City of Scottsdale, Arizona, "City Of Scottsdale Amendments To The International Building Code, 2012 Edition, Ordinance 4059," issued date December 4, 2012, Section 31-32(a) "Amendments," Chapter 1 "Scope and Administration," Part 2 "Administration And Enforcement," Section 107 "Submittal Documents," states the following:

- *"**[A]107.2.4 Exterior wall envelope**. Construction documents for all buildings shall describe the exterior wall envelope in sufficient detail to determine compliance with this code. The construction documents shall provide details of the exterior wall envelope as required, including flashing, intersections with dissimilar materials, corners, end details, control joints, intersections at roof, eaves or parapets, means of drainage, water-resistive membrane and details around openings.*

  The construction documents shall include manufacturer's installation instructions that provide supporting documentation that the proposed penetration and opening details described in the construction documents maintain the weather resistance of the exterior wall envelope. The supporting documentation shall fully describe the exterior wall system which was tested, where applicable, as well as the test procedure used."

- *"**[A]107.2.5 Site plan**. The construction documents submitted with the application for permit shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from lot lines, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and design flood elevations; and it shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The building official is authorized to waive or modify the requirement for a site plan when the application for permit is for alteration or repair or when otherwise warranted."*

City of Scottsdale, Arizona, "City Of Scottsdale Amendments To The International Building Code, 2012 Edition, Ordinance 4059," issued date December 4, 2012, Section 31-32(a) "Amendments," Chapter 1 "Scope and Administration," Part 2 "Administration And Enforcement," Section 111 "Certificate of Occupancy," states the following:

- *"**[A]111.1 Use and Occupancy**. No building or structure shall be used or occupied, and no change in the existing occupancy classification of a building or structure or portion thereof shall be made, until the building official has issued a certificate of occupancy therefor as provided herein. Issuance of a certificate of occupancy shall not be construed as an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction."*

In evaluating the standard of care for the developer, SBSA also relied upon the following developer's agreements with the local jurisdiction:

City of Scottsdale, Building Permit, Permit No. 225988 Subdivision "The Gallery," issued date August 29, 2016, Owner "K. Hovnanian," Building Code "IRC 2012," states the following:

Note: This language is generally similar for all lots/units.

- ***"This permit becomes null and void if work or construction authorized is not commenced within 180 days of if construction or work is suspended or abandoned for a period of 180 days at any time after work is commenced. All provisions of laws and ordinances governing this type of work will be complied with whether specified herein or not. The granting of a permit does not presume to give authority to violate or cancel the provisions of any other state or local law regulating construction or the performance of construction."***

City of Scottsdale, Certificate of Occupancy, Building Address "3124 N 71st St (Lot 1) SFAT," issued date December 2, 2016, Owner of Building "K. Hovnanian," Building Code "IRC 2012," states the following:

Note: This language is generally similar for all lots/units.

Certificate of Occupancy

Sec. 111.1 Use and Occupancy. A building or structure shall not be used or occupied, and a change in the existing use of occupancy classification of a building or structure or portion thereof shall not be made, until the *building official* has issued a certificate of occupancy therefor as provided herein. Issuance of a certificate of occupancy shall not be construed as an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction.

In evaluating the standard of care for the designer, SBSA also relied upon the following explanation of a designer's responsibility:

American Institute of Architects (AIA), "The Architect's Handbook of Professional Practice," Thirteenth Edition, 2001, Chapter 15 "Regulation," Section "The Architect's Legal Responsibility," states the following:

- *"Specifically the law sets a standard of reasonable care for the performance of architects and, indeed, all professionals: The architect is required to do what a reasonably prudent architect would do in the same community and in the same time frame, given the same or similar facts and circumstances."*

When design and/or construction is not performed in accordance with the project documents, building codes, jurisdictional requirements, manufacturer standards and guidelines, and industry guidelines, then the design and/or construction fell below the standard of care. Specific instances of such a failure to meet the standard of care are discussed in greater detail throughout this report.

The following graphic is intended to illustrate the general flow of SBSA's standard of care analysis. It is not intended to be a strict hierarchy.

In addition, the following site-specific contract information currently disclosed was considered where possible in the evaluation of the parties' site-specific standards of care:

Otak, Inc., "K. Hovnanian Homes, Gallery Townhomes," revised date August 2, 2016, Sheet A0.01 "Cover Sheet – Gallery," states the following:

- "***GENERAL NOTES***

  4. THE DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS, INCLUDING THOSE IN ELECTRONIC FORM, PREPARED BY THE ARCHITECT, AND THE ARCHITECT'S CONSULTANTS ARE INSTRUMENTS OF SERVICE THROUGH WHICH THE WORK TO BE EXECUTED BY THE CONTRACTOR IS DESCRIBED. UNLESS INDICATED OTHERWISE, THE ARCHITECT AND ARCHITECT'S CONSULTANTS SHALL BE DEEMED THE AUTHORS OF THEM AND WILL RETAIN ALL COMMON LAW, STATUTORY AND OTHER RESERVED RIGHTS, IN ADDITION TO THE COPYRIGHTS."

  …

  9. CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS AND METHODS AND SHALL MAINTAIN THE STRUCTURAL INTEGRITY OF CONSTRUCTION UNTIL FINAL LATERAL AND VERTICAL CARRYING SYSTEMS ARE COMPLETED.

  …

  11. CONTRACTOR IS RESPONSIBLE FOR VERIFICATION AND COORDINATION OF SUBCONTRACTOR WORK, COMPLIANCE WITH DRAWINGS AND SPECIFICATIONS, AND ACCURATE LOCATION OF STRUCTURAL MEMBERS, OPENINGS FOR MECHANICAL, ELECTRICAL, AND MISCELLANEOUS EQUIPMENT. CONTRACTOR SHALL VERIFY DIMENSIONS AND OPENING SIZES (CLEARANCES REQUIRED) FROM THE MANUFACTURERS PRIOR TO CONSTRUCTION OF OR INSTALLATION OF EQUIPMENT, FURNISHINGS, AND ACCESSORIES."

Felten Group, "K. Hovnanian Homes, Subdivision Gallery," revised June 8, 2016, Sheet GSN "General Structural Notes," states the following:

- "***GENERAL***

  1. ALL WORK SHALL COMPLY WITH THE GENERAL NOTES, DRAWINGS, APPLICABLE BUILDING CODES AND ALL LOCAL ORDINANCES, LAWS, REGULATIONS, AND PROTECTIVE COVENANTS GOVERNING THE SITE OF WORK.

  2. IN CASE OF CONFLICT, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN.

  …

  5. THE STANDARD OF CARE FOR ALL PROFESSIONAL ENGINEERING, AND RELATED SERVICES PERFORMED OR FURNISHED BY FELTEN GROUP, WILL BE THE CARE AND SKILL ORDINARILY USED BY MEMBERS OF THE SUBJECT PROFESSION PRACTICING UNDER SIMILAR GIRGUMSTANGES AT THE SAME TIME AND IN THE SAME LOCALITY. FELTEN GROUP MAKES NO HARRANTIES, EXPRESS OR IMPLIED, OR OTHERWISE, IN CONNECTION WITH FELTEN GROUP'S SERVICES. FELTEN GROUP AND ITS CONSULTANTS MAY USE OR RELY UPON THE DESIGN SERVICES OF OTHERS, INCLUDING, BUT NOT LIMITED TO, ENGINEERS, ARCHITECTS, DESIGNERS, CONTRACTORS, MANUFACTURERS, AND SUPPLIERS.

  …

7. THE CONTRACTOR, NOT FELTEN GROUP, IS RESPONSIBLE FOR THE CONSTRUCTION OF THE PROJECT, AND FELTEN GROUP IS NOT RESPONSIBLE FOR THE ACTS OR OMISSIONS OF ANY CONTRACTOR, SUBCONTRACTOR OR MATERIAL SUPPLIER FOR SAFETY PRECAUTIONS, PROGRAMS OR ENFORCEMENT; OR FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES EMPLOYED BY THE CONTRACTOR. FELTEN GROUP SHALL NOT AT ANY TIME SUPERVISE, DIRECT, OR HAVE CONTROL OVER ANY CONTRACTORS WORK."

Master Subcontract Agreement, Contractor "K. Hovnanian Building Company, LLC" Subcontractor "RenCo, LLC," dated June 24, 2016, Bates Number Renco 000005-14, states the following:

- *"9. Materials and Work Furnished by Others.*

  …It shall also be the absolute duty of Subcontractor to examine such work or areas prepared by others which is where Subcontractor's Work is to be performed, and to notify Contractor immediately in writing, and prior to commencing any Work affected by the deficiencies, of any deficiencies in the work or areas prepared by others which may adversely affect Subcontractor's Work. Use of such items or commencement of the Work by Subcontractor in such areas shall be deemed to constitute acceptance thereof, and responsibility therefore, by Subcontractor."

- *"11. Examination of Documents; Representations.*

  …

  (b) Information provided by Contractor regarding a Project Site or Contract Documents is and shall be believed by Contractor to be reasonably correct. However, Contractor does not warrant either the completeness or the accuracy of such information, and Subcontractor understands and agrees that it is Subcontractor's sole responsibility to verify all such information independently, and to make such examination of the Contract Documents and of the Project Site as shall be necessary for Subcontractor to satisfy itself with respect to the conditions to be encountered during the performance of the Work. In the event Subcontractor at any time detects any design deficiency, any error in measurements or any other errors in the Contract Documents, or any condition which Subcontractor believes to be at variance with approved plans, Subcontractor shall have an absolute duty under this Subcontract to immediately provide written notice thereof to Contractor."

- *"18. Materials and Workmanship; Inspection and Testing.*

  …

  (b) Except as otherwise provided herein, all materials, workmanship and Work, if not otherwise designated by the Contract Documents, shall be subject to inspection, examination and testing by or for Contractor at any and all times during manufacture and/or construction and at any and all places when such manufacturing and/or construction are carried on. Subcontractor shall cooperate with Contractor, and any third party inspectors retained by Contractor, to permit a thorough inspection of the Work and to correct any deficiencies discovered during such inspections. Contractor shall have the right to reject improper or defective material, workmanship or Work or require correction without charge to Contractor. Subcontractor shall promptly segregate and remove rejected material from a Project Site. Nothing contained in this Paragraph 18 shall in any way restrict the rights of Contractor under any warranty by Subcontractor of material, workmanship or Work. Subcontractor acknowledges and agrees that Contractor has no obligation or duty to perform continuous or comprehensive inspections of any such materials, workmanship or Work. No such inspection, examination, testing or approval by or for Contractor shall be construed as an inspection or approval of material, workmanship

or Work not in compliance with this Subcontract, the Contract Documents or applicable Laws. Neither the inspections referred to in this Paragraph 18, nor the failure to inspect, shall in any way relieve Subcontractor of its sole responsibility for properly performing the Work in accordance with this Subcontract, the applicable Work Agreement, the other Contract Documents and applicable Laws, or relieve Subcontractor of any of its liabilities or obligations, under this Subcontract, under any Work Agreement, under Law or otherwise."

- *"22. Laws. All Work and materials furnished by Subcontractor shall conform to the requirements of all Laws. All Work shall meet with the approval and pass inspection of the city, county, and State where the Work is to be performed or materials are to be furnished. If the Work is being constructed under specification of the FHA and the VA, or either of them, such Work and materials furnished shall meet with all of the applicable requirements of the FHA and VA and shall be subject to applicable inspection of the FHA and VA. No Work is to be deemed completed until final inspection is approved by the city, county, state, or other applicable agency, as well as any inspection by Contractor."*

METHODOLOGY

When using the term "damages" within this report, SBSA assesses the intended use and the expected useful life of the following: a component, a system of components, the completed assembly, the completed property, and the corresponding actual or probable physical manifestation of damage to the property. This definition of damages has been developed from our experience, education, and training regarding construction and design compliance. Over time, this position has become known as the two-prong approach and this premise is the foundation for the findings and opinions developed and expressed within this report. The two-prong approach is founded on the following precepts:

- The analysis begins with an assessment of the first prong of damage. SBSA uses the following definition for the first prong: the inability of an element, assembly, or system to perform its intended function. If the construction cannot perform its intended function(s) throughout its expected useful life, thus a loss of use, then it is SBSA's opinion that this condition is damage, and thus it satisfies the first prong of our damage analysis. The intended function of each element, assembly, or system is generally defined by the code requirements, site-specific construction documents, manufacturer product information, and relevant industry standards.
- SBSA defines the second prong of damage as the manifestation of damage resulting from the first prong; in other words, there is observable distress or effective loss of use that is a result from the inability of an element, assembly, or system to function as intended. The manifestation of damage creates resultant damages to the element, assembly, or system itself and to otherwise non-damaged products that adjoin the defective condition. This resultant damage can be patently observable or latent. It is important to emphasize the distinction of observations by an expert trained to recognize construction defects compared to a less sophisticated person without the education, experience, and knowledge of an expert in the field. When SBSA refers to observations of construction defects, we are referring to the first prong; when referring to the second prong, SBSA is referring to the actual manifestation of damages from the underlying defect.

Figure 1 graphically displays the relationship of damages to the two prongs and also introduces a causal relationship into the overall process using water intrusion as an example.

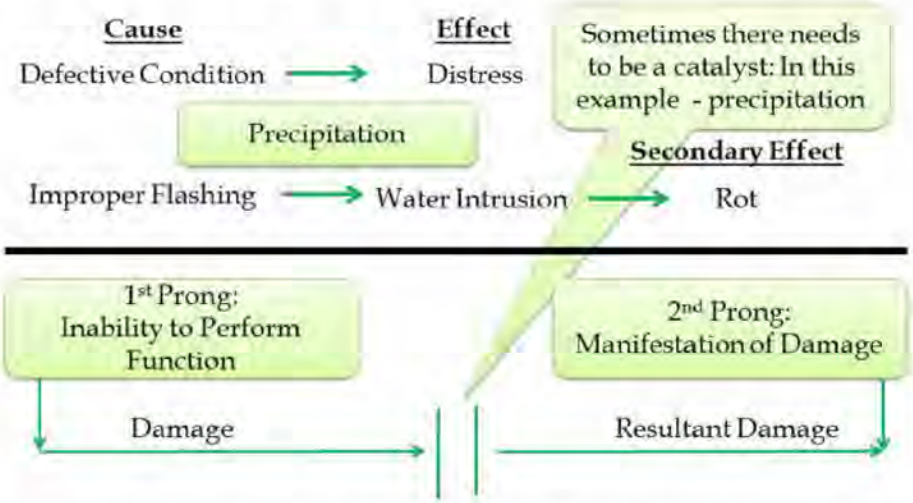


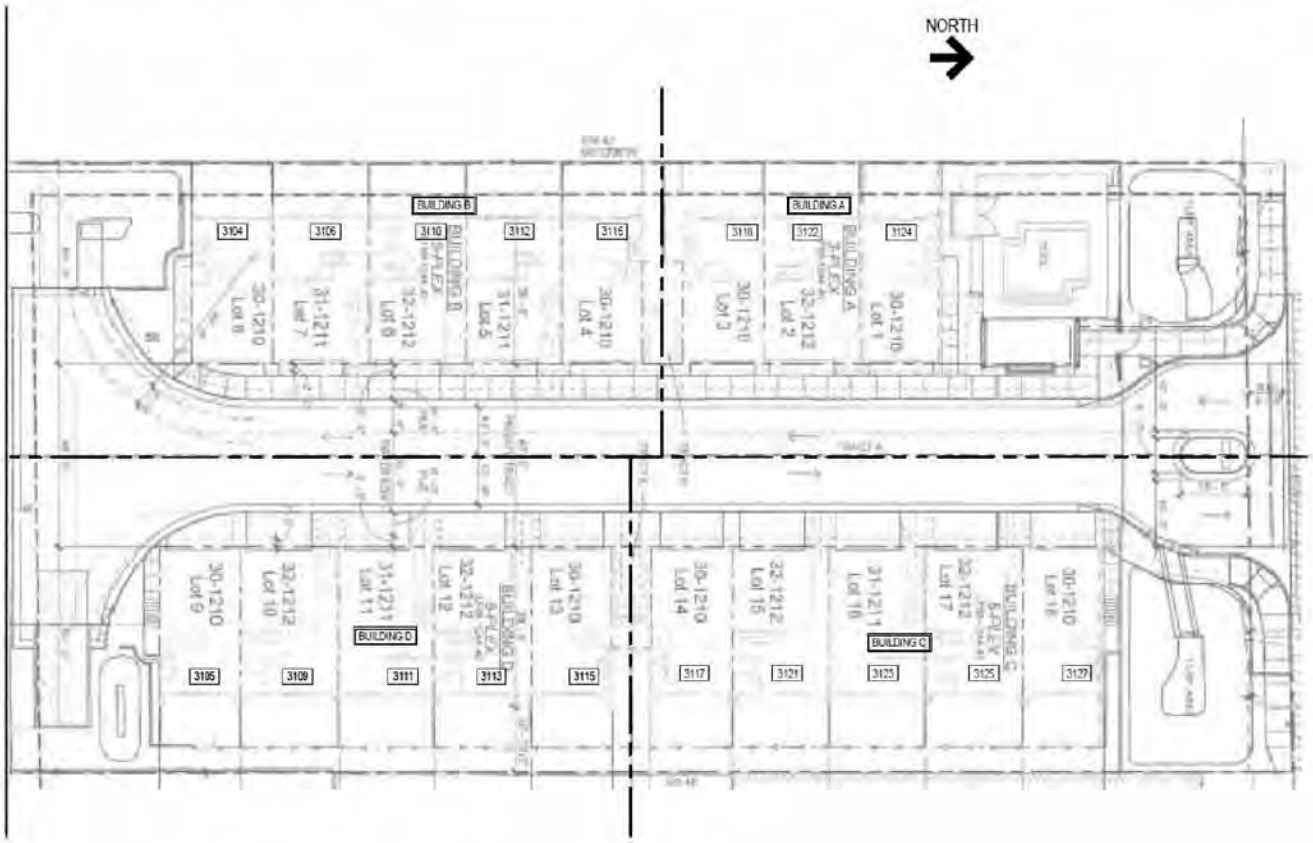
Figure 1- Manifestation Timeline

First prong damage initially occurs near substantial completion when the non-compliant construction is installed and/or becomes a part of the completed system. The defect standing alone, absent some causal event, yields no resultant manifestation, prong two, damage. However, this condition, as to the types of damage, does not negate the loss of use, potential void of warranties, and damage to otherwise non-damaged elements on the property. Simply stated, improperly integrated construction does not and will not work in its constructed state. Conditions that require repair are damage; the existence of the defect is itself damage. During construction, the developer and contractor have the best ability to remedy defective conditions. For example, flashing may be reverse-lapped during construction, which would obviously be a defective condition. However, if that damaged condition (first prong damage) is identified and corrected prior to completion of the project, then the condition will no longer be a defect. In theory, the developer and contractor can correct any deficient conditions up until the substantial completion of the project.

SBSA's determination of defective or non-compliant conditions is not based solely on prescriptive code requirements, but considers the non-compliance in light of the observed systems' and elements' ability to function as designed and intended. The expectation is that code-compliant construction will perform for the expected life of those individual systems, components, or assemblies. SBSA's intent is to analyze the constructed systems, not just provide verification of strict compliance. This analysis is referred to as "performance standards" versus "prescriptive standards." Thus, the SBSA repair approach is intended to provide a means for functionality even though at times such construction fails prescriptively to meet the minimum standards of the code, manufacturer guidelines, industry guidelines, or other industry knowledge.

PROJECT INFORMATION

The Google Earth© aerial image and site plan of the Gallery site below show buildings investigated by SBSA for the reporting of this project.



