

April 8, 2024

Jennie Elliott  
Iowa Department of Administrative Services  
109 SE 13<sup>th</sup> Street  
Des Moines, Iowa 50319

RE: IDAS – DOC Anamosa State Penitentiary Partial Tunnel Evaluation  
IDAS Project No. 9386.00

Dear Ms. Elliott:

The purpose of this memo is to summarize our findings of the Anamosa utility tunnels in the two locations specified by the State where there were concerns regarding structural integrity. On January 30, 2024, Shive-Hattery structural engineers, Matt Mettemeyer, PE and Chris Marvin, PE completed an onsite review of two areas of the utility tunnels to observe conditions and evaluate the need for remedial measures to maintain operation. Locations reviewed were Tunnels 6, 6A, 7, and 8, located north of Living Units B and D and tunnels 5, 5A, 5B, and 5C located at the north central portion of the yard.

**Locations 6, 6A, 7, and 8 Observations:**

Tunnel appears to house steam, water, electrical, and communication lines. Walls were made of concrete in front of Living Unit D and transitioned to stone about 100 feet to the east towards Living Unit B. Walls are in decent condition overall considering their age. Tunnel roof is concrete and is severely deteriorated. There is a significant amount of spalled concrete on the floor that has fallen from the underside of the roof. There is at least one crack in the roof that is visible from the pavement above. The majority of the tunnel roof has spalled and delaminated concrete with visible corroded reinforcement with significant section loss.

**Locations 5, 5A, 5B, and 5C Observations:**

This tunnel appears to only house a water line and some minor electrical cables. At one location near the far north end there is a large section of concrete crossing and partially obstructing the tunnel that likely houses another utility. Walls consist of stacked limestone and roof is concrete with some wood forms left in place. Walls appeared to be in good condition for their age with some signs of stone degradation including mineral deposits where ground water had leached through the walls. Portions of the tunnel roof appeared to have been repaired in the past with full depth replacements. Near the north end of the tunnel the roof is severely deteriorated. There are large spalls and delaminations in the roof with exposed reinforcement that is severely corroded with significant section loss. The roof at this location appears to be supported by the iron gate below, preventing the gate from being opened. This area of the roof also has some substantial cracking visible from the surface. The facility has barricaded this area to prevent any loading on the roof.

**Recommendations:**

Tunnels 6, 6A, 7, and 8 are severely deteriorated. The structural capacity of the roof over this tunnel is significantly diminished. Large vehicles should be prevented over this area unless temporary shoring is installed in this area of the tunnel, which is approximately 350 feet in length. Foot traffic and small vehicles such as golf carts are acceptable. Repairs to this area, including roof replacement, should be planned for within the next two years. Full closure in certain areas or emergency shoring may be required before repairs can occur. The tunnels should be monitored for any additional significant concrete spalling, cracking, settlement, or failure that may pose potential hazards at the surface and/or



damage or loss of utilities within the tunnel. The attached opinion of probable construction costs, based on current construction data and bid results, suggests approximately \$151,000 if emergency shoring needs to be installed and approximately \$563,000 for recommended repairs.

Tunnels 5, 5A, 5B, and 5C is severely deteriorated at the north end. This area should remain barricaded until the roof can be replaced. If the facility leaves the barricades in place until the repairs are complete, no temporary shoring is needed in this area. The recommended repair includes approximately 25 linear feet of full depth roof replacement. The rest of this area of the tunnel is anticipated to last longer than 2 years. The attached opinion of probable construction costs, based on current construction data and bid results, suggests approximately \$67,000 for recommended repairs. Consideration could also be given to abandoning the tunnel due to the limited number of utilities in this section. Abandonment or relocation of utilities should only be considered along with verification that utility operations and access to the other tunnels at the facility would not be impacted. Abandonment of this tunnel may include filling the tunnel with a low strength grout mixture followed by a removal of the roof and repouring the sidewalk as a slab on grade.

Thank you for the opportunity to assist you with these concerns. Feel free to reach out with any comments, questions, or concerns you may have about our observations and recommendations.

Sincerely,

Shive-Hattery, Inc.



Matt Mettemeyer, PE  
Structural Engineer



Chris Marvin, PE  
Structural Engineer

## PHOTOS



*Photo 1: Location 6*



*Photo 2: Location 6*





Photo 3: Location 6A



Photo 4: Location 6A



Photo 5: Location 7



Photo 6: Location 8



Photo 7: Location 8



Photo 8: Location 5



Photo 9: Location 5



Photo 10: Location 5A/5B



Photo 11: Location 5A/5B



Photo 12: Location 5B



Photo 13: Location 5C



Photo 14: Location 5C



Photo 15: Location 5C



Photo 16: Location 5C



Photo 17: Location 5C



Photo 18: Location 5C



--	--	--	--	--	--	--	--

<b>CONSTRUCTION SUBTOTAL</b>	=	<b>\$289,000.00</b>
UNDEVELOPED DESIGN CONTINGENCY (25%)	=	\$72,000.00
SMALL PROJECT PREMIUM (15%)	=	\$43,000.00
BID CONTINGENCY (15%)	=	\$43,000.00
<b>CONSTRUCTION TOTAL</b>	=	<b>\$447,000.00</b>
DESIGN FEE AND ADMINISTRATION FEES (26%)	=	\$116,000.00
<b>PROJECT TOTAL</b>	=	<b>\$563,000.00</b>