MORRISON HERSHFIELD

April 11, 2017

Stela Diaz
Bellwether Housing
1651 Bellevue Avenue
Seattle, WA 98122

MH ref: 8170089.00

Re: Leak Investigation
2020 Terry Apartments, 2020 Terry Avenue, Seattle, WA

Dear Ms. Diaz:

Morrison Hershfield (MH) is issuing this report to outline the results of the leak investigation related to moisture intrusion discovered at Units 324, 424, 524, 624, and 724.

1. BACKGROUND

The 2020 Terry Apartments building complex was completed in 1992. In 2003, a stucco survey was performed by Ian McGlynn that included the east (alley) elevation, which according to a summary of the report noted that there were some problem areas, but the elevation at the alley did not need an immediate stucco replacement. In 2006, Wiss, Janney, Elstner Associates, Inc. (WJE) investigated water infiltration of the exterior wall construction and noted that some stucco repairs were apparent on the east elevation. Subsequently, in 2009, the stucco cladding of the uppermost story (seventh) of the east elevation was over-clad with a sheetmetal panel system. In 2010, MH performed a preliminary building envelope condition assessment that included the east elevation for the Housing Resource Group, predecessor to Bellwether Housing (BH). Recently, some tenants occupying units on the east side of the east wing of the 2020 Terry Apartments complained of moisture intrusion into their units, and BH performed exploratory openings in the units listed above, confirming the presence of moisture intrusion.

2. OBSERVATIONS

On April 7, 2017, David Rash of MH met with Brian Huff of BH to review the exploratory openings and in the affected units, as well the condition of the roof above these units and the exterior of the east wall.

In Unit 724, exploratory openings were located in the exterior wall on the south side of the window, in the ceiling above this wall opening, and in the adjacent south interior wall at floor level. The interior face of the gypsum board sheathing above the mid-point of the window jamb appeared to have past evidence of water intrusion in the form of intermittent detached paper facing. Below the mid-point, Brian Huff indicated that the sheathing was visibly wet when the opening was first made and at the base of the wall the gypsum sheathing was physically deteriorated and wood framing members were wet. The framing members and sheathing in the ceiling cavity were dry.

In Unit 624, an exploratory opening was located in the exterior wall on the south side of the window. The interior face of the gypsum board sheathing had water stains and areas of deterioration. Photographs provided to MH by Brian Huff on April 5, 2017, showed visibly wet sheathing and water migrating past the wood framing members of the ceiling. Cracks and water stains were visible at the interior wall finish below the window. Rust was evident on a metal conduit and its base plates, as well as water stains on the framing members.

In Unit 524, exploratory openings were located in the exterior wall on the south side of the window and in the ceiling above this wall opening. Water stains were evident on the wood framing members. Photographs provided to MH by Brian Huff on April 5, 2017, showed visibly wet plywood sheathing at the first stud spaces adjacent to the window and minor moisture migration at the wood studs. Rust was evident on a metal conduit in the wall cavity.

In Unit 424, the exploratory opening located in the exterior wall on the south side of the window had been closed on April 6, 2017, at the request of the tenant. Brian Huff indicated that the water intrusion discovered in this unit was similar to that in Unit 524.

In Unit 324, exploratory openings were located in the exterior wall on the south side of the window and above the southern half of the window head. Some water stains were evident on the wood framing members and plywood sheathing. The window frame had separated from the wall construction at the jamb and water stained was visible on the interior wall finish below the window sill. Some rust was evident on a metal conduit in the wall cavity. The tenant indicated that water intrusion had been observed at the window head, which was noticeable during driving rain with wind from the east; the tenant first noticed this approximately two months ago.

On the roof, the roofing membrane above the affected units appeared to be in good condition with no open seams or loss of roofing granules. The sheetmetal coping covering the building parapet appeared to be in good condition. Where the parapet over the affected units intersected with a higher parapet to the north, which also projected eastward, the coping interface with the wall did not appear to be fully sealed; however, this location was at the north side of the affected units. At the approximate location of the south side of the affected units, the coping standing seam was sealed, both at the pin-holes at the front and rear faces of the coping and at the lapped joints in the vertical faces of the seam.

At the seventh story of the building complex, the sheetmetal cladding of the east (alley) wall appeared to be in generally good condition; however, the sealant in a joint at a vent penetration to the south of the Unit 724 window had lost some of its adhesion to the vent hood. The condition of other sealant joints could not be determined visually without having better exterior access. Flashings at wall penetrations, including window openings, appeared to be fabricated from sheetmetal with pop-riveted and sealant seams. The window head flashings were attached through the siding and into the building with exposed gasketed screws. Likewise, the bottom edge of the metal siding was attached to the building with exposed gasketed screws. The transition flashing between the parapet coping and the top of the siding, lacked functional sealant over the affected units.

The remainder of the east (alley) wall was clad with stucco having an elastomeric coating as a surface finish. Vent penetrations through the stucco appeared to lack sealant or penetration flashings and were typically attached to the building with exposed screws. Window openings typically lack sheetmetal flashings. Rust, to varying degrees, was visible at the J-molding of the stucco panels and was most noticeable at window sills. Some sealant joints in the stucco had

failed and, in one location, was missing.