Construction Period:	2016-2018
Permit Application Date:	2016-2018
Certificate of Occupancy Issue Date:	2016-2018
Legal Description:	A Portion of the Southeast Quarter of the Southeast Quarter of Section 27, Township 2 North, Range 4 East, of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. For additional information refer to legal description on approved architectural site plan.
Building and Occupancy Type:	V-B/R-3
Jurisdiction with Authority:	City of Scottsdale in the County of Maricopa, Arizona

Owner/Builder/General Contractor:	K. Hovnanian 20830 North Tatum Boulevard, Suite 250 Phoenix, Arizona 85050 (480) 824-4200
Architect:	Otak, Inc. 51 West Third Street Tempe, Arizona 85281 (480) 557-6670
Structural Engineer:	Felten Group 18325 North Allied Way, Suite 200 Phoenix, Arizona 85054 (602) 867-2500
Geotechnical Engineer:	Protex 3206 South Fair Lane Tempe, Arizona 85282 (602) 272-7891
Civil Engineer:	Hoskin Ryan Consultants, Inc. 6245 North 24th Parkway, Suite 100 Phoenix, Arizona 85016 (602) 252-8384
Landscape Engineer:	LVA Urban Design Studio 120 South Ash Avenue Tempe, Arizona 85281 (480) 994-0994
Mechanical, Electrical & Plumbing:	Energy Inspectors 2527 South Miller Lane Las Vegas, Nevada 89117 (702) 365-8080

SUMMARY OF CONSTRUCTION NON-COMPLIANCE

A. STRUCTURAL
   1. COMPLIANCE WITH GEOTECHNICAL REPORT
   2. LATERAL FORCE RESISTING SYSTEM (LFRS)
      a. Non-Compliant LFRS

B. CIVIL
   1. GRADING AND DRAINAGE
      a. Drainage Bounded by Concrete Flatwork
      b. Non-Compliant Management of Concentrated Flows
   2. CONCRETE FLATWORK
      a. Non-Compliant Cross-Slope of Sidewalks
      b. Non-Compliant Longitudinal Slope of Sidewalks
      c. Non-Compliant Landings

C. BUILDING ENVELOPE
   1. FAÇADE (EXTERIOR CLADDING AND SEALANTS) TYPE 1 – STUCCO
      a. Missing Weep Mechanism in Stucco
      b. Non-Compliant WRB for Stucco System
      c. Non-Compliant EPS Foam Board for Stucco System
      d. Non-Compliant Slope of Horizontal Stucco Surfaces
      e. Deficient Self-Adhered Membrane under Horizontal Stucco System
      f. Missing Control/Movement Joints
   2. MOISTURE-MANAGEMENT SYSTEM (BARRIERS, FLASHINGS, DRAINAGE, ETC.)
      a. Missing Sheet Metal Flashing at Fenestrations
      b. Non-Compliant Flashing to Stucco Interface
      c. Non-Compliant Isolation Joints at Dissimilar Materials
   3. ROOFING SYSTEM TYPE 1 – SPRAY POLYURETHANE FOAM (SPF)
      a. Non-Compliant Slope to Roof Drains
   4. ELEVATED DECKS, BALCONIES, OR WALKWAYS
      a. Non-Compliant Slope of Deck

PROJECT DOCUMENTATION REVIEWED

The following project-specific documentation was reviewed by SBSA as a part of its Scope of Work for this project:

- "Building Department Documents," Received May 6, 2019, Bates Numbers GALLERY_BLDG DEPT 000001-001921.
- "Video from 3112 N 71st St," Received September 30, 2019.
- "Roof Leak Photos," Received from Burg Simpson on February 10, 2021.
- "Disclosure," Received from Burg Simpson on February 19, 2021, Bates Numbers GALLERY_000001-000115.
- Felten Group, "Structural Set," Signed June 8, 2016, Sheet Numbers RL, GSN, S1.1, S1.2, S1.3, S1.4, S1.5, S1.6, S1.7, S1.8, S1.9, S2.1, S2.2, S2.3, S2.4, S2.5, S2.6, S3.1, S3.2, S3.3, S3.4, S3.5, S3.6, SD.
- HanmiGlobal Partner Otak, Inc, "Gallery Townhomes Architectural Plans," Signed August 2, 2016, Sheet Numbers A0.01, A0.02, A0.11, A0.12, A1.01, A1.02, A1.11, A2.11, A2.12, A2.21, A2.22, A2.31, A2.32, A2.41, A2.42, A3.11, A3.21, A3.31, A3.41, A4.01, A4.02, A4.03, A4.04, A4.11, A4.12, A4.13, A5.01, A5.02, A5.03, A5.11, A5.12, A5.12.1, A5.13, A5.14, A5.14.1, A5.14.2, A5.15, A5.16, A5.16.1, A5.16.2, A6.10, A6.11, A6.12, A6.13, A6.14, A6.15, A6.16, A6.17, A6.18, A7.14, A7.15, A7.16, A8.01, A8.02, A8.03, A8.04, A8.05, A8.11.
- "Disclosure," Received from Burg Simpson on June 7, 2021, Bates Numbers CHAS 000001-000053; LEBLANC 002301-002678; LIBERTY 000001-000063; RENCO 000001-000245; SMC000001-000094, 000146-000196, 000234-000261, 000267-000386, 000509-000567, 000574-000676, 000691-000697, 000705-000711, 000719-000725; GALLERY_000001-001065.
- Various Photographs by Homeowners and Nautilus, Received from Burg Simpson on June 16, 2021.
- Protex, "Geotechnical Investigation," dated March 18, 2015, Received from Burg Simpson on June 16, 2021.
- "Disclosure," Homeowner Photos Received from Burg Simpson on June 18, 2021, Bates Numbers GALLERY-CHANG_3112-000001-0000006, GALLERY-JONES_3104-000001-000009, GALLERY-LINE_3110-000001-000004, GALLERY-SLUSARZ-000001-000025, GALLERY-STAVROFF_3124-000001-000082.

APPLICABLE CODE AND INDUSTRY-AFFILIATED STANDARD REFERENCES

In determination of the applicable building code and jurisdictional requirements relevant to this project, SBSA reviewed the Code Adoption History issued by City of Scottsdale, the Jurisdiction with Authority for the building permits and inspections on this property. SBSA also reviewed the building permits and the certificate(s) of occupancy issued by the City of Scottsdale for the subject property as well as the Contract Documents. This verified that when built, this property was under the jurisdiction of the building department. According to the building department, the 2012 building codes were adopted on December 4, 2012 and the 2015 building codes were adopted on November 28, 2016. The building permits and the certificate(s) of occupancy both specify the 2012 International Residential Code (IRC) as the building code. In addition to the documents issued by the local building department, the approved architectural and structural plans state the following:

Otak, Inc., "K. Hovnanian Homes, Gallery Townhomes," revised August 2, 2016, Sheet A0.11 "Code Summary & Fire Life Safety Plans – Gallery," states the following:

- ***"BUILDING CODE SUMMARY – BASED ON 2012 INTERNATIONAL RESIDENTIAL CODE (IRC)***

  GENERAL INFORMATION

  Building Code Editions (with City of Scottsdale amendments)

  International Residential Code (IRC) - 2012

  *International Building Code (IBC) - 2012 *For Use As Referenced In The IRC*

  National Electric Code (NEC) - 2011

  International Plumbing Code (IPC) - 2012

  International Fuel Gas Code (IFGC) - 2012

  International Mechanical Code (IMC) - 2012

  International Energy Consevation [sic] *Code (IECC) - 2012*

  International Fire Code (IFC) - 2012

  2012 IRC, ICC/ANSI 117.1-2009 ANSI & 2010 ADA Standards"

Felten Group, "K. Hovnanian Homes, Subdivision Gallery," revised June 8, 2016, Sheet GSN "General Structural Notes," states the following:

- ***"DESIGN LOADS***

  2012 International Building and Residential Codes (IBC/IRC)"

In addition to the above, the architectural drawings referred to specific sections of the 2012 International Building Code (IBC). Thus, the 2012 IRC and the 2012 IBC with their respective amendments by the City of Scottsdale were applicable to the design and construction of the project.

The following documents were reviewed and referenced by SBSA as a part of its Scope of Work for this project:

STANDARD OF CARE

1. American Institute of Architects (AIA), "The Architect's Handbook of Professional Practice," Thirteenth Edition, 2001.
2. City of Scottsdale, Arizona, "City Of Scottsdale Amendments To The International Building Code, 2012 Edition, Ordinance 4059," Issued Date December 4, 2012.
3. City of Scottsdale, Arizona, "City Of Scottsdale Amendments To The International Residential Code For One- And Two-Family Dwellings, 2012 Edition, Ordinance 4060," Issued Date December 4, 2012.

A. STRUCTURAL

B. CIVIL

1. American Concrete Institute (ACI), ACI 332R-84 "Guide to Residential Cast-in-Place Concrete Construction," 1999.
2. American National Standards Institute (ANSI), A117.1-2009 "Accessible and Usable Buildings and Facilities," Approved October 20, 2010.
3. Arizona Geological Survey, "A Home Buyer's Guide to Geologic Hazards in Arizona," Down-To-Earth 13, 2002.
4. Arizona Registrar of Contractors, "Workmanship Standards for Licensed Contractors," June 2009.
5. City of Scottsdale, Arizona, "City of Scottsdale Amendments To The International Building Code, 2012 Edition, Ordinance 4059," issued date December 4, 2012.
6. Code of Federal Regulations, "Title 24 Housing and Urban Development," April 1, 2012.
7. International Code Council, Inc. (ICC), "International Residential Code for One- and Two-Family Dwellings (IRC)," 2012.
8. National Fire Protection Association (NFPA), NFPA 101 "Life Safety Code," 2006.
9. U.S. Department of Housing and Urban Development, HUD Handbook 4145.1 REV-2 "Architectural Processing and Inspections for Home Mortgage," March 1990.
10. U.S. Department of Housing and Urban Development, HUD 4910.1 "Minimum Property Standards for Housing," 1994 Edition.
11. U.S. Department of Housing and Urban Development, "Residential Rehabilitation Inspection Guide," February 2000.
12. U.S. Department of Transportation, Federal Highway Administration (FHWA), "Designing Sidewalks and Trails for Access, Part I of II: Review of Existing Guidelines and Practices," July 1999.
13. U.S. Department of Transportation, Federal Highway Administration (FHWA), "Designing Sidewalks and Trails for Access, Part II of II: Best Practices Design Guide," September 2001.

C. BUILDING ENVELOPE

1. American Architectural Manufacturers Association, AAMA 2400-10 "Standard Practice for Installation of Windows with a Mounting Flange in Open Stud Frame Construction for Low Wind/Water Exposure," 2010.
2. American Society for Testing and Materials (ASTM), ASTM C1063-16 "Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster," 2016.
3. American Society of Testing and Materials (ASTM), ASTM E2112–07 "Standard Practice for Installation of Exterior Windows, Doors and Skylights," 2007.
4. Amerimix, "Fiber Base Coat Stucco AMX 750 FBC," Revised June 2016.
5. City of Scottsdale, Arizona, "City Of Scottsdale Amendments To The International Building Code, 2012 Edition, Ordinance 4059," issued date December 4, 2012.
6. GMC Roofing & Building Paper Products, Inc. (GMC), "GMCraft 10 Minute Weather-Resistive Barrier, Product Data," June 2020.
7. ICC Evaluation Service, Evaluation Report ESR-3529 "Evaluation Subject: Amerimix Fiber Base Coat Stucco," reissued February 2017.
8. ICC Evaluation Service Report (ESR), "Evaluation Subject: GMCraft 10 Minute, GMCraft 30 Minute, and GMCraft 60 Minute Water-Resistive Barriers, ESR-2376," reissued May 2019.
9. International Code Council, Inc. (ICC), "International Building Code (IBC)," 2012.
10. International Code Council, Inc. (ICC), "International Energy Conservation Code (IECC)," 2012.
11. International Code Council, Inc. (ICC), "International Residential Code (IRC)," 2012.
12. International Conference of Building Officials (ICBO), "AC11 – Acceptance Criteria for Cementitious Exterior Wall Coatings," approved March 2010, Effective March 1, 2010.
13. Sheet Metal and Air Conditioning Contractors' National Association, Inc. (SMACNA), "Residential Sheet Metal Guidelines," First Edition, 2001.
14. Structure Magazine, "Low-Slope Roof and Deck Design Considerations Part 2: Mitigate Ponding and Water Intrusion by Scott D. Coffman, PE, SECB," September 2017.
15. Stucco Manufacturers Association (SMA), prepared by the Northwest Wall and Ceiling Bureau, "Portland Cement Plaster Stucco Resource Guide," Third Edition, 1997.

FIELD OBSERVATIONS AND EVALUATIONS

A. STRUCTURAL

1. COMPLIANCE WITH GEOTECHNICAL REPORT

Proper design and construction of buildings and site improvements rely upon an understanding of the interaction between the on-site soils, the structures, and other systems that are supported on those soils, as well as an understanding of how the constructed improvements will react to soil movement due to variations in the soil moisture conditions. Properly designed and constructed properties, including building and exterior site elements with sufficient tolerance for the predicted soil movement, will provide long-term performance and serviceability, and will allow an owner to properly maintain those properties for the duration of their useful lives. Improper design and construction result in failures of the constructed systems, with occurrences when these systems cause damage to themselves or to otherwise undamaged property and construction. Improper construction, where it exists, would not be considered maintainable if replacement and modifications are required to correct the deficient conditions. In order to evaluate the risks, potential modifications, and adverse impacts, site-specific geotechnical reports examine the interaction between the soils and the proposed building and site elements.

Protex provided a site-specific geotechnical report for the Gallery site titled "Geotechnical Investigation 71st and Earll," dated March 18, 2015. Protex's findings were that based on the analysis of two test holes drilled to a nominal depth of 15-feet, the existing soils consisted primarily of clayey sands and sand clays of medium to medium-high plasticity for the depths of the test holes. Protex summarized its findings as follows:

- *"3.1 Soil Stratigraphy*

  Based on the field exploration and laboratory testing the subsurface profile, to the depths explored, consist primarily of clayey sands and sandy clays of medium to medium-high plasticity soils extending to depths explored. Refer to the boring logs in Appendix C for a detailed description of the subsurface soil profile.

  3.2 Potential for Soil Hydro-Collapse (Settlement Potential)

  Laboratory tests and Blow Counts (N-values) indicate the subsurface soils are loose/soft and susceptible to hydro-collapse at the anticipated foundation load of 1500psf (See the attached laboratory test results and boring logs). The potential for hydro-consolidation of the subsurface soils, can be mitigated. Foundation bearing soils should be over-excavated and re-compacted. (See Section 5.0 – Site Preparation).

  3.3 Potential for Soil Expansion (Expansion Potential)

  The expansion potential of the native soils, to the depths explored based on ASTM test method D4829, is considered very low to low. Soils selected for testing for expansion potential were those that represented clayey soils with varying plasticity index values to determine the range of expansive potential soils across the site. The Expansion Index values typically trend to be higher with higher plasticity indices as can be seen in the test data for the site (Expansion Index value of 41). However, soils that have lower plasticity indices but have a larger percent passing

the 200 sieve may have lower potential for expansion based on the soil composition as can also be seen in the test data for the site (Expansion Index of 18).

3.4 Potential for Corrosion

Soils were tested for water soluble sulfates and chlorides The International Building Code specifies limits for soluble sulfate levels of 1000ppm. The soils tested yielded results below these levels and do not require any specialized design requirements. The test results are presented in Appendix A.

3.5 Excavation and Workability

Based on the soil borings, it is anticipated that conventional excavation equipment may be utilized to depths of 15 feet. However, this generalized assessment is not intended to be the sole basis for contractors preparing earthwork bids. Undiscovered shallow bedrock, cemented soils, cobbles, boulders, and weathered/broken bedrock may make excavation more difficult than expected. In addition, the relative ease/efficiency of excavation is heavily dependent on operator skill and the type of equipment assigned to the project. Thus, prospective earthwork contractors bidding on this project need to assess site excavation conditions for themselves. Trench shoring, benching, or laying back of excavations greater than 3 feet in depth may be required to satisfy government safety regulations for personnel safety.

3.9 Shrinkage

Field and laboratory tests such as blow counts (N-values), in-situ densities, and hydro-collapse testing indicates that during grading, soils will likely be compacted to densities greater than the current density of the native soils. Both site specific testing and experience indicates that there is variability of the site soils subsurface and thus shrinkage across the site will vary such that uniform shrinkage across this site during earthwork operations is unlikely. The shrinkage values provided are based on standard construction techniques and may vary depending on the equipment used and the manner in which the grading is performed."

Depth (ft)	*Estimated Shrinkage (%)*
0-3	*15-20%*

Protex determined that post-tension slab-on-ground foundations were suitable for the lightly loaded single-family residential structures and that conventional foundations were suitable for the isolated patio footings and site walls. Protex also noted the possibility for their use in conjunction with post-tensioned slabs.

Protex recommended that due to loose/soft conditions, the surface soils be overexcavated to the deeper minimum depth of 1.0-feett below existing grade, or 1.0-feet below finished pad grade. As well, Protex recommended that the overexcavation extend across the entire building pad and a minimum lateral distance of 5-feet beyond the edges of the foundations. Protex also recommended that after clearing and overexcavation, the exposed soils be scarified until the surface was free from ruts or other uneven features.

Protex recommended fill material free of organics, vegetative matter, deleterious or foreign material, rocks, and lumps more than 6-inches in size, and stated that native soils were suitable as fill material if compacted as specified. Protex recommended that each layer be placed evenly and thoroughly mixed and compacted to the specified density and

moisture content. The fill material was also required to be placed in layers that, when compacted, did not exceed 6-inches. Finally, Protex provided the following compaction recommendations in accordance with ASTM D-698, AASHTO T-99, and applicable equivalents:

Compaction Specifications for Post-Tension and Conventional Foundations		
Material	**Compaction**	**Percent Moisture**
Below Conventional Foundation Level and Post-tension Slab-on-Grade	90% to 95%	Optimum to +4
Fills at Depths 5 to 10 Feet Below Finish Grade	98% Min	-2 to +2 of Optimum
Fills at Depths 10 Feet or Greater Below Finish Grade	100% Min	-2 to +2 of Optimum

NRCS Web Soil Survey

In addition to the Protex report, SBSA also reviewed the information provided on the USDA's Natural Resources Conservation Service (NRCS) online Web Soil Survey (WSS) to gain a further understanding of the feasibility and concerns associated with construction on this site. These NRCS soil surveys are intended for *"general farm, local and wider area planning;"* however, they also provide *"engineering properties"* of soils and as such are used by engineers in a similar manner as relied upon by SBSA for understanding the physical characteristics of the soils. The NRCS WSS for the Gallery site shows the existing on-site soils to be entirely Mohall loam (Map Unit Name: MLRA 40).

WSS map showing the entire Gallery site located on Mohall loam.

Mohall loam is classified as Hydrologic Soil Group C and is well drained, with the depth to water table more than 80-inches. The information obtained from the NRCS varies

somewhat from the findings contained in the Protex report, which found the on-site soils to consist of clayey sands and sandy clays of medium to medium-high plasticity.

NRCS WSS – Suitabilities and Limitations Ratings – Building Site Development

The WSS website also provides ratings for the risks associated with various types of construction on different soils. These ratings are determined from the specific characteristics and engineering properties of the soils, and each is expressed numerically as a decimal value to indicate the severity of each individual limitation. The risks for the potential for damage to the specific construction type are expressed as values between the point at which a soil feature has the greatest negative impact on the construction type (1.00) and the point at which the soil feature is not a limitation (0.00). The higher the rating, the greater the risk associated with the construction type.

NRCS WSS – Suitabilities and Limitations Ratings

The WSS online application provides a "somewhat limited" rating for the entire site for the construction of buildings without basements. The specific rating was 0.05 due to the shrink-swell potential.

Tables – Dwellings Without Basements – Summary By Map Unit

Summary by Map Unit – Eastern Maricopa and Northern Pinal Counties Area, Arizona (AZ655)

Summary by Map Unit – Eastern Maricopa and Northern Pinal Counties Area, Arizona (AZ655)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
Mv	Mohall loam MLRA 40	Somewhat limited	Mohall (80%)	Shrink-swell (0.05)	1.1	100.0%
Totals for Area of Interest					**1.1**	**100.0%**

WSS map showing the "somewhat limited" (yellow) rating for construction of buildings without basements.

Felten Group, "K. Hovnanian Homes, Subdivision Gallery," revised June 8, 2016, Sheet S1.1 "Foundation Plan Building A," states the following:

SOIL	
1. ALL EXCAVATION, FILL (INCLUDING BASEMENT WALL AND RETAINING WALL BACKFILL), COMPACTION, AND SOIL RELATED OPERATIONS SHALL BE PERFORMED ACCORDING TO SOILS CONSULTANT'S RECOMMENDATIONS. SEE SOILS REPORT AND ADDENDUMS BY THE GEOTECHNICAL ENGINEER FOR RECOMMENDATIONS ON THE CONSTRUCTION OF THE FOUNDATION SYSTEM. 2. SOME SOIL REPORTS REFERENCE FOUNDATION DEPTH FROM "LOWEST ADJACENT GRADE WITHIN 5 FEET OF THE FOUNDATION" WHILE OTHER SOIL REPORTS USE "ADJACENT GRADE". SEE SITE SPECIFIC SOILS REPORT FOR PROPER DATUM FOR THIS PROJECT.	
SOILS REPORT INFORMATION	
GEOTECHNICAL REPORT BY:	PROTEX
GEOTECHNICAL REPORT #:	4222
GEOTECHNICAL REPORT DATE:	3/18/2015
ALLOWABLE BEARING PRESSURE	1250 psf.
ALL EXCAVATION, FILL, COMPACTION AND SOIL RELATED OPERATIONS SHALL BE PERFORMED ACCORDING TO GEOTECHNICAL REPORT RECOMMENDATIONS.	

K. Hovnanian Homes, "Standard Specifications, The Gallery, 18 Lots," dated May 2, 2016, Bates Number "SMC000241," states the following:

Concrete: POST TENSION – 9" slab
Note: Soils Reports to be used are Pro Tex, project number # 4222 dated March 18th, 2015.

These notes are generally consistent with the Protex recommendations.

2. LATERAL FORCE RESISTING SYSTEM (LFRS)

The buildings at the Gallery site are three-story 3-plex and 5-plex townhomes. The foundation system includes 8-inch-thick post-tensioned slab-on-ground for each building footprint. The superstructure is constructed of conventional 2x wood stud framing and prefabricated engineered floor and roof trusses. The LFRS is comprised of the roof and floor diaphragms and gypsum wall board and wood-sheathed braced or shear walls.

a. Non-Compliant LFRS

The LFRS is a system of framing members and connections that are intended to transfer the lateral forces, which are developed from wind or seismic loads, from the roof and floor diaphragms of a building through collectors and ultimately into the foundation systems that transfer loads to the supporting soils. For an LFRS to function as a complete system, it must provide a continuous load path as the code mandates. This continuous load path system includes the use of properly designed and installed floor and roof diaphragms, collectors, shear walls, blocking, straps, hold-downs, anchorage from the bottom of the shear wall to the level below or foundation, and other mechanical connectors. The building's lateral resistance is part of the occupant safety criteria and building performance criteria. Failure to design and construct a complete LFRS based on the site-specific design criteria results in the potential for building damage and loss of use due in part to increased damages.

Intrusive examination revealed the framing at Unit 3111 of Building D of the Gallery site was constructed without the proper LFRS that was clearly detailed on structural braced/shear wall plans. The architectural plans label Building D as plan type 31-1211. The structural braced/shear wall plans for the front of the second floor of plan type 31-1211 specify a braced/shear wall type 4, which is a continuous 3/8-inch minimum rated sheathing behind the pop-out wall with .113 x 2-3/8-inch nails spaced per the braced/shear wall schedule. The braced/shear wall plan required one CMSTC16 or two CS16 straps at each end of the exterior sheathing installed with required fasteners to provide minimum tensile capacity of 3410-pounds-force.

