



Grandview Reserve Fil. No. 1

Drainage Memo

April 2026

HR Green Project No: 201662.210

PUDSP-21-10

Prepared For:

D.R. Horton

Contact: Bryan Reid, PE

9555 S. Kingston Court

Englewood, CO 80112

Prepared By:

HR Green Development, LLC

Contact: Ken Huhn, P.E.

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(720) 602-4965



Engineer's Statement:

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the applicable master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

Kenneth Huhn

04/20/26

Date

Kenneth Huhn, P.E.

State of Colorado No. 54022

For and on behalf of HR Green Development, LLC



Owner/Developer's Statement:

I, the developer, have read and will comply with all of the requirements specified in this drainage report and plan.

By: D.R. Horton

Authorized Signature

4/20/26

Date

Address: D.R. Horton
9555 S. Kingston Court
Englewood, CO

El Paso County Statement

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development code, as amended.

4/22/26

Joshua Palmer, P.E.

Date

County Engineer/ECM Administrator

Conditions:



Table of Contents

Table of Contents	1
I. General Project Description	2
a. Project Description	2
b. Runoff Summary Pre-Development Conditions	2
c. Runoff Summary Pre-Development	3
II. Summary	4

Appendices

- A. NRCS Soil Survey
- B. Hydrologic Analysis
- C. Drainage Maps
- D. As-Built Survey

I. General Project Description

a. Project Description

The site consists of approximately 12 disturbed acres that were part of the early Grandview Reserve Filing No. 1 Early Grading & Erosion Control Plans (approved 03/05/24). To date only a portion of the grading within Filing 1 has been completed. The Owner/ Developer has paused the project and is seeking to close out their early grading permit with the disturbed area having been vegetated in accordance with County requirements. The disturbed area is located the southwest portion of the Grandview Reserve Filing 1 PUD/Preliminary Plan Area Development (PUDSP-21-10). A Drainage Map from the approved DP (Sheet DR-4 see Appendix C) has been marked up to indicate the impacted area. The affected site is located within unincorporated El Paso County and is bounded on the north and south sides with existing agricultural land part of the Grandview Reserve Filing No. 1. To the east is the Gieck Ranch Tributary #1 (Channel A). The site is bounded to the west by Eastonville Road, a public roadway that is currently gravel. The project area is currently zoned PUD and contains undeveloped area with existing vegetation in the form of native grasses and shrubs. Early grading for this area established a fill stockpile for future areas of the project. The stockpile area has since been seeded and is now vegetated. The disturbed area was surveyed by Edward James Survey in December 2025 (see Appendix D). Per a NRCS soil survey, the site is made up of Hydrologic Soil Group B Stapleton Sandy Loam soil type. Group B soils have a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils. The NRCS soil survey is presented in Appendix A.

There are no major drainageways or irrigation facilities that traverse the disturbed site nor does the area fall within mapped Floodplain. The grading modifications that were completed and vegetated are referred to as the as-built condition have not caused a significant impact to existing drainage patterns or peak flows, as discussed in the section below. The Pre-Development & As-Built Existing Drainage Maps are presented in Appendix C to support our analysis.

b. Runoff Summary Pre-Development Conditions

The Pre-Development Existing Drainage Map contains six (6) subbasins that were delineated within the Disturbed Area with one design point established to represent the combined Pre-Development flows for the impacted and studied area (studied area is 15.1 acres). The design point and basin descriptions are provided below. Ultimately, all described flows are conveyed to Gieck Ranch Tributary #1 (Channel A). The flow within Channel A was not evaluated within this study. Only the flows from the disturbed area were analyzed so that they could be compared directly with those in the as-built condition.

Design Point 1 – Pre-Development

Basin **EX6** is comprised of 3.05 undeveloped acres west of Eastonville Road. Runoff sheet flows east at 5 and 100 year rates of 0.88 and 5.92 cfs, respectively to a low point near the roadway, and is conveyed east via existing public 18" CMP culvert into Basin PD1. This basin was previously studied in the *Eastonville Road-Londonderry Dr. to Rex Rd. Preliminary Drainage Report*, prepared by HR Green, dated September 2023, however, basin details are also delineated in the *Preliminary Drainage Report for Grandview Reserve Filing No. 1*, prepared by Galloway and Company, Inc. and approved March 6th, 2024.

Basin **PD1** consists of 0.55 undeveloped acres within the studied project area east of Eastonville Road. Runoff combines with the outfall of Basin EX6. In the undeveloped condition, it collects in a low area with a bottom

elevation of 6992. The low area overflows at an elevation of 6993.6 (1.6' depth of ponding) and then flows east across PD6 and then on to the design point 1.

Basin **EX5** is comprised of 22.35 undeveloped acres west of Eastonville Road, to the north of Basin EX6. Runoff sheet flows east at 5 and 100 year rates of 7.00 and 43.30 cfs, respectively and is conveyed east via existing public 18" CMP culvert into Basin PD2. This basin was previously studied in the *Eastonville Road-Londonderry Dr. to Rex Rd. Preliminary Drainage Report*, prepared by HR Green, dated September 2023, however, basin details are also delineated in the *Preliminary Drainage Report for Grandview Reserve Filing No. 1*, prepared by Galloway and Company, Inc. and approved March 6th, 2024.

Basin **PD2** consists of 1.18 undeveloped acres within the studied project area east of Eastonville Road. Runoff combines with the outfall of Basin EX5. In the undeveloped condition, it drains north along the existing roadway ditch where it then flows east through a break in the berm where it joins with basin PD3 and then to the design point 1.

Basin **PD3** consists of 5.79 undeveloped acres within the studied project area east of Eastonville Road. Runoff combines with the flows from Basin PD2. In the undeveloped condition, it drains southeast and then to the design point 1 in Channel A.

Basin **PD4** consists of 1.98 undeveloped acres within the studied project area north of PD4. In the undeveloped condition, it drains east into Channel A and then to the design point 1.

Basin **PD5** consists of 3.17 undeveloped acres within the studied project area. In the undeveloped condition, it drains southeast and then to the design point 1 in Channel A.

Basin **PD6** consists of 2.44 undeveloped acres within the studied project area. Runoff combines with the flows from Basins EX6 & PD1. In the undeveloped condition, it drains southeast and then to the design point 1 Channel A.

The overall combined flows for the Pre-Development Condition at design point 1 are summarized below:

5 Year Flow:	5.68 cfs
100 Year Flow:	34.61cfs

c. Runoff Summary As-Built Conditions

The As-Built Existing Drainage Map contains four (4) subbasins that were delineated within the Disturbed Area with one design point established to represent the combined As-Built Existing flows for the impacted and studied area (studied area is 15.1 acres). The design point and basin descriptions are provided below. Ultimately, all described flows are conveyed to Gieck Ranch Tributary #1 (Channel A). The flow within Channel A was not evaluated within this study. Only the flows from the disturbed area were analyzed so that they could be compared directly with those in the pre-development condition.

