# Drainage Review for Geneva Glen Camp – Marathon Lodge Addition

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#### **Prepared For:**

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#### **General Location, Description and Overview**

#### a. Location

The proposed addition to the existing Marathon Lodge (the "Building") is located within the larger 485-acres of land owned and operated by Geneva Glen Camp (the "Camp"). The street address of the Camp is 5793 Santa Clara Rd, Indian Hills, CO 80454.

The property is zoned *A-2*, Agricultural —Two District, and functions as a summer camp for youth. Founded in 1922 as an educational and leadership training program, Geneva Glen Camp is a private, non-profit organization that welcomes hundreds of second-generation through fifthgeneration campers each summer.

#### **b.** Description of Property

Geneva Glen camp encompasses 485 acres. The Building sits approximately 600 feet away from the nearest adjacent property line. The overall Camp is sparsely developed, and the area immediately adjacent to the Building is undeveloped forest. The Building is hiked to on foot and is home of the camp store, which sells snacks and toiletries and also contains ping-pong and pool tables. Vehicular access to the building is nearly non-existent, aside from ATV visits for maintenance when necessary, and use of a pickup truck approximately 3-4 times a summer to deliver the cans of soda sold to the campers. There is no parking, sidewalk or any other impervious surface either adjacent to or in conjunction with the building itself.

Existing grades around the building are steep, at approximately 20%-60%. The soils in the immediate area are Grimstone-Peeler-Rock outcrop complex, composed of mainly gravelly sandy loam. This is a well drained soil, in the hydrologic soil group B. The anticipated depth to water table, or any other restrictive feature, is over 80". Soils information was prepared using the Web Soil Survey tool from the United States Department of Agriculture Natural Resources Conservations Service. For further information, see *Appendix C*.

#### c. Project Overview

Geneva Glen Camp is planning an addition to the existing Building. The existing square footage is 1,855 square feet and the addition is planned to be 1,384 square feet of building and an additional 272 square feet of covered deck; totaling a 1,656 square foot addition. The only additional impervious area in conjunction with this project will be the new roof area.

### **Existing Drainage Analysis**

#### a. Existing Drainage Conditions

The existing Marathon Lodge is shown below (Picture 1). The grades fall away from the front of the building, facilitating positive drainage patterns. There are no reported drainage challenges with the existing structure.

A seasonal creek bed sits approximately 150 feet northeast of the Building that is dry much of the year.



Picture 1: Existing façade of Marathon Building



Picture 2:Standing East of Marathon Looking West



Picture 3:Standing SE of Marathon Looking NW



Picture 4:Standing South of Marathon Looking North



Picture 5:Standing SW of Marathon Looking NE



Picture 6:Standing West of Marathon Looking North



Picture 7:Standing NW of Marathon Looking SE

#### b. Existing Drainage Basin Description

A small site survey was performed in preparation of this minor project that extends to limits approximately 50 to 60 feet away from the existing structure (see *Appendix D*). For the overall basin analysis for purposes of this report, the available USGS mapping was utilized, as shown in *Appendix B*.

The overall basin that flows to the area of the Building is approximately 575 acres. This water is all eventually collected in the seasonal stream bed that sits approximately 150 feet west of the Marathon Lodge. As seen on Google Earth, there are two structures located upstream from the Marathon Lodge with a total combined footprint of approximately 3200 sf, or approximately 0.073 acres.

The smaller basin area immediately adjacent to Marathon Lodge is shown on the survey in *Appendix D*. The existing roof area of the Building is 1,855 square feet, or approximately 0.043 acres. The area of the new proposed roof area is 1,656 square feet, or approximately 0.038 acres.

#### **Waiver Request and Basis**

#### a. Stormwater Runoff Detention and Water Quality Waivers

As described on Page 14 of the *Jefferson County Design and Technical Criteria, Storm Drainage* criteria manual, Planning and Zoning can grant a variance for stormwater detention request based on the following:

1. Non-residential development will not total more than 10,000 square feet.

Further, on page 14 of the same document, Planning and Zoning can grant a variance for stormwater quality request based on the following:

- 1. The project disturbs less than one acre of ground.
- 2. The project is not part of a larger common plan of development or sale.

