

**PRELIMINARY/FINAL DRAINAGE REPORT
FOR
TIMBER RIDGE WEST**

January 2019

Revised February 2019

Revised April 2019

Prepared For:

JACOB DECOTO

10620 Vollmer Road

Colorado Springs, CO 80908

206-419-4533

Prepared By:

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Colorado Springs, CO 80904

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TNE Job No. 1752.00
County Job No. EA-1895

**PRELIMINARY/FINAL DRAINAGE REPORT
FOR
TIMBER RIDGE WEST**

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APPENDICES

VICINITY MAP

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FEMA FIRM MAP

HYDROLOGIC & HYDRAULIC CALCULATIONS

DRAINAGE PLANS

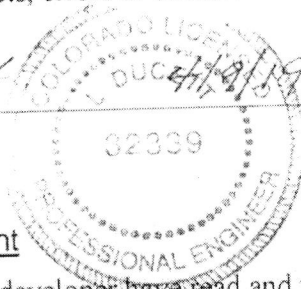
FINAL PLAT

CERTIFICATION STATEMENT:

Engineer's Statement

This 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 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.


L DUCETT, P.E. 32339



Seal

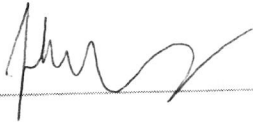
Developer's Statement

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

JACOB DECOTO

Business Name

By:

 (Jacob Decoto)

Title:

Address:

10620 Vollmer Rd
Colorado Springs, CO 80908

El Paso County Approval:

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

Approved
by Elizabeth Nijkamp
El Paso County Planning and Community Development
on behalf of Jennifer Irvine, County Engineer, ECM Administrator



04/17/2019 12:45:12 PM

Jennifer Irvine,
County Engineer / ECM Administrator

Conditions:

PRELIMINARY/FINAL DRAINAGE REPORT FOR TIMBER RIDGE WEST

PURPOSE

The purpose of this Preliminary/Final Drainage Report is to identify and analyze the proposed drainage patterns, determine proposed runoff quantities, size drainage structures for conveyance of developed runoff, and present solutions to drainage impacts on-site and off-site resulting from this development.

GENERAL DESCRIPTION

This Preliminary/Final Drainage Report is an analysis of 36.0 acres of undeveloped land located in northern El Paso County. The property is in the upper portion of the Sand Creek drainage basin on the south edge of Black Forest and consists mainly of native grasses with some scattered pine trees. The site is located in the south west quarter of Section 22, Township 12 South, Range 65 West of the 6th Principal Meridian currently within El Paso County, Colorado and is bounded to the north and west by open space (rural residential), to the east by Vollmer Road, and to the south by Wildflower Road.

The site is being subdivided into three properties - Lot 1 (3.2 ac), Lot 2 (3.8 ac) and Lot 3 (29.0 ac) of the Timber Ridge West development.

Soils for this project are delineated by the map in the appendix as Kettle gravelly loamy sand (41), 8 to 40 percent slopes and Pring Coarse sandy loam (71), 3 to 8 percent slopes. Soils in the study area are shown as mapped by S.C.S. in the "Soils Survey of El Paso County Area" and contains soils of Hydrologic Group B.

FLOODPLAIN STATEMENT

No portion of this site is within a designated F.E.M.A. floodplain, as determined by Flood Insurance Rate Map No. 08041C0535 G, dated December 7, 2018 (see the Appendices).

EXISTING DRAINAGE CONDITIONS

Basin OS-1 (A= 11.2 ac, Q5= 1.0 cfs, Q100= 13.3 cfs) consists of currently undeveloped land covered with native grasses and scattered pine trees. The area is zoned RR-5 (rural residential with 5 ac or larger lot size) and runoff from this offsite basin flows southeast directly onto Basin EX-1.

Basin EX-1 (A= 16.4 ac, Q5= 2.9 cfs, Q100=20.7 cfs) consists of currently undeveloped land (RR-5) covered with native grasses and scattered pine trees.

Basins OS-1 and EX-1 contribute to Design Point 1 and produce combined flow rates of Q5= 4.6 cfs and Q100= 32.7 cfs which are conveyed under Vollmer Road by an existing 60" CMP.

Basin EX-2 (A= 12.9 ac, Q5= 2.8 cfs, Q100= 20.0 cfs) consists of currently undeveloped land (RR-5) covered with native grasses and scattered pine trees. Runoff from this basin flows offsite to the south at Design Point 2 through an unplatted parcel of property. These existing conditions flow values represent the allowable release flows for developed conditions at this location.

Basin EX-3 (A=6.7 ac, Q5= 1.1 cfs, Q100= 8.1 cfs) consists of currently undeveloped land (RR-5) covered with native grasses and scattered pine trees. Runoff from this basin flows southeast to a roadside ditch that runs south along Vollmer Road and releases at the southern corner of the property at Design Point 3.

PROPOSED DRAINAGE CONDITIONS

The site is being subdivided into three lots - Lot 1 (3.2 ac), Lot 2 (3.8 ac) and Lot 3 (29.0 ac) of Timber Ridge West development (see Final Plat in the Appendices).

Lot 3 is not being developed as part of this project. As a consequence, there are no changes for Basins OS-1, EX-1, or EX-2 under the developed drainage conditions. There is an existing home on this lot. Upon future development of Lot 3, further drainage analysis will be required for these basins. When Lot 3 is developed, Lot 1 and Lot 2 will be accessed from the north via the proposed roadway to be constructed as part of that future development. Until that time, temporary access via Vollmer Road has been granted at the shared property line approximately 425 ft southwest of the intersection of Vollmer Road and Arroya Lane. An entrance pipe is required at this location; therefore, Basin EX-3 is divided into two basins (PR-3a and PR-3b) to analyze the proposed development conditions.

Lot 1 and Lot 2 are designated as Rural Residential (avg. lot size 3.5 ac) and are to be developed following the criteria as given in the approved *MDDP for The Retreat at TimberRidge*:

The rural lots will have paved streets and roadside ditches... Development of rural lots proposed within the site will be limited to roadways and building pads, conserving the nature feature areas. Individual home sites on these lots are to be

left generally in their natural condition with minimal disturbance to existing conditions per individual lot construction.

The impervious area for the developed condition was estimated at a total of 0.2 acres per lot, comprised of a house with attached garage, an outbuilding, and a driveway. The balance of the area is considered to remain in pre-development condition.

Basin PR-3a ($A=2.9$ ac, $Q_5=1.0$ cfs, $Q_{100}=4.9$ cfs) is comprised mostly of the area designated as Lot 2 and it is assumed that all of the impervious area for Lot 2 will be located in this basin. The runoff from Basin PR-3a is conveyed under the temporary access from Vollmer Road via an entrance pipe at Design Point 3a. The entrance pipe will be an 18" RCP (or equivalent) approximately 44 ft long at a minimum slope of 0.5% ($Q_{\max}=7.3$ cfs at 80% full).

Basin PR-3b ($A=3.8$ ac, $Q_5=1.1$ cfs, $Q_{100}=5.3$ cfs) is comprised of all the area designated as Lot 1 and a portion of Lot 2 and it is assumed that all of the impervious area for Lot 1 will be located in this basin.

Basins PR-3a and PR-3b contribute to Design Point 3b and produce combined flow rates of $Q_5=2.0$ cfs and $Q_{100}=9.5$ cfs. Per the approved *MDDP for The Retreat at TimberRidge*, sediment control is to be provided on each lot and the minimal developed conditions runoff from these lots will be allowed to continue southward in the roadside ditch adjacent to Vollmer Road. For the temporary access, the erosion and sediment control shall consist of 1 Vehicle Tracking Control and 1 Temporary Sediment Basin.

FOUR STEP PROCESS

In an effort to protect receiving water and as part of the "four-step process to minimize adverse impacts of urbanization" this site was analyzed in the following manner:

1. Reduce Runoff – Runoff at the site either sheet flows across natural grass slopes or is collected in natural grass swales before entering the existing roadside ditch, thus allowing for reduction of runoff to occur.
2. Treat and Slowly Release WQCV – Per the ECM Section I.7.1.B, WQCV is not required for these lots since they are "low density (rural) housing (2.5 acres or larger lots)". However, sediment control is to be provided on each lot.
3. Stabilize Stream Channels – There are no proposed channels associated with this development and all existing swales and natural drainage ways are stable and to be left undisturbed, or revegetated to existing conditions.
4. Source Controls – Source controls will need to be implemented during the construction of the residential structure. Builders are required to get an Erosion and Stormwater Quality Control Permit (ESQCP) through El Paso County which identifies the necessary source controls.