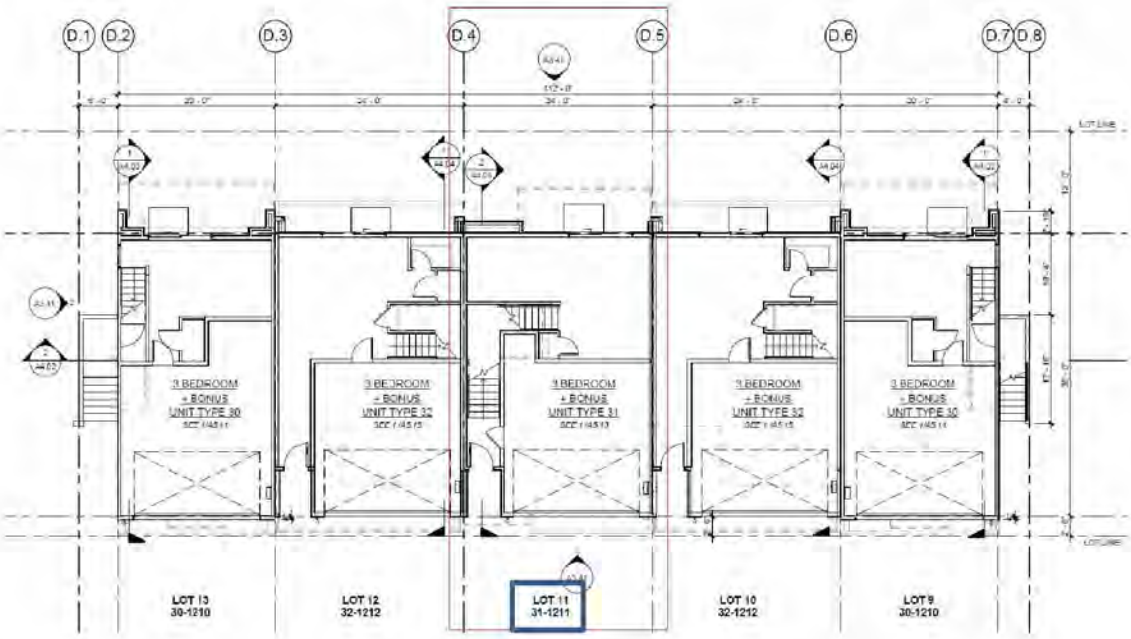
As constructed, the cladding was installed over open stud framing without the required exterior sheathing at the second floor level between the triple panel slider window in the great room and the pop-out wall. Fasteners in the CS16 strap connecting the exterior sheathing below the triple panel window were missing and the steel strap had buckled. The buckled steel strap and the missing exterior wood sheathing failed to comply with the braced/shear wall plan specified on the structural drawings. The non-compliant condition more likely than not reduces the structural integrity of the LFRS, as intended by the Structural Engineer of Record (EOR) and requires repairs.

Where non-compliant LFRS exists, the as-built condition falls short of the prescriptive requirements of the relevant codes, design, and industry standards and, therefore, the developer, contractor, and subcontractors who performed the work fell below the standard of care.

Applicable Code/Industry Standard References/Project-Specific Documents:

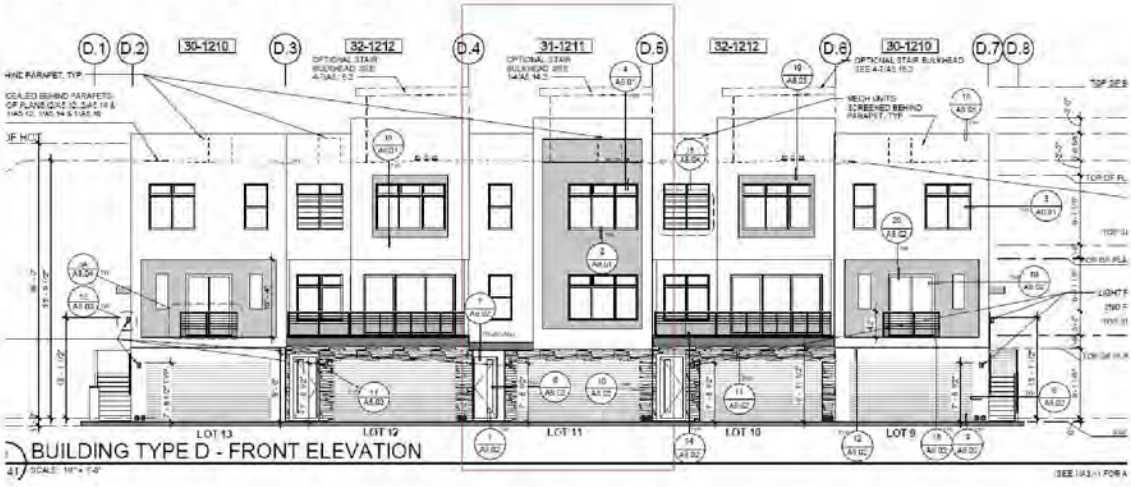
Otak, Inc., "K. Hovnanian Homes, Gallery Townhomes," revised date August 2, 2016, Sheet A2.41 "1st & 2nd Floors Building D, 5-Plex, Gallery Site #4,," Detail 1, illustrates the following:

- *"1/A2.41 First Floor Plan – Building D- 5 Plex"*



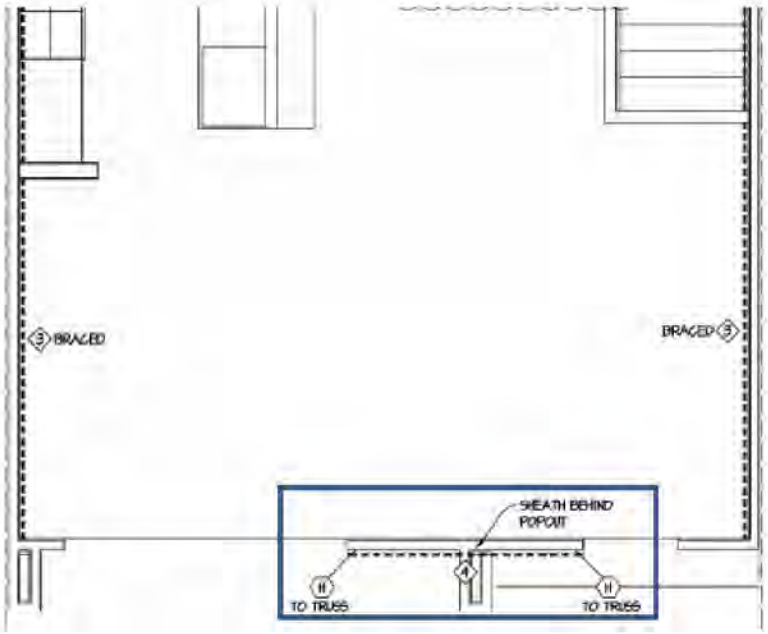
Otak, Inc., "K. Hovnanian Homes, Gallery Townhomes," revised date August 2, 2016, Sheet A3.41 "Exterior Elevations Building D, 5-Plex, Gallery Site #4," Detail 1, illustrates the following:

- *"1/A3.41 Building Type D- Front Elevation"*



Felten Group, "K. Hovnanian Homes, Subdivision Gallery," revised June 8, 2016, Sheet 3.3 "Braced/Shear Wall Plans," states the following:

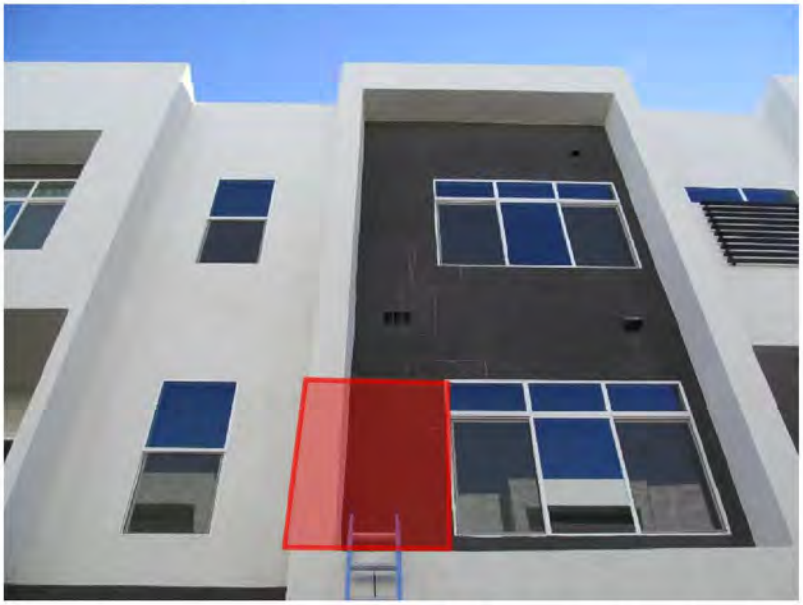
- *"31-1211, 2nd Floor, Braced/ Shear Wall Plan"*



- *"Holdown Schedule"*

H	CMSTC16 STRAP CLEAR SPAN + 38" W/ (44) 10d NAILS (3410 LBS.) OR (2) CS16 STRAPS CLEAR SPAN + 28" W/ (26) 8d NAILS EACH STRAP (3410 LBS.)

Example Photographs:



March 10, 2021, Disc IT8, Photograph 41, SSR, Building D – Unit 3111, overall view of building elevation with non-compliant LFRS. Red box outlines the approximate area within which the exterior sheathing was identified to be missing.

March 10, 2021, Disc IT8, Photograph 237, SSR, Building D – Unit 3111, missing OSB sheathing at existing stud framing.

March 10, 2021, Disc IT8, Photograph 248, SSR, Building D – Unit 3111, missing OSB sheathing at existing stud framing.

March 10, 2021, Disc IT8, Photograph 278, SSR, Building D – Unit 3111, CS-16 metal strap is disengaged and buckled.

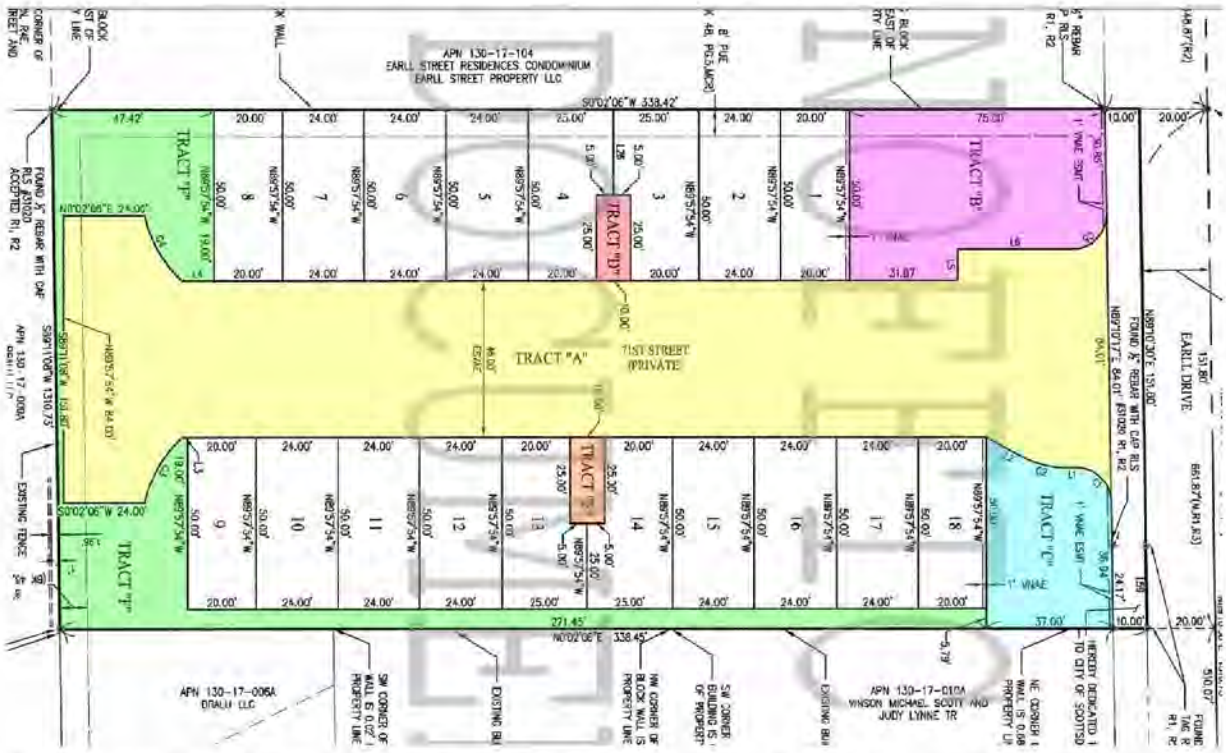
Locations:

Non-compliant LFRS was identified at Building D - Unit 3111 of the Gallery site. Refer to the attached Observation Drawings and Defect Matrix for locations and details of findings. Similar non-compliant LFRS issues will more likely than not be discovered during stucco repairs recommended in Sections C.1.b and C.1.c of this report.

B. CIVIL

1. GRADING AND DRAINAGE

Gallery is a 1.2-acre site located on the south side of the City of Scottsdale in Maricopa County, Arizona. It is bounded on the north by East Earll Drive, and on the east, south, and west by the Olene, Pearl Pegler, and Earll Street Residences Condominium subdivisions, respectively. It lies in a north-south alignment with the four residential buildings on both sides on North 71st Street. Access is on the north property boundary off East Earll Drive. There are 18 individual single-family lots on the site, and the common areas are contained within six tracts. These are identified as Tracts A through F. Tract A encompasses the private street (71st Street) and driveways, and Tracts B and C located at the north end of the site contain the Pool/Clubhouse area and drainage ponds. Tracts D and E are generally located between the buildings on each side of the street and contain the access to the stairs to the upper levels of the buildings. Tract F encompasses the south portion of the site and a strip along the east property boundary, and generally contains detention ponds at the southeast and southwest corners of the site.



Hoskin Ryan Consultants, Inc., "Final Plat for "The Gallery"," June 24, 2016, excerpt from Sheet 3 of 4. The tracts have been colored for clarity, and north is to the right of the illustration.

According to the Dedication on page 1 of the plat, Tracts A through F are to be maintained by the Association, and accordingly Notes 1 and 3 of that Dedication state the following:

- *"1. Tracts 'A' - 'F' shall be owned and maintained by the Gallery Homeowners' Association.*

  3. A perpetual, non-exclusive drainage easement (D.E.) for the purposes of construction, operation, replacement, and repair of levies, dikes, channels, and other works of drainage or

flood control in and over a portion of the areas designated as such hereon an easement upon, over, and across real property described hereon. Maintenance shall be the responsibility of the individual owner of the lot or tract where the easement is located hereon."

As stated in the "Preliminary Drainage Design Report for 71st Street & Earll Drive," prepared by Hoskin Ryan Consultants, Inc., dated November 17, 2015, per FEMA Flood Insurance Rate Map number 04013C2235L, the site is located in flood zone X. This is defined as areas of 0.2-percent annual chance flood. This is consistent with the information provided by the FEMA Map Service Center's website (https://msc.fema.gov/portal/home). The Drainage Design Report also stated that on-site storage is typically required for the 100-year 2-hour rainfall event; however, a waiver was obtained, and the constructed storm drainage system discharges directly into the existing 90-inch storm drain in East Earll Street. Lower detention volumes are provided in the detention basins.

a. Drainage Bounded by Concrete Flatwork

Proper grading and dispersal of runoff and other collected flows around the perimeter of a building is important in minimizing the amount of water that infiltrates into the soil adjacent to its foundation and, subsequently, under the foundation elements and the building itself. Building codes and the industry over the last 50 years define a protective/backfill zone around a building's perimeter as the first 6- to 10-feet away from the structure. This backfill zone is well defined in engineering and construction literature beginning as early as 1973. The US Department of Housing and Urban Development (HUD) Land Planning Data Sheet Handbook 4140.3 is one of the publications that first defined many of the concepts associated with site grading. These grading concepts include lot types (A, B, and C), block and lot grading, and protective slopes. Additionally, Handbook 4140.3, within the section titled "Block and Lot Drainage," defines the areas within the backfill zone of a building's foundation as foundation protective zones. It states that their purpose is to drain roof water and other surface water away from all building walls and backfilled areas.

These protective zone areas are subject to stringent requirements set by building codes, site-specific geotechnical reports, and industry standards. The purpose of these protective zone requirements is to minimize the impact of water on a building's foundation elements by ensuring that adequate drainage is provided in this area so that any roof runoff and surface water that collects next to the building is efficiently and rapidly directed away. Rapid removal of water in this area minimizes the potential for infiltration into the backfill adjacent to the foundation elements. Water that infiltrates into the protective zone soil causes damage in several ways, including increased hydrostatic pressure that may exceed the design capacity of foundation walls and settlement of the backfill soil, resulting in vertical movement of adjacent slab-on-ground concrete flatwork.

Infiltration of water into the soil in the protective zone is increased when no means are provided to allow water (concentrated and non-concentrated runoff flows) to cross bounding structures such as concrete flatwork. This increased infiltration affects the performance of the flatwork and the structure's foundation systems, and water that is permitted to pond within the protective zone (either during or post-construction) can

result in significantly higher soil movements than anticipated in the design. At the Gallery site, there are unpaved areas next to the buildings at the front elevations where the grading is such that the ground surface is below the concrete flatwork (sidewalks and driveways). This condition creates bounded conditions because the concrete prevents positive drainage away from the foundations. Because the ground surface is lower than the flatwork, water ponds to depths up to several inches in the protective zone. Both the geotechnical report and the structural drawings provide recommendations to not allow ponding of water next to the post-tensioned slab-on-ground foundations of the buildings because of the potential for adverse effects due to the collapsible soils, and this is violated by the condition where concrete flatwork impounds roof and surface flows next to the foundations. The Protex report specifically identified these bounded areas as *"undrained landscape islands"* that must be avoided. In addition to the rainfall runoff, the condensate from the roof-mounted AC units is also captured in the roof drains and routed to the undrained islands. This creates ongoing conditions of high moisture content in the soil adjacent to the buildings.

As noted above, SBSA reviewed the Natural Resources Conservation Service Web Soil Survey (WSS) for the site and the existing Mohall Loam has a somewhat limited rating for construction of buildings without basement due to its shrink-swell potential. Therefore, minimizing the quantity of water trapped next to the foundations is an important consideration in maintaining the performance of the buildings and site elements.

At the Gallery site, the drainage bounded by the concrete flatwork creates a condition where large quantities of water are able to infiltrate into the bearing soils below the foundations, sidewalks, and driveways. This condition constitutes a deficiency that directly violates the requirements of the site-specific geotechnical report and impairs the functionality of the site to direct drainage flows away from the structures. Without the necessary repairs, it is reasonable to assume that this condition will impair the bearing capacity of soils below the buildings' post tension slabs on grade, resulting in a loss of structural integrity of the slabs and the supported building elements.

Where drainage is bounded by concrete flatwork, the as-built condition falls short of the prescriptive requirements of the relevant codes, design, and industry standards and, therefore, the developer, contractor, and subcontractors who performed the work fell below the standard of care.

Applicable Code/Industry Standard References/Project-Specific Documents:

Protex, "Geotech Investigation 71st and Earll," March 18, 2015, states the following:

- *"3.0 GENERAL SITE CONDITIONS*

  3.2 Potential for Soil Hydro-Collapse (Settlement Potential)

  Laboratory tests and Blow Counts (N-values) indicate the subsurface soils are loose/soft and susceptible to hydro-collapse at the anticipated foundation load of 1500psf (See the attached laboratory test results and boring logs). The potential for hydro-consolidation of the subsurface soils, can be mitigated. Foundation bearing soils should be over-excavated and re-compacted. (See Section 5.0 – Site Preparation)."

- *"4.4 Drainage*

  Establishment and long term maintenance of proper lot post-construction surface drainage is critical. Because of the potential for an adverse effect on structures, it is highly recommended that structural foundation/floor slab bearing soils not be exposed to moisture infiltration or fluctuations. Roof runoff should be collected and discharged away from the house structures. Drainage of surface water away from the structures should be provided during construction and maintained by the homeowner throughout the life of the structure. In no case should long-term ponding be allowed near house structures. IRC Section R401.3 specifically requires "The grade away from the foundation walls shall fall a minimum of 6 inches within the first 10 feet. Where lot lines, walls, slopes or other physical barriers prohibit 6 inches of fall within 10 feet, drains or swales shall be provided to ensure drainage away from the house structure". Thus, un-drained landscape "islands" bounded by concrete flatwork and/or foundation wall/slab elements are to be avoided.

  Drainage and moisture infiltration should be considered during landscaping design and placement to ensure foundation and slab bearing soils are not exposed to moisture infiltration or moisture content fluctuation. Distance from house structures to vegetative plants, planters, irrigation lines or landscape borders should not be less than 3 feet. Trees should be placed at a distance of 8 feet or more. Landscape irrigation schedules should be adjusted for climatic changes to minimize moisture content fluctuation of foundation bearing soils."

Felten Group, "K. Hovnanian Homes, Subdivision Gallery," revised June 8, 2016, Sheet Number GSN "General Structural Notes," states the following:

- *"Grading and Drainage*

  1. Grading and drainage shall be constructed to the stricter requirements of the site specific soils report or those listed below.

  2. The grade away from foundation walls shall fall a minimum of 6 inches within the first 10 feet. Where lot lines, walls, slopes or other physical barriers prohibit 6 inches of fall within 10 feet, drains or swales shall be provided to ensure drainage away from the structure.

  3. Storm water shall be drained away from the structure through proper grading and drainage.

  4. In areas where expansive or collapsible soils are known to exist, all dwellings shall have a controlled method of water disposal from roofs that will collect and discharge all roof drainage to the ground surface at least 5 feet from foundation walls or to an approved drainage system.

  5. Proper grading shall be provided during construction as well as throughout the life of the structure.

  6. Landscape watering should not lead to moisture infiltration or moisture content fluctuation in the soils under the foundation. It is recommended that vegetation be kept a minimum of 3 feet from the structure and that the vegetation be desert type. (Shallow watering, moisture not to penetrate into the soil more than 8 inches.)

  7. It is recommended that trees be kept away from the structure such that the drip line of the mature tree does not overlap the foundation."

International Code Council, Inc. (ICC), "International Residential Code for One- and Two- Family Dwellings (IRC)," 2012, Chapter 4 "Foundations," Section R401 "General," states the following:

- *"**R401.3 Drainage.***

  Surface drainage shall be diverted to a storm sewer conveyance or other approved point of collection that does not create a hazard. Lots shall be graded to drain surface water away from foundation walls. The grade shall fall a minimum of 6 inches (152 mm) within the first 10 feet (3048 mm).

