Parking Garage & Roof Structural Condition Evaluation

Location:

Prepared for:

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Engineer of Record:
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Results and Conclusions

Based upon the information obtained and relied upon to date, we offer the following opinions:

Parking Garage

1) The physical evidence observed at the property indicated that parking garage was in fair to poor condition.

2) The physical evidence observed at the property found the following areas of concern that should be addressed:

   a) A portion of the mid-level parking garage near the northeast corner of the building should be sealed off to prevent use until repairs are made. **Please notify the current owner of this condition immediately.**

   b) The upper and mid-level asphalt surface was in poor condition this surface should be have a thin top coat placed to create a slope towards the existing drains to facilitate drainage and eliminate standing water. This surface should then be resealed with a waterproof sealant that can withstand traffic loads.

      a. Prior to resealing and retopping this area, all cracks should be thoroughly cleaned and sealed with an elastomeric sealant.

      c) The drain downspouts should be rerouted so that they drain to the edge of the mid-level parking area on not simply deposit water directly onto the mid-level parking area.

   d) The structural steel framing and metal floor deck at each floor level should be brushed to remove all rust and then repainted. Once the rust has been removed and prior to repainting the condition of each beam should be evaluated to determine if the beams require additional repairs. In general it did not appear that the beams needed significant/if any repair.
e) Additional steel members should be installed below all deteriorated metal deck. An additional center member and a member on either side of the beams where the metal deck is deteriorated should be installed along with intermediate supporting members to reinforce the metal deck where the joints have become separated.

f) Where the metal deck has completed deteriorated and the reinforcement is visible the areas of exposed reinforcement should have a layer of high strength shotcrete placed to provide adequate coverage and then an additional deck should be installed along with additional steel support beams to ensure sufficient support for those particular spans.

g) The steel column supporting the upper level beam that framed the opening along the northeast corner should be shored up and replaced such that it bears directly upon the supporting steel beam below as the concrete and metal deck at that location appeared to be significantly deteriorated.

h) At the basement level it appeared that moisture was being trapped within the level resulting in some of the corrosion observed. Different methods should be evaluated to determine the most cost effective way to provide some circulation at that level.

i) All repairs should be performed by a qualified contractor and should comply with all applicable building codes.

Roof

a) The sealant at the parapet cap joints appeared to be deteriorated and should be removed and replaced.

b) All loose and missing condensation drains for the six roof top units should be repaired to ensure that water is directed to the correct location on the roof system, ie the interior drains.

c) The missing gutter cap should be re-installed.
d) All thru roof penetrations should be visually inspected and repaired as necessary as several appeared to have deteriorated to the point where cracks were observed around the penetration and staining was observed along the bottom of the roof surface.

**Windows & Miscellaneous Items**

a) The windows were observed to be single pane windows and in several instances the glazing sealant appeared to be deteriorated and cracked. At a minimum all the sealant along both the interior and exterior should be removed and replaced in order to ensure a water tight seal and thought should be given to replacing the windows with IG units to prevent condensation issues as well as provide better overall thermal performance.

b) The step cracks observed in the lower level stair well should be repointed and observed for further movement.
Introduction

A.S. Engineering Services, P.C. was retained by, to evaluate the structural condition of the three-story parking structure along the rear and lower levels of the property. Our work to complete this assignment was performed by Alex Spyrou, PE on October 1, 2014. Sellers real estate agent, was present during our inspection and provided some of the information pertaining to the building. All measurements and data cited in this report are considered to be approximate values and are based on readily available visual evidence. No destructive testing was performed as part of this evaluation.

Building Information

Mr. reported that the building was constructed sometime in the 1980’s. The subject structure was three-story, steel parking structure located along the rear and lower levels of the property. The upper level parking area was accessed via a ramp along the north side of the building while the mid-level and lower levels were accessed by ramps along the east and west side of the building all of which were off of Powerhouse Road. The parking structure consisted of steel beams with a concrete floor slab supported by a metal deck. The metal deck did not appear to be composite, with the exception of the west ramp leading to the mid-level parking floor. The front of the building is referenced as facing south.

Representative photographs are included in this report. The photographs taken but not included in the report are available upon request.

This report was prepared by A.S. Engineering Services, P.C. for the exclusive use of. Any other use is prohibited without the written consent of and A.S. Engineering Services, P.C. Our opinions are based on experience, education, work performed, industry resources, engineering references, and other information acquired. We reserve the right to modify or supplement our opinions and conclusions.
Photographs

Parking Garage

Photograph 1: Plan view of the building and parking structure.

Photograph 2: View of the west (left) side of the building.
Photograph 3: View of the north (rear) side of the building.

Photograph 4: View of the west side, parking garage access ramps.
Photograph 5: View of the east (right) side parking garage access ramps.

Photograph 6: View of the gap between the rear of the building and adjacent sidewalk.
Photograph 7: View of the deteriorated and missing sealant between the rear of the building and adjacent sidewalk.

Photograph 8: View of the standing water along the rear upper exterior parking level.
Photograph 9: View of the standing water along the rear upper exterior parking level.

Photograph 10: View of a drain for the upper level parking area.
Photograph 11: View of the cracked asphalt surface of the upper level parking area adjacent to the north entrance ramp.

![Cracked Asphalt Surface](image1)

Photograph 12: View of standing water along the midlevel parking area directly below the north entrance ramp of the upper level parking area.

![Standing Water](image2)
Photograph 13: View of the building line relative to the mid level parking area.

Photograph 14: View of the outlet of the upper level parking area drain.
Photograph 15: View of the completely deteriorated metal deck and spalled concrete along the bottom of the mid-level parking area.

Photograph 16: View of the cracked concrete along the mid-level parking area adjacent to the northeast corner.
Photograph 17: View of the cracked concrete along the mid-level parking area of the northeast corner.

Photograph 18: View of the cracked parking surface along the mid-level parking area along the northeast corner. Note the vertical differential movement along the crack.
Photograph 19: View of the area of the mid-level parking structure referenced in the photos above.

Photograph 20: View of deteriorated metal deck and adjacent steel beam below the west side ramp leading to the mid-level parking area.
Photograph 21: View of the framing below the west ramp leading to the mid-level parking area.

Photograph 22: View of the deteriorated metal deck below the west ramp leading to the mid-level parking area.
Photograph 23: View of the significantly deteriorated metal deck below the mid level parking area along the west side of the building.

Photograph 24: View of the rusted metal floor framing below the mid-level parking area.
Photograph 25: View of the steel column supporting the opening in the upper level parking area along the northeast corner. Note the deflected beam.

Photograph 26: View of the deteriorated concrete and wood shim directly below the column noted in the picture above.
Roof

Photograph 27: View of the roof of the building facing west.

Photograph 28: View of the roof of the building facing north.
Photograph 29: View of the standing water along the roof surface of the building.

Photograph 30: View of the deteriorated roof surface along a roof penetration.
Photograph 31: View of the cracked and deteriorated sealant along the parapet cap.

Photograph 32: View of the standing water adjacent to the roof top equipment along the southwest corner of the building. This area is adjacent to where the stains were observed in the roof framing.
Photograph 33: View of a stain along the bottom of the roof surface adjacent to the area noted in the previous picture.

Photograph 34: View of a stain along the bottom of the roof surface adjacent to the area noted in the previous picture.
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<th>Photograph 35: View of a typical window. Note the single pane glazing.</th>
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<th>Photograph 36: View of the sealant along an exterior window.</th>
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Photograph 37: View of a plastic layer along the interior of the window.

Photograph 38: View of some step cracks in the interior stairwell along the lowest level of the building.