Date: **July 1, 2024**
Re: Civil Site Assessment
Project Location: 2555/2577 N Chelton Road, Colorado Springs, CO

CSCA Civil Site Assessment Summary Report

To Whom it May Concern,

A Site Assessment was performed on June 7th, 2024, by Raptor Civil Engineering by the request of Colorado Springs Charter Academy. The Civil scope of the Site Assessment was limited to the expressed drainage concerns along the northern edge of the school grounds adjacent to the existing Middle School ("MS"). Additional scope items that came up during the site assessment included: swale drainage capacity south of N Chelton Rd, and fire line capacities for the existing Elementary School to provide sprinkler coverage to the entire building.

The majority of Civil assessment is intended to identify estimated mitigation efforts to recommend keeping the MS or relocating the MS on the south side of N Chelton Road. It is noted that additional coordination with the City and stormwater analysis is being undertaken in pursuit of understanding the extents of Stormwater Mitigation required for relocation of the MS.

Current Mitigation Measures

Stormwater

Raptor reviewed existing Development Plans for the site and reviewed the existing drainage mitigation systems onsite. A concrete channel existing that's routes concentrated mountain runoff towards the rear of the MS to a 6" area drain between the MS and mountain base. The 6" drain outfalls into the grassed courtyard between the MS and Elementary school and is routed to a drainage swale that routes flow south under Chelton Rd and into a ditch that continues south offsite. The surrounding mountain runoff sheet flows to the base of the mountain. A manmade berm is intended to direct flows west away from the MS or towards the area drain. A large stormwater inlet exists in the NE portion of the lot is intended to capture a portion of the maintain runoff and direct towards the existing ditch that runs south.

Other Civil Items

The Elementary School, within its basement, has a fire system that services the basement. Per the 1966 Sprinkler Plans, the service line from N Chelton Road is 4".

Civil Deficiencies

In the existing condition, the MS abuts to the base of a mountain range that currently directs over 3-acres of runoff towards the MS. Raptor understands that during rainfall, runoff from the maintain is directed directly towards the MS and has caused flooding of multiple feet in depth which resulted in damage to the school interior/exterior as a result. Videos were viewed from the Charter School showing the extent of flooding that occurs around the MS during heavy rainfall. The MS contains multiple locations of sandbags and manmade berms to attempt to redirect runoff.

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- The existing ditch system running south of N Chelton Rd has a swale section that inadequately conveys the volume of runoff directed to it which is causing erosion of the landscaping area adjacent to the existing house.

- The existing 6" drainage pipe and area drain lack the capacity to adequately capture and convey the 3+ acres of mountain runoff. And the surrounding "swales" lack the capacity to adequately convey flows around the school and/or to the existing area drain.

- The existing retaining wall in the NE corner of the existing MS is degrading and due to its proximity to the MS, poses safety concerns due to its increasing instability.

- The existing line to the building from N Chelton road may require upgrade in size from 4" which is likely undersized for future demand needs.

Raptor Recommendations

Raptor proposes the following recommendations. Please note that these recommendations are conceptual in nature and require additional analysis and City approval to verify full design. Additional capacity and detailed analysis is required to confirm recommendations. Refer to Images 1 and 2 below for a visual summary.

Non-Relocation of MS

A. A new drainage swale and inlet will be required to convey the mountain flows around the MS. Preliminary drainage analysis identifies over 3.5 acres of mountain face which produces an estimated peak of ~28 cfs in the 100-yr storm event. A trapezoidal concrete swale that's approximately 5' wide at its base, 4:1 slope, and 2 feet deep will be required to route flows west away from the school. A new 6'x4' Type D (parallel & depressed) inlet will be required to capture flows. ~50 lf 30" RCP pipe will be required tie flows into the existing storm system to the west.

Relocation of MS

A. A new drainage swale and inlet will be required to convey the mountain flows around the MS. Preliminary drainage analysis identifies over 3.5 acres of mountain face which produces an estimated peak of ~28 cfs in the 100-yr storm event. A trapezoidal concrete swale that's approximately 5' wide at its base, 4:1 slope, and 2 feet deep will be required to route flows west away from the school. A new 6'x4' Type D (parallel & depressed) inlet will be required to capture flows. ~50 lf 30" RCP pipe will be required tie flows into the existing storm system to the west. A water quality feature, likely a grass swale, will be required to treat stormwater runoff from the new building. If area of improvement is < 1 acre, no onsite detention is required.

B. The existing line to the building from N Chelton road may require upgrade in size from 4" to 6"-8" based on demand need.

C. The existing drainage swale along western parking lot will require widening to match the surrounding uphill concrete ditch section.

D. The existing retaining wall will require rebuild or reinforcement to increase integrity. A concrete diversion channel to be located uphill to reduce flows over wall.

Please reach out if you have any questions.