  Exception: Where lot lines, walls, slopes or other physical barriers prohibit 6 inches (152 mm) of fall within 10 feet (3048 mm), drains or swales shall be constructed to ensure drainage away from the structure. Impervious surfaces within 10 feet (3048 mm) of the building foundation shall be sloped a minimum of 2 percent away from the building."

Arizona Registrar of Contractors, "Workmanship Standards for Licensed Contractors," June 2009, Section "Site Work," states the following:

- *"1. PD Settling of ground around foundations, filled areas and trenches.*

  AT Excessively settled areas are unacceptable. Evaluation must be made on a case-by-case basis. The contractor should not be required to correct conditions caused by owner or landscapers not under the control of the contractor.

  CR The contractor should upon notification of this condition, fill and compact the affected area taking care to maintain the proper slope and drainage.

- *2. PD Excessive settlement or cracking of floors, slabs, walks, drives or stems due to improper compaction of the subsurface and/or improper compaction of trenches.*

  AT None.

  CR Contractor should make necessary repairs.

- *3. PD Excessive cracking due to expansive soils.*

  AT None. Soil conditions are known or should be known to the contractor prior to construction. The technology is available and a state of the art exists to avoid problems arising from expansive soil.

  CR Contractor should make necessary repairs.

- *4. PD Improper drainage of site.*

  AT None - Grades should be established to insure proper drainage away from the structure. No standing water should remain in the yard more than 48 hours after a rain, unless requirements specify retention of storm water in yard. If a sump pump is included in the contract, all water should drain to the sump.

  CR The contractor should correct deviations from the established grades, but is not responsible for conditions caused by others not under the contractor's control."

Arizona Registrar of Contractors, "Workmanship Standards for Licensed Contractors," June 2009, Section "Concrete," states the following:

- *"Settling or heaving of soils under concrete caused by alteration of grades by owner or owner's agent, which create excessive ponding or moisture adjacent to concrete foundations, walks, drives, slabs, or patios, should not be considered the contractor's responsibility providing the contractor has met all the conditions called for in the contract, plans, specifications, and all code requirements.*

  The contractor should be responsible to correct or ensure correction of settling or heaving if compaction is not according to the licensed soils engineer's report or if no alterations have been made by owner or owner's agent.

  All concrete should be placed in compliance with applicable codes and standards. This will apply to design strengths, testing, dimensions, frost lines, and reinforcement along with items not specifically contained in the codes, such as proper placement in a good and workmanlike manner to achieve appearance and function of the finished product."

Arizona Geological Survey, "A Home Buyer's Guide to Geologic Hazards in Arizona," Down-To-Earth 13, 2002, Section "Problem Soils," subsection "Dealing With Expansive Soil," states the following:

- *"Because expansive soils swell with increased moisture, drainage should be controlled to divert water away from the structure. Poor drainage can result in ponding of water, which allows clays to absorb water, expand, and cause problems. Rain gutter downspouts should direct water away from buildings to prevent infiltration near the foundation."*

U.S. Department of Housing and Urban Development, HUD 4910.1 "Minimum Property Standards for Housing," 1994 Edition, Chapter 6 "Construction," Section 602 "Site," Subsection 602-2 "Roads and Walks," subsection 602-2.2 "Drainage," states the following:

- *"Adequate surface and underground drainage systems shall serve all paving and improvements so as to ensure continuing stable soil support for these improvements."*

Code of Federal Regulations, "Title 24 Housing and Urban Development," April 1, 2012, Subtitle B, Chapter II, Subchapter A, Part 200 "Introduction to FHA Programs," Subpart S "Minimum Property Standards," § 200.926d "Construction requirements," (b), states the following:

- *"(3) Site conditions. (i) The property shall be free of those foreseeable hazards and adverse conditions which may affect the health and safety of occupants or the structural soundness of the improvements, or which may impair the customary use and enjoyment of the property. The hazards include toxic chemicals, radioactive materials, other pollution, hazardous activities, potential damage from soil or other differential ground movements, ground water, inadequate surface drainage, flood, erosion, or other hazards located on or off site."*

U.S. Department of Transportation, Federal Highway Administration (FHWA), "Designing Sidewalks and Trails for Access, Part I of II: Review of Existing Guidelines and Practices," July 1999, Chapter 4 "Sidewalk Design Guidelines and Existing Practices," Section 4.4 "Sidewalk Elements," subsection 4.4.12 "Drainage," states the following:

- *"Sidewalks and sidewalk elements, such as curb ramps and driveway crossings, must be designed to provide efficient drainage as well as good access. Sidewalks provide the main conduit for draining the walking surface, adjacent properties, and, in some cases, the roadway. Sidewalks with poor drainage can accumulate precipitation that is not only a nuisance but might impede access or endanger the health, safety, and welfare of all pedestrians. For example, poorly drained sidewalks in cold climates can freeze over with ice and cause a hazard for pedestrians. Poorly drained sidewalks also permit the accumulation of silt and debris, further impeding access."*

U.S. Department of Transportation, Federal Highway Administration (FHWA), "Designing Sidewalks and Trails for Access, Part II of II: Best Practices Design Guide," September 2001, Chapter 4 "Sidewalk Corridors," Section 4.3 "Sidewalk Surfaces," subsection 4.3.1 "Surface Material," subsection 4.3.1.3 "Wet or icy surfaces," states the following:

- *"Slip resistant surfaces are more difficult to achieve when the sidewalk material is wet or icy. Surfaces that are wet or icy are difficult for all pedestrians to travel across, but they are especially difficult for people who use wheelchairs or walking aids. Crutch users, for example, rely on being able to securely plant their crutch tip to travel effectively on the sidewalk. If the surface is icy, it creates a major safety problem.*

  Solutions for preventing water and ice from collecting on the sidewalk include:

  SOLUTION 1 - Design the sidewalk so that only water that falls directly onto the sidewalk and not water that falls onto adjacent surfaces requires management;

  SOLUTION 2 - Create drainage systems to prevent water from settling on the sidewalk; or

  SOLUTION 3 - Establish a regular maintenance program to remove snow and add salt or sand to slippery sidewalk areas."

U.S. Department of Housing and Urban Development, "Residential Rehabilitation Inspection Guide," February 2000, Chapter 1 "Site," Section 1.1 "Drainage," states the following:

- *"Because downspouts create concentrated sources of water in the landscape, where they discharge is important. Down-spouts should not discharge where water will flow directly on or over a walk, drive, or stairs."*

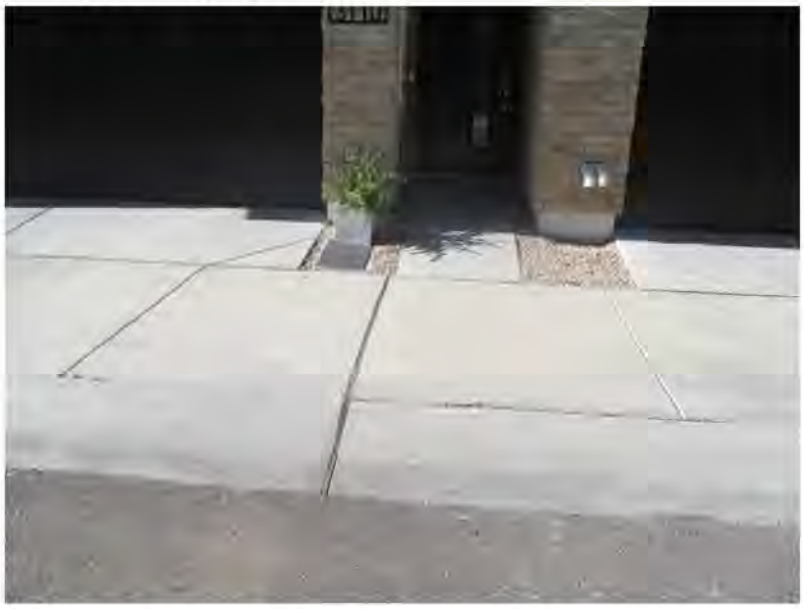
U.S. Department of Housing and Urban Development, "Residential Rehabilitation Inspection Guide," February 2000, Chapter 2 "Building Exterior," Section 2.8 "Gutters and Downspouts," states the following:

- *"For roofs with gutters, make sure that downspouts are clear and that they discharge so water will drain away from the foundation."*

American Concrete Institute (ACI), ACI 332R-84 "Guide to Residential Cast-in-Place Concrete Construction," 1999, Chapter 9 "Concrete slab construction," Section 9.1 "Quality assurance," subsection 9.1.2 "Cracking," states the following:

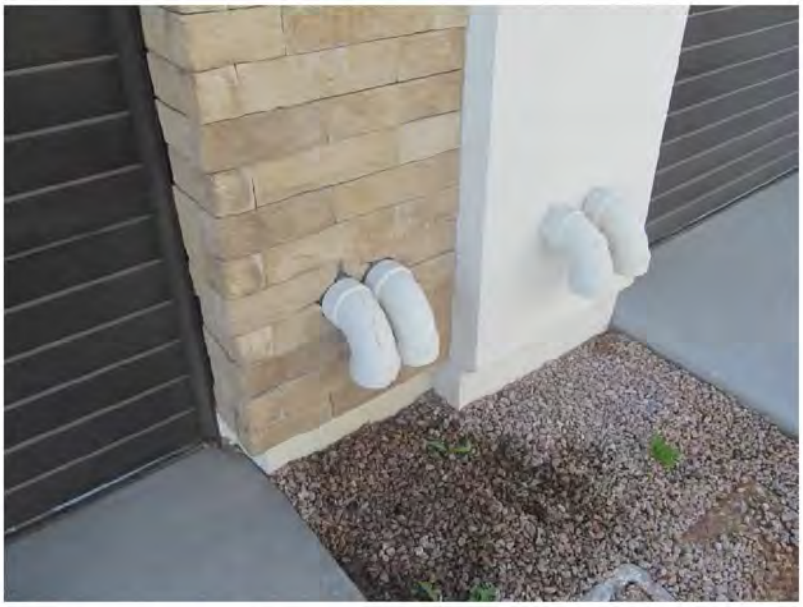
- *"Cracks may be caused by settlement, soil expansion, concentrated loading, penetrations, uneven drying shrinkage between top and bottom, or restraint to drying shrinkage or temperature changes. Settlement cracks can often be prevented by proper preparation of the sub-grade. Cracks from expanding soil can often be prevented by protecting the sub-grade from absorbing water, including either water that can be drawn out of fresh concrete by the soil or rainwater that can collect beneath the slab and be absorbed by the soil."*

Example Photographs:



December 19, 2018, Disc OBS1, Photograph 154, JBF, east elevation of Building B, undrained landscaped islands next to foundation are bounded by concrete flatwork. Roof drains discharge into this area also.

December 19, 2018, Disc OBS1, Photograph 157, JBF, east elevation of Building A, undrained landscaped islands next to foundation are bounded by concrete flatwork. Roof drains discharge into this area also and flow into the electrical vault.



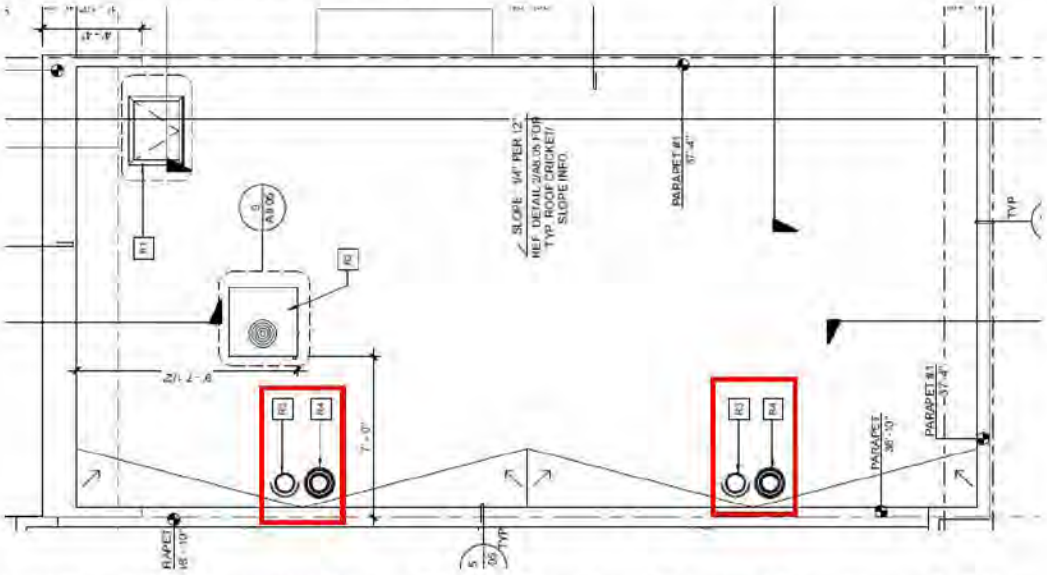
December 19, 2018, Disc OBS1, Photograph 52, JBF, Building C, condensate from high efficiency units drain water adjacent to foundation bound by concrete flatwork into the electrical vault.

Locations:

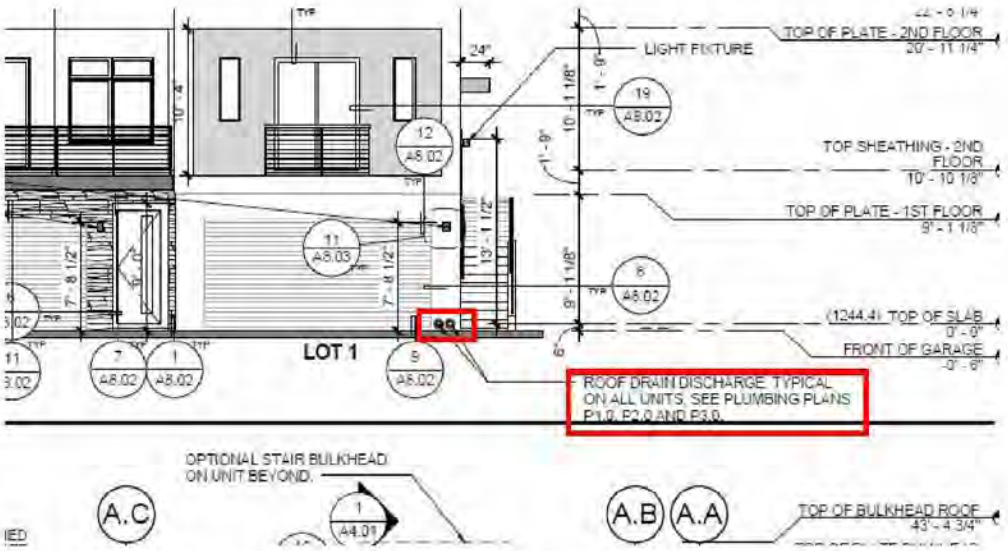
Drainage bounded by concrete flatwork exists across the Gallery site. Refer to the attached Observation Drawings and Defect Matrix for locations and details of findings.

b. Non-Compliant Management of Concentrated Flows

The buildings are constructed with low-sloped roofs and parapet walls, and rooftop drainage is collected in roof drains and overflow roof drains that terminate directly above grade and discharge into the undrained landscaped islands described above. Ultimately, the intent of the site drainage system was to direct the water into the drainage basins located on the north and south sides of the property. This method of managing the rooftop drainage is consistent with the architectural drawings prepared by Otak that depict the following:



Otak, Inc., "K. Hovnanian Homes, Gallery Townhomes," revised date August 2, 2016, 30-1210 3rd & Roof Plans, Sheet A5.12, showing locations of main and overflow roof drains.



Otak, Inc., "K. Hovnanian Homes, Gallery Townhomes," revised date August 2, 2016, Exterior Elevations Building A, 3-Plex, Gallery Site #1, Sheet A3.11, showing roof drain and overflow discharging into undrained islands.

As discussed above regarding the foundation protective zone, and in consideration of the Protex warning to not allow water to pond near the foundation because of the collapsible soils, the quantity of water that infiltrates into the soil in the protective zone is increased when no means are provided to allow water (concentrated and non-concentrated runoff flows) to cross bounding structures such as concrete flatwork. This increased infiltration affects the performance of the flatwork and the structure's foundation systems, and water that is permitted to pond within the protective zone (either during or post-construction) can result in significantly higher soil movements than anticipated in the design.

At the Gallery site, the discharge of roof drainage directly into the undrained areas creates a condition where large quantities of water are able to infiltrate into the bearing soils below the foundations, sidewalks, and driveways. This condition constitutes a deficiency that directly violates the requirements of the site-specific geotechnical report and impairs the functionality of the site to direct drainage flows away from the structures. Without the necessary repairs, it is reasonable to assume that this condition will impair the bearing capacity of soils below the buildings' post-tensioned slabs-on-ground, resulting in a loss of structural integrity of the slabs, the supported building elements in the foreseeable future.

Drainage conveyance structures are required at locations where these concentrated roof flows are discharged in the unpaved, undrained islands behind the sidewalks. Such devices would allow concentrated flows to drain from one side of the concrete flatwork to the other in a manner that avoids water crossing over sidewalks and other pedestrian access routes. Examples of drainage conveyances include sidewalk chase drains, trench drains, culverts, curb cuts, and area drains connected to underground storm drains. Drainage conveyance structures were not installed at any locations at the Gallery site.

Where concentrated flows discharge into the undrained islands and over sidewalks, the as-built condition falls short of the prescriptive requirements of the relevant codes, design, and industry standards, and, therefore, the developer, contractor, and subcontractors who performed the work fell below the standard of care.

Applicable Code/Industry Standard References/Project-Specific Documents:

Protex, "Geotech Investigation 71st and Earll," March 18, 2015, states the following:

- *"3.0 GENERAL SITE CONDITIONS*

  3.2 Potential for Soil Hydro-Collapse (Settlement Potential)

  Laboratory tests and Blow Counts (N-values) indicate the subsurface soils are loose/soft and susceptible to hydro-collapse at the anticipated foundation load of 1500psf (See the attached laboratory test results and boring logs). The potential for hydro-consolidation of the subsurface soils, can be mitigated. Foundation bearing soils should be over-excavated and re-compacted. (See Section 5.0 – Site Preparation).

  4.4 Drainage

  Establishment and long term maintenance of proper lot post-construction surface drainage is critical. Because of the potential for an adverse effect on structures, it is highly recommended that structural foundation/floor slab bearing soils not be exposed to moisture infiltration or fluctuations. Roof runoff should be collected and discharged away from the house structures. Drainage of surface water away from the structures should be provided during construction and maintained by the homeowner throughout the life of the structure. In no case should long-term ponding be allowed near house structures. IRC Section R401.3 specifically requires "The grade away from the foundation walls shall fall a minimum of 6 inches within the first 10 feet. Where lot lines, walls, slopes or other physical barriers prohibit 6 inches of fall within 10 feet, drains or swales shall be provided to ensure drainage away from the house structure". Thus, un-drained landscape "islands" bounded by concrete flatwork and/or foundation wall/slab elements are to be avoided.

  Drainage and moisture infiltration should be considered during landscaping design and placement to ensure foundation and slab bearing soils are not exposed to moisture infiltration or moisture content fluctuation. Distance from house structures to vegetative plants, planters, irrigation lines or landscape borders should not be less than 3 feet. Trees should be placed at a distance of 8 feet or more. Landscape irrigation schedules should be adjusted for climatic changes to minimize moisture content fluctuation of foundation bearing soils."

  Felten Group, "K. Hovnanian Homes, Subdivision Gallery," revised June 8, 2016, Sheet Number GSN "General Structural Notes," states the following:

  - *"Grading and Drainage*

    1. Grading and drainage shall be constructed to the stricter requirements of the site specific soils report or those listed below.

    2. The grade away from foundation walls shall fall a minimum of 6 inches within the first 10 feet. Where lot lines, walls, slopes or other physical barriers prohibit 6 inches of fall within 10 feet, drains or swales shall be provided to ensure drainage away from the structure.

3. Storm water shall be drained away from the structure through proper grading and drainage.

4. In areas where expansive or collapsible soils are known to exist, all dwellings shall have a controlled method of water disposal from roofs that will collect and discharge all roof drainage to the ground surface at least 5 feet from foundation walls or to an approved drainage system.

5. Proper grading shall be provided during construction as well as throughout the life of the structure.

6. Landscape watering should not lead to moisture infiltration or moisture content fluctuation in the soils under the foundation. It is recommended that vegetation be kept a minimum of 3 feet from the structure and that the vegetation be desert type. (Shallow watering, moisture not to penetrate into the soil more than 8 inches.)

7. It is recommended that trees be kept away from the structure such that the drip line of the mature tree does not overlap the foundation."

International Code Council, Inc. (ICC), "International Residential Code for One- and Two-Family Dwellings (IRC)," 2012, Chapter 4 "Foundations," Section R401 "General," states the following:

- *"**R401.3 Drainage.***

  Surface drainage shall be diverted to a storm sewer conveyance or other approved point of collection that does not create a hazard. Lots shall be graded to drain surface water away from foundation walls. The grade shall fall a minimum of 6 inches (152 mm) within the first 10 feet (3048 mm).

  Exception: Where lot lines, walls, slopes or other physical barriers prohibit 6 inches (152 mm) of fall within 10 feet (3048 mm), drains or swales shall be constructed to ensure drainage away from the structure. Impervious surfaces within 10 feet (3048 mm) of the building foundation shall be sloped a minimum of 2 percent away from the building."

Arizona Registrar of Contractors, "Workmanship Standards for Licensed Contractors," June 2009, Section "Site Work," states the following:

- *"1. PD Settling of ground around foundations, filled areas and trenches.*

  AT Excessively settled areas are unacceptable. Evaluation must be made on a case-by-case basis. The contractor should not be required to correct conditions caused by owner or landscapers not under the control of the contractor.

  CR The contractor should upon notification of this condition, fill and compact the affected area taking care to maintain the proper slope and drainage.

