Kumar & Associates, Inc.®
Geotechnical and Materials Engineers
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December 31, 2025

St. Francis of Assisi Roman Catholic Church
Attn: Mark Zacker
2746 Fifth Street
Castle Rock, CO 80104

mzacker@stfranciscr.org

Subject: 2025 Annual Geologic Observations of Existing Rockfall Mitigation Measures, St. Francis of Assisi Roman Catholic Church, 2746 Fifth Street, Castle Rock, Colorado.

Project Number 24-2-141

Dear Fr. Zacker,

Kumar & Associates, Inc. has completed a follow-up annual Inspection of the existing rockfall mitigation measures at the subject site in accordance with our proposal for geotechnical engineering services to St. Francis of Assisi Roman Catholic Church dated April 12, 2024, Proposal Number P7-24-285. The purpose of this letter is to summarize the geologic conditions at the site, convey the observed condition of the existing rockfall mitigation measures and any noted changes in condition, along with providing our recommendations for maintenance of the existing rockfall mitigation measures and future inspection.

The site, located at 2746 Fifth Street in Castle Rock, Colorado, is situated within the northwest quarter of the northeast quarter of Section 12 in Township 8 South, Range 67 West, Sixth Meridian of the Public Land Survey System. The area of interest is located on the south and southwest side of the St. Francis of Assisi Roman Catholic Church complex and consists of a cliff face formed from the Castle Rock Conglomerate. The cliff has heights of up to 25 feet in places, averaging between 15 and 20 feet. The area above the cliff face has gentle slopes with a general slope trending down to the southeast, while the area below the cliff has steep slopes averaging between about 85 and 175 percent down to the southwest toward existing residential housing.

The Colorado Geological Survey originally began monitoring the site in 1981 following a rockfall event in which a large block detached from the cliff face, posing a rockfall hazard to residences below. The block was broken up with passive demolition methods. In 2005, the parish proposed a major expansion, at which point Douglas County and the Colorado Geological Survey determined mitigation and monitoring would be required moving forward at the subject site. The mitigation plan involved a rockfall catchment trench, cable-lashing a large, partially detached pillar of rock, scaling unstable rocks, and using rock bolts and shotcrete for the anchoring of unstable areas of rock. This mitigation plan was completed in 2008, and annual observations of the mitigation methods and other potential rockfall hazards began in 2013 following the completion of site development. The area of interest has been divided into three separate locations in previous investigative reports and observations, originally described by Investigative Engineers & Geologist LLC in the “Scope of Work for Rockfall Hazard Mitigation and Containment” dated July 13, 2006, which is continued for uniformity in this observation report. Area 3 has been further subdivided into an Area 3 East and Area 3 West. Kumar & Associates, Inc., referred to as K&A

in this letter, visited the site on May 3, 2024 to observe the rockfall mitigation methods, with Jill Carlson of the Colorado Geological Survey present. K&A returned to the site for an annual observation on December 19, 2025, the observations of which are noted in this letter.

Area 1 is the southeast-most area observed and is located approximately 140 feet south of the southeast corner of the main building at the site. This area is situated just east of the large block that detached in 1981, with mitigation measures consisting of cable-lashing to secure a large, partially detached pillar. A secondary block just east of the cable-lashed block was measured by K&A in 2024. Observation and measurement of this secondary block just east of the cable-lashed block showed an approximate movement of about 0.5-inches since the previous observation by K&A in 2024. As movement was observed, observation should continue, with additional measurement methods recommended in subsequent annual observations. This unrestrained, detached block was measured approximately 2 feet west of the east edge of the block, and observation and measurement of this block should continue to occur. The unrestrained block has a vertical joint trending east to west that is a continuation of the joint that separated the adjacent cable-lashed block. Erosion at the base of the block and freeze-thaw cycles create the potential for continued movement. K&A should be notified if any noticeable movement occurs. The cables and cable seating of the cable-lashed block did not show any signs of deterioration since the previous observation by K&A.

