Town of Grand Lake

Planning Department
• P.O. Box 99 • 1026 Park Avenue • Grand Lake, CO 80447
• Phone: 970-627-3435 • Fax: 970-627-9290
glplanning@townofgrandlake.com • www.townofgrandlake.com

ZONING VARIANCE REQUEST APPLICATION

PROPERTY LOCATION:

Street Address: 501 Mountain Ave, Grand Lake, CO 80447

Legal Description: Lot 8 Block 24 Subdivision Lenada

PROPERTY OWNER INFORMATION:

Name: Nicholas and Kathryn Rosenbeck Email: nrosenbeck@gmail.com

Mailing Address: 3344 W 11th Avenue Dr Phone: 512-913-6137

City: Broomfield State: CO Zip: 80020 Fax:

APPLICANT INFORMATION: Is the Applicant the Property Owner? ☑ YES ☐ NO

Name: Nicholas Rosenbeck Email: nrosenbeck@gmail.com

Mailing Address: 3344 W 11th Avenue Dr Phone: 512-913-6137

City: Broomfield State: CO Zip: 80020 Fax:

CONTACT INFORMATION: Is the Contact Person the Applicant? ☐ YES ☑ NO

Contact Person (if not Applicant): Cooper Karsch, P.E., CFM Email: ckarsh@jvajva.com

Mailing Address: 47 Cooper Creek Way, Suite 328 Phone: 970-402-0644

City: Winter Park State: CO Zip: 80482 Fax:

VARIANCE REQUEST (Brief Description):

Please refer to attached Memo from JVA Civil Engineering requesting a variance from regulation 11-2-9-(B) (4) and Explanation of Hardship Considerations 11-2-11-(D)

REQUIRED INFORMATION CHECKLIST:

- ☑ Site Plan — (showing dimensions to existing and proposed features, locations of specific activities, proposed and existing signage, parking, ingress and egress points, traffic circulation, utilities, drainage features, and property lines)
- ☑ Explanation of Hardship — (See Municipal Code for review criteria)
- ☐ Statement of Authority **N/A** — (If applicable. Required for representatives of entities and property owners.)
- ☑ Property Survey
- ☑ Agreement for Services Form
- ☑ Application Deposit **$350.00** — (See Fee and Deposit schedule for amount)
- ☑ Additional Information — (If applicable. Staff may require other helpful information for review.)

Grand Lake Fire Variance and JVA Drainage Memo

AFFIDAVIT:

BY MY SIGNATURE, I attest that the information contained or attached to this application is true and correct to the best of my knowledge. I further understand that submission of false or misleading information shall be sufficient cause for the Variance Request to be revoked immediately without notice or hearing.

Print Name: **Nicholas Rosenbeck**

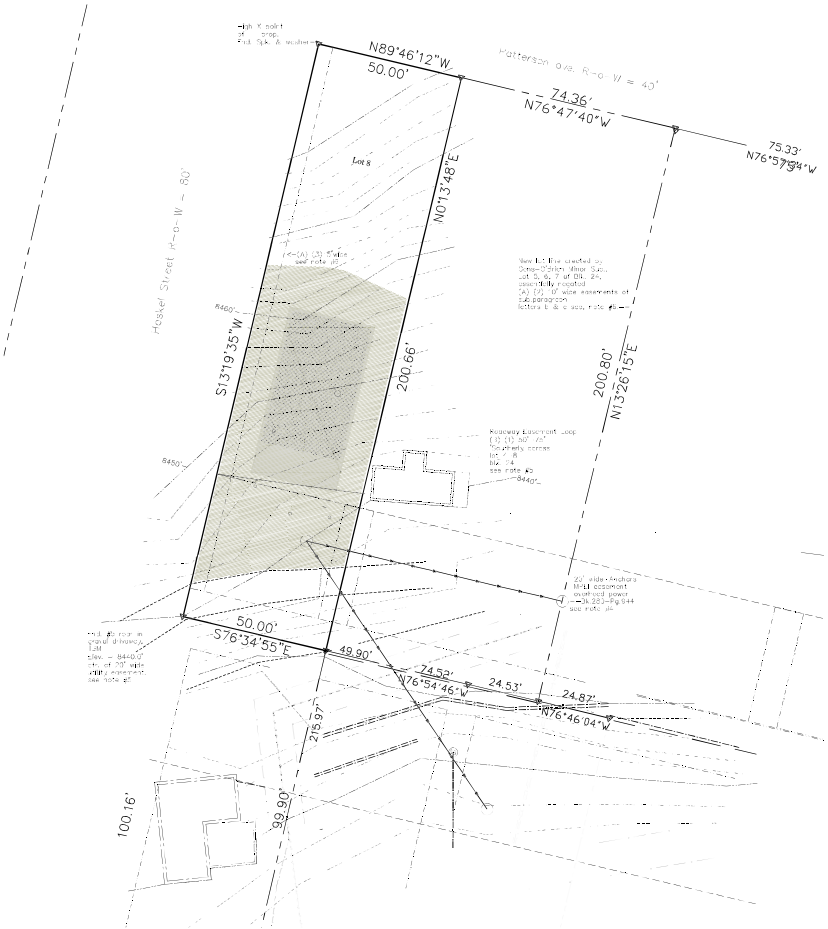
Signature : Nicholas Rosenbeck Digitally signed by Nicholas Rosenbeck DN: C=US, E=nrosenbeck@gmail.com, CN=Nicholas Rosenbeck Reason: I agree to the terms defined by the placement of my signature on this document Date: 2024.08.26 22:03:29-06'00' Date: **8/26/2024**

STAFF USE ONLY

Application Received By: Date & Time:

File Name: Deposit: ☐ YES ☐ NO Amount: $

Agreement for Services Form Signed? ☐ YES ☐ NO


N89°46'12"W
50.00'
Patterson Ave. R-o-W = 40'
74.36'
N76°47'40"W
75.33'
N76°57'34"W
Hoskel Street R-o-W = 60'
Lot 8
N0°13'48"E
200.80'
N13°26'15"E
S13°19'35"W
200.66'
50.00'
S76°34'55"E
49.90'
74.52'
N76°54'46"W
24.53'
24.87'
N76°46'04"W
216.97'
99.90'
100.16'

JVA, Incorporated
P.O. Box 1860
47 Cooper Creek Way
Suite 328
Winter Park, CO 80482
970.722.7677
info@jvajva.com

www.jvajva.com

August 23, 2024

Kim White
Community Development Director
Grand Lake, CO 80447

RE: 501 Mountain Avenue Single Family Residence: Road Improvement Variance Request

Dear Kim:

We are providing this Variance Request regarding the proposed construction of a single family residence at 501 Mountain Avenue. Please reach out with any questions regarding this request, or the overall application.

