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February 28, 2018

Ms. Linda Hernandez
Klapper Group
424 Pacific Coast Highway
Hermosa Beach, CA 90254

Subject: Limited Structural Site Inspection
4140 Admirable Drive
Rancho Palos Verdes, CA 90275

PVEC #: 2-18-0101

Date of Inspection: February 27, 2018

Dear Linda:

ASSIGNMENT

At your request, we have personally inspected the single-family residence at 4140 Admirable Drive in Rancho Palos Verdes, for the purpose of determining the existing condition of structural integrity. We base our conclusions on visual observations of accessible interior and exterior areas, and a review of our office files for this property dating back to 2008. Our firm did no subsurface or destructive testing. We did a limited manometer survey of the floor elevations to compare with our 2008 survey. A copy of that survey is included with this report.

CONCLUSIONS

In our opinion, the overall foundation and framing elements of the house appear to be adequate. Several conditions will be discussed in detail below, and recommendations will be made for repairing certain areas.

The maintenance of the surface and sub-surface drainage around



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the property is of primary importance. The surface runoff from the uphill adjacent areas, around the house, and down to the streets below will need to be monitored. A large amount of water could flow through the property during a heavy rain. The roof gutters and downspouts will require modifications to ensure that all the roof water is captured in sub-drain pipes and directed safely to the street.

Because of the underlying clay fill soil, the foundation has settled unevenly since original construction. This results in uneven interior floors that have been adjusted over the years. However, the amount of settlement is typical for houses of this age in this vicinity. If the wood floor framing is properly attached to the concrete footings, the structural integrity of the house remains adequate to resist moderate seismic and wind loads.

DISCUSSION AND RECOMMENDATIONS

At the time of our inspection on Tuesday, February 27, 2018, you were present at the site and heard our comments and concerns following the inspection. The house was built around 1959 and appears to have been well constructed. It survived the 1994 Northridge earthquake and subsequent seismic and storm events. Our original manometer survey in 2008 measured 6.4 inches of floor height variation. The survey on February 27, 2018 shows an increase of only 0.2 inches of height variation compared to 2008. That minor amount of movement in 10 years indicates that the foundation settlement has slowed considerably. The industry standard is approximately one inch of slope in twenty feet of horizontal distance for new construction. This house exceeds that standard, but is typical of similar houses of this age in this vicinity.

Generally, the type of soil found in this area and which likely underlies the site, is expansive clay. In such soils, changes in



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soil moisture create volume changes in the soil structure. When the soil becomes wet due to rainfall or landscape irrigation, it tends to swell out from beneath the perimeter house foundations, or downhill on a slope. During the subsequent dry periods, it shrinks and causes settling of the foundations. This outward and downward movement, called creep, induces stresses in foundations and house framing members, allowing them to settle and flex. For this reason, maintenance of the drainage around the house is critical to the long-term performance of the structure. The amount of foundation settlement measured in this house indicates that a blanket of fill soil likely underlies the site. Because of this underlying clay soil, any changes in soil moisture will encourage flexure in the foundation and framing, as well as contribute to the reinforcing steel corrosion. If additional information regarding the soils or geology of the property is desired, please retain a geotechnical engineer familiar with this area.

In 2008 our firm was asked to provide repair details for re-leveling portions of the floor and properly attaching the floor framing to the perimeter foundations. A pdf file of this design will be sent with this report. Since the original drawings were in 24"x36" format, a reduced hard copy would be difficult to read.

The house is framed with wood, and this wood framing is more flexible than the brittle plaster walls, ceilings and tile floors. As the wood flexes with temperature and humidity changes, or vibrates during an earthquake, the structure will absorb and resist the forces. The brittle surfaces likely will crack. This does not indicate any structural weakness, only that the plaster is not as flexible as the wood. The smooth exterior plaster finish also is more likely to show cracks than would stucco with a heavier texture. These cracks should be monitored to ensure that they stay surficial and do not trap water inside the wall.



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The slope terracing below the house contains a variety of retaining structures. It is important to eliminate any surface runoff over this rear slope. The only water incident to this rear slope should be what rains onto it directly. It should not accept any runoff from uphill areas. Since changes in soil moisture create slope creep, it is imperative that the rear slope be kept just moist enough to sustain the plants, but no more.

Several shrinkage and flexure cracks are visible in the planter walls around the property. Such signs of movement are usually not serious, but should be watched for any changes. The expansive soil exerts more pressure on such walls than would a more granular soil. The cracks and separations in the hardscape around the house also indicate the movement of the clay soil.

If a more permanent foundation system is desired, we estimate it would cost in the range of \$180,000 to \$200,000, including the subsurface geotechnical investigation and reinforced concrete caisson and grade beam underpinning. However, the alternate method of periodic re-leveling has maintained the structural integrity of the house, and may be continued if desired.

In summary, the overall foundation and framing elements of the house appear to be stable at this time. The surface drainage must be meticulously maintained to avoid damage to the house and the slope below.

This report is based solely on a visual inspection and is limited to the stated areas of concern. Other conditions affecting this or other properties that were not inspected, accessible or anticipated are beyond the scope of this report.

Palos Verdes Engineering Corporation does not inspect or test for mold or any other biologic or health hazards, which may be present at this site. Areas with limited ventilation, high humidity or evidence of moisture intrusion may contain such hazards. A professional inspection and test procedure can be



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done to obtain specific information about such conditions at this property.

Services performed by this firm, at the subject site, were conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. The contents of this report represent our professional opinions based on limited visual observation. This report may not be construed as a guarantee or warranty of the performance of the structure under future adverse circumstances.

Please do not hesitate to call if you have any questions or require further information.

Very truly yours,

PALOS VERDES ENGINEERING CORPORATION

A handwritten signature in blue ink, appearing to read 'JOS', with a long horizontal flourish extending to the right.

John O. Schuricht
Structural Engineer 2391

Manometer survey attached

