

November 5, 2008

VIA EMAIL

Ms. Nickie Greco
Parkway Towers Condominium Association
c/o WestStar Management
6795 East Tennessee Avenue, Suite 601
Denver, Colorado 80224
Email: ngreco@weststarmanagement.com

Re: Roof Deck Evaluation for Parkway Towers Condominium Association
Project No.: 08103

Dear Ms. Greco and Members of the Board of Directors:

We have completed our site observations of the roof deck at Parkway Towers Condominiums, located in Denver, Colorado. The following is a summary of our observations, comments and recommendations.

The recommendations provided within this report are not intended to be a complete set of construction documents but will give the Parkway Towers Condominium Association a general idea of the repair recommendations.

General Information

Parkway Towers is a 17-story condominium building consisting of approximately 100 residential units, a roof top pool, upper surface parking surface and below grade parking structure.

Drawings of the building were provided however, they did not include any of the waterproofing details for the roof structure.

We performed our observation on Monday, October 20, 2008.

Observations, Conclusions and Recommendations

Upper Surface Deck

A1. Upper Surface Slab – North Portion of Building (Not Pool Side)

Description: Concrete cast-in-place slab with an elastomeric waterproof membrane.

Comments: We observed a significant amount of deterioration of the waterproof membrane that was applied to the surface of the concrete deck.



We performed a chain drag test which involves dragging a heavy link chain across the slab surface while listening to the acoustic response. Areas where significant delamination has occurred often have an audible acoustic response that contains different frequencies than areas where sound concrete/coatings are present.

There was very little distress in the concrete deck slab. Minor exposed aggregate was visible on the east side of the deck near the parapet wall. In addition, there appears to have been previously embedded steel anchors in a circular pattern on the east elevation. The cut anchors are visibly rusted.

Recommendations: We recommend that the existing waterproof membrane be completely removed. The areas of spalled concrete should be cleaned and patched with a repair mortar with integral corrosion inhibitor.



The cut, rusted bolts shall be removed, the surrounding concrete cleaned and patched with a repair mortar with integral corrosion inhibitor. The entire concrete surface shall be cleaned and a pedestrian grade waterproof coating shall be installed.

If the association elects to postpone the repair through the winter, it is recommended that, once the surface has been cleaned and the surface repairs made that an alkylalkoxysilane penetrating sealer be installed on the surface to protect the concrete through the winter.

A2. Upper Surface Slab – South Portion of Building (Pool Side)

Description: Concrete cast-in-place slab with an elastomeric waterproof membrane.

Comments: We observed deterioration and delamination of the waterproof membrane that was applied to the surface of the concrete deck.

We performed a chain drag test which involves dragging a heavy link chain across the slab surface while listening to the acoustic response. Areas where significant delamination has occurred often have an audible acoustic response that contains different frequencies than areas where sound concrete/coatings are present.



The delamination of the membrane has occurred at the following locations:

1. At the deck/wall transition around the three sides (east, south and west) of the mechanical room.
2. At the deck/wall transition along the east edge of the building for approximately 40 lineal feet.
3. At the steel embed plate located at the east end of the south building wall.
4. Around the drain located at the west end of the deck along the south side of the pool.

Approximately 80% of the coping stones surrounding the pool deck give an acoustic response indicating a detachment from the structure. The membrane approximately 6" – 8" outward from the coping stones has also delaminated.

The sealant joint between the coping stone and the pool deck has also failed around the majority of the pool perimeter.



Recommendations: We recommend that the existing waterproof membrane be completely removed. Any areas of spalled concrete should be removed and the affected area cleaned and patched with a repair mortar with integral corrosion inhibitor. The entire concrete surface shall be cleaned and a fluid-applied polyurethane waterproofing coating shall be installed. Because of the chemical and greater need for performance, the waterproof system used for the pool area will be slightly more costly than the open air deck coating.

All joints in the concrete shall also be sealed with a polyurethane sealant.

The coping stones around the perimeter of the pool shall be removed and reset prior to the installation of the new waterproof membrane.

A3. Privacy/Security Glass Panel Curtain Wall

Description: There is a glass panel curtain wall separating the pool area and the remainder of the roof area and is located near column line D (as shown on sheet S-5 of the provided documents). The wall is constructed of glass and what appears to be either extruded aluminum or steel mullions. It is attached to the roof deck with embedded steel plates.



Comments: The attachment of the curtain wall to the deck is severely deteriorated, with the damage worse on the west elevation. Although not visible, it is assumed that the deterioration at this location has damaged the concrete deck to some extent.

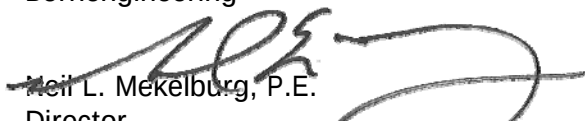
Recommendations: The curtain wall that separates the pool area from the remainder of the roof area shall be removed. The concrete shall be observed at this time for deterioration. It is assumed that a portion of the deck will need to be removed and replaced. The concrete shall be removed in such a manner as to salvage the reinforcing steel. If salvageable, the steel shall be cleaned to bare steel prior to the install of a repair mortar. A new curtain wall shall be installed. The waterproof membrane will need to be incorporated with the new curtain wall.



All comments made are based on conditions seen at the time of this visual observation. We do not accept any responsibility for unknown or unknowable conditions within the existing site or structures.

Please contact our office if you have any questions.

Sincerely,
Bornengineering


Neil L. Mekelburg, P.E.
Director
Structural Engineering Group

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