Thank you,

Madison Jurewicz, EI
Project Manager
Raptor Civil Engineering, LLC

Eric Burtzlaff, PE
Principal
Raptor Civil Engineering, LLC

Assessment Summary Images:

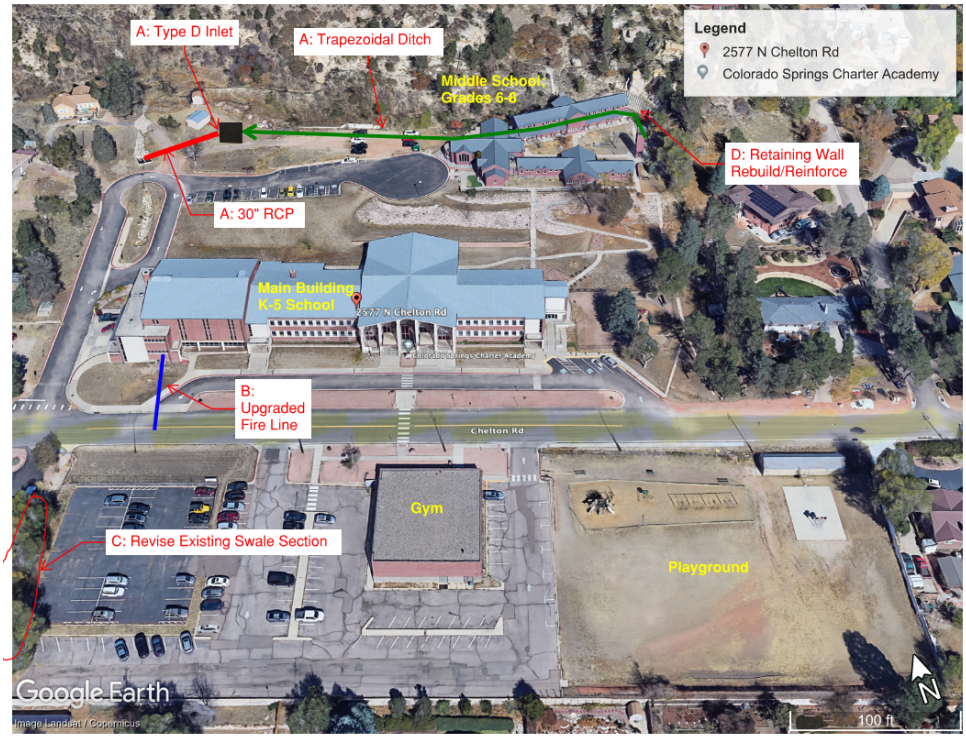

Image 1: Civil Assessment Mitigation Visual Summary

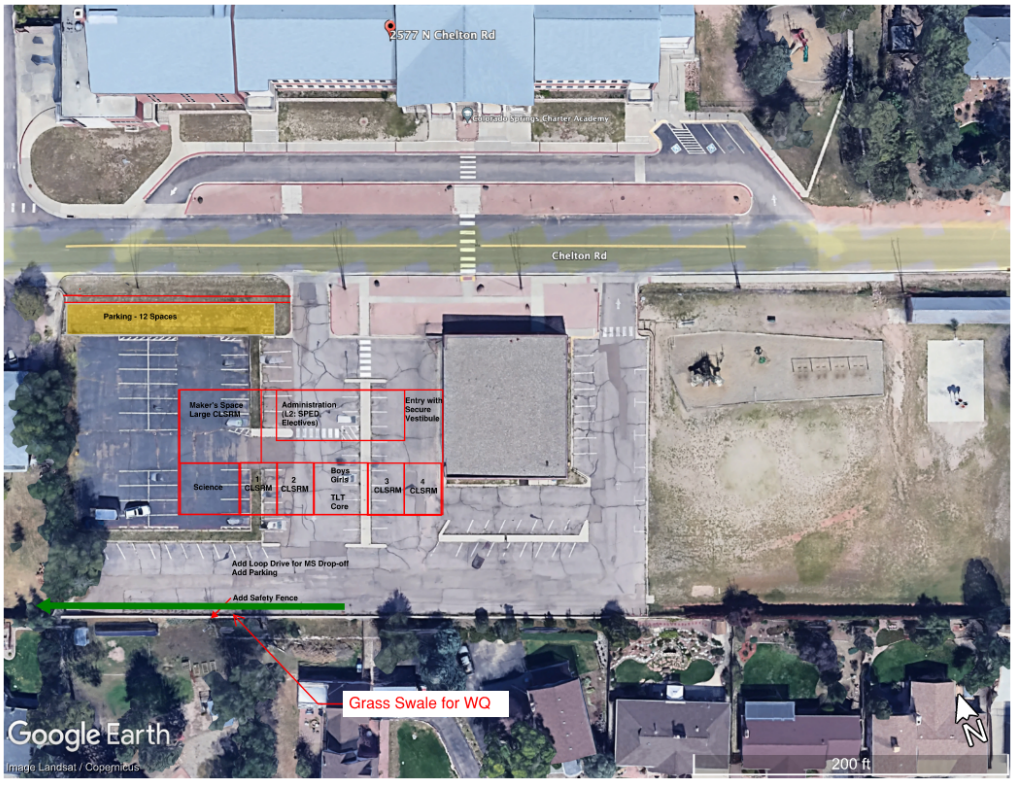

Image 2: Relocation of MS Stormwater mitigation

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Site Visit Images:

Image 3: Existing Retaining Wal

Image 4: Existing Retaining wall concrete rundown

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Image 5: Existing Concrete Pan within Mountain

Image 6: Existing 6" area drain behind MS rear at base of concrete pan

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Image 7: Existing manmade berming adjacent to MS at base of mountain

Image 8: Existing manmade berming adjacent to MS at base of mountain and area drain

Image 9: 6” Area drain outlet

Image 10: Existing stormwater inlet

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Image 11: Existing Storm ditch downstream of inlet

Image 12: Existing Ditch where flooding causing erosion to adjacent residence

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Image 10: Existing Fire Riser Room in the Elementary School basement

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