Design Point 1 – As-Built

Basin **EX6** is comprised of 3.05 undeveloped acres west of Eastonville Road. Runoff sheet flows east at 5 and 100 year rates of 0.88 and 5.92 cfs, respectively to a low point near the roadway, and is conveyed east via existing public 18" CMP culvert into Basin AB1. This basin was previously studied in the *Eastonville Road-Londonderry Dr. to Rex Rd. Preliminary Drainage Report*, prepared by HR Green, dated September 2023, however, basin details are also delineated in the *Preliminary Drainage Report for Grandview Reserve Filing No. 1*, prepared by Galloway and Company, Inc. and approved March 6th, 2024.

Basin **AB1** consists of 0.45 undeveloped acres within the studied project area east of Eastonville Road. Runoff combines with the outfall of Basin EX6. In the as-built condition, it collects in a low area with a bottom elevation of 6992. The low area overflows at an elevation of 6993.6 (1.6 depth of ponding) just as it does in the pre-development condition. It flows east into AB3 but due to the stockpile location it is now diverted to the north and ultimately back to the east across AB3 towards the design point 1 in Channel A

Basin **AB3** consists of 5.21 disturbed acres within the studied project area. Runoff combines with the flows from Basins EX6 & AB1. In the as-built condition, it drains north along the toe of slope of the stockpile and then to the design point 1 Channel A.

Basin EX5 is comprised of 22.35 undeveloped acres west of Eastonville Road, to the north of Basin EX6. Runoff sheet flows east at 5 and 100 year rates of 7.00 and 43.30 cfs, respectively and is conveyed east via existing public 18" CMP culvert into Basin PD2. This basin was previously studied in the *Eastonville Road-Londonderry Dr. to Rex Rd. Preliminary Drainage Report*, prepared by HR Green, dated September 2023, however, basin details are also delineated in the *Preliminary Drainage Report for Grandview Reserve Filing No. 1*, prepared by Galloway and Company, Inc. and approved March 6th, 2024.

Basin **AB2** consists of 3.27 disturbed acres within the studied project area east of Eastonville Road. Runoff combines with the outfall of Basin EX6. In the as-built condition, it drains north along the existing roadway ditch where it then flows east through a break in the berm as it did in the pre-development condition. Instead of draining directly east, it has been diverted into a constructed vegetated ditch that is in general conformance with the approved Early Grading Plan. This diversion ditch then turns east and drains directly to Channel A and on to design point 1.

Basin **AB4** consists of 6.17 disturbed acres within the studied project area. In the as-built condition, it drains east and then to the design point 1 in Channel A. This basin also contains the gravel drive that was constructed to provide access to the Wells. This drive is in general conformance with that which was shown on the approved Early Grading Plan. The gravel surface condition was accounted for in the basin flow calculations.

The overall combined flows for the As-Built Condition at design point 1 are summarized below:

5 Year Flow:	6.39 cfs
100 Year Flow:	33.68 cfs

II. Water Quality

The original approved PDR for the project proposed the construction of six (6) Extended Detention Basins (EDB), two (2) Sand Filter Basins (SFB), and some runoff reduction areas. Due to the development being put on hold none of these permanent water quality treatment measures nor were any of the permanent impervious areas constructed. All of the disturbed area has been re-vegetated. The only impervious area that was completed was the temporary gravel access drive for the access to the wells. The gravel drive was constructed with an area of 1.25 acres. In order to meet the County Criteria for an exclusion for water quality treatment, the Developer will be removing a portion of the gravel and re-vegetating the area to its predevelopment condition (see the As Built Existing Drainage Map sheet 02 in Appendix C) . With

this work completed the remaining area will be 0.98 acres (less than 1 acre), thus a water quality treatment pond will not be required.

III. Summary

Our understanding of the purpose of this analysis was to evaluate the as-built condition of the disturbed area for this project and determine if there are any adverse impacts to the upstream and downstream areas. In regard to the upstream analysis, Basin EX5 was evaluated and it was determined that the flows from the 18" culvert will not be blocked or hindered in the as-built condition. Runoff will continue to pond in a low point that will overtop at the same elevation as it did in the pre-development condition. These flows have been slightly diverted to the north but ultimately drain to Channel A. Upstream Basin EX6 was also evaluated, and it was also determined that the flows from the 18" culvert will not be blocked or hindered in the as-built condition. Similar to Basin EX5, the runoff has been slightly diverted to the north but ultimately drains to Channel A.

In regard to potential impacts to the downstream area, we have evaluated the 5 year and 100 year flows calculated for the pre-development and the as-built conditions. The combined flows for the 15.1 acres disturbed by this project have been summarized below:

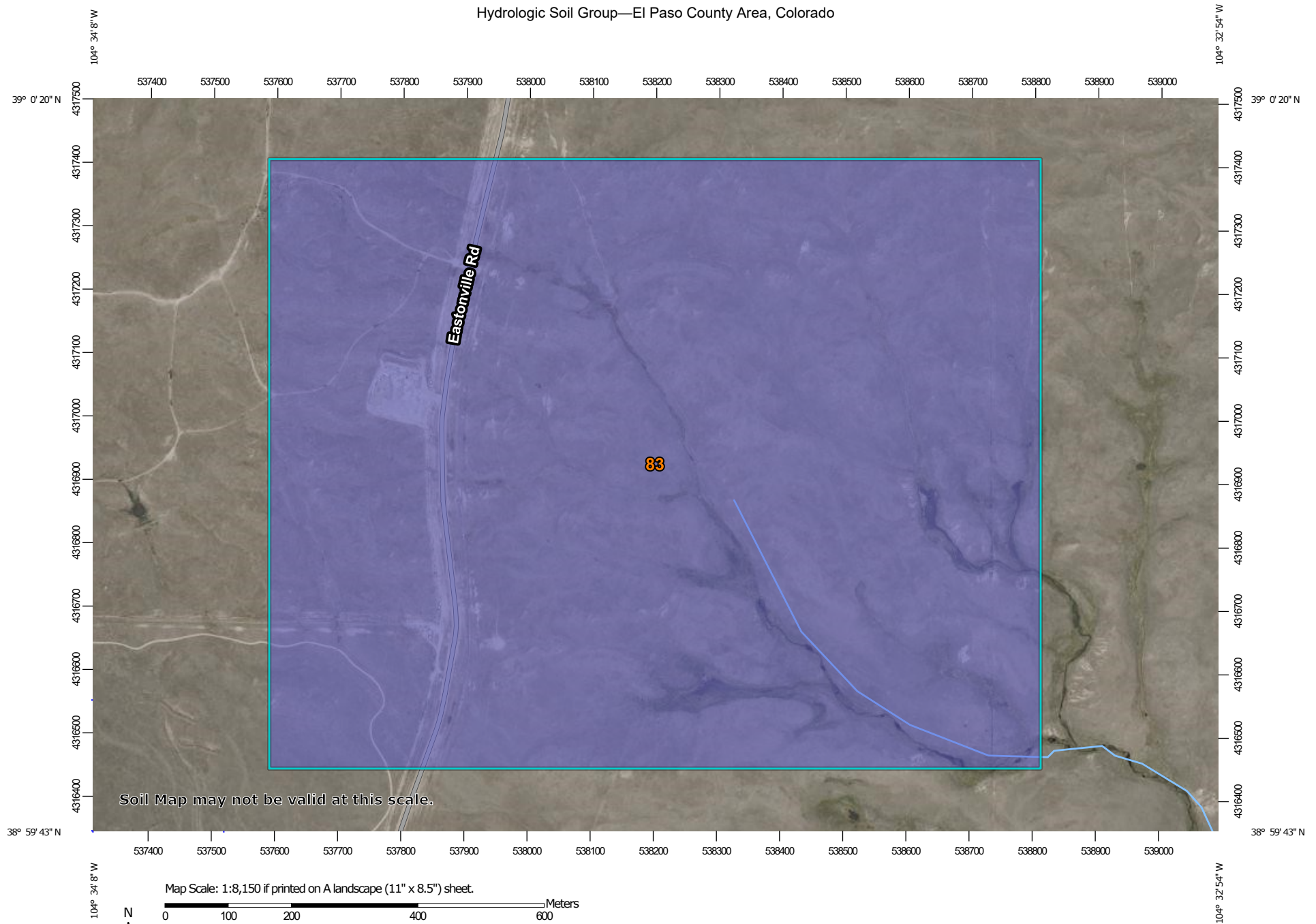
	Pre-Dev (cfs)	As-Built (cfs)	Increase (cfs)
5 Year Flow	5.68	6.39	+0.70
100 Year Flow:	34.61	33.68	-0.93

While there was a small increase in the 5 year flow there was also a small decrease to the 100 year. The increase was primarily due to the construction of the gravel access drive which increased the composite impervious C factor. Since the increased flows are relatively small and will be combined with the much higher flows in Channel A it is our opinion that the impact is negligible. Channel A is contained within the property limits of the Grandview Reserve Property for approximately 2,000 feet downstream. The small increased flow will be mitigated within this distance and not result in any significant changes to the peak flow within Channel A when it leaves the site. The modifications associated with the affected southwestern portion of the Grandview Reserve Filing No. 1 early grading in the as-built conditions remain consistent with pre-development drainage patterns and outfall points. The proposed development will not adversely affect upstream or downstream stormwater infrastructure or surrounding property.



APPENDIX A – NRCS SOIL SURVEY

Hydrologic Soil Group—El Paso County Area, Colorado



MAP LEGEND**Area of Interest (AOI)**
 Area of Interest (AOI)
Soils**Soil Rating Polygons**

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features
 Streams and Canals
Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background
 Aerial Photography
MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
 Survey Area Data: Version 23, Aug 29, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 23, 2024—Aug 4, 2024

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
83	Stapleton sandy loam, 3 to 8 percent slopes	B	291.4	100.0%
Totals for Area of Interest			291.4	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX B – HYDROLOGIC CALCULATIONS

**GRANDVIEW RESERVE FIL. NO. 1 MEMO****Calc'd by:****CVW****PRE-DEVELOPMENT EXISTING CONDITIONS****Checked by:****KMH****ELPASO COUNTY, CO****Date:****2/20/2026****SUMMARY RUNOFF TABLE**

BASIN	AREA (ac)	% IMPERVIOUS	Q ₅ (cfs)	Q ₁₀₀ (cfs)
PD1	0.55	16	0.46	1.82
PD2	1.18	16	0.81	3.16
PD3	5.79	2	1.87	12.59
PD4	1.98	2	0.67	4.47
PD5	3.17	2	1.03	6.92
PD6	2.44	2	0.84	5.66

DESIGN POINT SUMMARY TABLE

DESIGN POINT	CONTRIBUTING BASINS	ΣQ ₅ (cfs)	ΣQ ₁₀₀ (cfs)
1	PD1-PD6	5.68	34.61



GRANDVIEW RESERVE FIL. NO. 1 MEMO
PRE-DEVELOPMENT EXISTING CONDITIONS
ELPASO COUNTY, CO

Calc'd by: CVW
Checked by: KMH
Date: 2/20/2026

SOIL TYPE: HSG A&B

COMPOSITE 'C' FACTORS																						
BASIN	LAND USE TYPE																		TOTAL	COMPOSITE IMPERVIOUSNESS & C FACTOR		
	Paved			Drive and Walks			Roofs			Gravel			Lawns			Historic Flow Analysis--Greenbelts,						
	%I	C ₅	C ₁₀₀	%I	C ₅	C ₁₀₀	%I	C ₅	C ₁₀₀	%I	C ₅	C ₁₀₀	%I	C ₅	C ₁₀₀	%I	C ₅	C ₁₀₀				
	100	0.90	0.96	100	0.90	0.96	90	0.73	0.81	80	0.59	0.70	0	0.08	0.35	2	0.09	0.36				
	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES	ACRES				
PD1										0.10						0.45			0.55	16	0.18	0.42
PD2										0.22						0.96			1.18	16	0.18	0.42
PD3																5.79			5.79	2	0.09	0.36
PD4																1.98			1.98	2	0.09	0.36
PD5																3.17			3.17	2	0.09	0.36
PD6																2.44			2.44	2	0.09	0.36
TOTAL SITE	0.00			0.00			0.00			0.31			0.00			14.80			15.11	4	0.09	0.36