Regulation for Requested Variance: 11-2-9 (B.4) Where a new development impacts an existing road or drainage facility by accessing onto the road or increasing storm runoff onto or along the road, the developer(s) will be responsible for upgrading the roadway to the minimum standards required by these Street Standards. The construction of new roadways for the purpose of providing access to a development is the responsibility of the developer(s).

Hardships for Consideration:
1. That by reason of exceptional shape, size or topography of lot, or other exceptional situation or condition of the building or land, practical difficulty or unnecessary hardship would result to the owners of said property from a strict enforcement of these Regulations;

- The property at 501 Mountain Ave has been previously platted with anticipated construction of a Single Family Residence. No additional use, change of approved use, or subdivision of the property is being proposed. While strict enforcement of the regulations would consider this a 'development' that is responsible for improving the accessed roadway to the minimum published standards (which includes a 30' roadbed, curb and gutter, and an 8' sidewalk), this is not typically required of single-family home construction and would provide several difficulties as listed here.
- The existing topography and adjacent improvements suggest that improving the road to these standards would require significant retaining walls, utility relocations, and may not even be feasible to reconnect existing driveways.
- The topography of the remaining Rights-of-Way of both Haskell Street and Mountain Avenue prevent future connections to other road systems in Town. With no other properties or roads requiring access off of Haskell Avenue, this road will not see any additional generated traffic in the future and does not necessitate improving to the published standards.
- The applicant has agreed to widen a significant portion of the current drive as requested by Grand Lake Fire to accommodate emergency vehicle access to the property. While these improvements will not meet current standards for a road, they will significantly improve the existing access and drainage along the drive for all properties accessed off of Haskell Street.

2. That literal interpretation of the provisions of these Regulations would deprive the applicant of rights commonly enjoyed by other properties in the same district under the terms of these Regulations.

- Several properties across Grand Lake have drive accesses off of Town Right-of-Ways with roads far less than the published standards. Disallowing construction of a single family residence would prevent this property from falling under the same condition of these other homes.

3. That the special conditions and circumstances do not result from the actions of the applicant;

- The owner purchased the lot under these existing conditions.

4. That granting the variance request will not confer on the applicant any special privilege that is denied by this ordinance to other lands, structures, or buildings in the same district;

- As mentioned above, granting this variance will put this property on par with other properties within the Town rather than a conferring any special privileges.

5. That the granting of the variance does not pose a detriment to the public good and does not substantially impair the intent and purpose of the Zone Plan and these Regulations.

- The applicant has agreed to widen a significant portion of the existing access drive to meet the request of Grand Lake Fire. Granting of this variance, and hence allowing the proposed project, will only provide benefit to the public good considering the direct neighbors.

Sincerely,
JVA, INCORPORATED

By: _____
Cooper Karsh, P.E., CFM
Senior Engineer

CC:
Nicholas Rosenbeck – Owner

Boundary / Topographic
2' contours Survey Lot 8
Block 24, Grand Lake
NE4 Section 6, T3N, R75W, 6th P.M.

PLAT NOTES

1) Basis of Bearing –Northern R–o–W of Portal Road bears N 64°30'10"E

2) Title Commitment _ This survey preformed without the benifit of a Title Commitment

3) Ordinance No.4 series 1980 (4–80) Vacating Mountain Ave lying between Blocks 24 & 25, and that portion of the alley in block 25 lying westerly of Tunnel road (a.k.a. Portal Road) section 1.(a) & (b).

4) A 20' wide easement through Lots 1–8 Blk. 24, Lot 7 & 8 Blk. 23 et.al. MPEI.

5) Utility Easement reserved – Section 2_Bk.276_Pg735, 20' in width (10' either side of said Mountain ave. centerline). And reiterated Bk 276 at Pg. 739, sec.A(1).

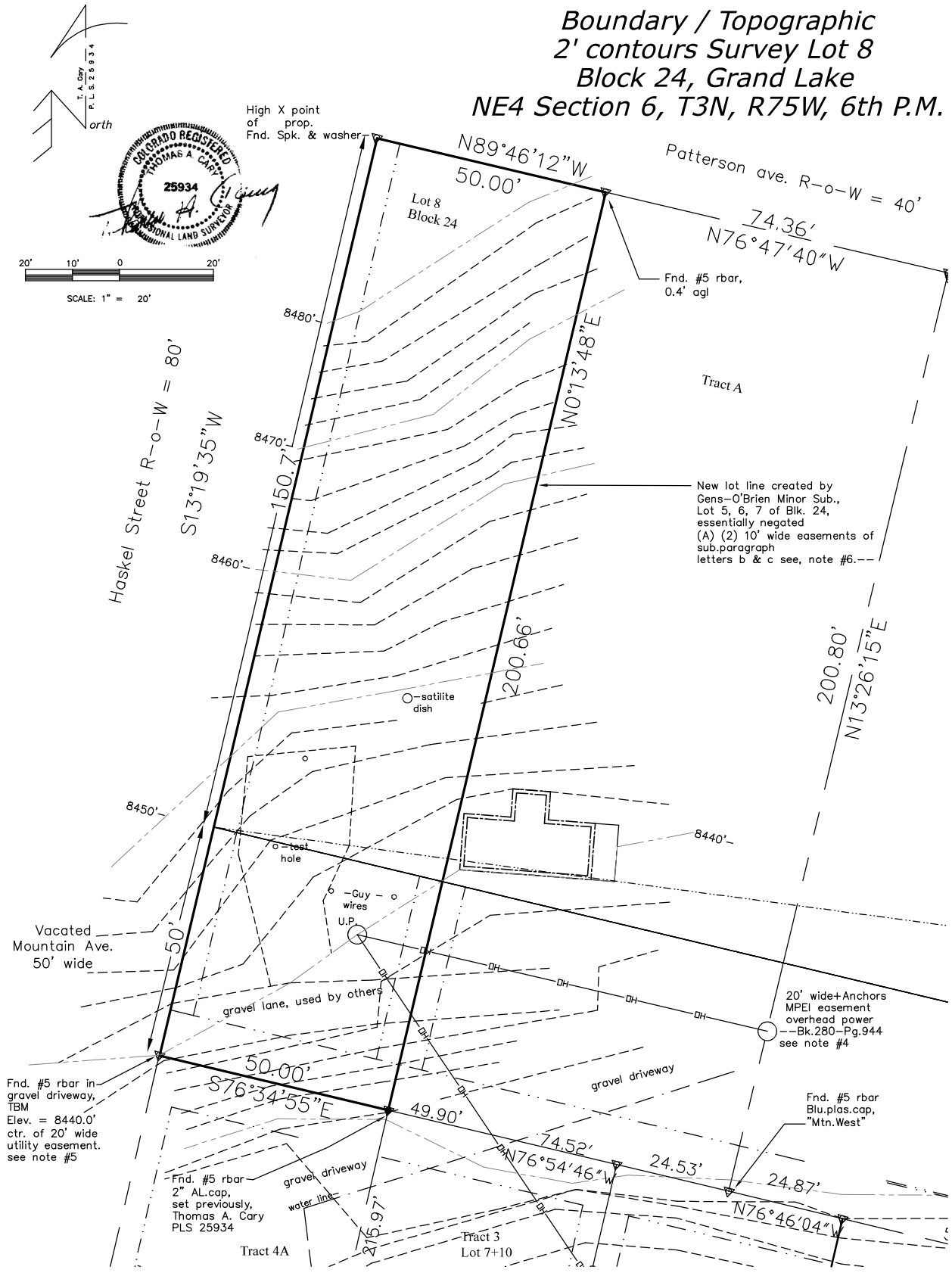
6) Utility Easement – Exhibit A Bk.276–Pg.739, Para. A, (2), (e)–(g), A 10' wide easement. 5' on either side of lot line' from centerline running Northerly along said lot line a distance of fifty (50).