HYDROLOGIC CALCULATIONS

Hydrologic calculations were performed using the El Paso County Storm Drainage Design Criteria Manual - Volumes 1 & 2, latest editions. The Rational Method was used to estimate storm water runoff anticipated from design storms with 5-year and 100-year recurrence intervals. The pertinent data sheets are included with the appendices of this report.

HYDRAULIC CALCULATIONS

Hydraulic calculations were estimated using the Manning's Formula and the methods described in the El Paso County Storm Drainage Design Criteria Manual – Volumes 1 & 2, latest editions. The pertinent data sheets are included with the appendices of this report.

MAINTENANCE

The storm water systems for this project are private and therefore must be maintained by the owner. These should be cleaned and checked after any significant precipitation event and at least once every three months. Any proposed erosion control measures will be repaired and maintained by the property owner or owner's representative as required.

CONSTRUCTION COST OPINION

Private Non-Reimbursable

Item	Quantity	Unit Price	Cost
18" RCP	44 LF	\$45	\$1980.00
		Total	\$1980.00

DRAINAGE FEES

The site is in the Sand Creek Basin. The combined Drainage Fees (2019) for Lot 1 and Lot 2 are due prior to final plat recordation.

Fee Type	% Imp.	Parcel Area (acre)	Imp. Area (acre)	Fee per Imp Acre	Mod %	Fee Cost
Drainage	9.4	6.98	0.656	\$18,940	75	\$9320.18
Bridge	9.4	6.98	0.656	\$5,559	100	\$3647.37
				Total		\$12,967.55

SUMMARY

Development of this site will not adversely affect the downstream and surrounding developments. Proposed flows, as detailed in this report, will follow the drainage patterns outlined in this report and be safely routed downstream. This report and its findings are in general conformance with all previously approved reports which include this site.

PREPARED BY:
TERRA NOVA ENGINEERING, INC.

L Ducett, P.E.
President

BIBLIOGRAPHY

“MDDP for The Retreat at TimberRidge” (2/22/18) by Classic Consulting Engineers & Surveyors

“PDR for The Retreat at TimberRidge (South of Arroya Lane)” (2018) by Classic Consulting Engineers & Surveyors

El Paso County Drainage Criteria Manual-Volumes 1 & 2, latest edition

El Paso County Board Resolution No 15-042 (Adoption of Chapter 6 and Section 3.2.1 Chapter 13 of the City of Colorado Springs Drainage Criteria Manual dated May 2014, Hydrology and Full Spectrum Detention)

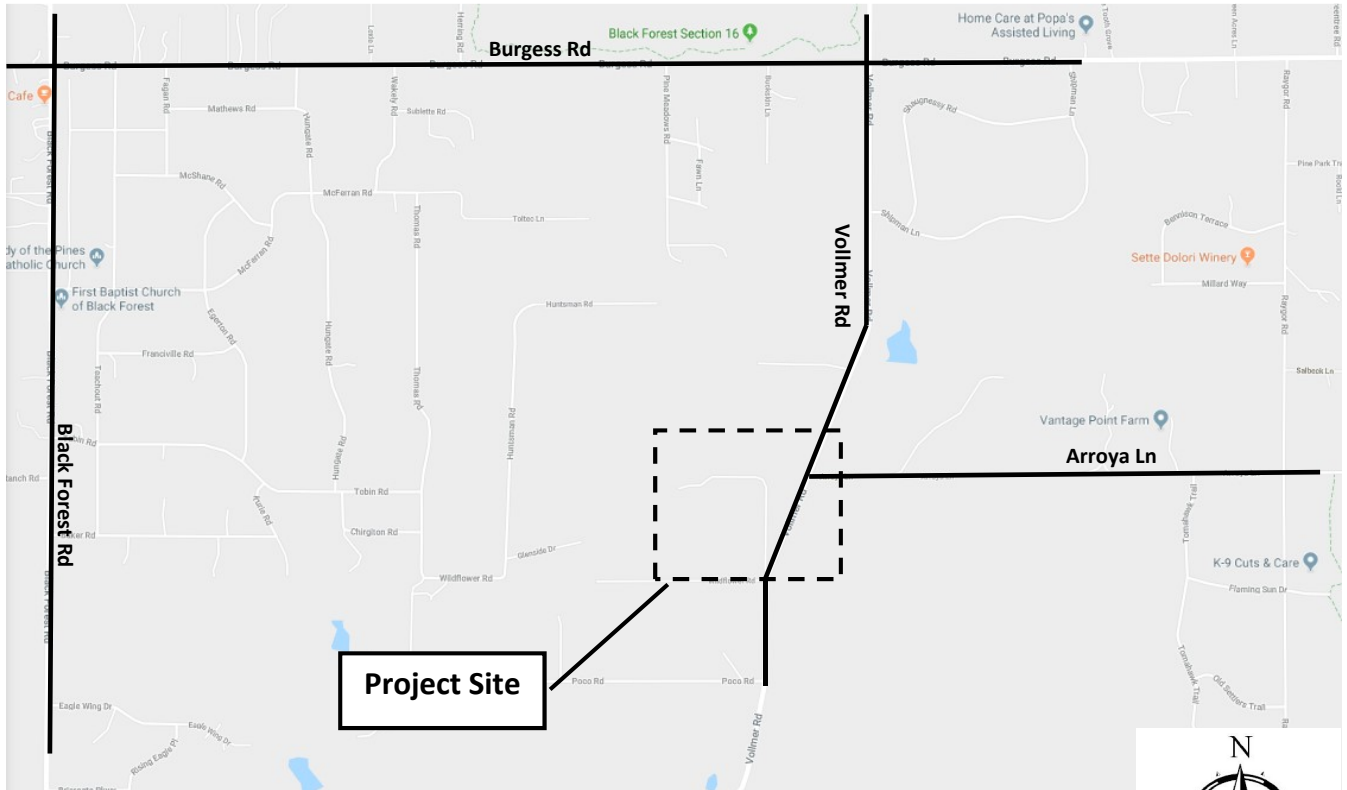
Engineering Criteria Manual (Revision 6), El Paso County

SCS Soils Map for El Paso County

Federal Emergency Management Agency (FEMA) flood maps

APPENDICES

VICINITY MAP



Not to Scale

1752.00

S.C.S. SOILS MAP

FEMA FIRM MAP

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, V, A99
	With BFE or Depth Zone AE, AO, AH, VE, AR
OTHER AREAS OF FLOOD HAZARD	Regulatory Floodway
	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
	Future Conditions 1% Annual Chance Flood Hazard Zone X
	Area with Reduced Flood Risk due to Levee. See Notes. Zone X
OTHER AREAS	Area with Flood Risk due to Levee Zone D
	NO SCREEN Area of Minimal Flood Hazard Zone X
GENERAL STRUCTURES	Effective LOMRs
	Area of Undetermined Flood Hazard Zone D
OTHER FEATURES	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall
MAP PANELS	Cross Sections with 1% Annual Chance Water Surface Elevation
	Coastal Transect
MAP PANELS	Base Flood Elevation Line (BFE)
	Limit of Study
MAP PANELS	Jurisdiction Boundary
	Coastal Transect Baseline
MAP PANELS	Profile Baseline
	Hydrographic Feature
MAP PANELS	Digital Data Available
	No Digital Data Available
MAP PANELS	Unmapped
	The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/6/2019 at 12:44:46 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

HYDROLOGIC & HYDRAULIC CALULATIONS

1752.00 Timberridge West
(Area Runoff Coefficient Summary)

EXISTING CONDITIONS

		STREETS / IMPERVIOUS			OVERLAND / NONIMPERVIOUS			WEIGHTED	
BASIN	TOTAL AREA	AREA	C₅	C₁₀₀	AREA	C₅	C₁₀₀	C₅	C₁₀₀
	<i>(Acres)</i>	<i>(Acres)</i>			<i>(Acres)</i>				
OS-1	11.2	0.0	0.90	0.96	11.2	0.08	0.35	0.08	0.35
EX-1	16.4	0.0	0.90	0.96	16.4	0.08	0.35	0.08	0.35
EX-2	12.9	0.0	0.90	0.96	12.9	0.08	0.35	0.08	0.35
EX-3	6.7	0.0	0.90	0.96	6.7	0.08	0.35	0.08	0.35

1752.00 Timberridge West
(Area Runoff Coefficient Summary)

DEVELOPED CONDITIONS

		<i>STREETS / IMPERVIOUS</i>			<i>OVERLAND / NONIMPERVIOUS</i>			<i>WEIGHTED</i>	
BASIN	TOTAL AREA	AREA	C₅	C₁₀₀	AREA	C₅	C₁₀₀	C₅	C₁₀₀
	<i>(Acres)</i>	<i>(Acres)</i>			<i>(Acres)</i>				
PR-3a	2.9	0.2	0.90	0.96	2.7	0.08	0.35	0.14	0.39
PR-3b	3.8	0.2	0.90	0.96	3.6	0.08	0.35	0.12	0.38