	GRANDVIEW RESERVE FIL. NO. 1 MEMO							Calc'd by:		CVW			
	PRE-DEVELOPMENT EXISTING CONDITIONS							Checked by:		KMH			
	ELPASO COUNTY, CO							Date:		2/20/2026			
TIME OF CONCENTRATION													
BASIN DATA			OVERLAND TIME (T_t)			TRAVEL TIME (T_t)					TOTAL	tc=(L/180)+10	Design tc
DESIGNATION	C _s	AREA (ac)	LENGTH (ft)	SLOPE %	t _t (min)	C _v	LENGTH (ft)	SLOPE %	V (ft/s)	t _t (min)	t _c (min)	tc max	tc design (min)
PD1	0.18	0.55	46	4.6	6.9	7	0	2.0	1.0	0.0	6.9	10.3	6.9
PD2	0.18	1.18	300	1.4	26.1	7	180	1.4	0.8	3.6	29.7	12.7	12.7
PD3	0.09	5.79	300	2.7	23.0	7	466	2.4	1.1	7.2	30.2	14.3	14.3
PD4	0.09	1.98	300	2.7	23.0	7	244	2.5	1.1	3.7	26.7	13.0	13.0
PD5	0.09	3.17	300	4.0	20.2	7	442	2.7	1.2	6.4	26.6	14.1	14.1
PD6	0.09	2.44	300	3.9	20.4	7	90	3.9	1.4	1.1	21.5	12.2	12.2

Table 6-7. Conveyance Coefficient, C_v

Type of Land Surface	C _v
Heavy meadow	2.5
Tillage/field	5
Riprap (not buried)*	6.5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

*For buried riprap, select C_v value based on type of vegetative cover.

$$t_t = \frac{0.395(1.1 - C_s)\sqrt{L}}{S^{0.33}} \quad V = C_v S_w^{0.5}$$

1433 HRGreen			GRANDVIEW RESERVE FIL. NO. 1 MEMO												Calc'd by:		CVW									
			PRE-DEVELOPMENT EXISTING CONDITIONS												Checked by:		KMH									
			DESIGN STORM: 5-YEAR												Date:		2/20/2026									
			DIRECT RUNOFF						TOTAL RUNOFF				STREET			PIPE				TRAVEL TIME			REMARKS			
	DESIGN POINT	BASIN ID	AREA (ac)	C _s	t _c (min)	C _s *A (ac)	I (in./ hr.)	Q (cfs)	t _c (min)	C _s *A (ac)	I (in./ hr.)	Q (cfs)	Q _{street} (cfs)	C _s *A (ac)	SLOPE %	Q _{pipe} (cfs)	C _s *A (ac)	SLOPE %	PIPE SIZE (ft)	LENGTH (FT)	VEL. (FPS)	TRAVEL TIME (min)				
		PD1	0.55	0.18	6.9	0.10	4.69	0.46	6.9	0.10	4.69	0.46														
		PD2	1.18	0.18	12.7	0.21	3.77	0.81	12.7	0.21	3.77	0.81														
		PD3	5.79	0.09	14.3	0.52	3.60	1.87	14.3	0.52	3.60	1.87														
		PD4	1.98	0.09	13.0	0.18	3.73	0.67	13.0	0.18	3.73	0.67														
		PD5	3.17	0.09	14.1	0.29	3.61	1.03	14.1	0.29	3.61	1.03														
		PD6	2.44	0.09	12.2	0.22	3.83	0.84	12.2	0.22	3.83	0.84														

1433 HRGreen			GRANDVIEW RESERVE FIL. NO. 1 MEMO												Calc'd by:		CVW						
			PRE-DEVELOPMENT EXISTING CONDITIONS												Checked by:		KMH						
			DESIGN STORM: 100-YEAR												Date:		2/20/2026						
			DIRECT RUNOFF					TOTAL RUNOFF				STREET			PIPE			TRAVEL TIME			REMARKS		
	DESIGN POINT	BASIN ID	AREA (ac)	C ₁₀₀	f _c (min)	C ₁₀₀ *A (ac)	I (lin./ hr.)	Q (cfs)	f _c (min)	C ₁₀₀ *A (ac)	I (lin./ hr.)	Q (cfs)	Q _{street} (cfs)	C ₁₀₀ *A (ac)	SLOPE %	Q _{pipe} (cfs)	C ₁₀₀ *A (ac)	SLOPE %	PIPE SIZE (ft)	LENGTH (ft)	VEL. (ft/s)	TRAVEL TIME (min)	
		PD1	0.55	0.42	6.9	0.23	7.88	1.82	6.9	0.23	7.88	1.82											
		PD2	1.18	0.42	12.7	0.50	6.34	3.16	12.7	0.50	6.34	3.16											
		PD3	5.79	0.36	14.3	2.08	6.04	12.59	14.3	2.08	6.04	12.59											
		PD4	1.98	0.36	13.0	0.71	6.27	4.47	13.0	0.71	6.27	4.47											
		PD5	3.17	0.36	14.1	1.14	6.06	6.92	14.1	1.14	6.06	6.92											
		PD6	2.44	0.36	12.2	0.88	6.44	5.66	12.2	0.88	6.44	5.66											

**GRANDVIEW RESERVE FIL. NO. 1 MEMO****Calc'd by:****CVW****AS-BUILT EXISTING CONDITIONS****Checked by:****KMH****ELPASO COUNTY, CO****Date:****4/7/2026****SUMMARY RUNOFF TABLE**

BASIN	AREA (ac)	% IMPERVIOUS	Q ₅ (cfs)	Q ₁₀₀ (cfs)
AB1	0.45	20	0.45	1.57
AB2	3.27	0	0.89	6.54
AB3	5.21	0	1.41	10.11
AB4	6.17	13	3.64	15.46

DESIGN POINT SUMMARY TABLE

DESIGN POINT	CONTRIBUTING BASINS	ΣQ ₅ (cfs)	ΣQ ₁₀₀ (cfs)
1	AB1-AB4	6.39	33.68



HRGreen

GRANDVIEW RESERVE FIL. NO. 1 MEMO

AS-BUILT EXISTING CONDITIONS

ELPASO COUNTY, CO

Calc'd by:

CVW

Checked by:

KMH

Date:

4/7/2026

SOIL TYPE: HSG A&B

COMPOSITE 'C' FACTORS																						
BASIN	LAND USE TYPE																TOTAL	COMPOSITE IMPERVIOUSNESS & C FACTOR				
	Paved			Drive and Walks			Roofs			Gravel			Lawns			Historic Flow Analysis-- Greenbelts,						
	%I	C ₅	C ₁₀₀	%I	C ₅	C ₁₀₀	%I	C ₅	C ₁₀₀	%I	C ₅	C ₁₀₀	%I	C ₅	C ₁₀₀	%I					C ₅	C ₁₀₀
	100	0.90	0.96	100	0.90	0.96	90	0.73	0.81	80	0.59	0.70	0	0.08	0.35	2					0.09	0.36
	ACRES			ACRES			ACRES			ACRES			ACRES			ACRES					ACRES	%I
AB1										0.12			0.33						0.45	20	0.21	0.44
AB2													3.27						3.27	0	0.08	0.35
AB3										0.02			5.19						5.21	0	0.08	0.35
AB4										0.97			5.20						6.17	13	0.16	0.40
TOTAL SITE	0.00			0.00			0.00			1.11			13.99			0.00			15.10	6		