7) Notice: According to Colorado law, you MUST commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event, may any legal action based upon any defect in this survey be commenced more than "Ten Years After" the date of certification shown heron.

Cary Enterprise-D
Thomas A. Cary
305 GOR 1933
PO Box 122
Kremmling, Colorado 80459
1.970.724.2912 / 970.509.0185

Field Work: 12 Sept. 2023
Drawing: 25 March 2024
Rev.
MSCAD 2022 Sheet 1 of 2
PLS 25934 Scale 1" = 20'
Loosehorse56@gmail.com

Boundary / Topographic
2' contours Survey Lot 8
Block 24, Grand Lake
NE4 Section 6, T3N, R75W, 6th P.M.



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Drawing: 25 March 2024
Rev.
MSCAD 2022 Sheet 2 of 2
PLS 25934 Scale 1" = 20'
Loosehorse56@gmail.com

TOWN OF GRAND LAKE
AGREEMENT FOR PAYMENT OF
REVIEW AND DEVELOPMENT EXPENSES INCURRED BY THE TOWN SUBDIVISION, ANNEXATION, LAND USE AND ZONING PROCESS

THIS AGREEMENT ("the Agreement" is entered into this 26TH day of AUGUST, 20 24, by and between the Town of Grand Lake, Colorado, a Colorado municipal corporation, ("the Town") and NICHOLAS AND KATHRYN ROSENBECK, a HOMEOWNER (homeowner, type of corporation, LLC, etc. if applicable), (collectively, "the Applicant").

WHEREAS, the Applicant owns, or has rights to the possession and use of, certain property situated in Grand County, Colorado described on Exhibit A, attached hereto and incorporated herein by reference, ("the Property");

WHEREAS, the development and land use review process includes review of all aspects of land use including, but not limited to, annexation, subdivision, zoning, change of land use, installation of public improvements, conditional uses, dedication of lands and the availability of and feasibility of providing utility services;

WHEREAS, the Applicant desires to develop or conduct a conditional use on the Property and has made application to the Town for approval of subdivision, annexation, conditional use, and/or zoning of the Property, and

WHEREAS, the Parties recognize that the land use fees as specified by the Municipal Code of the Town may not be adequate to fully cover the Town's expenses incurred during the application process, including but not limited to, legal publications, notices, reproduction of materials, public hearing expenses, recording of documents, engineering fees, attorney fees, consultant fees, and fees for administrative time of Town staff, including, but not limited to managerial, clerical, billing, and review time, and

WHEREAS, the Parties hereto recognize that the Town will continue to incur expenses through the entire review process until final completion of the development or conditional use including but not limited to, legal publications, notices, reproduction of materials, public hearing expenses, recording of documents, engineering fees, attorney fees, consultant fees, and fees for administrative time of Town staff, security, permits and easements;

NOW THEREFORE, for and in consideration of the foregoing premises and of the mutual promises and conditions hereinafter contained, it is hereby agreed as follows:

1. The Town has collected or will collect certain subdivision, annexation and land use fees from the Applicant and the Town will apply those fees against the review expenses incurred by the Town while processing the Applicant's development review or conditional use proposal. In the event the Town incurs review expenses greater than the monies collected from the Applicant, the Applicant agrees to reimburse the Town for the additional expenses and fees upon submittal of an invoice. Applicant shall pay all invoices submitted by the Town within ten (10) days of the Town's delivery of such invoice. Failure by the Applicant to pay any invoice within the specified time shall be cause for the Town to cease processing the application, cease development of the Property, deny approval of the application, withhold the issuance of building permits, conditional use permits, or certificates of occupancy and for the Town to exercise such rights and remedies as are otherwise available to it in law or equity or under the applicable provisions of the Town Code.

2. Except where the law or an agreement with the Town provides otherwise, the Applicant may terminate its application at any time by giving written notice to the Town. The Town shall take all reasonable steps necessary to terminate the accrual of costs to the Applicant and file such notices as are required by the Town's regulations. The Applicant shall be liable for all costs incurred by the Town in terminating the processing of the application.

3. If the Applicant fails to pay the fees and costs required herein when due, the Town may take those steps necessary and authorized by law to collect the fees and costs due, in addition to exercising those remedies set forth in Section 1, above. The Town shall be entitled to recover from Applicant all court costs and attorneys' fees incurred in collection of the balance due, including interest on the amount due from its due date at the rate of 18% per annum.

4. The Town will account for all funds expended and fees and expenses incurred by the Town as a result of review of the application throughout the review process. Statements of expenses incurred will be made available to the Applicant by the Town. Expenses to be charged to the Applicant's account shall include, but shall not be limited to legal publications, notices, reproduction of materials, public hearing expenses, recording of documents, engineering fees, attorney fees, consultant fees, fees for administrative time of Town staff, security, permits and easements. Within 60 days after the completion of the processing of the application by the Town, the Town will provide Applicant with a statement of account and will refund to the Applicant any funds paid by the Applicant that were not expended by the Town, except where the Parties expressly agree to the contrary.

5. Applicant's obligation to pay the costs and expenses provided for in this Agreement shall exist and continue independent of whether the Applicant's application, or any part thereof, is approved, approved with conditions, denied, withdrawn, or terminated by the Town or the Applicant prior to a final decision in the process.

IN WITNESS WHEREOF, the Town and the Applicant have caused this Agreement to be duly executed on the day and year first above written.

PRINTED APPLICANT'S NAME: NICHOLAS ROSENBECK

APPLICANT'S SIGNATURE: NICHOLAS ROSENBECK

Signature

TOWN OF GRAND LAKE

By: _____

Kim White, Community Development Director

S E A L

Attest:

_____

Alayna Carrell, Town Clerk

GRAND LAKE FIRE PROTECTION DISTRICT

DATE: August 19th, 2024

TO: Nicholas Rosenbeck – Others whom it may concern

RE: Fire Authority Variance to "Fire Apparatus Access Road" for property 501 Mountain Ave Grand Lake Co 80447

FROM: Fire Chief Seth St. Germain

The attached plans have been reviewed by the AHJ (Fire Authority Having Jurisdiction), being Grand Lake Fire Protection Districts Fire Chief, using the International Fire –

Code Appendix D – Fire Apparatus Access Roads and Section 503 Fire Apparatus Access Roads

- Section D103 Fire Apparatus Access Roads Minimum Specification
  - D103.3 Turning Radius
  - D103.4 Dead Ends
- 503.2.4 Turning Radius
- 503.2.5 Dead Ends

This letter therefore grants two variances, for the listed property, specific to the listed improvements to be made shown on the attached plans.