Calculated by: DWD
Date: 9/24/2018
Checked by: _____

**1752.00 Timberridge West
(Area Drainage Summary)**

EXISTING CONDITIONS

BASIN	AREA TOTAL (Acres)	WEIGHTED		OVERLAND				STREET / CHANNEL FLOW				T_t	INTENSITY		TOTAL FLOWS	
		C_5	C_{100}	C_5	Length	Height	T_C	Length	Slope	Velocity	T_t	TOTAL	I_5	I_{100}	Q_5	Q_{100}
		<small>* For Calcs See Runoff Summary</small>			(ft)	(ft)	(min)	(ft)	(%)	(fps)	(min)	(min)	(in/hr)	(in/hr)	(c.f.s.)	(c.f.s.)
OS-1	11.2	0.08	0.35	0.08	300	10.0	22.2	1300	3.0%	1.2	18.1	40.3	2.10	3.38	1.9	13.3
EX-1	16.4	0.08	0.35	0.08	300	12.0	20.9	1400	4.0%	1.5	15.6	36.5	2.23	3.60	2.9	20.7
EX-2	12.9	0.08	0.35	0.08	300	12.0	20.9	400	4.0%	1.4	4.8	25.7	2.69	4.43	2.8	20.0
EX-3	6.7	0.08	0.35	0.08	300	14.0	19.9	800	1.0%	0.7	19.0	38.9	2.14	3.45	1.1	8.1

**1752.00 Timberridge West
(Area Drainage Summary)**

DEVELOPED CONDITIONS

BASIN	AREA TOTAL (Acres)	WEIGHTED		OVERLAND				STREET / CHANNEL FLOW				T_t	INTENSITY		TOTAL FLOWS	
		C ₅	C ₁₀₀	C ₅	Length	Height	T _c	Length	Slope	Velocity	T _t	TOTAL	I ₅	I ₁₀₀	Q ₅	Q ₁₀₀
		<small>* For Calcs See Runoff Summary</small>			(ft)	(ft)	(min)	(ft)	(%)	(fps)	(min)	(min)	(in/hr)	(in/hr)	(c.f.s.)	(c.f.s.)
PR-3a	2.9	0.14	0.39	0.08	300	12.0	20.9	360	2.0%	1.0	6.0	26.9	2.6	4.3	1.0	4.9
PR-3b	3.8	0.12	0.38	0.08	300	12.0	20.9	860	2.0%	1.0	14.3	35.2	2.3	3.7	1.1	5.3

Calculated by: DWD
Date: 9/24/2018
Checked by: _____

**1752.00 Timberridge West
(Design Point Summary)**

EXISTING CONDITIONS									
Design Point(s)	Contributing Basins	Area (Acres)	Equivalent CA_5	Equivalent CA_{100}	Maximum T_C	Intensity		Flow	
						I_5	I_{100}	Q_5	Q_{100}
1	OS-1, EX-1	27.6	2.21	9.66	40.3	2.1	3.4	4.6	32.7
2	EX-2	12.9	1.03	4.52	25.7	2.7	4.4	2.8	20.0
3	EX-3	6.7	0.54	2.35	38.9	2.1	3.5	1.1	8.1

**1752.00 Timberridge West
(Design Point Summary)**

DEVELOPED CONDITIONS									
Design Point(s)	Contributing Basins	Area (Acres)	Equivalent CA_5	Equivalent CA_{100}	Maximum T_C	Intensity		Flow	
						I_5	I_{100}	Q_5	Q_{100}
3a	PR-3a	2.9	0.40	1.14	26.9	2.6	4.3	1.0	4.9
3b	PR-3a, PR-3b	6.7	0.86	2.59	35.2	2.3	3.7	2.0	9.5

Calculated by: DWD
Date: 9/24/2018
Checked by: _____

**1752.00 Timberridge West
(Pipe Routing Summary)**

DEVELOPED CONDITIONS

<i>Pipe Run(s)</i>	<i>Contributing Design Points</i>	<i>Area (Acres)</i>	<i>Equivalent CA₅</i>	<i>Equivalent CA₁₀₀</i>	<i>Maximum T_c</i>	<i>Intensity</i>		<i>Flow</i>	
						<i>I₅</i>	<i>I₁₀₀</i>	<i>Q₅</i>	<i>Q₁₀₀</i>
1	3a	2.9	0.40	1.14	26.9	2.6	4.3	1.0	4.9

Calculated by: DWD

Date: 9/24/2018

Checked by: _____

MANNING'S EQUATION FOR PIPE FLOW

Project: 1752.00 Timberridge West Location: Pipe Run 1 (Entrance Pipe Design Point 3a)

By: DWD

Date: 9/24/2018

Chk. By:

Date:

mdo version 12.8.00

Clear Data
Entry Cells

INPUT

D= 18 inches
d= 14.4 inches
n= 0.013 manning's coeff
θ= 106.3 degrees
S= 0.005 slope in/in

Mannings Formula

$$Q = (1.486/n) A R_h^{2/3} S^{1/2}$$

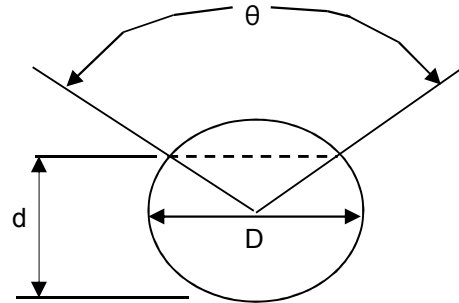
$$R = A/P$$

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient



$$V = (1.49/n) R_h^{2/3} S^{1/2}$$

$$Q = V \times A$$

			Solution to Mannings Equation		Manning's n-values	
Area, ft ²	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs		
1.52	3.32	0.46	4.79	7.26	PVC	0.01
					PE (<9"dia)	0.015
					PE (>12"dia)	0.02
					PE(9-12"dia)	0.017
					CMP	0.025
					ADS N12	0.012
					HCMP	0.023
					Conc	0.013

Created by: Mike O'Shea

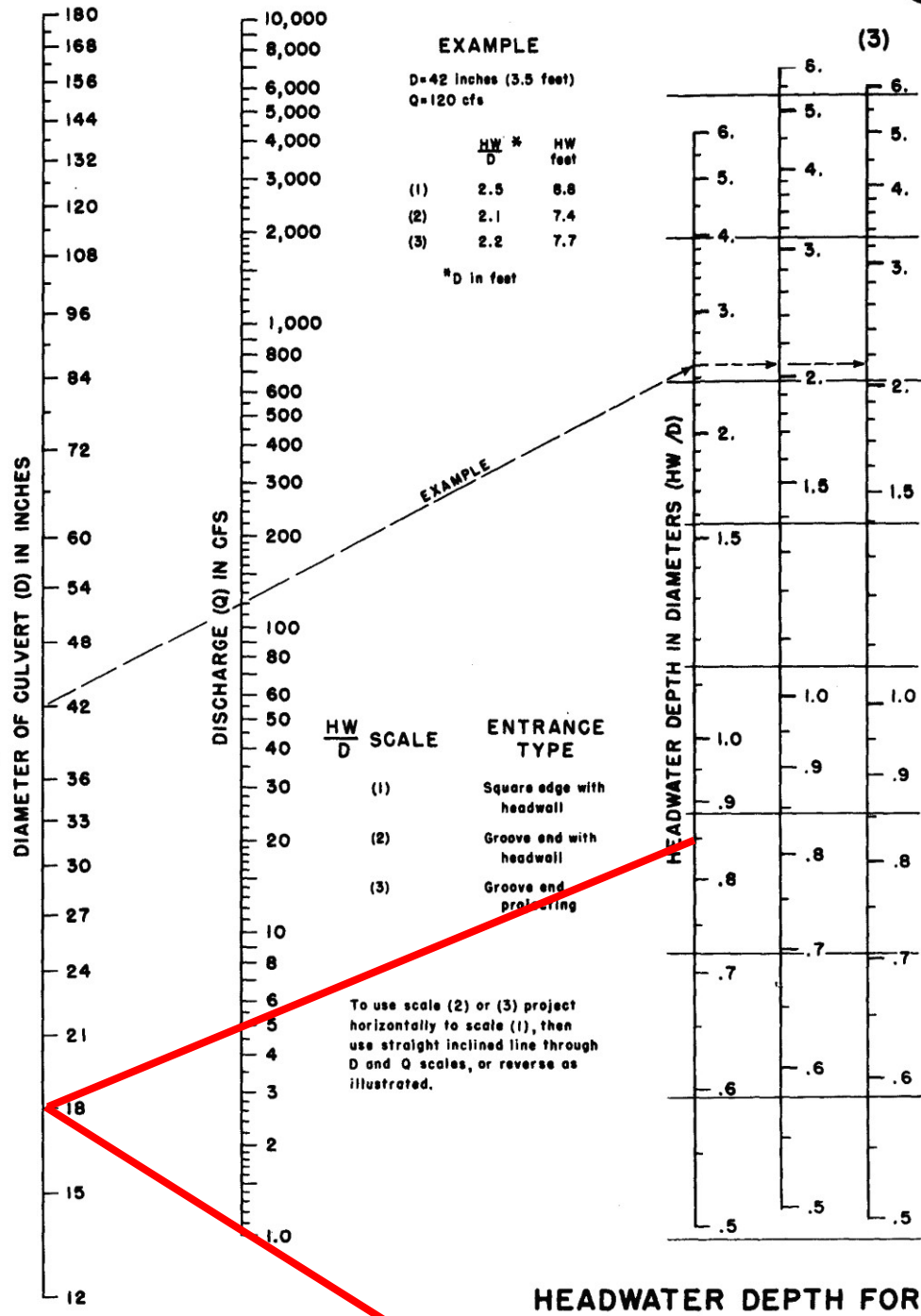
Single 18" Pipe Culvert under Entrance (Design Point 3a)