3. DISCUSSION

A summary by Lynda Carey Boyle of Ian McGlynn's stucco survey in 2003 noted:

- The east elevation (alley & courtyard) cladding has a short life-span.
- There is no proper building paper flashing around the windows (e.g., the window nail flanges were nailed directly to tyvek paper and building paper was installed under the stucco.)
- There are no head flashings at the windows.
- The metal joints are rusting (over and under the windows).

The Limited Moisture Infiltration Investigation (East and South Elevations) report by WJE of 2006 noted the following, in regards to the stucco cladding:

- Several cracks of varying widths were observed. Cracks were typically vertical and spanned between the horizontal reveal at floor lines and the center of the window assembly.
- Many vertical control joints above and below windows were crushed or deformed.
- The casing bead installed along the base of the stucco wall does not contain weep holes to allow drainage of water. Water stains and efflorescence were present on the concrete foundation wall below the stucco. Accumulation of rust on the casing bead at the base of the stucco wall was typical.
- The stucco casing bead at the perimeter of window openings was noted to be corroded typically at the head and sill of the windows.
- WRB (weather/water resistive barrier) was installed over window nail fins, including the sill fin.
- The WRB was installed cut to fit around the dryer vent penetration at Unit 524. Additional membrane flashing surrounding the vent did not exist. The dryer vent did not have fins. Plywood sheathing surrounding the vent was in good condition and free of water stains.

The Certificate of Substantial Completion for the 2009 metal siding installation at the seventh-story of the east (alley) elevation included information regarding how the siding was installed over the existing stucco cladding:

- Sheetmetal siding was attached to the stucco or tile cladding rather than the structural wood framing of the building (Pull-out tests were performed to confirm that adequate pull-out values could be achieved with the stucco and tile cladding).
- Sheetmetal siding was installed with WRB between the siding and existing wall cladding, but apparently without membrane flashings at window opening or wall penetrations.
- Sealants at window openings were removed and replace with backer rod and silicone sealant.
- Details at vent penetrations were not provided, but relied upon sealant joints to seal the penetration opening (based upon visual observation during site visit).

The Preliminary Building Envelope Condition Assessment report by MH in 2010 made similar observations regarding the condition of the stucco cladding as described above.

No moisture intrusion was observed above the window head in Unit 724 and limited evidence of

some past water intrusion from the window head to the mid-point of the window jamb. Recent moisture intrusion was evident from the mid-point of the window jamb and continuing down through Unit 324 with the moisture most evident near the jamb location and less evident as one moves away from the jamb location. At Unit 324, moisture intrusion also occurred at the window head. The tenant in Unit 424 reportedly did not notice any moisture intrusion in the unit and the discovered moisture intrusion was limited to the inside face of the exterior sheathing.

Based upon this pattern of moisture intrusion, failure of the sealant joints at the window openings, and particularly at the window jambs, is the likely probable cause for the water intrusion observed in the affected units. As water intrusion occurs at approximately the vertical mid-point of the sheetmetal siding installed over stucco and tile cladding, the possibility exists that the screws attaching the siding to the cladding are not well seated and are allowing the siding to flex during wind events resulting in water intrusion at the window jambs and possibly at other locations as well. It is also possible, that since most of the water intrusion was found at the interior face of the exterior sheathing, the water intrusion issue may be more widespread than what has been found at the affected Units 324 through 724.

4. RECOMMENDATIONS

MH recommends that a limited number of additional exploratory openings be performed to determine if the degree of water intrusion is limited to the affected units described in this report or if the water intrusion is more widespread.

If the degree of water intrusion is limited to the currently affected units, then replacement of sealant joints at window openings and in the stucco cladding is recommended; however, since both the exposed stucco cladding and the sheetmetal siding are essentially face-sealed weather barriers that lack membrane flashings into wall openings and at wall penetrations, the long-term solution would be to replace the present wall claddings at the east (alley) elevation with an appropriately detailed rainscreen cladding assembly.

5. LIMITATIONS

This assessment is based on a review of available documents, visual observations, selective destructive exploratory openings and moisture content measurements taken at a sample of building envelope elements. This report documents our observations of the current condition of various building envelope elements and identifies factors or mechanisms that are believed to have led to the current condition. The report is not intended to provide an opinion regarding responsibility of any specific party in causing or contributing to the conditions observed.

Any comments or conclusions within this report represent our opinion, which is based upon the documents provided to us, our field review of physical conditions, specifically identified testing and our past experience. This review is limited to technical, construction and performance items related to the building envelope. In issuing this report, MH does not assume any of the duties, liabilities of the designers, builders or owners of the subject property. Owners, prospective purchasers, tenants, or others who use or rely on the contents of this report do so with the understanding as to the limitations of the documents reviewed, the general visual review undertaken and limited openings conducted, and understand that MH cannot be held liable for damages which may be suffered with respect to the purchase, ownership, or use of the subject property

The review was limited to building envelope performance issues, specifically related to water penetration. Where feasible and applicable, and as may be outlined in this report, the envelope systems were also reviewed for assemblies used to control air leakage, vapor diffusion and thermal performance. Our review for this assessment does not include structural connections, mechanical systems, fire rated assemblies, interior finishes, or other components not related to the building envelope.

Please contact MH should there be any questions regarding the above.

Regards,

Morrison Hershfield Corporation

David A. Rash, RRC
Building Science Consultant

Reviewed by:

Y. Ken K. Chin, Architect, NCARB
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