Variance 1 for 501 Mountain Ave – initial driveway access width.

- Road improvement will consist of widening the road to 20', however the initial driveway improvement area will begin at approximately 15' wide and "taper" to 20' wide within 15 feet.

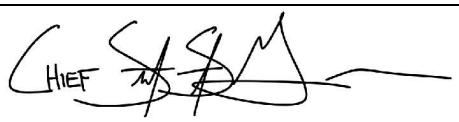
Variance 2 for 501 Mountain Ave – Fire Apparatus Turnaround

- Per Fire Code, the length of the driveway does meet the requirements for an established fire apparatus turnaround. However, with the listed driveway widening improvements and the provisional "open space" to the east of the property, a fire apparatus turnaround is not required.

If there are any questions regarding these variances, please feel free to contact me. My contact information is as follows:

- Email – sstgermain @grandlakefire.org
- Phone # - 970-627-8428
- Cell # - 970-553-9347

Respectfully,



FIRE CHIEF


501 MOUNTAIN AVE - FIRE APPARATUS ACCESS ROAD VARIANCE
501 MOUNTAIN AVE PROPERTY IMPROVEMENTS
COMPLETE WIDENING AT PROPERTY CORNER
HASKELL ST ROADWAY WIDENING (20' MIN ROADWAY WIDTH)
VACATED MOUNTAIN AVE (LOOP ROAD)
VACATED MOUNTAIN AVE (LOOP ROAD)
20'-0"
20'-0"
20'-0"
20'-0"
20'-0"
20'-0"
15'-0"
START WIDENING AT THIS POINT
HASKELL ST
TRIM BACK TREES AND BRUSH ALONG EXISTING HASKELL STREET AS NECESSARY TO MAINTAIN EXISTING DRIVEWAY CLEARANCES
Per Fire Code Appendix D - Fire Apparatus Access Road
D103.4 Dead-end fire apparatus access roads in excess of 150 feet shall be provided with width and turnaround provision.
1) VARIANCE PROVIDED FOR 20' ROADWAY WIDTH, EXCEPT FOR PORTION OF ROADWAY AT CURVE AS IDENTIFIED IN HIGHLIGHTED AREAS ON THIS PLAN
2) VARIANCE PROVIDED FOR TURNAROUND
Google Earth
Imagery Date: 8/27/2019 40°15'18.17" N 105°49'39.66" W elev 8485 ft eye alt 8801 ft

CONSULTING ENGINEERS

www.jvajva.com

☐ **Boulder**
1319 Spruce Street
Boulder, CO 80302
303.444.1951

☐ **Fort Collins**
213 Linden Street
Suite 200
Fort Collins, CO 80524
970.225.9099

☒ **Winter Park**
PO Box 1860
47 Cooper Creek Way
Suite 328
Winter Park, CO 80482
970.722.7677

☐ **Glenwood Springs**
817 Colorado Avenue
Suite 301
Glenwood Springs, CO
81601
970.404.3100

☐ **Denver**
1675 Larimer Street
#550
Denver, CO 80202
303.444.1951

D R A I N A G E M E M O

TO:	Kim White	DATE:	August 23, 2024
	Grand Lake Community Development Director	JOB NO.	
ADDRESS:	1026 Park Ave	PROJECT:	501 Mountain Ave – Single Family
	Grand Lake	SUBJECT:	Drainage Analysis

Dear Kim,

JVA, Inc. has been requested to perform a drainage analysis regarding the construction of a single-family home at 501 Mountain Avenue in Grand Lake. We analyzed to impact to the overall drainage basin of the proposed construction and determined that allowing this project to move forward will have a negligible impact on the anticipated stormwater that will flow to the Town rights-of-way of Haskell Street and W Portal Road. Furthermore, it is our understanding that the applicant for this property is being requested to widen a portion of the drive access (through right-of-way and private easement) to satisfy the need for fire protection vehicles to access the property. These required improvements will include drainage design that will control flows from the property and convey them into a roadside ditch. As such, it is our belief that approval of this project will not be of detriment to neighboring properties, or Town rights-of-way and road systems.

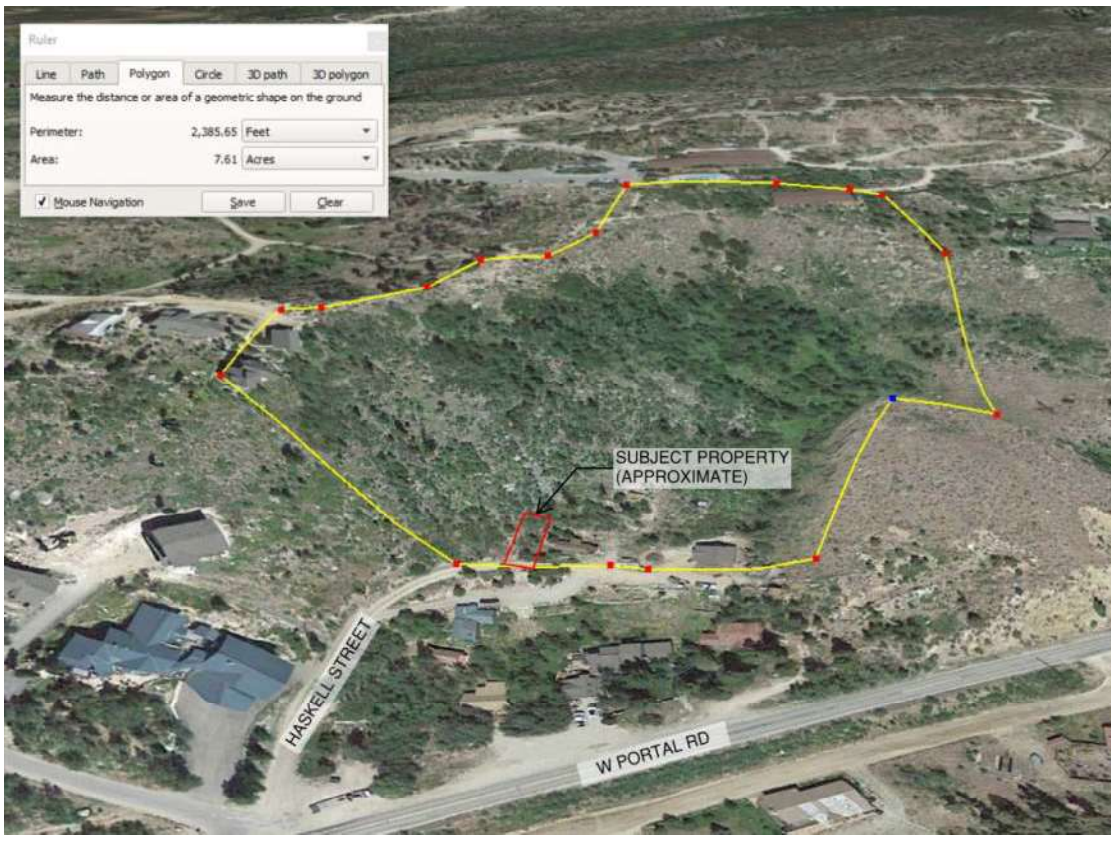


Figure 1. Property Location Within Drainage Basin

As noted in Figure 1 and the attached calculations, the existing site and proposed project have the following properties and results from our analysis.