Q5= 1.0 cfs, Q100= 4.9 cfs

5yr HW/D < 0.5

100yr HW/D = 0.85

CHART 1B

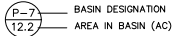


**HEADWATER DEPTH FOR
CONCRETE PIPE CULVERTS
WITH INLET CONTROL**

DRAINAGE PLANS

TIMBER RIDGE WEST
COLORADO SPRINGS, CO
EXISTING DRAINAGE MAP
 APRIL 2019

LEGEND



DESIGN POINT



BASIN BOUNDARY

EXISTING MINOR C

EXISTING MAJOR CONTOUR

EXISTING FLOW DIRECTION

EXISTING FENCE

EXISTING EASEMENT

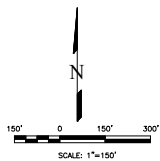
EXISTING CURB & GUTTER

BASIN SUMMARY

BASIN	ACRES	Q5 CFS	Q100 CFS
EX-1	16.4	2.9	20.7
EX-2	12.9	2.8	20.0
EX-3	6.7	1.1	8.1
OS-1	11.2	1.9	13.3

DESIGN POINT SUMMARY

DESIGN POINT	BASINS	ACRES	Q5 CFS	Q100 CFS
1	EX-1, OS-1	27.6	4.6	32.7
2	EX-2	12.9	2.8	20.0
3	EX-3	6.7	1.1	8.1



Drainage Boundaries not covered by displayed topography are derived from the Drainage Maps in the approved MDDP for The Retreat At TimberRidge

Note: See Sheet 3 for Additional
Contouring Sourced from CSU
2011 Contour Imagery

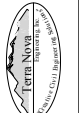
BISSELL MARK - TR A RANCH 51 FILING 1

BISSELL MARK L - THAT PART IN SEC
28-12-65 DESC AS PART OF N2NW4 LY E OF
W LN OF CIG CO RW, EX PART PLATTED TO
BISSELL FIL NO 1 & NO 3, NW4NE4, EX PART
CONV BY BK 2678-432, EX THAT PT
PLATTED TO RANCH 51 FILING NO 1

[illegible][illegible]

PREPARED FOR:

ATTN:



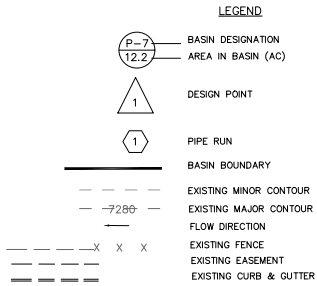
211 S. 2ND STREET
COLORADO SPRINGS, CO
87320 719-635-6422
719-635-6426
www.freshco.com

TIMBER RIDGE WEST

EXISTING DRAINAGE MAP

SIGNED BY LD
DRAWN BY JGF
CHECKED BY LD
SCALE AS NOTED
SCALE N/A
FIG. NO. 1752.00
DATE ISSUED 4/3/19
SHEET NO. 1 OF 3

TIMBER RIDGE WEST
COLORADO SPRINGS, CO
PROPOSED DRAINAGE MAP
APRIL 2019



BASIN SUMMARY

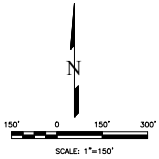
BASIN	ACRES	Q5 CFS	Q100 CFS
EX-1	16.4	2.9	20.7
EX-2	12.9	2.8	20.0
PR-3a	2.9	1.0	4.9
PR-3b	3.8	1.1	5.3
OS-1	11.2	1.9	13.3

DESIGN POINT SUMMARY

DESIGN POINT	BASINS	ACRES	Q5 CFS	Q100 CFS
1	EX-1, OS-1	27.6	4.6	32.7
2	EX-2	16.4	2.8	20.0
3a	PR-3a	2.9	1.0	4.9
3b	PR-3A, PR-3b	6.7	2.0	9.5

PIPE RUN SUMMARY

PIPE RUN	DESIGN PT	Q5 CFS	Q100 CFS
1	3a	1.0	4.9

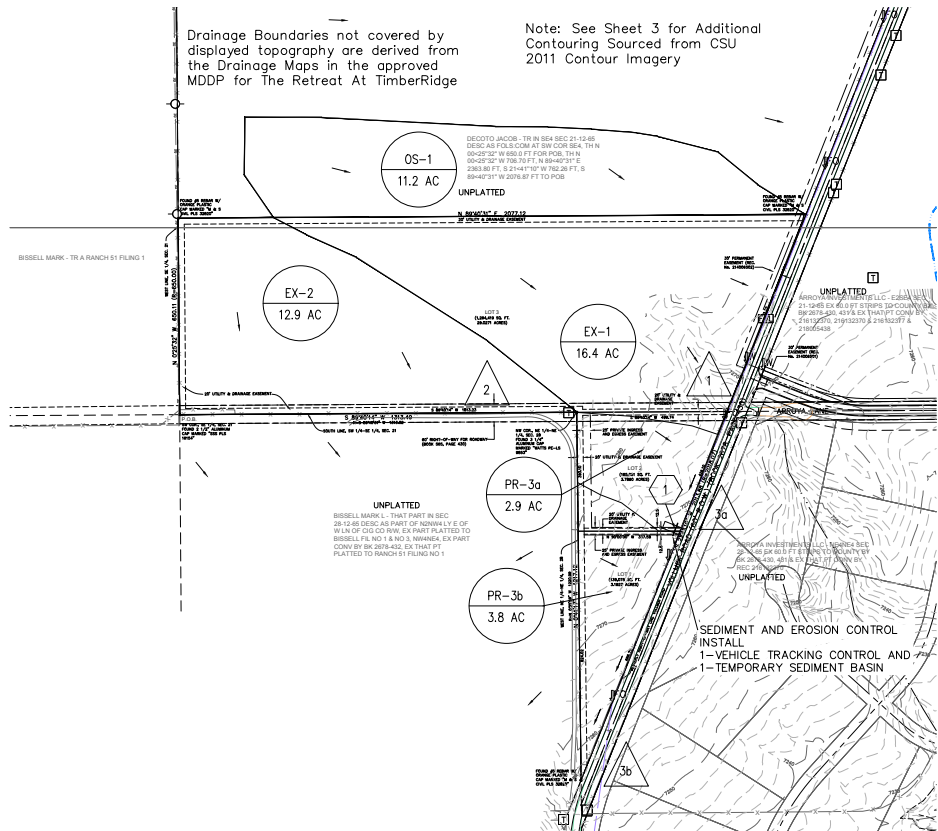


EROSION CONTROL LEGEND



Drainage Boundaries not covered by
displayed topography are derived from
the Drainage Maps in the approved
MDDP for The Retreat At TimberRidge

Note: See Sheet 3 for Additional
Contouring Sourced from CSU
2011 Contour Imagery



DESIGNED BY LD	DATE	NO. REVISIONS	DESCRIPTION
DRAWN BY JC	DATE	NO. REVISIONS	DESCRIPTION
CHECKED BY LD	DATE	NO. REVISIONS	DESCRIPTION
SCALE AS NOTED	DATE	NO. REVISIONS	DESCRIPTION
N/A	DATE	NO. REVISIONS	DESCRIPTION
NO. 1752.00	DATE	NO. REVISIONS	DESCRIPTION
DATE ISSUED 4/25/19	DATE	NO. REVISIONS	DESCRIPTION
SHEET NO. 2 OF 4	DATE	NO. REVISIONS	DESCRIPTION