	GRANDVIEW RESERVE FIL. NO. 1 MEMO						Calc'd by:		CVW				
	AS-BUILT EXISTING CONDITIONS						Checked by:		KMH				
	ELPASO COUNTY, CO						Date:		4/7/2026				
TIME OF CONCENTRATION													
BASIN DATA			OVERLAND TIME (T_i)			TRAVEL TIME (T_t)					TOTAL	tc=(L/180)+10	Design tc
DESIGNATION	C _s	AREA (ac)	LENGTH (ft)	SLOPE %	t _i (min)	C _v	LENGTH (ft)	SLOPE %	V (ft/s)	t _t (min)	t _c (min)	tc max	tc design (min)
AB1	0.21	0.45	46	4.6	6.7	7	0	2.0	1.0	0.0	6.7	10.3	6.7
AB2	0.08	3.27	300	0.9	33.5	7	821	1.8	0.9	14.6	48.1	16.2	16.2
AB3	0.08	5.21	300	1.5	28.2	7	1052	2.4	1.1	16.2	44.4	17.5	17.5
AB4	0.16	6.17	300	3.1	20.5	7	320	3.1	1.2	4.3	24.8	13.4	13.4

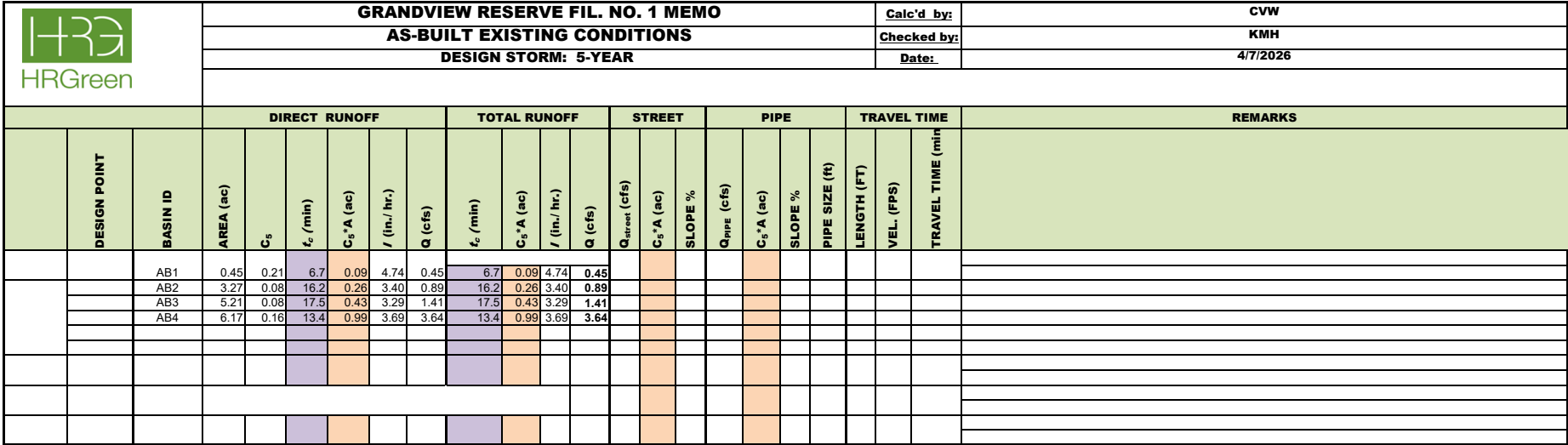
Table 6-7. Conveyance Coefficient, C_v

Type of Land Surface	C _v
Heavy meadow	2.5
Tillage/field	5
Riprap (not buried)*	6.5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

For buried riprap, select C_v value based on type of vegetative cover.

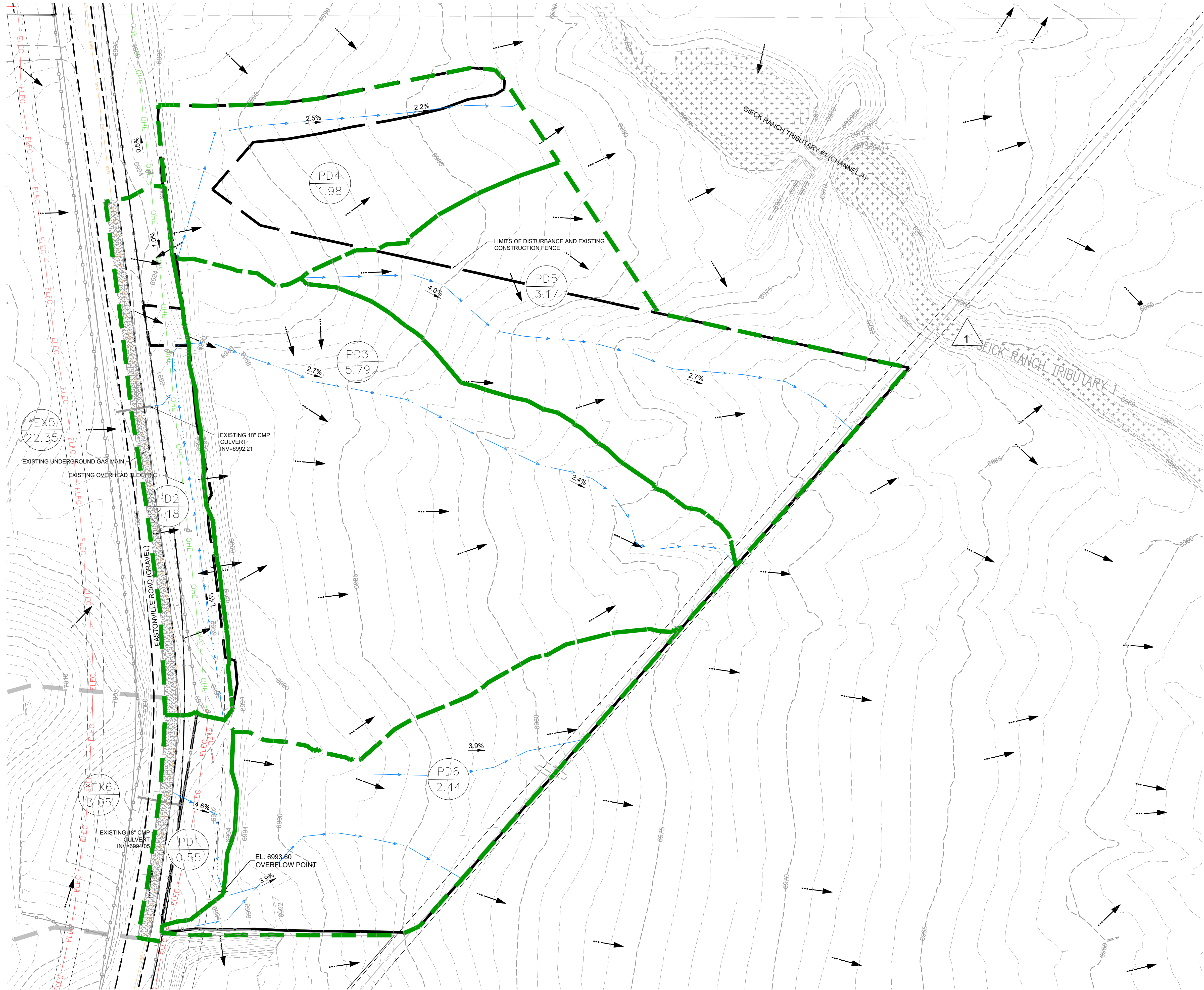
$$t_i = \frac{0.395(1.1 - C_s)\sqrt{L}}{S^{0.33}}$$