EXISTING PROJECT DATA

Address: 501 Mountain Ave
Lot Size: 0.23 Acres
Drainage Basin Size: 7.61 Acres
Existing Imperviousness: 22.6%
Historic 100-Year Storm Flow Rate: 20.21 cfs

PROPOSED PROJECT DATA

Drainage Basin Size: 7.61 Acres
Proposed Imperviousness: 23.1%
Proposed 100-Year Storm Flow Rate: 20.31 cfs
Increase in 100-Year Storm Flow Rate: 0.49%

This minimal increase in anticipated flows for the drainage basin that the subject property lies within is negligible to the degree that we believe stormwater detention should not be required for the construction of a single-family home on the platted lot of the subject property. As mentioned above, we do not believe that this minimal increase in flows will have any negative impacts to the surrounding properties or Town rights-of-way.

If you have any questions regarding the data presented or the methodology of our analysis, please feel free to contact us to discuss further.

Signed: Cooper Karsh, P.E., CF

JVA

COLORADO LICENSED
COOPER W. KARSH
50723
8/23/2024
PROFESSIONAL ENGINEER

Copies to:

Nicholas Rosenbeck (Owner)

Attachments:

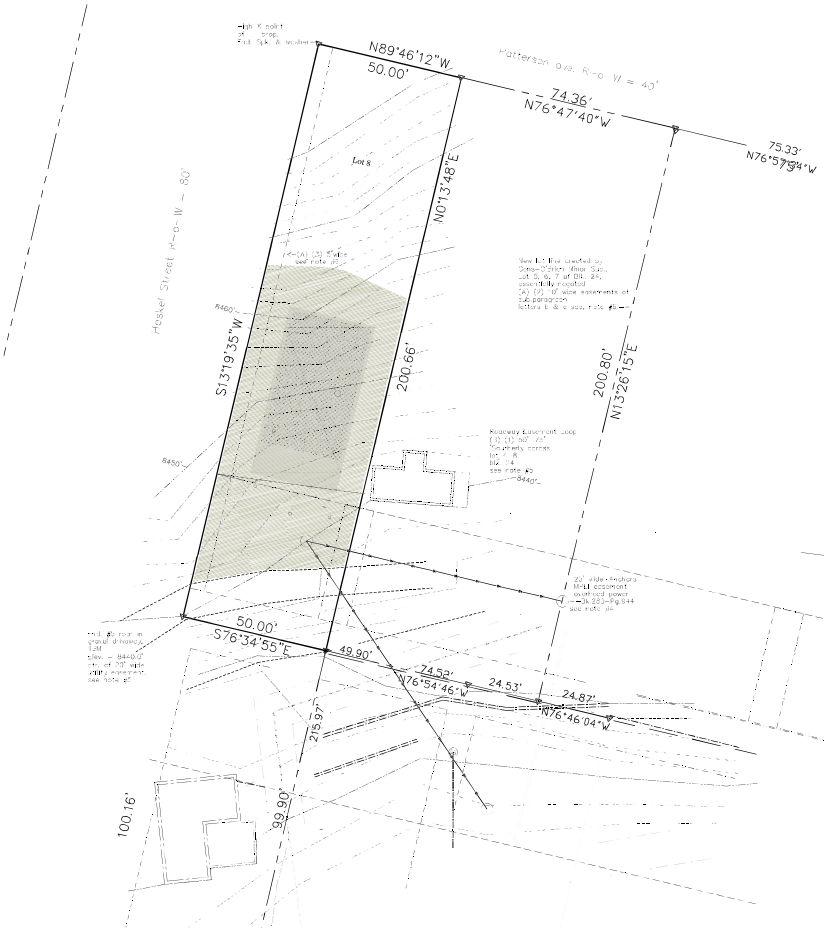
Site Plan (by BDC Design)

NOAA Precipitation Data

Historic Basin Data

Proposed Basin Data

Proposed Stormwater Runoff Calculations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216.97'
99.90'
100.16'

NOAA Atlas 14, Volume 8, Version 2
Location name: Grand Lake, Colorado, USA*
Latitude: 40.255°, Longitude: -105.827°
Elevation: 8439 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