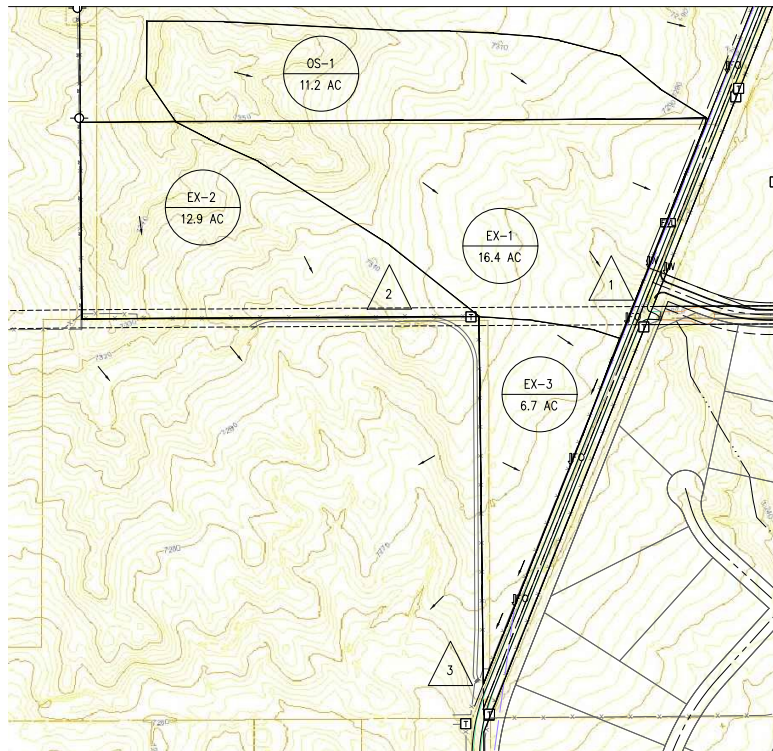
791 S. 2400 STREET
SUITE 100
DENVER, CO 80202
PHONE 773-442-4200
FAX 773-442-4208
www.turbid.com

PREPARED FOR: XXXX
ATTN: XXXX
FOR: XXXX
BY: XXXX
WRITTEN AUTHORIZATION: XXXX


DESIGNED BY LD
 DATE | NO. REVISIONS | DESCRIPTION || DRAWN BY JC | DATE | NO. REVISIONS | DESCRIPTION |
CHECKED BY LD	DATE	NO. REVISIONS	DESCRIPTION
SCALE AS NOTED	DATE	NO. REVISIONS	DESCRIPTION
N/A	DATE	NO. REVISIONS	DESCRIPTION
NO. 1752.00	DATE	NO. REVISIONS	DESCRIPTION
DATE ISSUED 4/25/19	DATE	NO. REVISIONS	DESCRIPTION
SHEET NO. 2 OF 4	DATE	NO. REVISIONS	DESCRIPTION

PREPARED FOR: XXXX
ATTN: XXXX
FOR: XXXX
BY: XXXX
WRITTEN AUTHORIZATION: XXXX

TIMBER RIDGE WEST
COLORADO SPRINGS, CO
EXISTING DRAINAGE MAP
 APRIL 2019



NOTE: ADDITIONAL CONTOURING SOURCED FROM CSU 2011 IMAGERY

DESIGNED BY LD	DATE ISSUED 4/2/79	PROJECTS	DATE
DRAWN BY JGF		DESCRIPTION	
CHECKED BY LD			
IN-SCALE AS NOTED			
V-SNO. N/A			
SHEET NO. 1752.00			
<p>  </p> <p> 701 W. 2ND STREET OMAHA, IOWA 55401 PHONE 781-26-4488 WWW.TETRI.COM </p>			
<p> PREPARED FOR: XX ATTN: XX PROJECT: XX DRAWN: XX CHECKED: XX DATE: XX </p>			
<p> TITLE: 300' TIE, 1/2" AS SHOWN 1/2" = 10' (SEE SHEET 1751.00) 1/2" = 10' (SEE SHEET 1752.00) 1/2" = 10' (SEE SHEET 1753.00) 1/2" = 10' (SEE SHEET 1754.00) 1/2" = 10' (SEE SHEET 1755.00) </p>			

FINAL PLAT

Timber Ridge West

A SUBDIVISION OF PORTIONS OF THE SOUTHEAST QUARTER OF SECTION 21,
AND OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 28,
TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE 6TH P.M.,
EL PASO COUNTY, COLORADO

KNOW ALL MEN BY THESE PRESENTS:

That Jacob Decoto, being the owner of the following described tract of land to wit:

A parcel of land located in a portion of the Southeast One-Quarter (SE1/4) of Section 21 and a portion of the Northeast One-Quarter (NE1/4) of Section 28, Township 12 South, Range 65 West of the 6th P.M., El Paso County, Colorado, being more particularly described as follows:

Basis of bearings: The west line of the Southeast One-Quarter (SE1/4) of Section 21, Township 12 South, Range 65 West is assumed to bear N00°25'32"W, a distance of 2636.67 feet;

Commencing at the southeast corner of said Southeast One-Quarter (SE1/4) said point also being the point of beginning of the parcel of land herein described;
Thence N00°25'32"W along the west line of said Southeast One-Quarter (SE1/4), a distance of 650.00 feet;
Thence N89°40'31"E, a distance of 2076.87 feet to a point on the westerly right-of-way line of Volmer Road as described in the document recorded in Book 2078 at Page 430 of the records of the El Paso County Clerk and Recorder;

Thence S27°41'11"W along said westerly right-of-way line, a distance of 2018.07 feet to a point on the east line of the Northeast One-Quarter of the Northeast One-Quarter (NW1/4 NE4) of said Section 28;

Thence N07°35'59"W along said east line, a distance of 1220.89 feet to the southeast corner of the Southeast One-Quarter of the Southeast One-Quarter (SW1/4 SE1/4) of said Section 21;

Thence S89°40'31"W along the south line of said Southwest One-Quarter of the Southeast One-Quarter (SW1/4 SE1/4), a distance of 1313.52 feet to the point of beginning.

Containing a calculated area of 1,688.54 square feet (38.0086 acres), more or less.

OWNERS CERTIFICATION:

The undersigned, being all the owners, mortgagees, beneficiaries of deeds of trust and holders of other interests in the land described herein, have sold out, subdivided, and plotted said lands into lots and easements as shown herein under the name and subdivision of **TIMBER RIDGE WEST**. The utility easements shown herein are hereby dedicated for public utility and communication systems and other purposes as shown herein. The entire responsibility for providing the services for which the easements are established are hereby granted the perpetual right of ingress and egress from and to adjacent properties for installation, maintenance, and replacement of utility lines and related facilities.

Jacob Decoto _____ Date _____
STATE OF COLORADO }
COUNTY OF EL PASO } SS
Acknowledged before me this _____ day of _____, 2019 by Jacob Decoto
My commission expires _____
Witness my hand and official seal _____
Notary Public

BOARD OF COUNTY COMMISSIONERS CERTIFICATE:

This plat for **TIMBER RIDGE WEST** was approved for filing by the El Paso County, Colorado Board of County Commissioners on the _____ day of _____, 200____, subject to any rules specified herein and any conditions included in the resolution of approval. The dedications of land to the public (Public Utility Easements) are accepted, but public improvements thereon will not become the maintenance responsibility of El Paso County until preliminary acceptance of the public improvements in accordance with the requirements of the Land Development Code and Engineering Criteria Manual, and the Subdivision Improvements Agreement.

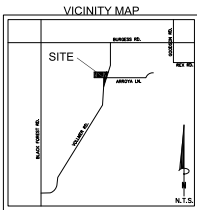
Chair, Board of County Commissioners _____ Date _____

COUNTY APPROVAL:

Approval is granted for this plat of **TIMBER RIDGE WEST** this _____ day of _____, 2019, A.D.

El Paso County Director of Planning and Community Development _____

El Paso County Assessor _____



Timber Ridge West

A SUBDIVISION OF PORTIONS OF THE SOUTHEAST QUARTER OF SECTION 21,
AND OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 28,
TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE 6TH P.M.,
EL PASO COUNTY, COLORADO

UNPLATTED

BASE OF BEARING
N 89°40'31" E 2077.12 (R=2076.87)
30' UTILITY & DRAINAGE EASEMENT

FOUND #5 REBAR
BY PRIVATE PLATIN
COP. MARKED "A" & S
ON PL. 338507

30' PERMANENT
EASEMENT (REC.
NO. 214008502)

UNPLATTED

LOT 3
(1,284.49 SQ. FT.
29.0271 ACRES)

30' PERMANENT
EASEMENT (REC.
NO. 214008501)

APPROX. LANE

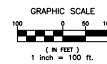
UNPLATTED

• - Denotes found monument, marked as noted.