- *2. PD Excessive settlement or cracking of floors, slabs, walks, drives or stems due to improper compaction of the subsurface and/or improper compaction of trenches.*

  AT None.

  CR Contractor should make necessary repairs.

- *3. PD Excessive cracking due to expansive soils.*

AT None. Soil conditions are known or should be known to the contractor prior to construction. The technology is available and a state of the art exists to avoid problems arising from expansive soil.

CR Contractor should make necessary repairs.

- *4. PD Improper drainage of site.*

  AT None - Grades should be established to insure proper drainage away from the structure. No standing water should remain in the yard more than 48 hours after a rain, unless requirements specify retention of storm water in yard. If a sump pump is included in the contract, all water should drain to the sump.

  CR The contractor should correct deviations from the established grades, but is not responsible for conditions caused by others not under the contractor's control."

Arizona Registrar of Contractors, "Workmanship Standards for Licensed Contractors," June 2009, Section "Concrete," states the following:

- *"Settling or heaving of soils under concrete caused by alteration of grades by owner or owner's agent, which create excessive ponding or moisture adjacent to concrete foundations, walks, drives, slabs, or patios, should not be considered the contractor's responsibility providing the contractor has met all the conditions called for in the contract, plans, specifications, and all code requirements.*

  The contractor should be responsible to correct or ensure correction of settling or heaving if compaction is not according to the licensed soils engineer's report or if no alterations have been made by owner or owner's agent.

  All concrete should be placed in compliance with applicable codes and standards. This will apply to design strengths, testing, dimensions, frost lines, and reinforcement along with items not specifically contained in the codes, such as proper placement in a good and workmanlike manner to achieve appearance and function of the finished product."

Arizona Geological Survey, "A Home Buyer's Guide to Geologic Hazards in Arizona," Down-To-Earth 13, 2002, Section "Problem Soils," subsection "How Can Soil Cause Problems," states the following:

- *"Damage to structures in Arizona is commonly related to soil characteristics, with expansive (shrink/swell) soils and collapsing soils causing the most problems. Cracking of foundations, walls, driveways, swimming pools, and roads costs millions of dollars each year in repairs. Severe or recurring damage can lower the value of a house or property."*

Arizona Geological Survey, "A Home Buyer's Guide to Geologic Hazards in Arizona," Down-To-Earth 13, 2002, Section "Problem Soils," subsection "Dealing With Expansive Soil," states the following:

- *"Because expansive soils swell with increased moisture, drainage should be controlled to divert water away from the structure. Poor drainage can result in ponding of water, which allows clays to absorb water, expand, and cause problems. Rain gutter downspouts should direct water away from buildings to prevent infiltration near the foundation."*

U.S. Department of Housing and Urban Development, HUD 4910.1 "Minimum Property Standards for Housing," 1994 Edition, Chapter 6 "Construction," Section 602 "Site," Subsection 602-2 "Roads and Walks," subsection 602-2.2 "Drainage," states the following:

- *"Adequate surface and underground drainage systems shall serve all paving and improvements so as to ensure continuing stable soil support for these improvements."*

Code of Federal Regulations, "Title 24 Housing and Urban Development," April 1, 2012, Subtitle B, Chapter II, Subchapter A, Part 200 "Introduction to FHA Programs," Subpart S "Minimum Property Standards," § 200.926d "Construction requirements," (b), states the following:

- *"(3) Site conditions. (i) The property shall be free of those foreseeable hazards and adverse conditions which may affect the health and safety of occupants or the structural soundness of the improvements, or which may impair the customary use and enjoyment of the property. The hazards include toxic chemicals, radioactive materials, other pollution, hazardous activities, potential damage from soil or other differential ground movements, ground water, inadequate surface drainage, flood, erosion, or other hazards located on or off site."*

U.S. Department of Transportation, Federal Highway Administration (FHWA), "Designing Sidewalks and Trails for Access, Part I of II: Review of Existing Guidelines and Practices," July 1999, Chapter 4 "Sidewalk Design Guidelines and Existing Practices," Section 4.4 "Sidewalk Elements," subsection 4.4.12 "Drainage," states the following:

- *"Sidewalks and sidewalk elements, such as curb ramps and driveway crossings, must be designed to provide efficient drainage as well as good access. Sidewalks provide the main conduit for draining the walking surface, adjacent properties, and, in some cases, the roadway. Sidewalks with poor drainage can accumulate precipitation that is not only a nuisance but might impede access or endanger the health, safety, and welfare of all pedestrians. For example, poorly drained sidewalks in cold climates can freeze over with ice and cause a hazard for pedestrians. Poorly drained sidewalks also permit the accumulation of silt and debris, further impeding access."*

U.S. Department of Transportation, Federal Highway Administration (FHWA), "Designing Sidewalks and Trails for Access, Part II of II: Best Practices Design Guide," September 2001, Chapter 4 "Sidewalk Corridors," Section 4.3 "Sidewalk Surfaces," subsection 4.3.1 "Surface Material," subsection 4.3.1.3 "Wet or icy surfaces," states the following:

- *"Slip resistant surfaces are more difficult to achieve when the sidewalk material is wet or icy. Surfaces that are wet or icy are difficult for all pedestrians to travel across, but they are especially difficult for people who use wheelchairs or walking aids. Crutch users, for example, rely on being able to securely plant their crutch tip to travel effectively on the sidewalk. If the surface is icy, it creates a major safety problem.*

  Solutions for preventing water and ice from collecting on the sidewalk include:

SOLUTION 1 - Design the sidewalk so that only water that falls directly onto the sidewalk and not water that falls onto adjacent surfaces requires management;

SOLUTION 2 - Create drainage systems to prevent water from settling on the sidewalk; or

SOLUTION 3 - Establish a regular maintenance program to remove snow and add salt or sand to slippery sidewalk areas."

U.S. Department of Housing and Urban Development, "Residential Rehabilitation Inspection Guide," February 2000, Chapter 1 "Site," Section 1.1 "Drainage," states the following:

- *"Because downspouts create concentrated sources of water in the landscape, where they discharge is important. Down-spouts should not discharge where water will flow directly on or over a walk, drive, or stairs."*

U.S. Department of Housing and Urban Development, "Residential Rehabilitation Inspection Guide," February 2000, Chapter 2 "Building Exterior," Section 2.8 "Gutters and Downspouts," states the following:

- *"For roofs with gutters, make sure that downspouts are clear and that they discharge so water will drain away from the foundation."*

American Concrete Institute (ACI), ACI 332R-84 "Guide to Residential Cast-in-Place Concrete Construction," 1999, Chapter 9 "Concrete slab construction," Section 9.1 "Quality assurance," subsection 9.1.2 "Cracking," states the following:

- *"Cracks may be caused by settlement, soil expansion, concentrated loading, penetrations, uneven drying shrinkage between top and bottom, or restraint to drying shrinkage or temperature changes. Settlement cracks can often be prevented by proper preparation of the sub-grade. Cracks from expanding soil can often be prevented by protecting the sub-grade from absorbing water, including either water that can be drawn out of fresh concrete by the soil or rainwater that can collect beneath the slab and be absorbed by the soil."*

Example Photographs:

March 10, 2021, Disc OBS5, Photograph 61, SSR, Building B, east side, roof drains discharge into undrained landscaped islands next to foundation at multiple locations.

March 10, 2021, Disc OBS5, Photograph 107, SSR, Building B, east side, main and overflow roof drains discharge into undrained landscaped islands next to foundation between entrance to unit and driveway.

December 19, 2018, Disc OBS1, Photograph 52, JBF, Building C, roof drains from adjacent units discharge into undrained island area.

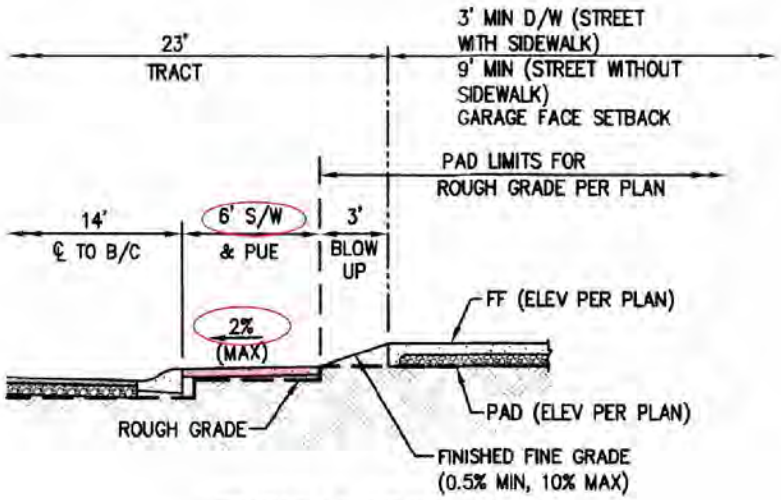
Locations:
Non-compliant management of concentrated flows exists across the Gallery site. Refer to the attached Observation Drawings and Defect Matrix for locations and details of findings.

2. CONCRETE FLATWORK

The concrete flatwork constructed on this site provides egress, building access, roadway drainage conveyance, and pedestrian walkways. The flatwork provides this function through geometric considerations and durability. The connection of the roadway, curbs, walkways, and driveway aprons creates a unique situation where consideration must be given to the cross-slopes and longitudinal slopes, and the integrated systems must be carefully designed and coordinated to meet the specific requirements of the codes and jurisdictional standards.

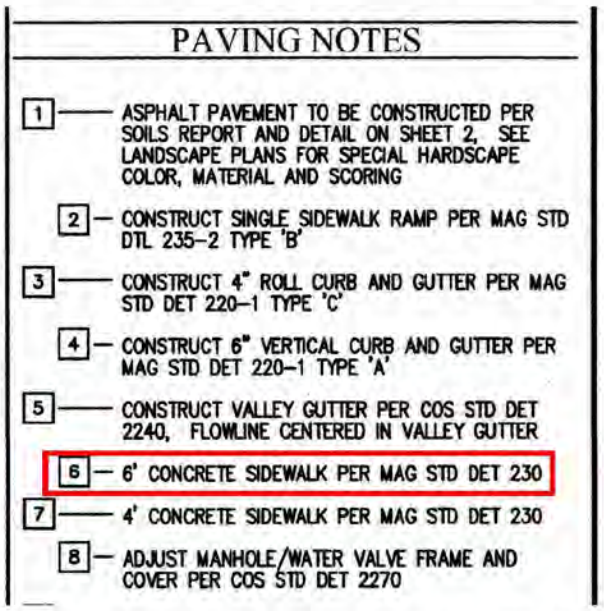
a. Non-Compliant Cross-Slope of Sidewalks

A concrete sidewalk is constructed on the west side of 71st Street in front of lots 1 – 8. Per the Hoskin Ryan Consultants "Gallery Improvement Plan" drawings, the sidewalk was required to be constructed with a maximum cross-slope of 2.0-percent versus a standard maximum slope of 1.5-percent in conformance with the Maricopa Association of Governments (MAG) Detail 230.



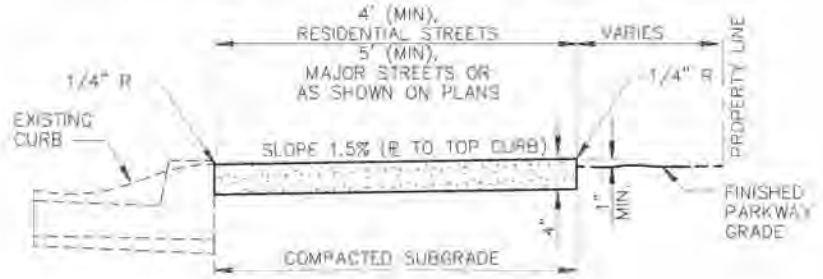
TYPICAL FRONT YARD
FINE GRADING SECTION
SCALE 1"=5'

Hoskin Ryan Consultants, Inc., "Gallery Improvement Plan," March 31, 2016, excerpt from Sheet 3 of 7, showing 6-foot-wide sidewalk to be constructed at a maximum cross-slope of 2-percent.

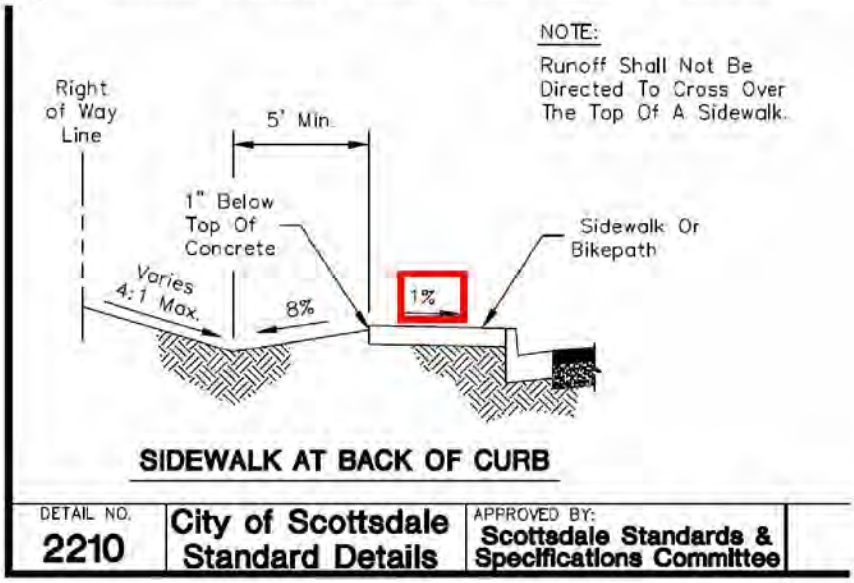


Hoskin Ryan Consultants, Inc., "Gallery Improvement Plan," March 31, 2016, excerpt from Sheet 5 of 7, showing requirement for 6-foot-wide sidewalk to be constructed per MAG Standard Detail 230.

Maricopa Association of Governments (MAG), "Uniform Standard Details for Public Works Construction," 1998 (includes Revisions Through 2006), Detail 230 "Sidewalks," illustrates the following:



City of Scottsdale Standard Details, Detail No. 2210, illustrates the following:



According to the referenced MAG Detail 230, the maximum allowable sidewalk cross-slope is limited to 1.5-percent. The applicable design codes also specify that cross-slopes on sidewalks should not exceed 2-percent, or 1/4-inch-per-foot. At some locations on the Gallery site, the cross-slopes of the sidewalks exceed 2-percent. There is generally no evidence of settlement of the sidewalks or adjacent grade, an indication that the sidewalls were originally constructed with the non-compliant cross-slopes. In addition to the north to south walkways, Tracts D and E contain stairways to provide access to the upper levels of the buildings, and 4-foot-wide sidewalks were constructed from the street to the stairs. These sidewalks were also required to be constructed per MAG Detail 230, and as measured by SBSA, the cross-slopes of this 4-foot sidewalk also exceeded the 1.5-percent maximum. In addition to the jurisdictional standards, the Otak drawings also require that the construction comply with the 2012 IRC, ICC/ANSI 11.7.1, and 2010 ADA standards.

Otak, Inc., "K. Hovnanian Homes, Gallery Townhomes," revised date August 2, 2016, Sheet A0.11 "Code Summary & Fire Life Safety Plans," depicts the following:

BUILDING CODE SUMMARY - BASED ON 2012 INTERNATIONAL RESIDENTIAL CODE (IRC)

GENERAL INFORMATION

PROJECT DESCRIPTION
THE PROPOSED PROJECT IS A COMMUNITY 19 UNIT SINGLE-FAMILY PROJECT WITH THREE BEDROOM TOWNHOME UNITS.

BUILDING CODE EDITIONS (WITH CITY OF SCOTTSDALE AMENDMENTS):
INTERNATIONAL RESIDENTIAL CODE (IRC) - 2012
INTERNATIONAL [illegible] (IRC) - 2012 *FOR USE AS REFERENCE IN THE IRC
NATIONAL ELECTRIC CODE (NEC) - 2011
INTERNATIONAL PLUMBING CODE (IPC) - 2012
INTERNATIONAL FUEL GAS CODE (IFGC) - 2012
INTERNATIONAL MECHANICAL CODE (IMC) - 2012
INTERNATIONAL ENERGY CONSERVATION CODE (IECC) - 2012
INTERNATIONAL FIRE CODE - (IFC) - 2012
[illegible]

Where sidewalk cross-slopes exceed the maximum allowable values, the as-built condition falls short of the prescriptive requirements of the relevant codes, design, and industry standards and, therefore, the developer, contractor, and subcontractors who performed the work fell below the standard of care in the construction.

Applicable Code/Industry Standard References/Project-Specific Documents:

Hoskin Ryan Consultants, Inc., "Gallery Improvement Plan," March 31, 2016, excerpt from Sheet 5 of 7, depicts the following:

PAVING NOTES

1 — ASPHALT PAVEMENT TO BE CONSTRUCTED PER SOILS REPORT AND DETAIL ON SHEET 2, SEE LANDSCAPE PLANS FOR SPECIAL HARDSCAPE COLOR, MATERIAL AND SCORING

2 — CONSTRUCT SINGLE SIDEWALK RAMP PER MAG STD DTL 235-2 TYPE 'B'

3 — CONSTRUCT 4" ROLL CURB AND GUTTER PER MAG STD DET 220-1 TYPE 'C'

4 — CONSTRUCT 6" VERTICAL CURB AND GUTTER PER MAG STD DET 220-1 TYPE 'A'

5 — CONSTRUCT VALLEY GUTTER PER COS STD DET 2240, FLOWLINE CENTERED IN VALLEY GUTTER

6 — 6' CONCRETE SIDEWALK PER MAG STD DET 230

7 — 4' CONCRETE SIDEWALK PER MAG STD DET 230

City of Scottsdale, Arizona, "City of Scottsdale Amendments To The International Building Code, 2012 Edition, Ordinance 4059," issued date December 4, 2012, Section 31-32(a) "Amendments," Chapter 11 "Accessibility," states the following:

- *"1101.2 Design*

  Buildings and facilities shall be designed and constructed to be accessible in accordance with this code and ICC A117.1, and the "Arizonans with Disabilities Act" (Arizona Revised Statutes, Title 41, Chapter 9, Article 8), and the "Arizonans with Disabilities Act Implementing Rules" (Arizona Administrative Code, Title 10, Chapter 3, Article 4), which

rules incorporate the federal "2010 Americans with Disabilities Act Standards for Accessible Design," and shall apply to new construction and alterations."

U.S. Department of Housing and Urban Development (HUD), "Handbook 4145.1 REV-2 - Architectural Processing and Inspections for Home Mortgage," March 1990, Section III "Walks, Steps and Driveways," states the following:

- *"A. General. A walk and any necessary step(s) should provide safe and convenient use from house directly to the street or to a driveway connected to a street. Walk and step construction should be of durable and appropriate material, on stable, adequately drained subgrade or bed.*

  B. Walk Design.

  1) Gradient should not be steeper than 1 in 20 (5%) in areas subject to frequent freezing or 1 in 10 (10%) in other areas.

  2) Cross-slope should be adequate for immediate drainage of surface water off the walk; required walk must not be used as a drainage channel.

  3) Walk surfaces should be at or below adjacent ground elevations."

U.S. Department of Transportation, Federal Highway Administration (FHWA), "Designing Sidewalks and Trails for Access Part II of II: Best Practices Design Guide," September 2001, Chapter 4 "Sidewalk Corridors," Section 4.3 "Sidewalk Surfaces," subsection 4.3.1 "Surface material," subsection 4.3.1.3 "Wet or icy surfaces," states the following:

- *"Slip resistant surfaces are more difficult to achieve when the sidewalk material is wet or icy. Surfaces that are wet or icy are difficult for all pedestrians to travel across, but they are especially difficult for people who use wheelchairs or walking aids. Crutch users, for example, rely on being able to securely plant their crutch tip to travel effectively on the sidewalk. If the surface is icy, it creates a major safety problem.*

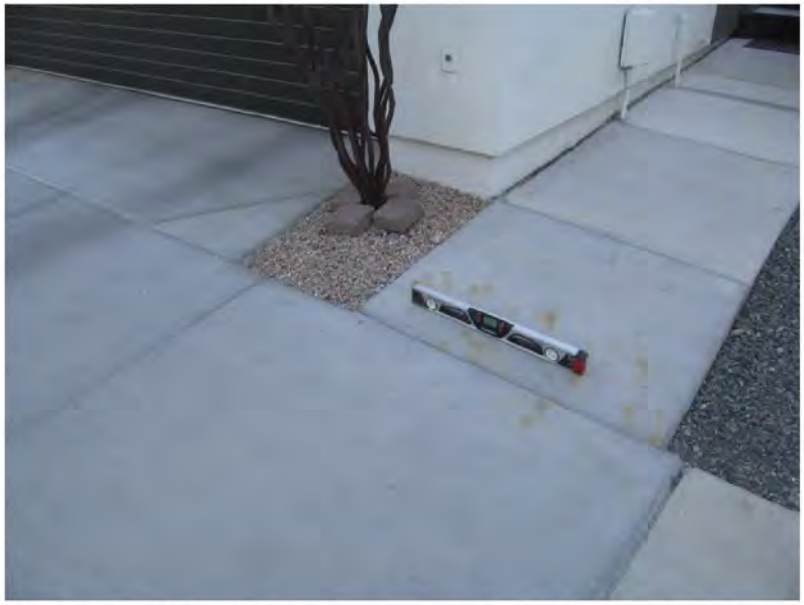
  Solutions for preventing water and ice from collecting on the sidewalk include:

  SOLUTION 1 - Design the sidewalk so that only water that falls directly onto the sidewalk and not water that falls onto adjacent surfaces requires management;

  SOLUTION 2 - Create drainage systems to prevent water from settling on the sidewalk; or

  SOLUTION 3 - Establish a regular maintenance program to remove snow and add salt or sand to slippery sidewalk areas."

Example Photographs:



March 10, 2021, Disc OBS5, Photograph 44, SSR, Building A, east side, cross-slope of sidewalk is 4.1-percent, exceeding maximum allowable of 1.5-percent per MAG Detail 230.

March 10, 2021, Disc OBS5, Photograph 114, SSR, Building B, south side, cross-slope of sidewalk is 3.0-percent, exceeding maximum allowable of 1.5-percent per MAG Detail 230.