1-Hour Point Rainfalls

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.166 (0.131-0.215)	0.197 (0.155-0.256)	0.257 (0.201-0.335)	0.314 (0.245-0.412)	0.405 (0.310-0.570)	0.484 (0.359-0.689)	0.572 (0.408-0.838)	0.668 (0.457-1.01)	0.809 (0.530-1.27)	0.926 (0.586-1.46)
10-min	0.243 (0.191-0.315)	0.289 (0.227-0.375)	0.376 (0.295-0.490)	0.460 (0.358-0.603)	0.593 (0.454-0.834)	0.709 (0.526-1.01)	0.837 (0.598-1.23)	0.979 (0.669-1.48)	1.18 (0.776-1.85)	1.36 (0.858-2.14)
15-min	0.296 (0.233-0.384)	0.352 (0.277-0.458)	0.459 (0.359-0.598)	0.561 (0.437-0.736)	0.723 (0.553-1.02)	0.865 (0.641-1.23)	1.02 (0.729-1.50)	1.19 (0.816-1.81)	1.44 (0.947-2.26)	1.65 (1.05-2.60)
30-min	0.359 (0.283-0.466)	0.428 (0.336-0.556)	0.558 (0.438-0.728)	0.684 (0.533-0.897)	0.882 (0.675-1.24)	1.06 (0.782-1.50)	1.24 (0.889-1.83)	1.46 (0.995-2.21)	1.76 (1.16-2.76)	2.02 (1.28-3.18)
60-min	0.439 (0.346-0.570)	0.511 (0.402-0.664)	0.656 (0.514-0.855)	0.800 (0.624-1.05)	1.04 (0.797-1.47)	1.25 (0.928-1.78)	1.48 (1.06-2.19)	1.75 (1.20-2.66)	2.14 (1.41-3.36)	2.47 (1.56-3.89)
2-hr	0.519 (0.414-0.667)	0.595 (0.474-0.764)	0.753 (0.597-0.971)	0.917 (0.723-1.19)	1.19 (0.930-1.68)	1.44 (1.09-2.05)	1.72 (1.25-2.52)	2.05 (1.42-3.09)	2.52 (1.68-3.93)	2.92 (1.87-4.56)
3-hr	0.590 (0.474-0.753)	0.662 (0.531-0.846)	0.823 (0.658-1.06)	0.998 (0.792-1.29)	1.30 (1.02-1.83)	1.58 (1.20-2.24)	1.90 (1.39-2.77)	2.27 (1.58-3.41)	2.82 (1.89-4.37)	3.29 (2.12-5.10)
6-hr	0.739 (0.600-0.932)	0.813 (0.660-1.03)	0.990 (0.801-1.25)	1.19 (0.956-1.52)	1.54 (1.24-2.15)	1.88 (1.45-2.64)	2.26 (1.68-3.27)	2.71 (1.92-4.04)	3.39 (2.30-5.21)	3.97 (2.58-6.09)
12-hr	0.921 (0.758-1.15)	1.01 (0.834-1.27)	1.23 (1.01-1.54)	1.47 (1.20-1.85)	1.88 (1.52-2.59)	2.28 (1.78-3.16)	2.73 (2.04-3.90)	3.25 (2.32-4.79)	4.04 (2.76-6.14)	4.71 (3.09-7.15)
24-hr	1.12 (0.936-1.38)	1.25 (1.04-1.54)	1.52 (1.26-1.88)	1.81 (1.49-2.25)	2.30 (1.88-3.11)	2.76 (2.17-3.76)	3.28 (2.48-4.61)	3.87 (2.79-5.63)	4.76 (3.29-7.14)	5.51 (3.66-8.29)
2-day	1.33 (1.13-1.62)	1.49 (1.26-1.82)	1.83 (1.53-2.24)	2.17 (1.81-2.68)	2.75 (2.27-3.67)	3.28 (2.61-4.42)	3.88 (2.97-5.39)	4.57 (3.33-6.56)	5.58 (3.89-8.28)	6.44 (4.32-9.58)
3-day	1.48 (1.26-1.79)	1.65 (1.40-2.00)	2.02 (1.71-2.45)	2.40 (2.02-2.93)	3.04 (2.52-4.02)	3.62 (2.90-4.84)	4.28 (3.30-5.90)	5.03 (3.70-7.18)	6.15 (4.32-9.06)	7.09 (4.79-10.5)
4-day	1.60 (1.37-1.93)	1.79 (1.53-2.16)	2.18 (1.86-2.64)	2.59 (2.19-3.15)	3.27 (2.72-4.30)	3.88 (3.12-5.16)	4.58 (3.54-6.28)	5.37 (3.96-7.61)	6.54 (4.61-9.58)	7.52 (5.10-11.1)
7-day	1.93 (1.67-2.30)	2.17 (1.87-2.59)	2.63 (2.26-3.15)	3.08 (2.63-3.71)	3.81 (3.19-4.92)	4.45 (3.61-5.83)	5.17 (4.03-6.99)	5.98 (4.44-8.36)	7.15 (5.08-10.4)	8.13 (5.56-11.9)
10-day	2.22 (1.94-2.64)	2.49 (2.17-2.96)	2.99 (2.59-3.56)	3.47 (2.98-4.16)	4.22 (3.54-5.38)	4.86 (3.96-6.30)	5.57 (4.36-7.46)	6.36 (4.74-8.82)	7.49 (5.34-10.8)	8.43 (5.80-12.2)
20-day	3.06 (2.70-3.58)	3.38 (2.98-3.96)	3.96 (3.48-4.66)	4.48 (3.90-5.30)	5.25 (4.44-6.55)	5.90 (4.85-7.49)	6.59 (5.20-8.65)	7.33 (5.52-9.99)	8.38 (6.03-11.8)	9.23 (6.42-13.3)
30-day	3.74 (3.33-4.35)	4.13 (3.67-4.81)	4.80 (4.25-5.61)	5.38 (4.73-6.33)	6.23 (5.29-7.66)	6.91 (5.71-8.68)	7.62 (6.05-9.90)	8.38 (6.34-11.3)	9.42 (6.81-13.2)	10.2 (7.17-14.6)
45-day	4.60 (4.12-5.30)	5.11 (4.57-5.90)	5.95 (5.31-6.90)	6.66 (5.90-7.78)	7.66 (6.53-9.32)	8.44 (7.01-10.5)	9.23 (7.37-11.9)	10.0 (7.64-13.4)	11.1 (8.10-15.4)	12.0 (8.44-17.0)
60-day	5.32 (4.80-6.11)	5.96 (5.37-6.85)	7.00 (6.28-8.07)	7.86 (7.00-9.12)	9.03 (7.73-10.9)	9.93 (8.28-12.2)	10.8 (8.67-13.8)	11.7 (8.95-15.5)	12.9 (9.42-17.8)	13.8 (9.77-19.5)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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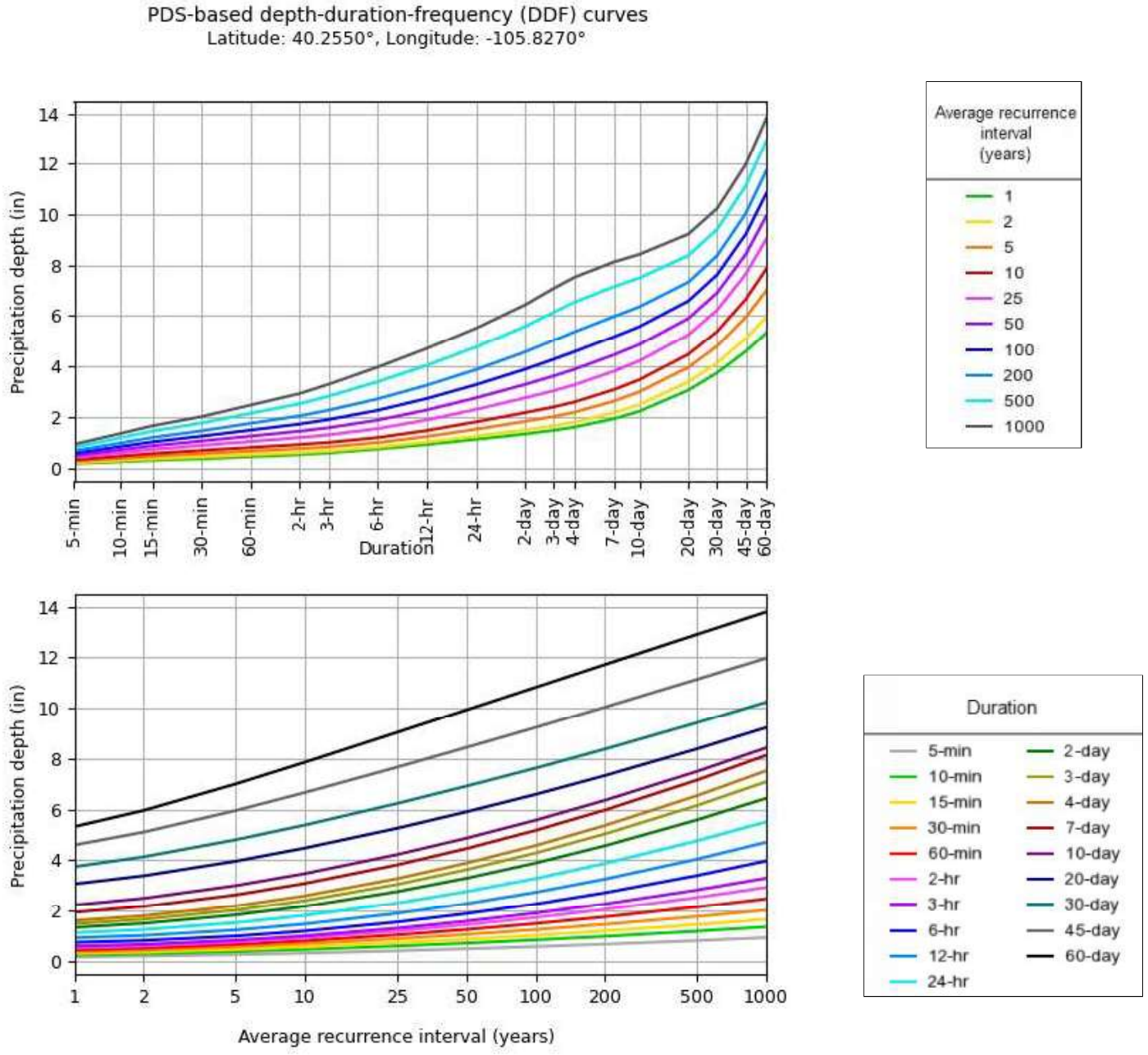
PF graphical