$$V = C_v S_w^{0.5}$$



 HRGreen			GRANDVIEW RESERVE FIL. NO. 1 MEMO										Calc'd by:		CVW								
			AS-BUILT EXISTING CONDITIONS										Checked by:		KMH								
			DESIGN STORM: 100-YEAR										Date:		4/7/2026								
			DIRECT RUNOFF				TOTAL RUNOFF				STREET		PIPE		TRAVEL TIME		REMARKS						
	DESIGN POINT	BASIN ID	AREA (ac)	C ₁₀₀	t _c (min)	C ₁₀₀ *A (ac)	I (in./ hr.)	Q (cfs)	t _c (min)	C ₁₀₀ *A (ac)	I (in./ hr.)	Q (cfs)	Q _{street} (cfs)	C ₁₀₀ *A (ac)	SLOPE %	Q _{PIPE} (cfs)	C ₁₀₀ *A (ac)	SLOPE %	PIPE SIZE (ft)	LENGTH (ft)	VEL. (ft/s)	TRAVEL TIME (min)	
		AB1	0.45	0.44	6.7	0.20	7.96	1.57	6.7	0.20	7.96	1.57											
		AB2	3.27	0.35	16.2	1.14	5.71	6.54	16.2	1.14	5.71	6.54											
		AB3	5.21	0.35	17.5	1.83	5.52	10.11	17.5	1.83	5.52	10.11											
		AB4	6.17	0.40	13.4	2.50	6.19	15.46	13.4	2.50	6.19	15.46											

APPENDIX C – DRAINAGE MAPS



LEGEND:

EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
CHANNELIZED FLOW PATH
FLOW DIRECTION
DRAINAGE BASIN
DESIGN POINT
PROPOSED BASIN LABEL
LIMITS OF DISTURBANCE

5250
11
1.25
BASIN DESIGNATION
AREA (AC.)

SUMMARY RUNOFF TABLE				
BASIN	AREA (ac)	% IMPERVIOUS	Q ₅ (cfs)	Q ₁₀₀ (cfs)
PD1	0.55	16	0.46	1.82
PD2	1.18	16	0.81	3.16
PD3	5.79	2	1.87	12.59
PD4	1.98	2	0.67	4.47
PD5	3.17	2	1.03	6.92
PD6	2.44	2	0.84	5.66

DESIGN POINT SUMMARY TABLE			
DESIGN POINT	CONTRIBUTING BASINS	ΣQ ₅ (cfs)	ΣQ ₁₀₀ (cfs)
1	PD1-PD6	5.68	34.61

DRAWN BY: CVW
APPROVED: KMH
CAD DATE: 2/20/2026
CAD FILE: J:\2020\201662\CAD\Drawings\Grandview_662_10\Drainage\201662.210-DR-Pre-Dev-Exhibit

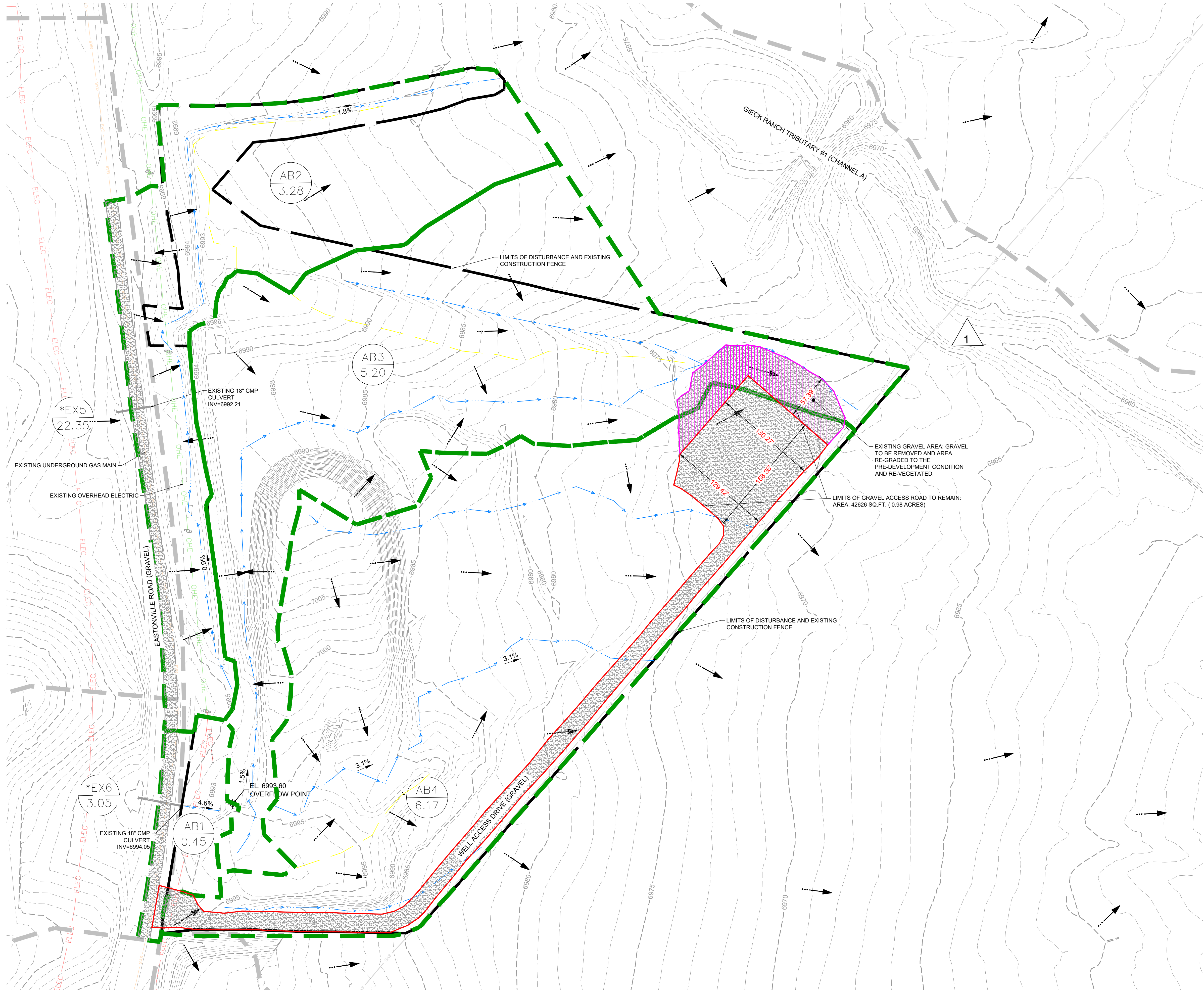
JOB DATE: 01/16/2026
JOB NUMBER: 201662.210