Locations:
Non-compliant cross-slope of sidewalks exists across the Gallery site. Refer to the attached Observation Drawings and Defect Matrix for locations and details of findings.

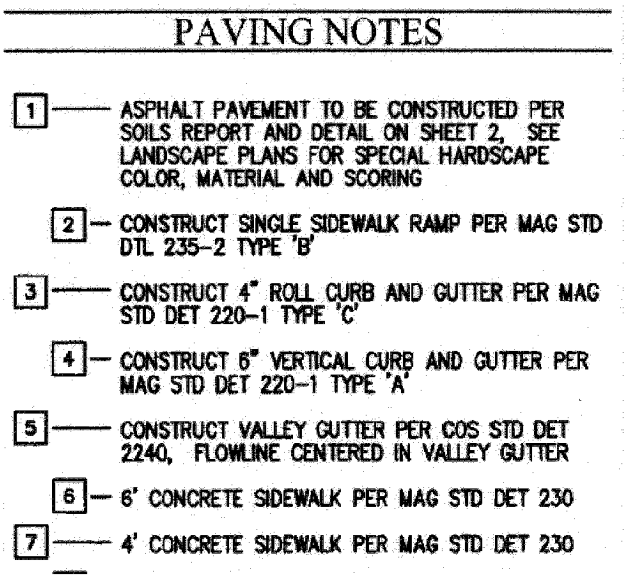
b. Non-Compliant Longitudinal Slope of Sidewalks

As noted previously, sidewalks leading to the stairways in Tracts D and E were constructed from the street to the stairs. As measured by SBSA, the longitudinal slopes of the sidewalks at some locations exceed the maximum allowable. Per ANSI A117.1 guidelines, the maximum allowable slope for a ramp that is part of an accessible route is 8.33-percent, and the slopes measured are excessive. The sidewalks as constructed exceed the allowable maximum slopes for ramps and are non-compliant both as ramps and as sidewalks. The sidewalk slopes are excessive and range from 10- to 15.5-percent and are attributable to poor construction. Where these conditions occur, complete removal and replacement with code-compliant construction is required.

Where non-compliant longitudinal slope of sidewalks occur on the site, the as-built condition falls short of the prescriptive requirements of the relevant codes, design, and industry standards and, therefore, the developer, contractor, and subcontractors who performed the work fell below the standard of care.

Applicable Code/Industry Standard References/Project-Specific Documents:

Hoskin Ryan Consultants, Inc., "Gallery Improvement Plan," March 31, 2016, excerpt from Sheet 5 of 7, depicts the following:



PAVING NOTES

1 — ASPHALT PAVEMENT TO BE CONSTRUCTED PER SOILS REPORT AND DETAIL ON SHEET 2, SEE LANDSCAPE PLANS FOR SPECIAL HARDSCAPE COLOR, MATERIAL AND SCORING

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- *"**1101.2 Design***

  Buildings and facilities shall be designed and constructed to be accessible in accordance with this code and ICC A117.1, and the "Arizonans with Disabilities Act" (Arizona Revised Statutes, Title 41, Chapter 9, Article 8), and the "Arizonans with Disabilities Act Implementing Rules" (Arizona Administrative Code, Title 10, Chapter 3, Article 4), which rules incorporate the federal "2010 Americans with Disabilities Act Standards for Accessible Design," and shall apply to new construction and alterations."

International Code Council, Inc. (ICC), "International Residential Code for One- and Two-Family Dwellings (IRC)," 2012, Chapter 3 "Building Planning," Section R311 "Means of Egress," states the following:

- *"**R311.8 Ramps**.*
  - ***R311.8.1 Maximum slope**. Ramps shall have a maximum slope of 1 unit vertical in 12 units horizontal (8.3 percent slope).*

    ***Exception**: Where it is technically infeasible to comply because of site constraints, ramps may have a maximum slope of one unit vertical in eight horizontal (12.5 percent slope)."*
  - *"**R311.8.2 Landings required**. A minimum 3-foot-by-3-foot (914 mm by 914 mm) landing shall be provided:*

    1. At the top and bottom of ramps.

    2. Where doors open onto ramps.

    3. Where ramps change direction."
  - ***"R311.8.3 Handrails required.** Handrails shall be provided on at least one side of all ramps exceeding a slope of one unit vertical in 12 units horizontal (8.33-percent slope)."*

American National Standards Institute (ANSI), A117.1-2009 "Accessible and Usable Buildings and Facilities," Approved October 20, 2010, Chapter 4 "Accessible Routes," Section 405 "Ramps," states the following:

- *"405.1 General. Ramps along accessible routes shall comply with Section 405.*

  EXCEPTION: In assembly areas, aisle ramps adjacent to seating and not serving elements required to be on an accessible route shall not be required to comply with Section 405.

  405.2 Slope. Ramp runs shall have a running slope ICCA117.1-2009

  EXCEPTION: In existing buildings or facilities, ramps shall be permitted to have slopes steeper than 1: 12 complying with Table 405.2 where such slopes are necessary due to space limitations.

  405.3 Cross Slope. Cross slope of ramp runs shall not be steeper than 1:48.

405.4 Floor Surfaces. Floor surfaces of ramp runs shall comply with Section 302.

405.5 Clear Width. The clear width of a ramp run shall be 36 inches (915 mm) minimum. Handrails and hand-I rail supports that are provided on the ramp run shall not project into the required clear width of the ramp run.

405.6 Rise. The rise for any ramp run shall be 30 inches (760 mm) maximum.

405.7 Landings. Ramps shall have landings at the bottom and top of each ramp run. Landings shall comply with Section 405.7.

- *405.7.1 Slope. Landings shall have a slope not steeper than 1 :48 and shall comply with Section 302.*
- *405.7.2 Width. Clear width of landings shall be at least as wide as the widest ramp run leading to the landing.*
- *405.7.3 Length. Landings shall have a clear length of 60 inches (1525 mm) minimum."*

U.S. Department of Housing and Urban Development (HUD), "Handbook 4145.1 REV-2 - Architectural Processing and Inspections for Home Mortgage," March 1990, Section III "Walks, Steps and Driveways," states the following:

- *"A. General. A walk and any necessary step(s) should provide safe and convenient use from house directly to the street or to a driveway connected to a street. Walk and step construction should be of durable and appropriate material, on stable, adequately drained subgrade or bed.*

  B. Walk Design.

  1) Gradient should not be steeper than 1 in 20 (5%) in areas subject to frequent freezing or 1 in 10 (10%) in other areas.

  2) Cross-slope should be adequate for immediate drainage of surface water off the walk; required walk must not be used as a drainage channel.

  3) Walk surfaces should be at or below adjacent ground elevations".

U.S. Department of Transportation, Federal Highway Administration (FHWA), "Designing Sidewalks and Trails for Access Part II of II: Best Practices Design Guide," September 2001, Chapter 4 "Sidewalk Corridors," Section 4.3 "Sidewalk Surfaces," subsection 4.3.1 "Surface material," subsection 4.3.1.3 "Wet or icy surfaces," states the following:

- *"Slip resistant surfaces are more difficult to achieve when the sidewalk material is wet or icy. Surfaces that are wet or icy are difficult for all pedestrians to travel across, but they are especially difficult for people who use wheelchairs or walking aids. Crutch users, for example, rely on being able to securely plant their crutch tip to travel effectively on the sidewalk. If the surface is icy, it creates a major safety problem.*

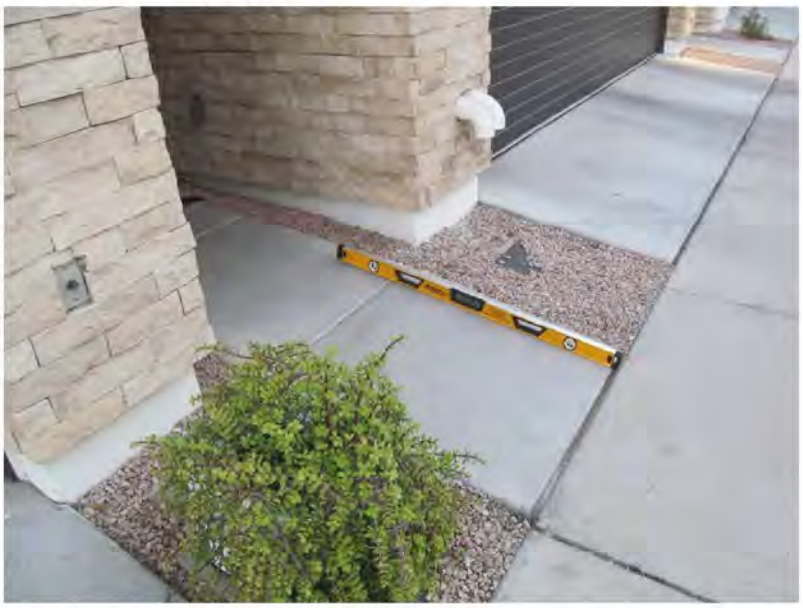
  Solutions for preventing water and ice from collecting on the sidewalk include:

  SOLUTION 1 - Design the sidewalk so that only water that falls directly onto the sidewalk and not water that falls onto adjacent surfaces requires management;

SOLUTION 2 - Create drainage systems to prevent water from settling on the sidewalk; or

SOLUTION 3 - Establish a regular maintenance program to remove snow and add salt or sand to slippery sidewalk areas."

Example Photographs:



March 10, 2021, Disc OBS5, Photograph 105, SSR, Building B, east side, longitudinal slope of sidewalk is 15.5-percent, exceeding maximum allowable of 8.33-percent for a ramp.

March 10, 2021, Disc OBS5, Photograph 108, SSR, Building B, east side, longitudinal slope of sidewalk is 11.5-percent, exceeding maximum allowable of 8.33-percent for a ramp.

March 10, 2021, Disc OBS5, Photograph 112, SSR, Building B, south side, longitudinal slope of sidewalk is 10.0-percent, exceeding maximum allowable of 8.33-percent for a ramp.

Locations:

Non-compliant longitudinal slope of sidewalks exists across the Gallery site. Refer to the attached Observation Drawings and Defect Matrix for locations and details of findings.

c. Non-Compliant Landings

Stairways are subject to strict criteria defined in the 2012 IRC. The requirements for stair risers, landings, and treads are all clearly defined in building code requirements. Stairways are constructed at the ends of each building to provide access to the upper floors of the buildings.

Landings are required to be constructed at the tops and bottoms of stairways to provide pedestrian safety by providing low-sloped, stable surfaces as pedestrians approach and depart stairways. These landings are required to be constructed with minimal slopes so as to not create a ponding hazard for pedestrians that would occur if constructed with perfectly flat grades. The 2012 IRC limits the maximum allowable slope of a landing to 2-percent in any direction and the minimum length in the direction of travel to 36-inches.

At the Gallery site, the landings at the bottoms of the stairs were constructed with slopes exceeding the 2.0-percent maximum as shown on the Civil Observation Drawings. These landings do not provide the prescriptive surface required at stairs and ramps to allow for safe usage of the sidewalk.

Where non-compliant landings occur on the site, the as-built condition falls short of the prescriptive requirements of the relevant codes, design, and industry standards and, therefore, the developer, contractor, and subcontractors who performed the work fell below the standard of care.

Applicable Code/Industry Standard References/Project-Specific Documents:

International Code Council, Inc. (ICC), "International Residential Code for One- and Two-Family Dwellings (IRC)," 2012, Chapter 1 "Administration," Section R102 "Applicability," subsection R102.1 "General," states the following:

- *"Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable."*

International Code Council, Inc. (ICC), "International Residential Code for One- and Two-Family Dwellings (IRC)," 2012, Chapter 3 "Building Planning," Section R311 "Means of Egress," subsection R311.7 "Stairways," states the following:

- *"R311.7.5 Landings for stairways. There shall be a floor or landing at the top and bottom of each stairway."*
- *"R311.7.6 Stairway walking surface. The walking surface of treads and landings of stairways shall be sloped no steeper than one unit vertical in 48 inches horizontal (2-percent slope)."*

International Code Council, Inc. (ICC), "International Residential Code for One- and Two-Family Dwellings (IRC)," 2012, Chapter 3 "Building Planning," Section R311 "Means of Egress," subsection R311.7 "Stairways," states the following:

- *R311.3 Floors and landings at exterior doors. There shall be a landing or floor on each side of each exterior door. The width of each landing shall not be less than the door served. Every landing shall have a minimum dimension of 36 inches (914 mm) measured in the direction of travel. Exterior landings shall be permitted to have a slope not to exceed 1/4 unit vertical in 12 units horizontal (2-percent).*
- *Exception: Exterior balconies less than 60 square feet (5.6 m2) and only accessible from a door are permitted to have a landing less than 36 inches (914 mm) measured in the direction of travel."*

National Fire Protection Association, NFPA 101 "Life Safety Code," 2006, Chapter 7 "Means of Egress," Section 7-2.2 "Stairs," subsection 7.2.2.3.4 "Tread and Landing Slope," states the following:

- *"The tread and landing slope shall not exceed 1/4 in./ft (21 mm/m) (a slope of 1 in 48)."*

U.S. Department of Housing and Urban Development, HUD Handbook 4145.1 REV-2 "Architectural Processing and Inspections for Home Mortgage," March 1990, Section III "Walks, Steps and Driveways," states the following:

- *"A. General. A walk and any necessary step(s) should provide safe and convenient use from house directly to the street or to a driveway connected to a street. Walk and step construction should be of durable and appropriate material, on stable, adequately drained subgrade or bed.*

  B. Walk Design.

  1) Gradient should not be steeper than 1 in 20 (5%) in areas subject to frequent freezing or 1 in 10 (10%) in other areas.

  2) Cross-slope should be adequate for immediate drainage of surface water off the walk; required walk must not be used as a drainage channel.

  3) Walk surfaces should be at or below adjacent ground elevations.

  C. Step Design.

  1) Width should not be less than width of walk that is served.

  2) A single step in a walk and any flight of steps of more than 5 feet total rise should be 265
  avoided wherever practical; substantial handrail of durable construction must be provided if more than a 30-inch rise in a single flight."

Example Photograph:

March 10, 2021 Disc OBS5, Photograph 97, SSR, Building B, north side, no landing constructed at bottom of stairs. Longitudinal slope of sidewalk is 4.7-percent.

Locations:
Non-compliant landings exist across the Gallery site. Refer to the attached Observation Drawings and Defect Matrix for locations and details of findings.

C. BUILDING ENVELOPE

1. FAÇADE (EXTERIOR CLADDING AND SEALANTS) TYPE 1 – STUCCO

One of the cladding materials installed at the Gallery site is a stucco (Portland cement-based plaster) system. As constructed, the materials comprising the stucco system from the outermost layer towards the interior typically included the following:

- Hard coat stucco with embedded metal lath
- Flat faced foam
- Weather-resistive barrier (WRB) manufactured by GMCraft
- OSB sheathing or stud framing

Stucco systems fall into one of two categories: one-coat and three-coat systems. One-coat systems (also sometimes referred to as two-coat systems) involve a basecoat and a finish coat and are generally 3/8- to 1/2-inch thick. Three-coat systems include two base coats (referred to as a scratch coat and brown coat) and a finish coat, with a total system thickness of 3/4- to 7/8-inch. The installed system was found to range from 1/8- to 3/4-inch thick, of which the thickness under 1/2-inch would correspond generally to a one-

coat system. For the purposes of this report, the specific type of system does not change the opinions included herein.

Common building materials are recognized in the building code, which provides specific installation requirements for them. Anchored brick veneer, wood lap siding, and traditional three-coat stucco are examples of these code-recognized building materials. The ICC publishes Acceptance Criteria for materials not directly recognized by the building code, such as one-coat stucco systems. The ICC Evaluation Services, AC11 "Acceptance Criteria for Cementitious Exterior Wall Coatings," provides the conditions under which cementitious exterior wall coatings with lath, such as stucco systems, can be recognized in an ICC report under the building code.

International Conference of Building Officials (ICBO), AC11 "Acceptance Criteria for Cementitious Exterior Wall Coatings," approved January 2013, Section 1.0 "Introduction," subsection 1.1 "Purpose," states the following:

- *"The purpose of this criteria is to establish requirements for cementitious exterior wall coatings with laths to be evaluated under the 2021, 2018, 2015, 2012, 2009 and 2006 International Building Code® (IBC), and the 2021, 2018, 2015, 2012, 2009 and 2006 International Residential Code® (IRC)."*

Alternate materials are allowed, provided that the building officials find that they are equivalent to what is prescribed in the code. The requirements for alternate materials are quoted below.

City of Scottsdale, Arizona, "City Of Scottsdale Amendments To The International Building Code, 2012 Edition, Ordinance 4059," issued date December 4, 2012, Section 31-32(a) "Amendments," Chapter 1 "Scope and Administration," Part 2 "Administration And Enforcement," Section 104 "Duties and Powers of Building Official," states the following:

- *"**[A] 104.11 Alternative materials, design and methods of construction and equipment**. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety."*
- *"**104.11.2 Tests**. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the building official shall have the authority to require tests as evidence of compliance to be made at no expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the building official shall approve the testing procedures. Tests shall be performed by an approved agency. Reports of such tests shall be retained by the building official for the period required for retention of public records."*

In instances where multiple standards specify differing requirements for the same aspect of construction, the most stringent standard shall apply.

The architectural drawings include assembly details for the Gallery site. The construction assembly specified for exterior walls with stucco from the outermost material towards the interior is listed below:

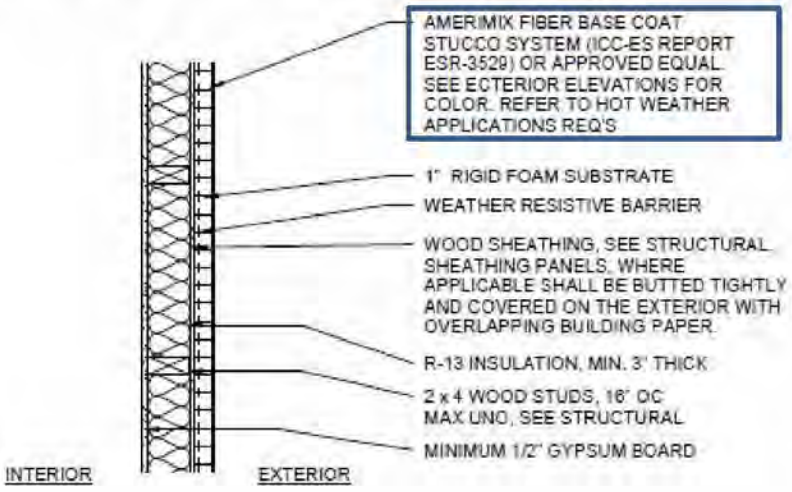
- Amerimix fiber basecoat stucco system or an approved equal alternative
- 1-inch of rigid foam substrate
- WRB
- wood sheathing or framing material.

The architectural drawings as well as the builder's specifications indicated the stucco to be Amerimix fiber basecoat stucco system. Therefore, Amerimix will be used in this report to provide a general description of this type of stucco system. The ICC-ES Evaluation Report ESR-3529 provides the material and installation requirements for Amerimix fiber basecoat stucco system. The February 2017 revision of the report complies with the 2012 International Codes and requires stucco installation by contractors approved by Bonsal American. Should additional stucco information be made available, SBSA retains the right to revise and supplement this report accordingly.

Applicable Code/Industry Standard References/Project-Specific Documents:

Otak, Inc., "K. Hovnanian Homes, Gallery Townhomes," revised date August 2, 2016, Sheet A1.01 "Construction Assemblies," Detail 14A "Exterior Wall – Stucco System – Non-Rated," states the following:

Note: Similar description for Detail 15A "Ext Wall – Stucco Sys Furring – Non-Rated" and Detail 16A "Ext Wall - Stucco System - 1-hr rated"



ICC Evaluation Service, Evaluation Report ESR-3529 "Amerimix Fiber Base Coat Stucco," reissued February 2017, Section 1 "Evaluation Scope," states the following:

- *"**Compliance with the following codes:***
  - *2012, 2009 and 2006 International Building Code® (IBC)*
  - *2012, 2009 and 2006 International Residential Code® (IRC)*
  - *1997 Uniform Building Code™ (UBC)*

  Propertied evaluated:
  - *Structural*
  - *Weathering and durability*
  - *Fire-resistance-rated construction*
  - *Types I, II, III and IV construction"*

ICC Evaluation Service, Evaluation Report ESR-3529 "Amerimix Fiber Base Coat Stucco," reissued February 2017, Section 5 "Conditions of Use," states the following:

- *"5.1 Materials and methods of installation must comply with this report and the manufacturer's published installation instructions. In the event of a conflict between the installation instructions and this report, this report governs. The manufacturer's published installation instructions must be available at the jobsite at all times during installation.*
- *5.2 Installation must be by contractors approved by Bonsal American."*

ICC Evaluation Service, Evaluation Report ESR-3529 "Amerimix Fiber Base Coat Stucco," reissued February 2017, Section 2 "Uses," states the following:

- *"Amerimix Fiber Base Coat Stucco is an alternative exterior wall covering to that specified in IBC Chapter 25, IRC Section R703 and UBC Chapter 25. The system may be used in any type of construction."*

Amerimix, "Fiber Base Coat Stucco AMX 750 FBC," Revised June 2016, section "2. Product Description," states the following:

- *"Note: Amerimix AMX 750 FBC should be installed in accordance with the provisions of applicable ASTM standards and the local building code. Always follow traditional industry best practices appropriate for the application and weather conditions. Good workmanship in conjunction with proper design and detailing assures durable, efficient, watertight construction."*

Amerimix, "Fiber Base Coat Stucco AMX 750 FBC," Revised June 2016, Section 3 "Technical Data," states the following:

- *"**Applicable Standards***

  ASTM International (ASTM)

  ...
  - *ICC-ESR 3529*

- *2012 International Building Code® (IBC)*
- *2012 International Residential Code® (IRC)."*

K. Hovnanian Homes, "Standard Specifications, The Gallery, 18 Lots," dated May 2, 2016, Bates Number "SMC000259," states the following:

Stucco:

- Scaffolding will be provided by others.
  - Must agree and sign Scaffolding use agreement
- Amerimix PRE-MIXED stucco standard
- All plans/elevations – Sand texture per plans/elevations
- Square corner aide to be used
- **Electrical / Low Voltage/ Mechanical / Plumbing Trades are all individually responsible for supplying and installing their own QuickFlash Flashing Panels (By QuickFlash Weatherproofing Products, Inc) at all exterior penetrations.** – Stucco contractor will weave QuickFlash Flashing Panels into lath to ensure a watertight connection.
- All "pop outs" or other stucco trim details per plan with Silica sand finish
- Pop outs which protrude 4" or less to be installed by stucco trade partner. Pop outs over 4" installed by framing trade partner
- All penetrations through lath to be caulked with Butyl caulk
- Weep metal to be install per current IBC code
- Install Diamond Lath behind all stone/brick areas
- Caulk weep metal to so sole plate exterior wall.

a. Missing Weep Mechanism in Stucco

Installation of a weep mechanism or drip edge at horizontal terminations of the stucco at locations where the stucco application is continued onto a horizontal surface, such as a soffit, is required by industry standards. The weep mechanism allows water within the cladding system to exit to the exterior as required by code, and the drip edge component is to allow the water to break from the surface adhesion and fall away from the structure. Sealing, blocking, omitting, or failing to integrate the weep mechanism results in moisture accumulating behind the cladding, promoting the continuous and progressive deterioration of the underlying water-sensitive building components, including the stucco. Generally, the outward signs due to the entrapped water result in stucco cracks and beneath the products result in damages to the interstitial spaces, including rusted fasteners and stained and/or deteriorated sheathing. All horizontal terminations of the stucco system should incorporate a weep mechanism that is properly integrated with the WRB so that water can travel down the drainage plane and drain to the exterior. Therefore, weep mechanisms are an essential component of the moisture-management system.