Geologic Hazard Area - No Build Area.
These areas are shown in an approximate
manner to indicate where geologic hazards
may exist. These areas are shown to
make potential lot owners aware of this
situation. The location of these areas was
determined by others. The certification
hereon does not apply as to the accuracy
or completeness of this information.
Potential lot owners are encouraged to
contact a qualified geo-technical engineer to
determine the exact location of these
areas. See Note #25

UNPLATTED



DSD File No: MS 19-1



COMPASS SURVEYING & MAPPING, LLC
721 SOUTH 23RD STREET, SUITE B
COLORADO SPRINGS, CO 80904
719-354-4120
WWW.CSMILLC.COM

REVISIONS:	
1	2/27/19 County comments.
2	5/24/19 County comments.

PROJECT NO. 18222
OCTOBER 3, 2018
SHEET 2 OF 2

PRELIMINARY/FINAL DRAINAGE REPORT FOR TIMBER RIDGE WEST

PURPOSE

The purpose of this Preliminary/Final Drainage Report is to identify and analyze the proposed drainage patterns, determine proposed runoff quantities, size drainage structures for conveyance of developed runoff, and present solutions to drainage impacts on-site and off-site resulting from this development.

GENERAL DESCRIPTION

This Preliminary/Final Drainage Report is an analysis of 36.0 acres of undeveloped land located in northern El Paso County. The property is in the upper portion of the Sand Creek drainage basin on the south edge of Black Forest and consists mainly of native grasses with some scattered pine trees. The site is located in the south west quarter of Section 22, Township 12 South, Range 65 West of the 6th Principal Meridian currently within El Paso County, Colorado and is bounded to the north and west by open space (rural residential), to the east by Vollmer Road, and to the south by Wildflower Road.

The site is being subdivided into three properties - Lot 1 (3.2 ac), Lot 2 (3.8 ac) and Lot 3 (29.0 ac) of the Timber Ridge West development.

Soils for this project are delineated by the map in the appendix as Kettle gravelly loamy sand (41), 8 to 40 percent slopes and Pring Coarse sandy loam (71), 3 to 8 percent slopes. Soils in the study area are shown as mapped by S.C.S. in the "Soils Survey of El Paso County Area" and contains soils of Hydrologic Group B.

FLOODPLAIN STATEMENT

No portion of this site is within a designated F.E.M.A. floodplain, as determined by Flood Insurance Rate Map No. 08041C0535 G, dated December 7, 2018 (see the Appendices).

EXISTING DRAINAGE CONDITIONS

Basin OS-1 (A= 11.2 ac, Q5= 1.0 cfs, Q100= 13.3 cfs) consists of currently undeveloped land covered with native grasses and scattered pine trees. The area is zoned RR-5 (rural residential with 5 ac or larger lot size) and runoff from this offsite basin flows southeast directly onto Basin EX-1.

Basin EX-1 (A= 16.4 ac, Q5= 2.9 cfs, Q100=20.7 cfs) consists of currently undeveloped land (RR-5) covered with native grasses and scattered pine trees.

Basins OS-1 and EX-1 contribute to Design Point 1 and produce combined flow rates of Q5= 4.6 cfs and Q100= 32.7 cfs which are conveyed under Vollmer Road by an existing 60" CMP.

Basin EX-2 (A= 12.9 ac, Q5= 2.8 cfs, Q100= 20.0 cfs) consists of currently undeveloped land (RR-5) covered with native grasses and scattered pine trees. Runoff from this basin flows offsite to the south at Design Point 2 through an unplatted parcel of property. These existing conditions flow values represent the allowable release flows for developed conditions at this location.

Basin EX-3 (A=6.7 ac, Q5= 1.1 cfs, Q100= 8.1 cfs) consists of currently undeveloped land (RR-5) covered with native grasses and scattered pine trees. Runoff from this basin flows southeast to a roadside ditch that runs south along Vollmer Road and releases at the southern corner of the property at Design Point 3.

PROPOSED DRAINAGE CONDITIONS

The site is being subdivided into three lots - Lot 1 (3.2 ac), Lot 2 (3.8 ac) and Lot 3 (29.0 ac) of Timber Ridge West development (see Final Plat in the Appendices).

Lot 3 is not being developed as part of this project. As a consequence, there are no changes for Basins OS-1, EX-1, or EX-2 under the developed drainage conditions. There is an existing home on this lot. Upon future development of Lot 3, further drainage analysis will be required for these basins. When Lot 3 is developed, Lot 1 and Lot 2 will be accessed from the north via the proposed roadway to be constructed as part of that future development. Until that time, temporary access via Vollmer Road has been granted at the shared property line approximately 425 ft southwest of the intersection of Vollmer Road and Arroya Lane. An entrance pipe is required at this location; therefore, Basin EX-3 is divided into two basins (PR-3a and PR-3b) to analyze the proposed development conditions.

Lot 1 and Lot 2 are designated as Rural Residential (avg. lot size 3.5 ac) and are to be developed following the criteria as given in the approved *MDDP for The Retreat at TimberRidge*:

The rural lots will have paved streets and roadside ditches... Development of rural lots proposed within the site will be limited to roadways and building pads, conserving the nature feature areas. Individual home sites on these lots are to be

left generally in their natural condition with minimal disturbance to existing conditions per individual lot construction.

The impervious area for the developed condition was estimated at a total of 0.2 acres per lot, comprised of a house with attached garage, an outbuilding, and a driveway. The balance of the area is considered to remain in pre-development condition.

Basin PR-3a ($A=2.9$ ac, $Q_5=1.0$ cfs, $Q_{100}=4.9$ cfs) is comprised mostly of the area designated as Lot 2 and it is assumed that all of the impervious area for Lot 2 will be located in this basin. The runoff from Basin PR-3a is conveyed under the temporary access from Vollmer Road via an entrance pipe at Design Point 3a. The entrance pipe will be an 18" RCP (or equivalent) approximately 44 ft long at a minimum slope of 0.5% ($Q_{max}=7.3$ cfs at 80% full).

Basin PR-3b ($A=3.8$ ac, $Q_5=1.1$ cfs, $Q_{100}=5.3$ cfs) is comprised of all the area designated as Lot 1 and a portion of Lot 2 and it is assumed that all of the impervious area for Lot 1 will be located in this basin.

Basins PR-3a and PR-3b contribute to Design Point 3b and produce combined flow rates of $Q_5=2.0$ cfs and $Q_{100}=9.5$ cfs. Per the approved *MDDP for The Retreat at TimberRidge*, sediment control is to be provided on each lot and the minimal developed conditions runoff from these lots will be allowed to continue southward in the roadside ditch adjacent to Vollmer Road. For the temporary access, the erosion and sediment control shall consist of 1 Vehicle Tracking Control and 1 Temporary Sediment Basin.

FOUR STEP PROCESS

In an effort to protect receiving water and as part of the "four-step process to minimize adverse impacts of urbanization" this site was analyzed in the following manner:

1. Reduce Runoff – Runoff at the site either sheet flows across natural grass slopes or is collected in natural grass swales before entering the existing roadside ditch, thus allowing for reduction of runoff to occur.
2. Treat and Slowly Release WQCV – Per the ECM Section I.7.1.B, WQCV is not required for these lots since they are "low density (rural) housing (2.5 acres or larger lots)". However, sediment control is to be provided on each lot.
3. Stabilize Stream Channels – There are no proposed channels associated with this development and all existing swales and natural drainage ways are stable and to be left undisturbed, or revegetated to existing conditions.
4. Source Controls – Source controls will need to be implemented during the construction of the residential structure. Builders are required to get an Erosion and Stormwater Quality Control Permit (ESQCP) through El Paso County which identifies the necessary source controls.

HYDROLOGIC CALCULATIONS

Hydrologic calculations were performed using the El Paso County Storm Drainage Design Criteria Manual - Volumes 1 & 2, latest editions. The Rational Method was used to estimate storm water runoff anticipated from design storms with 5-year and 100-year recurrence intervals. The pertinent data sheets are included with the appendices of this report.

HYDRAULIC CALCULATIONS

Hydraulic calculations were estimated using the Manning's Formula and the methods described in the El Paso County Storm Drainage Design Criteria Manual – Volumes 1 & 2, latest editions. The pertinent data sheets are included with the appendices of this report.

MAINTENANCE

The storm water systems for this project are private and therefore must be maintained by the owner. These should be cleaned and checked after any significant precipitation event and at least once every three months. Any proposed erosion control measures will be repaired and maintained by the property owner or owner's representative as required.

CONSTRUCTION COST OPINION

Private Non-Reimbursable

Item	Quantity	Unit Price	Cost
18" RCP	44 LF	\$45	\$1980.00
		Total	\$1980.00

DRAINAGE FEES

The site is in the Sand Creek Basin. The combined Drainage Fees (2019) for Lot 1 and Lot 2 are due prior to final plat recordation.