BAR IS ONE INCH ON OFFICIAL DRAWINGS.
0" = 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION

GRANDVIEW RESERVE FILING NO. 1
D.R. HORTON
EL PASO COUNTY, COLORADO

DRAINAGE MEMO
PRE-DEVELOPMENT EXISTING DRAINAGE MAP



LEGEND:

EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
CHANNELIZED FLOW PATH
FLOW DIRECTION
DRAINAGE BASIN
DESIGN POINT
PROPOSED BASIN LABEL

LIMITS OF DISTURBANCE
RIDGE

EXISTING GRAVEL AREA
(TO REMAIN)

EXISTING GRAVEL AREA
(TO BE REMOVED)

NOTES:
1. BASINS EX5 AND EX6 ARE SHOWN FOR REFERENCE ONLY AND ARE NOT INCLUDED IN HYDROLOGIC CALCULATIONS.
(*) BASIN DELINEATION AND DRAINAGE CHARACTERISTICS DERIVED FROM APPROVED PDR FOR GRANDVIEW RESERVE FILING NO. 1 BY GALLOWAY & COMPANY, INC.

SUMMARY RUNOFF TABLE				
BASIN	AREA (ac)	% IMPERVIOUS	Q ₅ (cfs)	Q ₁₀₀ (cfs)
AB1	0.45	20	0.45	1.57
AB2	3.27	0	0.89	6.54
AB3	5.21	0	1.41	10.11
AB4	6.17	13	3.64	15.46

DESIGN POINT SUMMARY TABLE			
DESIGN POINT	CONTRIBUTING BASINS	ΣQ ₅ (cfs)	ΣQ ₁₀₀ (cfs)
1	AB1-AB4	6.39	33.68

DRAWN BY: CVW
APPROVED: KMH
CAD DATE: 4/20/2026
CAD FILE: J:\2020\201662\CAD\Drawings\Grandview_662.10\Drainage\201662.210-DR-As-Built-Exhibit

JOB DATE: 01/16/2026
JOB NUMBER: 201662.210

BAR IS ONE INCH ON OFFICIAL DRAWINGS.
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION

GRANDVIEW RESERVE FILING NO. 1
D.R. HORTON
EL PASO COUNTY, COLORADO

DRAINAGE MEMO
AS BUILT EXISTING DRAINAGE MAP

SHEET
02

02

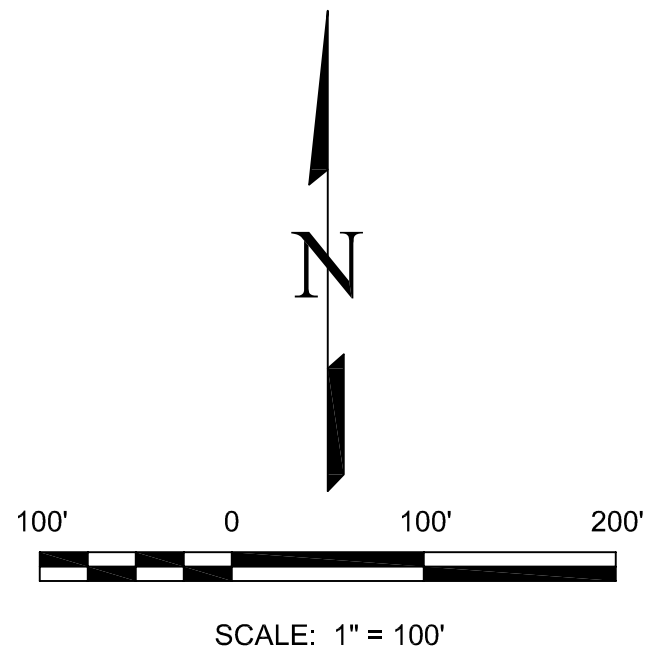
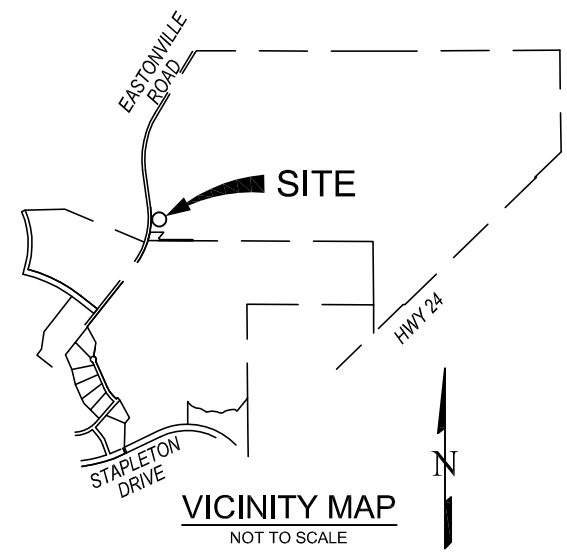


APPENDIX D – As-Built Survey

GRANDVIEW RESERVE

TOPOGRAPHIC SURVEY

DECEMBER 2025



LEGEND:

- UTILITY POLE
- GUY WIRE/ANCHOR
- UNKNOWN VALVE
- OVERHEAD ELECTRIC LINE
- FENCE
- GRAVEL

GENERAL NOTES:

- THIS TOPOGRAPHIC MAP WAS CREATED FROM DATA GATHERED FROM A FIELD SURVEY CONDUCTED ON THE GROUND DECEMBER 29, 2025 AND JANUARY 27, 2026.
- THIS TOPOGRAPHIC MAP DOES NOT REPRESENT A MONUMENTED LAND SURVEY AND CAN NOT BE RELIED UPON FOR DEFINITIVE PROPERTY BOUNDARY INFORMATION. THE BOUNDARY IS SHOWN PLACED PER FOUND MONUMENTS. NO MONUMENTATION WAS SET AT TIME OF SURVEY. FURTHER SURVEY WORK REQUIRED IS TO ESTABLISH ADDITIONAL BOUNDARY MONUMENTS.
- VERTICAL CONTOUR INTERVAL FOR THIS MAP IS 1 FOOT.
- BENCHMARK(BM); THE BENCHMARK FOR THIS TOPOGRAPHIC MAP IS NGS MONUMENT F24, WITH AN ASSUMED ELEVATION OF 6866.33 FEET, NAVD88.
- NO UTILITY LOCATES WERE ORDERED.