The architectural details specify base flashing with weep holes at stucco to window and door head interfaces and reference the stucco manufacturer. The stucco manufacturer requires a weep screed at base of walls, windows, doors, and roofs. The architectural details also specify a minimum 1/4-inch clearance at the stucco soffit to stucco siding interface, with a drainage strip installed per the stucco manufacturer. The architect specified the soffit WRB to be turned up and lapped 6-inches under the wall WRB. Stucco installation details provided in the ESR-3529 require a 1-3/8-inch weep screed shingle-lapped with the wall WRB at foam and solid substrates and 1/2-inch J-weep screed with a solid substrate at roofs. The applicable building codes

specify using a 0.019-inch, corrosion-resistant weep screed with a minimum 3-1/2-inch vertical attachment flange shingle-lapped with the WRB to allow drainage of water to the building exterior.

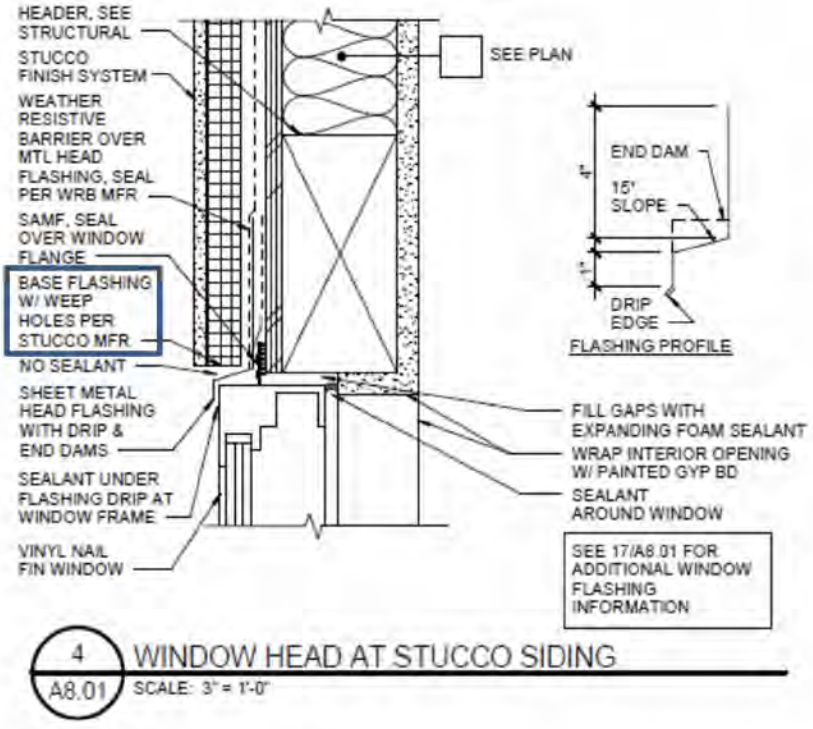
At the Gallery site, the weep casing beads were missing at fenestration heads, stucco roof pop-outs, and soffit terminations, which violates the architectural drawings, the stucco manufacturer requirements, and the building code requirements. This non-compliant condition creates a system which does not drain moisture to the exterior as required by the architectural drawings and stucco manufacturer requirements. Manifestation of resultant damages included stucco cracks, rusted fasteners, deteriorated WRB and stains at sheathing. Weep mechanisms were installed at stucco terminations to roofs, decks, and foundations, indicating the contractor was cognizant of installing weep mechanisms at horizontal terminations in stucco.

Where weep mechanisms in stucco are missing, the as-built condition falls short of the prescriptive requirements of the relevant codes, design, and industry standards and, therefore, the developer, contractor, and subcontractors who performed the work fell below the standard of care.

Applicable Code/Industry Standard References/Project-Specific Documents:

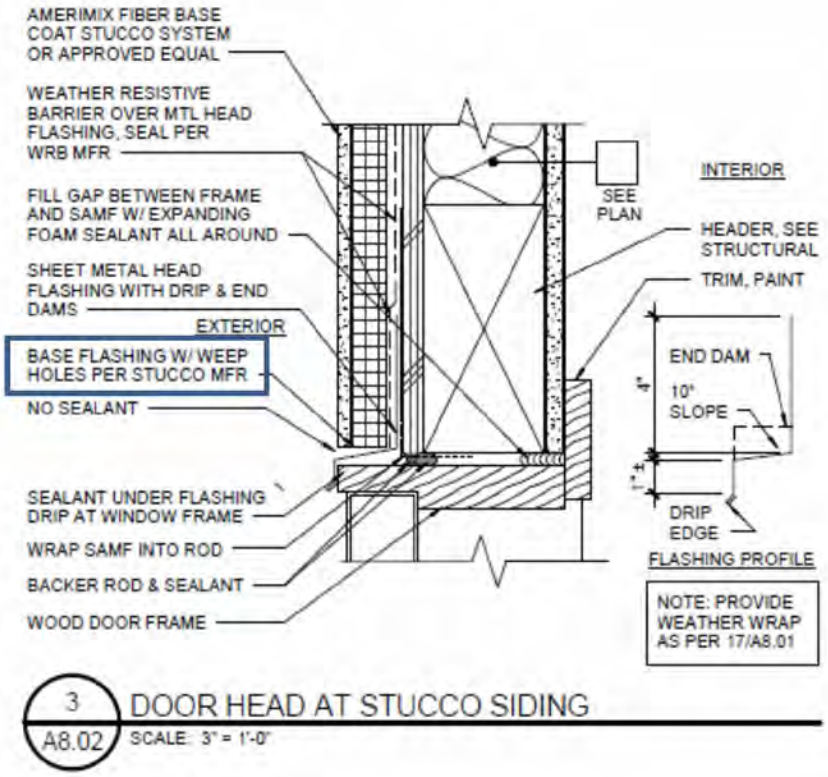
Otak, Inc., "K. Hovnanian Homes, Gallery Townhomes," revised date August 2, 2016, Sheet A8.01 "Exterior Details," illustrates the following:

- *"4/A8.01 Window Head at Stucco Siding"*



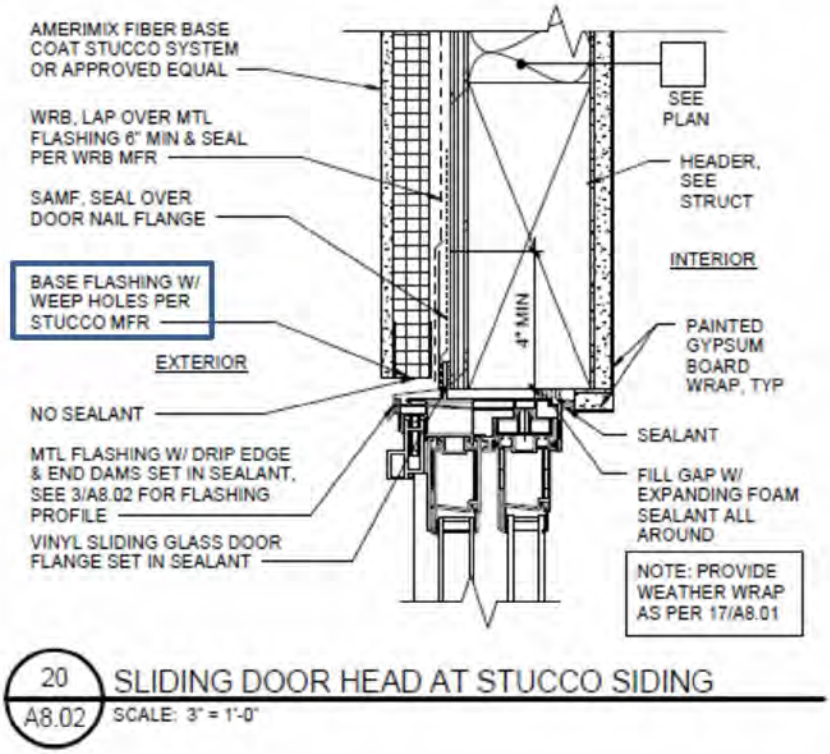
Otak, Inc., "K. Hovnanian Homes, Gallery Townhomes," revised date August 2, 2016, Sheet A8.02 "Exterior Details," illustrates the following:

- *"3/A8.02 Door Head at Stucco Siding"*



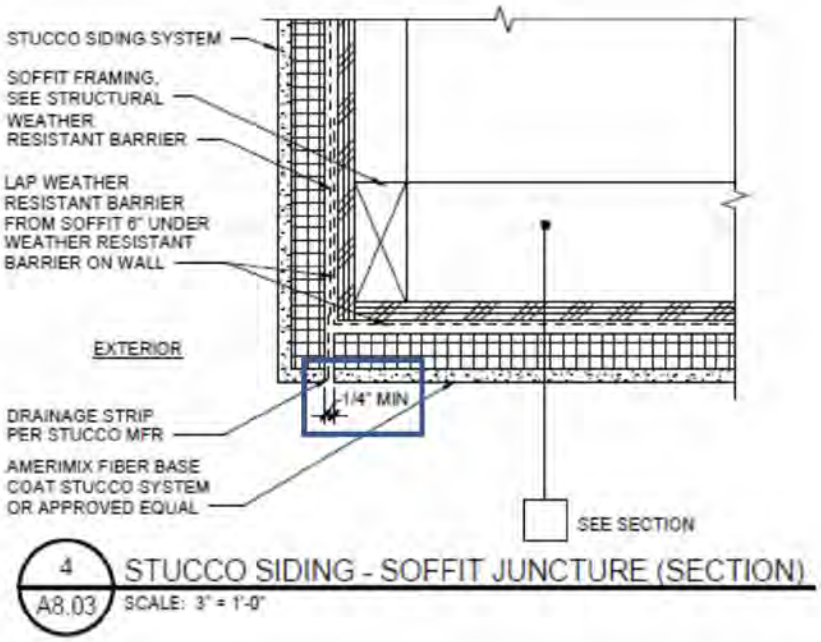
Otak, Inc., "K. Hovnanian Homes, Gallery Townhomes," revised date August 2, 2016, Sheet A8.02 "Exterior Details," illustrates the following:

- *"20/A8.02 Sliding Door Head at Stucco Siding"*



Otak, Inc., "K. Hovnanian Homes, Gallery Townhomes," revised date August 2, 2016, Sheet A8.03 "Exterior Details," illustrates the following:

- *"4/A8.03 Stucco Siding - Soffit Juncture (Section)"*



ICC Evaluation Service Report (ESR), Evaluation Report ESR-3529 "Evaluation Subject: Amerimix Fiber Base Coat Stucco," reissued February 2017, Section 4.0 "Installation," subsection 4.2 "Application over Open Framing," states the following:

- *"The water-resistive barrier, lath and EPS board must lap over the nailing leg of the flashing as shown in the standard weep screed details in Figure 2 of this report. Corrosion-resistant weep screeds must be installed at all locations where the horizontal edge of the EPS board is exposed after application of the stucco coating. Corrosion- resistant casing beads must be installed at all locations where the vertical edge of the EPS board is exposed after application of the stucco coating. The evaluation of the system is limited to use where penetrations through and terminations of the system are provided with flashing."*

ICC Evaluation Service Report (ESR), Evaluation Report ESR-3529 "Evaluation Subject: Amerimix Fiber Base Coat Stucco," reissued February 2017, Figure 2 "Typical Installation Details," illustrates the following:

- *"Weep Screed – Foam Substrate"*

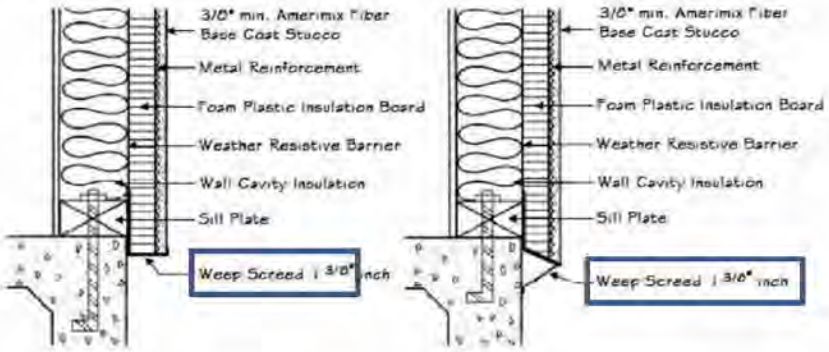


FIGURE 2—TYPICAL INSTALLATION DETAILS

- *"Typical Window - Solid Substrate"*

TYPICAL WINDOW—SOLID SUBSTRATE

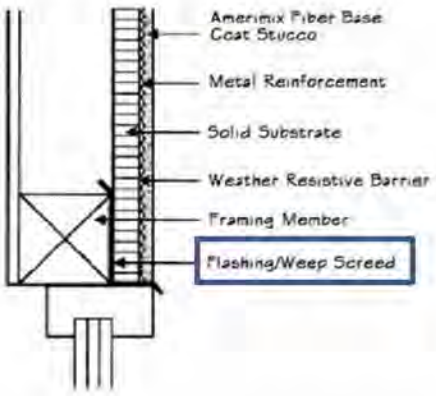
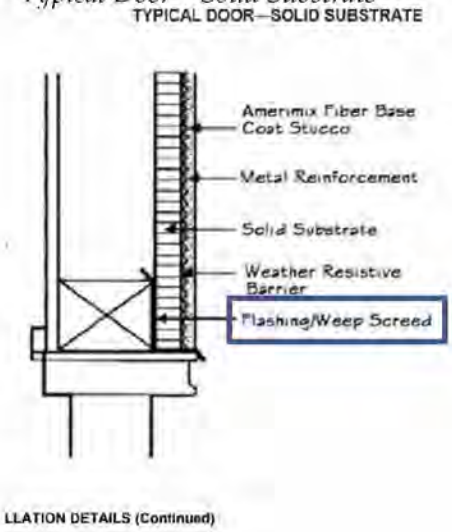


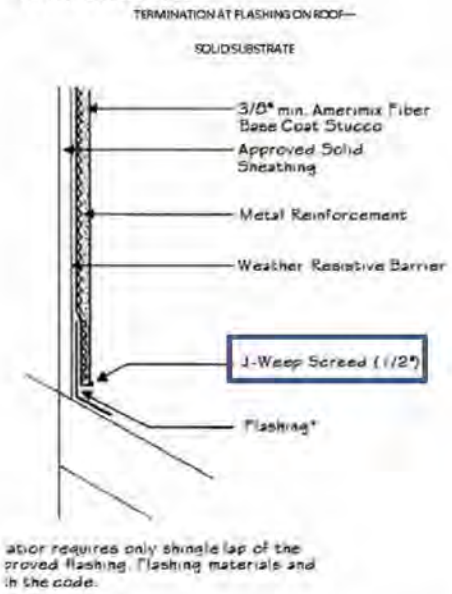
FIGURE 2—TYPICAL INSTALL

- *"Typical Door – Solid Substrate"*



LLATION DETAILS (Continued)

- *"Solid Substrate"*



ator requires only shingle lap of the proved flashing. Flashing materials and th the code.

International Code Council, Inc. (ICC), "International Residential Code (IRC)," 2012, Chapter 7 "Wall Covering," Section R703 "Exterior Covering," Subsection R703.6 "Plaster," states the following:

Note: No local amendments for this section.

- *"**R703.6.2.1 Weep screeds**. A minimum 0.019-inch (0.48 mm) (No. 26 galvanized sheet gage), corrosion-resistant weep screed with a minimum vertical attachment flange of 3 1/2 inches (89 mm) shall be provided at or below the foundation plate line on exterior stud walls in accordance with ASTM C 926. The weep screed shall be placed a minimum of 4 inches (102 mm) above the earth or 2 inches (51 mm) above paved areas and be of a type that will allow trapped water to drain to the exterior of the building. The water-resistive*

barrier shall lap the attachment flange. The exterior lath shall cover and terminate on the attachment flange of the weep screed."

International Code Council, Inc. (ICC), "International Building Code (IBC)," 2012, Chapter 25 "Gypsum Board and Plaster," Section 2512 "Exterior Plaster," states the following:

Note: No local amendments for this section.

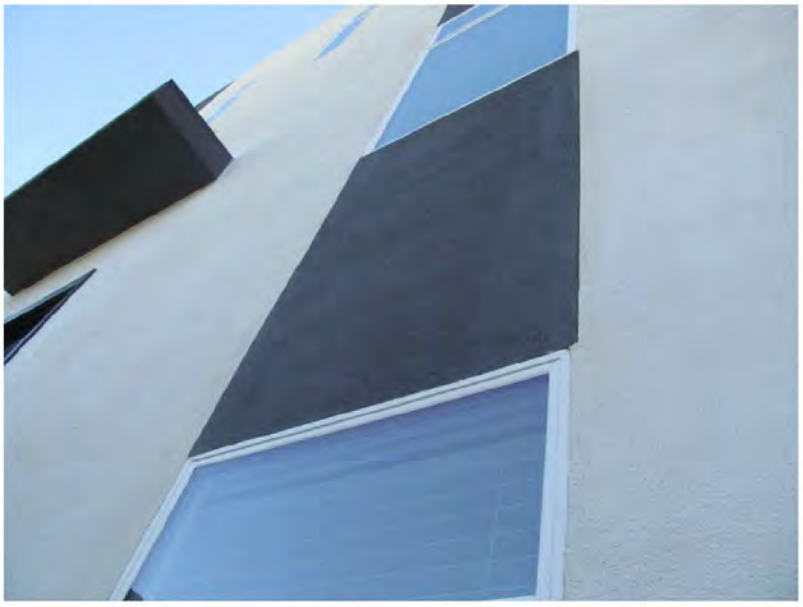
- *"2512.1.2* ***Weep Screeds****. A minimum 0.019-inch (0.48 mm) (No. 26 galvanized sheet gage), corrosion-resistant weep screed with a minimum vertical attachment flange of 3 1/2 inches (89 mm) shall be provided at or below the foundation plate line on exterior stud walls in accordance with ASTM C 926. The weep screed shall be placed a minimum of 4 inches (102 mm) above the earth or 2 inches (51 mm) above paved areas and be of a type that will allow trapped water to drain to the exterior of the building. The water-resistive barrier shall lap the attachment flange. The exterior lath shall cover and terminate on the attachment flange of the weep screed."*

Example Photographs:

March 9, 2021, Disc IT6, Photograph 32, SSR, Building A, no weep mechanism at soffit and stucco crack along the edge.

March 9, 2021, Disc IT6, Photograph 266, SSR, Building A, sheathing bottom edge stained at wall-soffit junction.

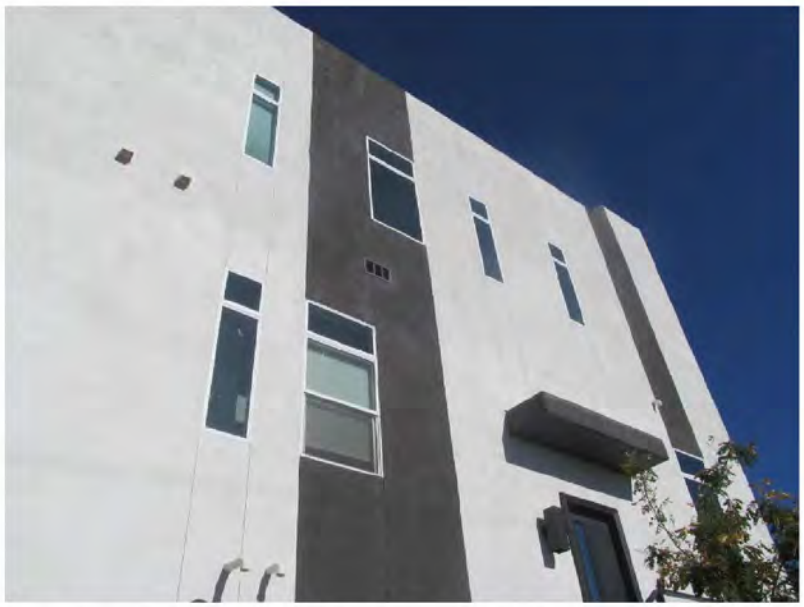
March 9, 2021, Disc IT6, Photograph 280, SSR, Building A, no weep mechanism at stucco termination above window head.



December 19, 2018, Disc OBS1, Photograph 129, JBF, Building A, no weep mechanism at window head.