Fee Type	% Imp.	Parcel Area (acre)	Imp. Area (acre)	Fee per Imp Acre	Mod %	Fee Cost
Drainage	9.4	6.98	0.656	\$18,940	75	\$9320.18
Bridge	9.4	6.98	0.656	\$5,559	100	\$3647.37
				Total		\$12,967.55

SUMMARY

Development of this site will not adversely affect the downstream and surrounding developments. Proposed flows, as detailed in this report, will follow the drainage patterns outlined in this report and be safely routed downstream. This report and its findings are in general conformance with all previously approved reports which include this site.

PREPARED BY:
TERRA NOVA ENGINEERING, INC.

L Ducett, P.E.
President

BIBLIOGRAPHY

“MDDP for The Retreat at TimberRidge” (2/22/18) by Classic Consulting Engineers & Surveyors

“PDR for The Retreat at TimberRidge (South of Arroya Lane)” (2018) by Classic Consulting Engineers & Surveyors

El Paso County Drainage Criteria Manual-Volumes 1 & 2, latest edition

El Paso County Board Resolution No 15-042 (Adoption of Chapter 6 and Section 3.2.1 Chapter 13 of the City of Colorado Springs Drainage Criteria Manual dated May 2014, Hydrology and Full Spectrum Detention)

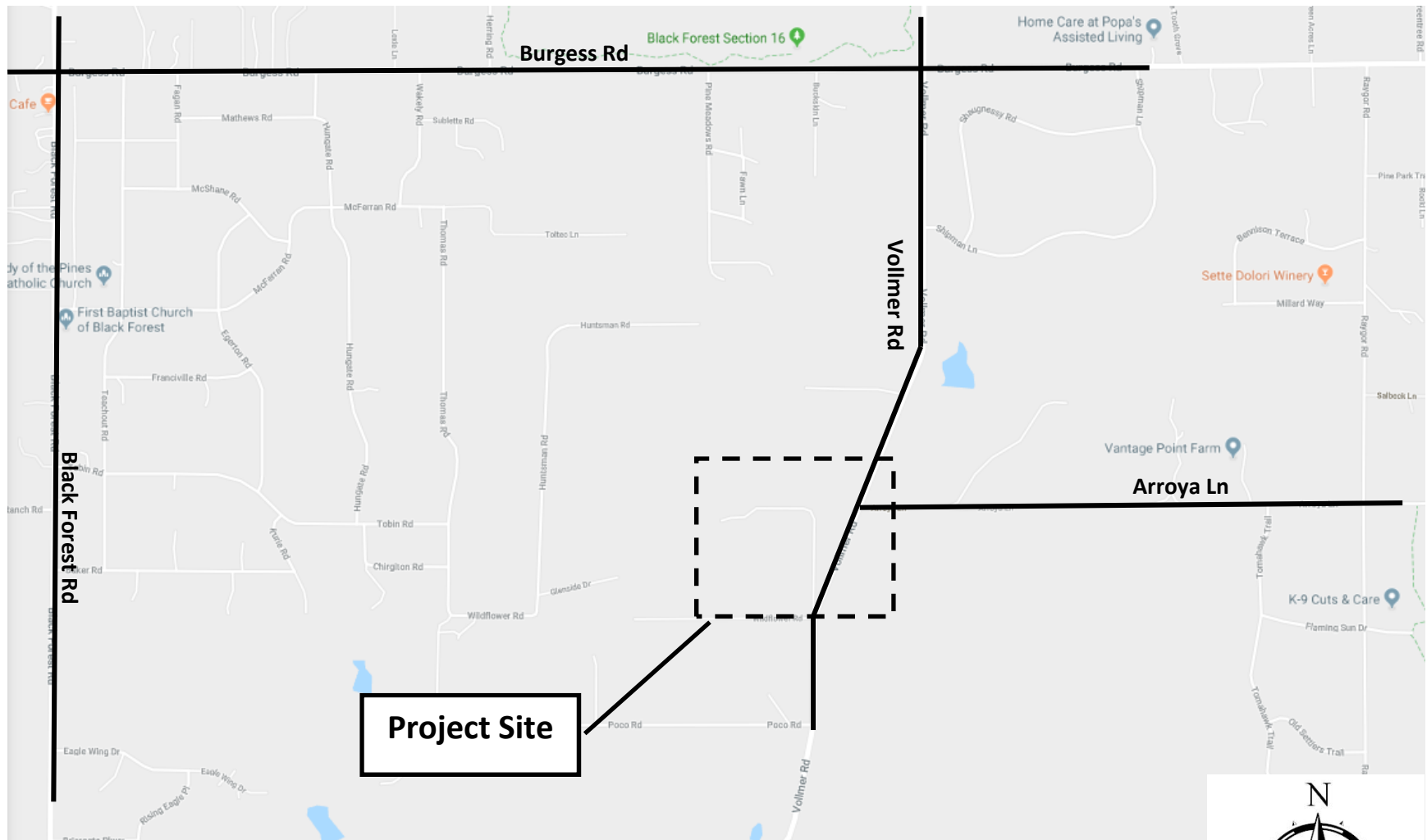
Engineering Criteria Manual (Revision 6), El Paso County

SCS Soils Map for El Paso County

Federal Emergency Management Agency (FEMA) flood maps

APPENDICES

VICINITY MAP



1752.00



Not to Scale

S.C.S. SOILS MAP



Not to Scale

FEMA FIRM MAP

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/6/2019 at 12:44:46 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

38°59'10.30"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000

38°58'42.33"N

104°39'42.79"W

HYDROLOGIC & HYDRAULIC CALULATIONS

***1752.00 Timberridge West
(Area Runoff Coefficient Summary)***

EXISTING CONDITIONS

		<i>STREETS / IMPERVIOUS</i>			<i>OVERLAND / NONIMPERVIOUS</i>			<i>WEIGHTED</i>	
BASIN	TOTAL AREA	AREA	C₅	C₁₀₀	AREA	C₅	C₁₀₀	C₅	C₁₀₀
	<i>(Acres)</i>	<i>(Acres)</i>			<i>(Acres)</i>				
OS-1	11.2	0.0	0.90	0.96	11.2	0.08	0.35	0.08	0.35
EX-1	16.4	0.0	0.90	0.96	16.4	0.08	0.35	0.08	0.35
EX-2	12.9	0.0	0.90	0.96	12.9	0.08	0.35	0.08	0.35
EX-3	6.7	0.0	0.90	0.96	6.7	0.08	0.35	0.08	0.35

***1752.00 Timberridge West
(Area Runoff Coefficient Summary)***

DEVELOPED CONDITIONS

		<i>STREETS / IMPERVIOUS</i>			<i>OVERLAND / NONIMPERVIOUS</i>			<i>WEIGHTED</i>	
BASIN	TOTAL AREA	AREA	C₅	C₁₀₀	AREA	C₅	C₁₀₀	C₅	C₁₀₀
	<i>(Acres)</i>	<i>(Acres)</i>			<i>(Acres)</i>				
PR-3a	2.9	0.2	0.90	0.96	2.7	0.08	0.35	0.14	0.39
PR-3b	3.8	0.2	0.90	0.96	3.6	0.08	0.35	0.12	0.38

Calculated by: DWD
Date: 9/24/2018
Checked by: _____

***1752.00 Timberridge West
(Area Drainage Summary)***

EXISTING CONDITIONS

		<i>WEIGHTED</i>		<i>OVERLAND</i>				<i>STREET / CHANNEL FLOW</i>				<i>T_t</i>	<i>INTENSITY</i>		<i>TOTAL FLOWS</i>	
BASIN	AREA TOTAL (Acres)	C₅	C₁₀₀	C₅	Length	Height	T_C	Length	Slope	Velocity	T_t	TOTAL	I₅	I₁₀₀	Q₅	Q₁₀₀
		<i>* For Calcs See Runoff Summary</i>			<i>(ft)</i>	<i>(ft)</i>	<i>(min)</i>	<i>(ft)</i>	<i>(%)</i>	<i>(fps)</i>	<i>(min)</i>	<i>(min)</i>	<i>(in/hr)</i>	<i>(in/hr)</i>	<i>(c.f.s.)</i>	<i>(c.f.s.)</i>
OS-1	11.2	0.08	0.35	0.08	300	10.0	22.2	1300	3.0%	1.2	18.1	40.3	2.10	3.38	1.9	13.3
EX-1	16.4	0.08	0.35	0.08	300	12.0	20.9	1400	4.0%	1.5	15.6	36.5	2.23	3.60	2.9	20.7
EX-2	12.9	0.08	0.35	0.08	300	12.0	20.9	400	4.0%	1.4	4.8	25.7	2.69	4.43	2.8	20.0
EX-3	6.7	0.08	0.35	0.08	300	14.0	19.9	800	1.0%	0.7	19.0	38.9	2.14	3.45	1.1	8.1