Area 2 is the center area observed and is situated approximately 80 feet south-southeast of the west end of the asphalt-paved fire lane located on the south side of the main building at the subject site. This area is located just west of the large block that detached in 1981. This area contains a catchment below an overhanging block. No movement of the overhanging block or adjacent blocks was observed since the previous observation by K&A. Several smaller cobble sized rocks were observed to have accumulated within the catchment. Erosion was observed to have progressed at the toe of the overhanging cliff, in addition to animal burrowing along the base of the cliff and soil slope beneath the toe of the cliff. Continuing increased erosion can reduce the stability of larger blocks supported by the soil being eroding and the progression of erosion should continue to be observed moving forward. The area of the 1981 detached block, between areas 1 and 2, was observed to show no signs of movement since the previous observation by K&A.

Area 3 East is located approximately 100 feet west-southwest of the south end of the west wing addition to the main building at the subject site. The rockfall mitigation in this area consists of shotcrete application and rock bolting. The rock bolted block did not show signs of movement since the previous observation by K&A. The K&A observations from 2024 showed that delamination is occurring on the outer extents of the shotcrete application, and that it was relatively easy to peel the shotcrete off in these areas. The current observation of the shotcrete showed that delamination is continuing on the outer extents of the shotcrete zone, increasing delamination from the prior observation. This is occurring on the outer edge of the application in an area not critical to stability, however, this delamination is expected to continue and should be observed annually to ensure the continual delamination/erosion of shotcrete will not reduce the stability of the blocks it is supporting.

Area 3 West is the northwest-most location observed and is situated approximately 80 feet west of the center of the west wall of the main building at the subject site. Rockfall mitigation methods in the area include rock bolting and shotcrete application. It was noted that there are not any homes directly beneath the fallout zone of this area. The shotcrete application in this area is

situated below an overhanging partially detached block. Multiple rock bolts are also applied to additional sections of overhanging partially detached blocks. At the northwest-most rock bolted block, a fracture was observed developing approximately 1 foot to the northwest of the rock bolt, in a position that would cause a portion of the block to fall should the fracture separate that portion of the block from the main mass of the rock bolted block. Measurement was taken of the detachment width of the northwest-most rock bolted block approximately 2 feet to the northwest of the rock bolt. No movement of this block was observed during the current K&A observation, however annual observation and measurement of this block should continue. Both the shotcrete and the rock bolted blocks did not show any signs of movement since the previous observation by others.

CONCLUSIONS:

There were no obvious signs of block movement observed in Area 2, Area 3 East, or Area 3 West compared to the previous observations made by K&A in 2024. The detached block east of the cable-lashed block in Area 1 had measured movement compared to the observations of 2024. Continuing observation and measurement of the detached block should occur, and additional measurement methods are recommended for subsequent observations. If movement continues, mitigation methods will need to be implemented. Erosion at the base of the cliff at the catchment of Area 2 was observed to increase from the year prior, and smaller, cobble-sized material, determined to originate from the base of the cliff, was noted to have accumulated within the catchment. The catchment should be cleared and maintained as material accumulates and should be observed regularly. It was noted that delamination appears to be continuing at the extent of the shotcrete in Area 2. This delamination does not appear to be occurring in an area critical to the overall stability of the stabilized block. This delamination and erosion is expected to continue and should be observed annually. The baseline references made within Area 1 and Area 3 West should have measurements taken as part of the annual observation. The next annual observation should occur in late 2026. Any observed movement outside of the annual observations should be reported to Kumar & Associates, Inc. immediately upon occurrence for reevaluation.

If you have any questions concerning the observations or conclusions made as part of this annual observation, please do not hesitate to contact our office.

Sincerely,

KUMAR & ASSOCIATES, INC.