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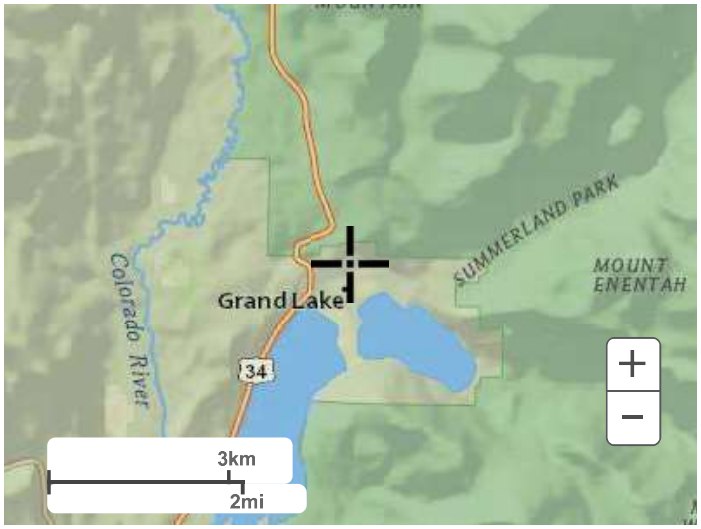
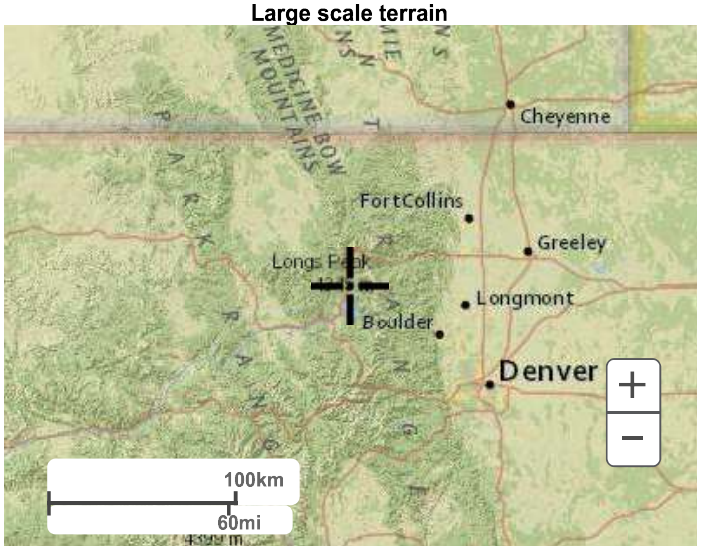
Maps & aerials

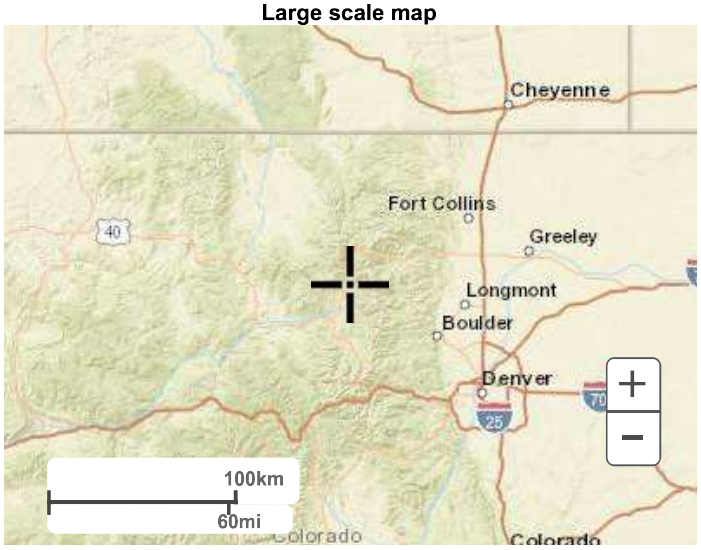
Small scale terrain



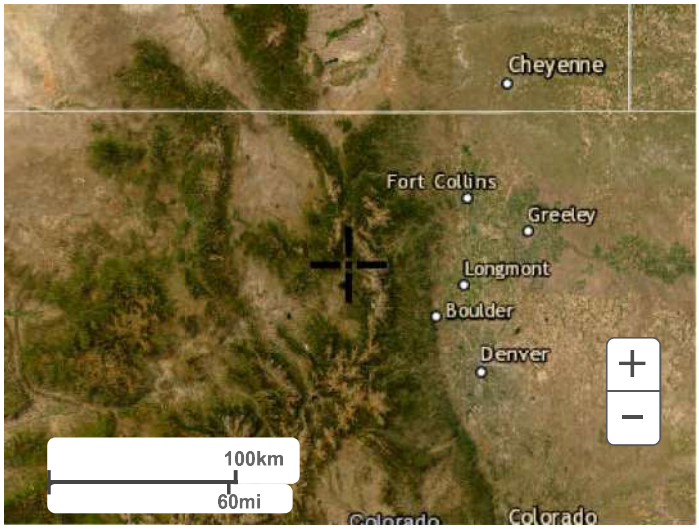
Large scale terrain



Large scale map



Large scale aerial



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Disclaimer

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Ph: (970) 722 7677
Municipality: MHFD