December 19, 2018, Disc OBS1, Photograph 129, JBF, Building A, no weep mechanism at base of stucco at soffits.

December 19, 2018, Disc OBS1, Photograph 82, JBF, Building B, no weep mechanism at stucco soffits.



December 19, 2018, Disc OBS1, Photograph 87, JBF, Building B, no weep mechanism at window heads.

March 9, 2021, Disc IT5, Photograph 73, JJF, Building B, visible stains at sheathing edge and deterioration.

March 9, 2021, Disc IT5, Photograph 164, JJF, Building B, visible stains at sheathing edge and rusted fasteners.

March 11, 2021, Disc OBS6, Photograph 48, JJF, Building C, no weep mechanism at stucco soffits.

March 11, 2021, Disc OBS6, Photograph 84, JJF, Building C, no weep mechanism at window heads.

December 19, 2018, Disc OBS1, Photograph 61, JBF, Building C, no weep mechanism at stucco soffits.

December 19, 2018, Disc OBS1, Photograph 18, JBF, Building D, no weep mechanism at stucco soffit.

March 10, 2021, Disc IT8, Photograph 96, SSR, Building D, rusted fastener head at EPS foam board.

March 10, 2021, Disc IT8, Photograph 96, SSR, Building D, rusted fastener head at framing.

March 10, 2021, Disc IT8, Photograph 120, SSR, Building D, deteriorated WRB over framing with visible stains.

December 19, 2018, Disc OBS1, Photograph 24, JBF, Building D, no weep mechanism at stucco soffits.

March 11, 2021, Disc OBS6, Photograph 222, JJF, Building D, no weep mechanism at window heads.

December 19, 2018, Disc OBS1, Photograph 19, JBF, Building D, weep mechanism at base of stucco at top of foundations.

Locations:

Weep mechanisms are missing at all soffit, fenestration head, and stucco termination to stucco pop-out box locations across the Gallery site. Refer to the attached Observation Drawings and Defect Matrix for locations and details of findings.

b. Non-Compliant WRB for Stucco System

The building code, manufacturer specifications, and industry standards require a complete and compliant WRB behind moisture-managed claddings. The architectural drawings specify installation of WRB per section 2510.6 of the IBC. The stucco manufacturer's product evaluation report ESR-3529 specifies installation of WRB per the applicable building codes.

The applicable codes and the ESR-3529 require the WRB with a performance equivalent to two layers of Grade D paper, such that each layer provides a separate continuous plane. An exception to the above stated requirements is if the WRB applied over solid sheathing has a water resistance equal to or greater than that of 60-minute Grade D paper and is separated from the stucco by an intervening, substantially non-water-absorbing layer or drainage space.

Intrusive examination revealed that a single layer of WRB was generally installed over open stud framing and solid sheathing. Occasionally, two layers of WRB over framing were identified to have been used. The WRB used at the Gallery site was labeled GMCraft-10 324, Type 1, Grade D, Style 2, ESR 2376. The label indicates that the WRB product used throughout the site is an asphalt-saturated type D building paper that has a nominal finish weight of 3.5-pounds-per-100-square-feet and designed to resist water intrusion for a minimum of 10-minutes when tested according to ASTM D-779. The nominal weight for a number 15 asphalt felt is generally between 7.5- to 12.5-pounds-per-100-square-feet (psf). The WRB manufacturer's product specifications state the GMCraft-10 exceeds 20-minutes of water resistance but does not meet the 60-minute requirement required by the building code and the stucco manufacturer. As constructed, the applied WRB does not meet the nominal weight, the number of required layers, the water resistance requirements of the applicable building code, and the ESR-3529 report for the Amerimix stucco system specified on the architectural drawings. This deficiency in material properties and number of WRB layers impairs the functionality of the stucco system as required in the building codes and the stucco manufacturer's product specifications.

Haphazardly installed and closely spaced staple and fastener holes facilitate the water intrusion, causing damage and increasing future additional damage. Full-length rusted fasteners and stains on framing indicate damage due to water intrusion where the non-compliant WRB was installed behind stucco. Failure of the moisture-management system along with the combination of other construction defects as discussed in this report will continue to direct water onto moisture-sensitive building components.

Where non-compliant WRB for stucco system exists, the as-built condition falls short of the prescriptive requirements of the relevant codes, design, and industry standards and, therefore, the developer, contractor, and subcontractors who performed the work fell below the standard of care.

Applicable Code/Industry Standard References/Project-Specific Documents:

Otak, Inc., "K. Hovnanian Homes, Gallery Townhomes," revised date August 2, 2016, Sheet A1.01 "Construction Assemblies," states the following:

- *"IBC 1405.10.1.1 WATER RESISTIVE BARRIERS*

  Water-Resistive Barriers Shall Be Installed As Required In Section 2510.6"

ICC Evaluation Service Report (ESR), "Evaluation Report ESR-3529 "Evaluation Subject: Amerimix Fiber Base Coat Stucco," reissued February 2017, Section 3.0 "Description," subsection 3.2 "Material," states the following:

- *"3.2.10 Weather Protection:*

  3.2.10.1 Water-resistive Barrier: A water-resistive barrier is required and must comply with IBC Section 1404.2, IRC Section R703.2 or UBC Section 1402.1, as applicable. The barrier must be minimum No. 15 asphalt non-perforated felt complying as Type 1 in accordance with ASTM D226 (IBC or IRC); minimum Grade D kraft building paper complying with UBC Standard 14-1; asphalt-saturated rag felt complying with UL standard 55A (UBC); or material recognized in a current evaluation report as complying with the ICC-ES Acceptance Criteria for Water-resistive Barriers (AC38).

  When applied over any wood-based sheathing, the barrier must be one of the following:

  a. A minimum of two layers of Grade D kraft building paper as set forth in IBC Section 2510.6, IRC Section R703.6.3 or UBC Section 2506.4, or an equivalent recognized in a current evaluation report.

  b. One layer of EPS insulation board having horizontal tongue-and-groove edges as described in Section 3.2.4, over one layer of Grade D kraft building paper having a minimum water-resistance rating of 60 minutes, or a water-resistive barrier recognized in a current ICC-ES evaluation report as having a minimum water-resistance rating of 60 minutes."

International Code Council, Inc. (ICC), "International Residential Code (IRC)," 2012, Chapter 7 "Wall Covering," Section R703 "Exterior Covering," Subsection R703.6 "Plaster," states the following:

Note: No local amendments for this section.

- ***"R703.6.3 Water-resistive barriers**. Water-resistive barriers shall be installed as required in Section 1404.2 and, where applied over wood-based sheathing, shall include a water-resistive vapor-permeable barrier with a performance at least equivalent to two layers of Grade D paper. The individual layers shall be installed independently such that each layer provides a separate continuous plane and any flashing (installed in accordance with Section 1405.4) intended to drain to the water-resistive barrier is directed between the layers.*

  Exception: Where the water-resistive barrier that is applied over wood-based sheathing has a water resistance equal to or greater than that of 60-minute Grade D paper and is separated from the stucco by an intervening, substantially nonwater-absorbing layer or drainage space."

International Code Council, Inc. (ICC), "International Building Code (IBC)," 2012, Chapter 25 "Gypsum Board and Plaster," Section 2510 "Lathing and Furring for Cement Plaster (Stucco)," states the following:

Note: No local amendments for this section.

- *"2510.6 **Water-resistive barriers**. Water-resistive barriers shall be installed as required in Section 1404.2 and, where applied over wood-based sheathing, shall include a water-resistive vapor-permeable barrier with a performance at least equivalent to two layers of Grade D paper. The individual layers shall be installed independently such that each layer provides a separate continuous plane and any flashing (installed in accordance with Section 1405.4) intended to drain to the water-resistive barrier is directed between the layers.*

  Exception: Where the water-resistive barrier that is applied over wood-based sheathing has a water resistance equal to or greater than that of 60-minute Grade D paper and is separated from the stucco by an intervening, substantially nonwater-absorbing layer or drainage space."

International Code Council, Inc. (ICC), "International Building Code (IBC)," 2012, Chapter 14 "Exterior Walls," Section 1404 "Materials," states the following:

Note: No local amendments for this section.

- *"**1404.2 Water-resistive barriers**. A minimum of one layer of No. l5 asphalt felt, complying with ASTM D 226 for Type 1 felt or other approved materials, shall be attached to the studs or sheathing, with flashing as described in Section 1405.4, in such a manner as to provide a continuous water-resistive barrier behind the exterior wall veneer."*

International Code Council, Inc. (ICC), "International Residential Code (IRC)," 2012, Chapter 7 "Wall Covering," Section R703 "Exterior Covering," states the following:

Note: No local amendments for this section.

- *"**R703.2 Water-resistive barrier.** One layer of No. 15 asphalt felt, free from holes and breaks, complying with ASTM D226 for Type l felt or other approved water-resistive barrier shall be applied over studs or sheathing of all exterior walls. Such felt or material shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2 inches (51 mm). Where joints occur, felt shall be lapped not less than 6 inches (152 mm). The felt or other approved material shall be continuous to the top of walls and terminated at penetrations and building appendages in a manner to meet the requirements of the exterior wall envelope as described in Section R703.1.*

  Exception: Omission of the water-resistive barrier is permitted in the following situations:

  1. In detached accessory buildings.

  2. Under exterior wall finish materials as permitted in Table R703.4.

  3. Under paperbacked stucco lath when the paper backing is an approved water-resistive barrier."

GMC Roofing & Building Paper Products, Inc. (GMC), "GMCraft 10 Minute Weather-Resistive Barrier, Product Data," June 2020, "Product Description," states the following:

- *"GMCraft is an asphalt saturated type "D" building paper exceeding the industry standards as a water-resistive-barrier. It is designed to prohibit water or moisture intrusion behind stucco and other exterior wall claddings. GMCraft offers superior protection against internal damage due to excessive moisture and condensation."*

GMC Roofing & Building Paper Products, Inc. (GMC), "GMCraft 10 Minute Weather-Resistive Barrier, Product Data," June 2020, "Test Results," states the following:

GMCraft 10	Test Method	Test Results
Water Vapor Transmission	ASTM E-96-00	**38 Perms**
Water Resistance	ASTM D-779	**Exceeds 20 minutes**
Tensile Strength	ASTM D-828	**MD 45 lb-f/in** **CD 21 lb-f/in**

ICC Evaluation Service Report (ESR), "Evaluation Subject: GMCraft 10 Minute, GMCraft 30 Minute, and GMCraft 60 Minute Water-Resistive Barriers, ESR-2376," reissued May 2019, Section 3.0 "Description," subsection 3.2 "GMCraft 10 Minute," states the following:

- *"GMCraft 10 Minute is asphalt-saturated kraft paper complying with UBC Standard 14-1 as Type I, Grade D, Style 2. The building paper has a nominal finish weight of 3.5 pounds per 100 square feet (0.17 kg/m2)."*

ICC Evaluation Service Report (ESR), "Evaluation Subject: GMCraft 10 Minute, GMCraft 30 Minute, and GMCraft 60 Minute Water-Resistive Barriers, ESR-2376," reissued May 2019, Section 4.0 "Installation," subsection 4.1 "General," states the following:

- *"When the barriers are installed over wood-based sheathing in exterior plaster applications, two layers of the product must be applied over the sheathing in accordance with Section 2510.6 of the 2012, 2009 and 2006 IBC or Section R703.7.3 [2012, 2009 and 2006 IRC Section R703.6.3] of the 2018 and 2015 IRC. As an alternative, one layer of the GMCraft 60 Minute may be installed in accordance with the exception to Section 2510.6 of the 2012, 2009 and 2006 IBC or the 2018 and 2015 IRC Section R703.7.3 [2012, 2009 and 2006 IRC Section R703.6.3]. Installation of water-resistive barriers under 2018 and 2015 IBC Section 2510.6 over wood-based sheathing is outside the scope of this report. For cementitious coatings over exterior insulation and finish systems, application must be in accordance with the ICC-ES evaluation report on the exterior coating system."*

Example Photographs:

March 9, 2021, Disc IT6, Photograph 314, SSR, Building A, one layer of WRB with 10-minute water resistance. Label references ESR 2376.

March 9, 2021, Disc IT5, Photograph 178, JJF, Building B, one layer of WRB over sheathing.

March 9, 2021, Disc IT5, Photograph 72, JJF, Building B, one layer of WRB over framing.

March 9, 2021, Disc IT5, Photograph 75, JJF, Building B, damaged framing due to water intrusion.

March 10, 2021, Disc IT9, Photograph 124, SSR, Building C, manufacturer's label shows the building paper is Type 1, Grade D, Style 2 building paper with 10-minute water resistance and references ESR 2376.

March 10, 2021, Disc IT8, Photograph 216, SSR, Building D, manufacturer's label shows the building paper is Type 1, Grade D, Style 2 building paper with 10-minute water resistance and references ESR 2376.

March 10, 2021, Disc IT8, Photograph 93, PER, Building C, deteriorated WRB over framing.

March 10, 2021, Disc IT8, Photograph 101, PER, Building C, deteriorated WRB over framing.

March 10, 2021, Disc IT7, Photograph 136, JJF, Building D, one layer of WRB over sheathing.

March 10, 2021, Disc IT8, Photograph 114, SSR, Building D, one layer of WRB over framing with visible stains.

March 10, 2021, Disc IT8, Photograph 120, SSR, Building D, deteriorated WRB over framing with visible stains.

March 10, 2021, Disc IT8, Photograph 172, SSR, Building D, full-depth rusted fasteners.

Locations:

Non-compliant WRB for the stucco system exists at all locations where stucco is applied across the Gallery site. Refer to the attached Observation Drawings and Defect Matrix for locations and details of findings.

c. Non-Compliant EPS Foam Board for Stucco System

The architectural drawings and builder's specifications both specify Amerimix stucco system installed over a 1-inch-thick rigid foam substrate. The architectural drawings and the manufacturer's product specification both refer to ESR-3529. Where the stucco system is installed over open stud framing, the ESR-3529 requires a minimum 1-inch-thick EPS foam plastic insulation board with 3/8-inch projecting tongues and compatible grooves for horizontal joints. Where installed over solids substrates such as OSB sheathing, the ESR-3529 requires a minimum 1/2-inch-thick EPS foam plastic insulation board with vertical grooves on the back face (interior side) of the boards. The groves are required to be a minimum 1/4-inch wide by 1/8-inch deep spaced a maximum of 12-inches to allow efficient drainage of moisture between the EPS foam boards and the WRB. As an alternative to EPS foam boards with vertical grooves, ESR-3529 allows using flat-faced EPS foam boards if Tyvek StuccoWrap® or Tyvek DrainWrap® WRB is installed over the solid substrate.

Intrusive examination revealed that the foam board used at the Gallery site was generally 3/8- to 7/8-inch thick, did not have the required vertical grooves, and was installed tight to the improperly selected WRB. The GMCraft-10 WRB was installed at all buildings and is not recognized by ESR-3529 for application of flat-faced foam boards without vertical grooves. Flat-faced foam boards installed tight to the WRB are non-compliant with the project requirements, prevent a bond break or drainage gap between the stucco system and the WRB, and obstruct drainage of the moisture behind the stucco. Use of non-compliant EPS foam boards in combination with the non-compliant WRB type reduces the overall performance of the moisture-management system. Damage included stains on the interior face of the EPS foam boards and full-length rusted fasteners where entrapped water overwhelmed the moisture-management system. This non-compliant condition, along with the combination of other construction defects of the stucco system, will more likely than not reduce the integrity of the structural components and the general appearance of the cladding in the foreseeable future.

Where non-compliant EPS foam board exists, the as-built condition falls short of the prescriptive requirements of the relevant codes, design, and industry standards and, therefore, the developer, contractor, and subcontractors who performed the work fell below the standard of care.

Applicable Code/Industry Standard References/Project-Specific Documents:

ICC Evaluation Service Report (ESR), Evaluation Report ESR-3529 "Evaluation Subject: Amerimix Fiber Base Coat Stucco," reissued February 2017, Section 3.0 "Description," subsection 3.2 "Material," states the following:

- *"3.2.4 **Foam Plastic Insulation Boards:** Foam plastic insulation formed from expanded polystyrene (EPS) resin, with a maximum flame spread index of 25 or less and a smoke-developed index not exceeding 450 when tested in accordance with ASTM E84 in the thickness intended for use. The foam plastic insulation boards must have a minimum nominal density of 1.5 pounds per cubic foot (24.0 kg/m3). When installed over open stud framing, the boards must be a minimum of 1 inch (25.4 mm) thick and have 3 /8-inch (9.5 mm) projecting tongues with compatible grooves for horizontal joints. See Figure 1 for*

joint detail. Foam plastic boards installed over solid substrates must have a minimum thickness of 1/2 inch (12.3 mm). The maximum board thickness must not exceed 4 inches (25.4 mm). All boards must be recognized in a current ICC-ES evaluation report. See Section 7.3 for board identification. When installation is over solid substrates, as described in Section 4.3, the boards must have minimum 1/4-inch-wide-by-1/8-inch-deep (6.4 mm by 3.2 mm) vertical grooves spaced a maximum of 12 inches (305 mm) on the back face of the boards. As an alternate to the vertical grooves in the foam plastic board, flat-faced boards may be installed over solid substrates provided the Tyvek StuccoWrap or Tyvek DrainWrap water-resistive barrier, recognized in ESR-2375, is installed between the EPS board and the solid substrate."

ICC Evaluation Service Report (ESR), Evaluation Report ESR-3529 "Evaluation Subject: Amerimix Fiber Base Coat Stucco," reissued February 2017, Section 4.0 "Installation," subsection 4.3 "Application over Solid Substrates," states the following:

- *"**4.3.1 General:** All solid substrates, except for concrete and unit masonry, must be covered with a minimum of one layer of water-resistive barrier as described in Section 3.2.10.1 of this report and the lath described in Section 3.2.3 of this report. The installation of EPS boards over solid substrates is optional and must be governed by the conditions stated in this report. When EPS boards are installed over solid substrates, the EPS boards must incorporate vertical grooves as described in Section 3.2.4 or be flat-faced foam boards incorporating Tyvek water-resistive barriers described in Section 3.2.4 of this report. Two layers of water-resistive barriers as described in Section 3.2.10.1 are needed where wood-based substrates occur and the length of the fasteners used to attach the lath must be increased by the thickness of the EPS boards."*

Example Photographs:

May 14, 2019, Disc IT3, Photograph 18, JBF, Building A, EPS foam board installed tight to WRB and vertical grooves generally missing at the inner face.

March 9, 2021, Disc IT6, Photograph 271, SSR, Building A, EPS foam board installed tight to GMCraft WRB and vertical grooves generally missing at the inner face.

March 10, 2021, Disc IT7, Photograph 20, JJF, Building B, EPS foam board installed over WRB with vertical grooves generally missing at the back face.

March 9, 2021, Disc IT5, Photograph 155, JJF, Building B, 3/8-inch-thick EPS foam board installed over WRB with vertical grooves generally missing at the back face.

May 13, 2019, Disc IT1, Photograph 116, JBF, Building B, 1/2-inch-thick EPS insulation installed over OSB sheathing does not incorporate vertical grooves.

March 10, 2021, Disc IT7, Photograph 279, JJF, Building C, EPS foam board installed over WRB with vertical grooves generally missing at the back face.

March 10, 2021, Disc IT7, Photograph 210, JJF, Building C, EPS foam board installed tight to WRB and vertical grooves generally missing at the back face.

March 10, 2021, Disc IT9, Photograph 92, PER, Building C, rusted lath

March 10, 2021, Disc IT9, Photograph 90, PER, Building C, rusted staples

March 10, 2021, Disc IT9, Photograph 87, PER, Building C, rusted staples and lath

March 10, 2021, Disc IT9, Photograph 95, PER, Building C, EPS foam board installed tight to WRB and vertical grooves generally missing at the back face. Note corrosion from the nails on the EPS foam board.

March 10, 2021, Disc IT7, Photograph 117, JJF, Building D, EPS foam board installed over WRB with vertical grooves generally missing at the back face.

March 10, 2021, Disc IT7, Photograph 226, JJF, Building D, EPS foam board installed over WRB with vertical grooves generally missing at the back face.

Locations:

Non-compliant EPS foam board installation for stucco exists at locations where stucco is applied over solid substrates across the Gallery site. Refer to the attached Observation Drawings and Defect Matrix for locations and details of findings.

d. Non-Compliant Slope of Horizontal Stucco Surfaces

Stucco is water-resistant, not waterproof, and is expected to be permeated by water. Horizontal stucco surfaces with little or no slope can pond or hold water. Water penetrates into the assembly, resulting in damage to the sheathing and other moisture-sensitive building products. To reduce the water migration into the moisture-managed system, stucco is required to slope and be waterproofed below in order to effectively shed water off its surface and away from the substrate.

Stucco roof parapet caps, roof pop-out boxes, and pop-out boxes at front and rear elevations with inadequate slope are present at locations across all buildings. The architectural elevations locate stucco pop-out boxes between the garage and first floor level for unit types 30-1210 and 31-1211. For unit type 32-1212, the stucco pop-out boxes are located between the first floor and second floor levels. The architectural drawings specify stucco parapet caps and pop-out boxes to be sloped but provide no further information. Stucco industry standards require a minimum 1:2 slope. Providing slope to stucco surfaces minimizes the absorption of the water through the stucco and into the framed wall components. Waterproofing below the stucco cap should be used regardless of the slope. For further discussion, refer to section C.1.e of this report.

The as-built slope measurements of the stucco parapet walls were constructed with varying slope ranging between 0- to 30-percent, and the stucco pop-out boxes were constructed with varying slope ranging between 5- to 15-percent. At some locations, the stucco was constructed with a slope away from the point of drainage. Also, at some locations the stucco at the roof parapets was sloped to the exterior instead of constructed with the slope inward towards the roof. Where stucco slope does not meet industry standards, and combined with the cracks in the stucco, water is allowed to penetrate under the stucco system.

Where non-compliant slope of stucco at horizontal surfaces exists, the as-built condition falls short of the prescriptive requirements of the relevant codes, design, and industry standards and, therefore, the developer, contractor, and subcontractors who performed the work fell below the standard of care.