Prepared by _____
Rob A. Yeoman, Staff Geologist

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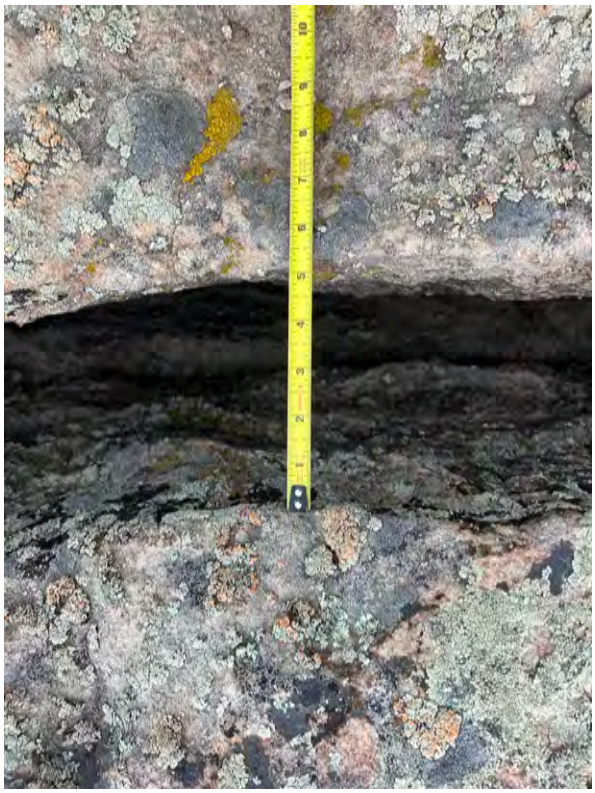
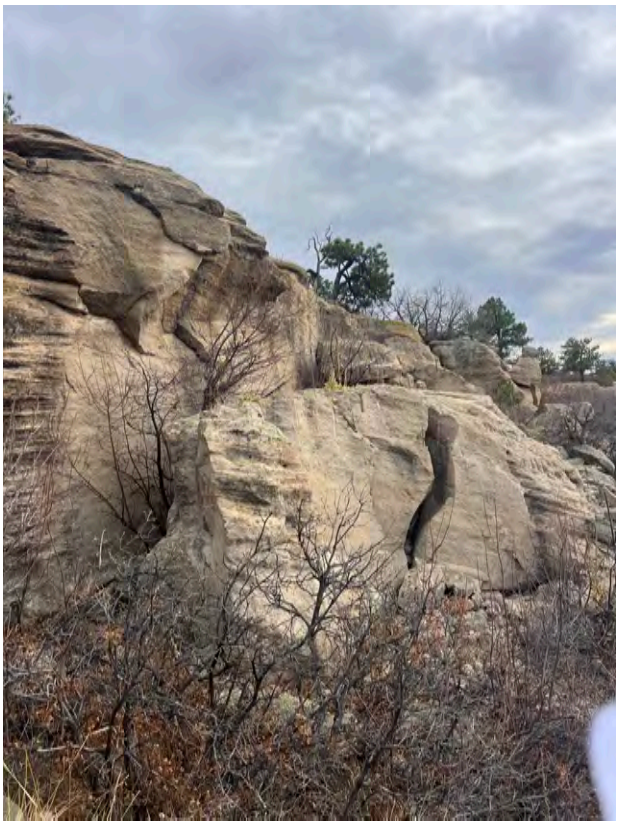
RAY/sw
Attachment: Site Photos

Area 1: Cable-lashed Pillar



Area 1: Secondary Boulder, Unrestrained, Baseline Reference

24-2-141	Kumar & Associates		Fig. 1



Area 2, From Catchment Looking East Toward 1981 Rockfall Area

Area 2, From Catchment Looking North Toward Area 2

24-2-141	Kumar & Associates		Fig. 2

Area 3 East, Rock Bolted Block and Shotcrete

Area 3 East, Rock Bolted Block

Area 3 West- Shotcrete

Area 3 West- Eroded Contact of Overhanging Block

24-2-141	Kumar & Associates		Fig. 4

Area 3 West, Rock Bolted Block From Below

Area 3 West, Rock Bolted Block, Baseline Reference

24-2-141	Kumar & Associates		Fig. 5