#### b. Justification

This project meets the requirements to request stormwater runoff detention and water quality waivers as identified above. The project is well below the 10,000 SF threshold and will not disturb one acre. Although part of an overall camp, it is not part of a larger development or master plan. The building addition is an isolated project and drainage shall be re-evaluated individually should future projects be pursued.

The entire impervious area of the building, which includes the existing building and the proposed addition, is approximately 0.08 acres. Runoff generated from that small impervious area is negligible compared to the large 575 acre overall drainage basin it contributes to.

The area in which this building addition will be constructed is approximately 600 feet away from the nearest adjacent land owner. The minimal runoff will not cross the property lines or negatively impact the surrounding properties. The area immediately adjacent to the new part of the structure will be regraded and revegetated, ultimately to its existing forested condition, such that any water runoff from the additional area (and existing roof area) will be treated through secondary methods, via overland flow and infiltration similar to a Phase 2 BMP. The proposed drainage patterns will remain the same as the existing drainage and runoff will flow through the undeveloped forest. This is consistent with the requirements to minimize directly connected impervious areas (MDCIA) by routing runoff from impervious surfaces over grassy areas to slow runoff and promote infiltration as outlined in Section 13.3.2 of Jefferson Counties *Design and Technical Criteria Storm Drainage* manual (the "Manual). No additional BMP's are required due to the small amount of runoff generated (refer to Table 1: Existing and Proposed Runoff) and the forested surface that the runoff traverses through. Additionally, the well draining soils ensure that the water will receive treatment and/or infiltrate over a short distance.

The Rational Method was used to determine the runoff of the existing building and the proposed addition. The property is located within the border of Zone IIa and Zone IIb of *Figure 501*:

Rainfall Zones in Jefferson County. For conservative values, Zone IIa, which produces higher runoff values, was used to determine the runoff. *Figure 502B* of the same Manual was used for the intensities, assuming a Time of Concentration of 10 (ten) minutes. Table 1: Existing and Proposed Runoff summarizes the calculated information.

**Table 1: Existing and Proposed Runoff** 

		Runoff Coeff. (Roof)	Runoff (100 Yr)
Description	Area (ac)	С	
Existing Buildings			
(upstream of			
Marathon Lodge)	0.073	0.90	0.44 cfs
Existing Building	0.043	0.90	0.26 cfs
Proposed Addition	0.038	0.90	0.23 cfs
Total Runoff:			0.93 cfs

During construction, an erosion control plan will be utilized, as designed by a licensed engineer, in order to mitigate any runoff before final vegetation has been established.

#### **Conclusions**

The proposed addition to the Marathon Lodge building is minor in nature. Any runoff generated by this small addition will be treated through natural methods and paths, similar to a Phase 2 BMP. The nature of the existing surrounding forest and elevation around the existing building create a unique situation. Construction of a detention facility to mitigate the minimal runoff will result in more impact to the native, surrounding property than the entire project. Since the runoff is so minimal and will have no negative impact downstream or on any surrounding properties, a waiver is being requested to avoid negatively impacting the property by the construction of a detention facility. A construction-stage erosion control plan will be designed to mitigate any construction-phase activities. A final site design and coordination with Jefferson County are required prior to any construction of the proposed improvements.

## References

- 1. Urban Drainage Flood Control District (UDFCD) Criteria Manual, January 2013. <a href="http://www.udfcd.org/downloads/down-critmanual-volII.htm">http://www.udfcd.org/downloads/down-critmanual-volII.htm</a>
- 2. Jefferson County Design and Technical Criteria Storm Drainage, November 25,  $2003\,$

## **Appendix List**

Appendix A: Vicinity and Zoning Maps

Appendix B: Google Earth Map with Historical Topographic Map (USGS)
Appendix C: Soils Information

Appendix D: Site Survey, Evergreen Surveying, March, 2013

Appendix E: Project Plan View

Appendix A

Appendix B

Appendix C

Appendix D

## **Appendix E**