Date: August 17, 2022

To: Sarah Hanzel, City of Rapid City

From: Stephen Kilber, PE, Albertson Engineering Inc.

Project: Block 75 Parking Garage Repairs
Project #: 2021-504

RE: Stair Enclosures

This document is meant to provide a summary of the proposed stair enclosures to be included within the upcoming repairs for the Block 75 Parking Garage adjacent to Main Street Square.

GARAGE HISTORY

- Circa 1999, the Garage was constructed with only a single level.
- In 2008-2009, the Garage was expanded by the addition of the third-floor level.
- The two stairways at the southwest and southeast corners consist of two different types of walking surfaces:
  - Concrete landings and tread risers atop structural steel from the second (original) level down to the ground
  - Steel bar grating atop structural steel from the second to third level
- In 2013 some repairs were carried out for the existing stairs, including the placement of the rough aggregate chip-seal on the concrete stair portions and slip resistant expanded metal grating atop the bar grating. Both of these repairs were done to mitigate the potential for slips and trips.

GARAGE STAIRS CURRENT CONDITION

The concrete stair risers at both stairs are in various states of disrepair, particularly the southeast corner stair. As shown in Photographs 1 & 2 at the end of this memo, there a few locations where the riser concrete and its internal reinforcement has experienced significant moisture induced deterioration. This deterioration has led to cracking, distortion (bowing/heaving) of the riser walking surface, and changes in the riser-to-riser run height. In other areas of the stairs, rust bleed of the perimeter support steel, paint bubbling, and corrosion at various structural members, guardrails, and handrails is also common. It should be noted that the concrete stairs are approximately 23 years old. Over the last 5-7 years, there have been 10 or more recorded slip, trip, or fall events within the garage due to inclement weather from City of Rapid City staff that use the garage.
GARAGE STAIRS REPAIRS AND PROPOSED ENCLOSURE

As part of the upcoming garage repair project, it is obvious the stairs will require significant renovations (removal/replacement and repainting) to correct the current deterioration. However, exposure to environmental moisture will eventually lead to similar deterioration in the future. In addition, further exposure to environmental moisture (rain and snow) extends the risk for future slips, trips, and falls.

The proposed solution is to enclose the stairs as shown in the attached renderings. The enclosures are meant to reduce weathering/freeze-thaw degradation of the new stair repairs, mitigate potential for slips, trips, and falls due to environmental moisture, and to reduce maintenance costs associated with snow removal.

The new stair enclosures will consist of aluminum storefront window systems and clear tempered glass or polycarbonate sheets. The new storefront will be supported by new structural steel wind beams and columns, which will be welded back to the existing structural systems. There will be no new foundations or hard attachments of the enclosure storefront to the existing concrete sidewalk at the ground level. The provided renderings not only show the enclosure layouts but also the proposed colors. The proposed stair enclosures are intended to have a similar look to the enclosed stairway at the Pennington County Parking Garage.

Photograph 1: Stair tread (red arrow) on southeast stairs with significant cracking, surface heave, and rust jacking of underlying structural steel.
Photograph 2: Stair treads (red arrows) on southeast stairs with longitudinal cracking and uneven walking surfaces present.
BLOCK 75 PARKING GARAGE REPAIRS
MAIN ST SQUARE LOOKING NORTHWEST AT 6TH STREET
8-16-2022
BLOCK 75 PARKING GARAGE REPAIRS
REAR OF STRUCTURE LOOKING SOUTHWEST
8-16-2022