SURVEYOR'S STATEMENT:

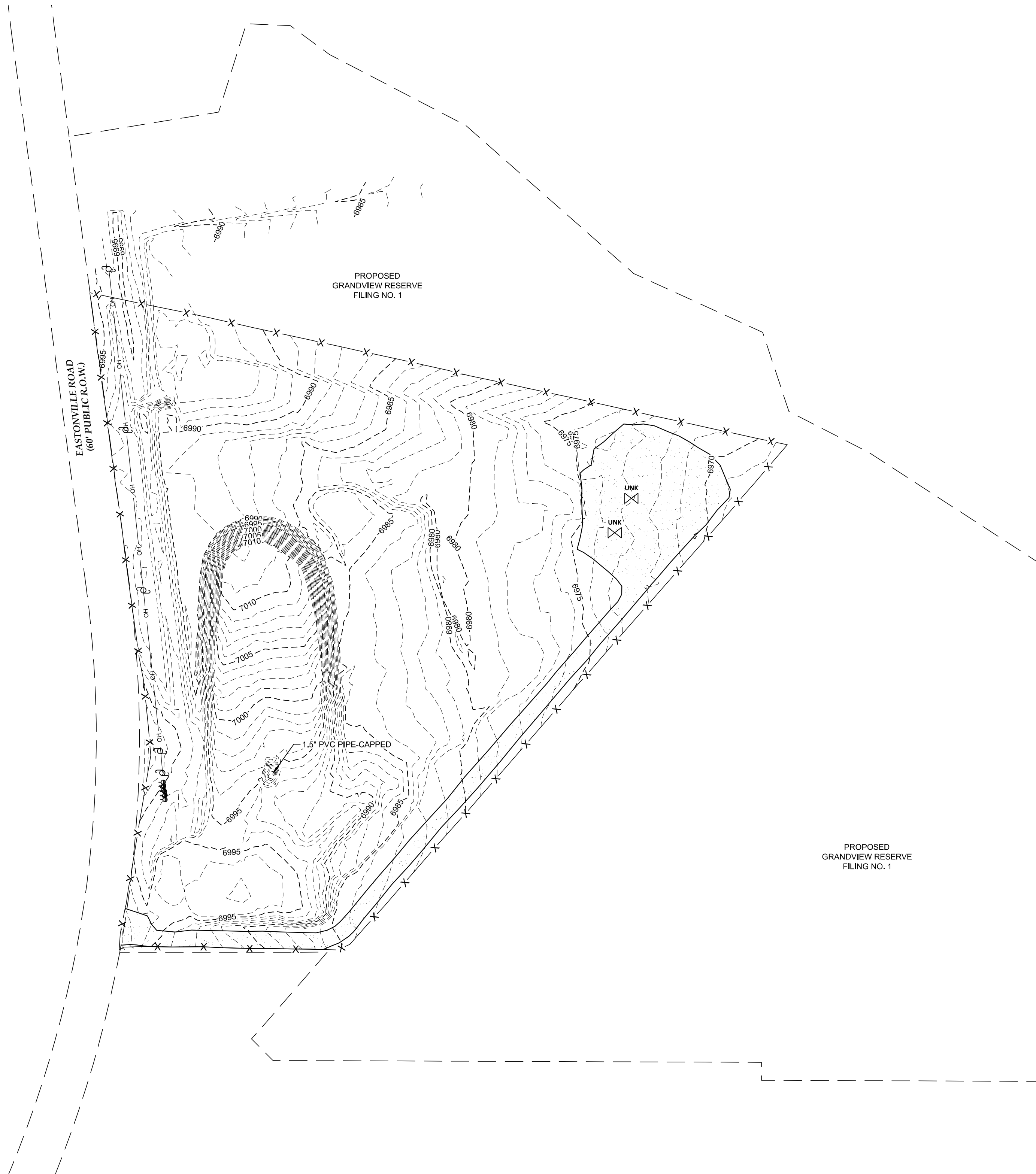
I, JONATHAN W. TESSIN, A PROFESSIONAL LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY STATE THAT THIS TOPOGRAPHIC SURVEY HAS BEEN PREPARED UNDER MY DIRECTION, AND THAT THIS SURVEY DOES ACCURATELY SHOW THE DESCRIBED TRACT OF LAND TO THE BEST OF MY KNOWLEDGE AND BELIEF.



JONATHAN W. TESSIN, PROFESSIONAL LAND SURVEYOR
COLORADO P.L.S. NO. 33196
FOR AND ON BEHALF OF EDWARD-JAMES SURVEYING, INC.

NOTICE:

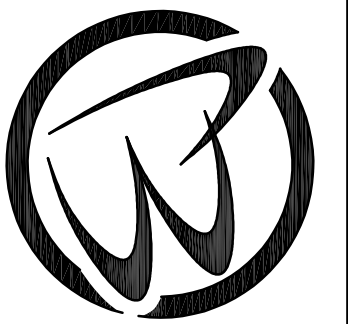
ACCORDING TO COLORADO LAW YOU **MUST** COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.



REVISIONS		DESCRIPTION	DATE
NO.			

EDWARD-JAMES SURVEYING, INC.
926 Elton Drive
Colorado Springs, CO 80907
Office: (719) 576-1216
Fax: (719) 576-1206

4732 Eagleridge Circle
Pueblo, CO 81008
Office: (719) 545-6240
Fax: (719) 545-6247



GRANDVIEW RESERVE
TOPOGRAPHIC SURVEY

DRAWN BY **JWT**
CHECKED BY **ERF**

H-SCALE **1" = 100'**

JOB NO. **2217-01**
DATE CREATED **1-12-2026**
DATE ISSUED **2-2-2026**
SHEET NO **1** OF **1**