Job Name: 501 Mountain Ave
Job Number: xxx
Date: 8/23/24
By: CWK

501 Mountain Ave

Historic Runoff Coefficient & Time of Concentration Calculations

Municipality: Grand Lake
Impervious Values: MHFD
Runoff Coefficients: MHFD Formulae
Major Design Storm: 100
Minor Design Storm: 10

Basin Design Data																											
		I (%) =	80%	95%	90%	20%			I (%)	Runoff Coefficients (MHFD Forumulae Table 6-5)				Initial Overland Time (t_i) MHFD Eq 6-3			Channelized Travel Time (t_t) MHFD Eq 6-4						t_c Comp	Regional Check ($t_{regional}$) MHFD Eq 6-5			t_c Final
			Area (sf)	Area (sf)	Area (sf)	Area (sf)																					
Basin Name	Soil Type	Design Point	Gravel (Road/Parking)	Concrete Drives/Walks	Roof	Landscaping	A_{Total} (sf)	A_{Total} (ac)	Imp (%)	C2	C5	C10	C100	Length (ft)	Slope (%)	t_i (min)	Length (ft)	Slope (%)	Type of Land Surface	K	Velocity (fps)	t_t (min)	Time of Conc $t_i + t_t = t_c$	Channelized Length (ft)	Channelized Slope (ft/ft)	$t_{regional}$	t_c or $t_{regional}$
A	C/D	1	5,553	0	7,610	318,329	331,492	7.61	22.6%	0.16	0.22	0.30	0.58	158	45.0%	5.7	448	13.3%	Paved areas & shallow paved swales	20	7.3	1.0	6.7	448	0.133	23.8	6.7
							0	0.00											Paved areas & shallow paved swales	20	0.0	0.0		0	0.000	N/A	
							0	0.00											Paved areas & shallow paved swales	20	0.0	0.0		0	0.000	N/A	
							0	0.00											Paved areas & shallow paved swales	20	0.0	0.0		0	0.000	N/A	
							0	0.00											Paved areas & shallow paved swales	20	0.0	0.0		0	0.000	N/A	
	TOTAL SITE		5,553	0	7,610	318,329	331,492	7.61	22.6%	0.16	0.22	0.30	0.58														

I = (28.5 P1) / ((10 + TC) 0.786)

											Point Hour Rainfall (P_1):		0.51	0.66	0.80	1.46
			Runoff Coeff's				Rainfall Intensities (in/hr)				Area		Flow Rates (cfs)			
Basin Name	Design Point	Time of Conc (tc)	C2	C5	C10	C100	2	5	10	100	A_{Total} (sf)	A_{Total} (ac)	Q2	Q5	Q10	Q100
A	1	6.7	0.16	0.22	0.30	0.58	1.59	2.04	2.49	4.61	331,492	7.61	1.90	3.41	5.65	20.21
											0	0.00				
											0	0.00				
											0	0.00				
											0	0.00				
										TOTAL SITE	331,492	7.61	1.90	3.41	5.65	20.21

Historic 100-Year Storm Flow Rate

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Winter Park, CO 80482
Ph: (970) 722 7677

Job Name: 501 Mountain Ave
Job Number: xxx
Date: 8/23/24
By: CWK

501 Mountain Ave

Composite Runoff Coefficient Calculations

Municipality: Grand Lake
Impervious Values: MHFD
Runoff Coefficients: MHFD Formulae

Proposed Site increases Gravel Paving and Roof Areas

Proposed Imperviousness

Basin Design Data

		I (%) =	80%	95%	90%	20%			I (%)	Runoff Coefficients (MHFD Forumulae Table 6-5)			
Basin Name	Soil Type	Design Point	Area (sf) Gravel (Road/Parking)	Area (sf) Concrete Drives/Walks	Area (sf) Roof	Area (sf) Landscaping	A_{Total} (sf)	A_{Total} (ac)	Imp (%)	C2	C5	C10	C100
A	C/D	1	6,235	0	9,331	315,926	331,492	7.61	23.1%	0.16	0.22	0.30	0.58
							0	0.00					
							0	0.00					
							0	0.00					
							0	0.00					
							0	0.00					
							0	0.00					
							0	0.00					
							0	0.00					
							0	0.00					
							0	0.00					
							0	0.00					
	TOTAL SITE		6,235	0	9,331	315,926	331,492	7.61	23.1%	0.16	0.22	0.30	0.58

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By: CWK

501 Mountain Ave

Time of Concentration Calculations

Municipality: MHFD
Impervious Values: MHFD
Runoff Coefficients: MHFD Formulae

Sub-Basin Data				Initial Overland Time (t_i) MHFD Eq 6-3			Channelized Travel Time (t_t) MHFD Eq 6-4						t_c Comp	Regional Check ($t_{regional}$) MHFD Eq 6-5			t_c Final
Basin Name	Design Point	A_{Total} (ac)	C5	Length (ft)	Slope (%)	t_i (min)	Length (ft)	Slope (%)	Type of Land Surface	C_v	Velocity (fps)	t_t (min)	Time of Conc $t_i + t_t = t_c$	Channelized Length (ft)	Channelized Slope (ft/ft)	$t_{regional}$	t_c or $t_{regional}$
A	1	7.61	0.22	158	45.0%	5.7	448	13.3%	Paved areas & shallow paved swales	20	7.3	1.0	6.7	448	0.133	23.7	6.7
									Paved areas & shallow paved swales	20				0	0.000	N/A	
									Paved areas & shallow paved swales	20				0	0.000	N/A	
									Paved areas & shallow paved swales	20				0	0.000	N/A	
									Paved areas & shallow paved swales	20				0	0.000	N/A	
									Paved areas & shallow paved swales	20				0	0.000	N/A	
									Paved areas & shallow paved swales	20				0	0.000	N/A	
									Paved areas & shallow paved swales	20				0	0.000	N/A	
									Paved areas & shallow paved swales	20				0	0.000	N/A	
									Paved areas & shallow paved swales	20				0	0.000	N/A	
									Paved areas & shallow paved swales	20				0	0.000	N/A	
									Paved areas & shallow paved swales	20				0	0.000	N/A	

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501 Mountain Ave

Developed Storm Runoff Calculations

Design Storm : **100 Year**

Point Hour Rainfall (P_1) : **1.48**

	Direct Runoff							Total Runoff				
Basin Name	Design Point	Area (ac)	C100	tc (min)	C*A (ac)	I (in/hr)	Q (cfs)	Total tc (min)	ΣC*A (ac)	I (in/hr)	Q (cfs)	Notes
A	1	7.61	0.58	6.7	4.40	4.61	20.29	6.70	4.40	4.61	20.31	Proposed Q

100-Year Storm Flow Rate in Proposed Conditions