***1752.00 Timberridge West
(Area Drainage Summary)***

DEVELOPED CONDITIONS

		WEIGHTED		OVERLAND				STREET / CHANNEL FLOW				T _t	INTENSITY		TOTAL FLOWS	
BASIN	AREA TOTAL (Acres)	C ₅	C ₁₀₀	C ₅	Length (ft)	Height (ft)	T _C (min)	Length (ft)	Slope (%)	Velocity (fps)	T _t (min)	TOTAL (min)	I ₅ (in/hr)	I ₁₀₀ (in/hr)	Q ₅ (c.f.s.)	Q ₁₀₀ (c.f.s.)
		* For Calcs See Runoff Summary														
PR-3a	2.9	0.14	0.39	0.08	300	12.0	20.9	360	2.0%	1.0	6.0	26.9	2.6	4.3	1.0	4.9
PR-3b	3.8	0.12	0.38	0.08	300	12.0	20.9	860	2.0%	1.0	14.3	35.2	2.3	3.7	1.1	5.3

Calculated by: DWD

Date: 9/24/2018

Checked by: _____

1752.00 Timberridge West
(Design Point Summary)

EXISTING CONDITIONS									
Design Point(s)	Contributing Basins	Area (Acres)	Equivalent CA_5	Equivalent CA_{100}	Maximum T_C	Intensity		Flow	
						I_5	I_{100}	Q_5	Q_{100}
1	OS-1, EX-1	27.6	2.21	9.66	40.3	2.1	3.4	4.6	32.7
2	EX-2	12.9	1.03	4.52	25.7	2.7	4.4	2.8	20.0
3	EX-3	6.7	0.54	2.35	38.9	2.1	3.5	1.1	8.1

**1752.00 Timberridge West
(Design Point Summary)**

DEVELOPED CONDITIONS									
Design Point(s)	Contributing Basins	Area (Acres)	Equivalent CA_5	Equivalent CA_{100}	Maximum T_C	Intensity		Flow	
						I_5	I_{100}	Q_5	Q_{100}
3a	PR-3a	2.9	0.40	1.14	26.9	2.6	4.3	1.0	4.9
3b	PR-3a, PR-3b	6.7	0.86	2.59	35.2	2.3	3.7	2.0	9.5

Calculated by: DWD
 Date: 9/24/2018
 Checked by: _____

***1752.00 Timberridge West
(Pipe Routing Summary)***

DEVELOPED CONDITIONS

<i>Pipe Run(s)</i>	<i>Contributing Design Points</i>	<i>Area (Acres)</i>	<i>Equivalent CA₅</i>	<i>Equivalent CA₁₀₀</i>	<i>Maximum T_c</i>	<i>Intensity</i>		<i>Flow</i>	
						<i>I₅</i>	<i>I₁₀₀</i>	<i>Q₅</i>	<i>Q₁₀₀</i>
1	3a	2.9	0.40	1.14	26.9	2.6	4.3	1.0	4.9

Calculated by: DWD

Date: 9/24/2018

Checked by: _____

MANNING'S EQUATION FOR PIPE FLOW

Project: 1752.00 Timberridge West Location: Pipe Run 1 (Entrance Pipe Design Point 3a)

By: DWD

Date: 9/24/2018

Chk. By:

Date:

mdo version 12.8.00

Clear Data
Entry Cells

INPUT

D= 18 inches
d= 14.4 inches
n= 0.013 manning's coeff
θ= 106.3 degrees
S= 0.005 slope in/in

Mannings Formula

$$Q = (1.486/n) A R_h^{2/3} S^{1/2}$$

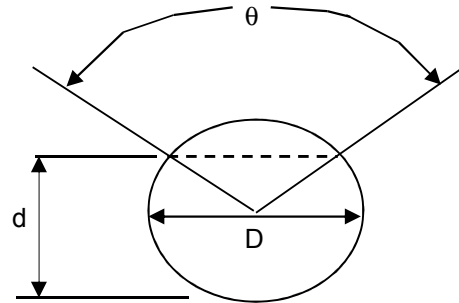
R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient



$$V = (1.49/n) R_h^{2/3} S^{1/2}$$

$$Q = V \times A$$

			Solution to Mannings Equation		Manning's n-values	
Area, ft ²	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs		
1.52	3.32	0.46	4.79	7.26	PVC	0.01
					PE (<9"dia)	0.015
					PE (>12"dia)	0.02
					PE(9-12"dia)	0.017
					CMP	0.025
					ADS N12	0.012
					HCMP	0.023
					Conc	0.013

Created by: Mike O'Shea

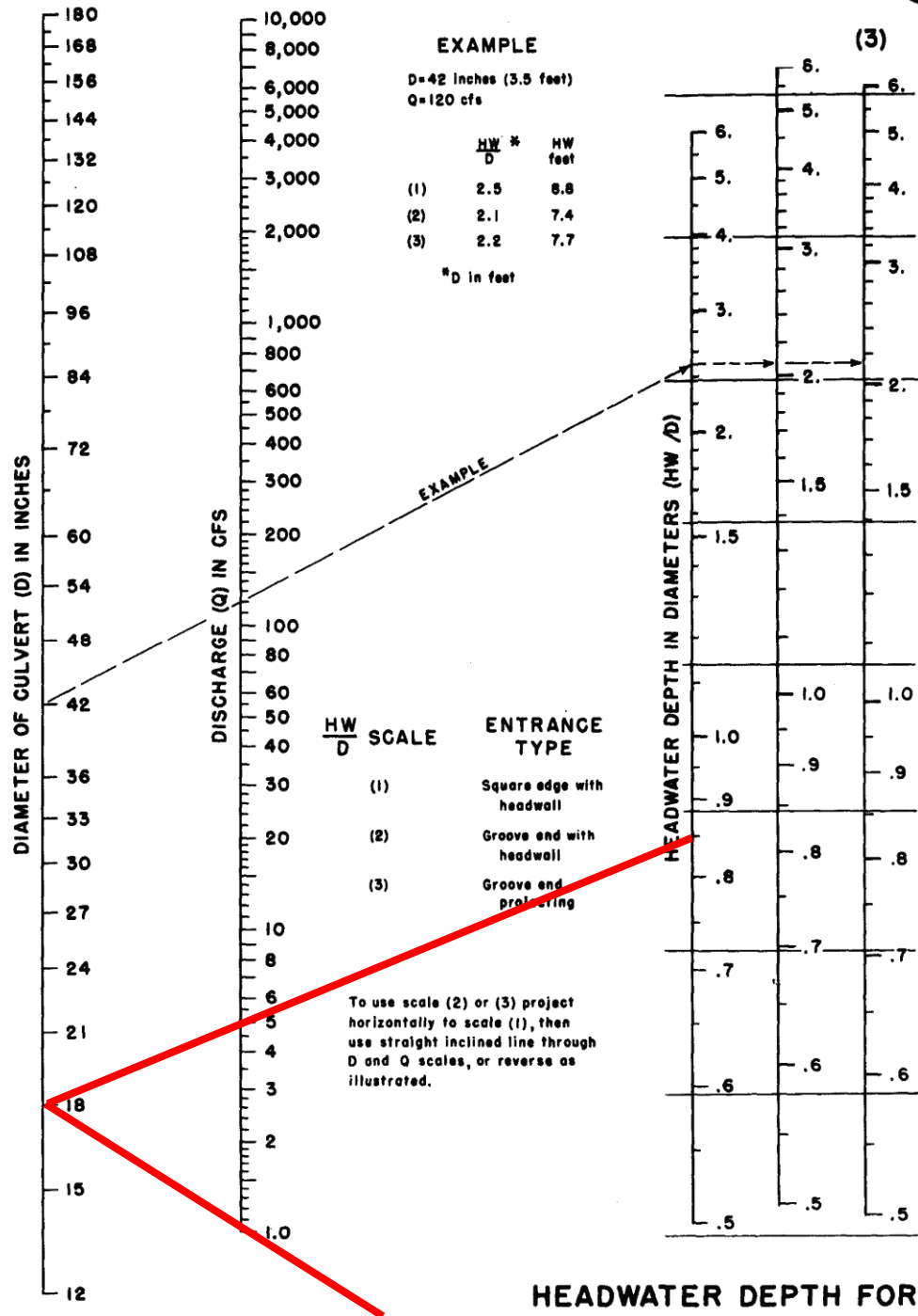
Single 18" Pipe Culvert under Entrance (Design Point 3a)

Q5= 1.0 cfs, Q100= 4.9 cfs

5yr HW/D < 0.5

100yr HW/D = 0.85

CHART 1B



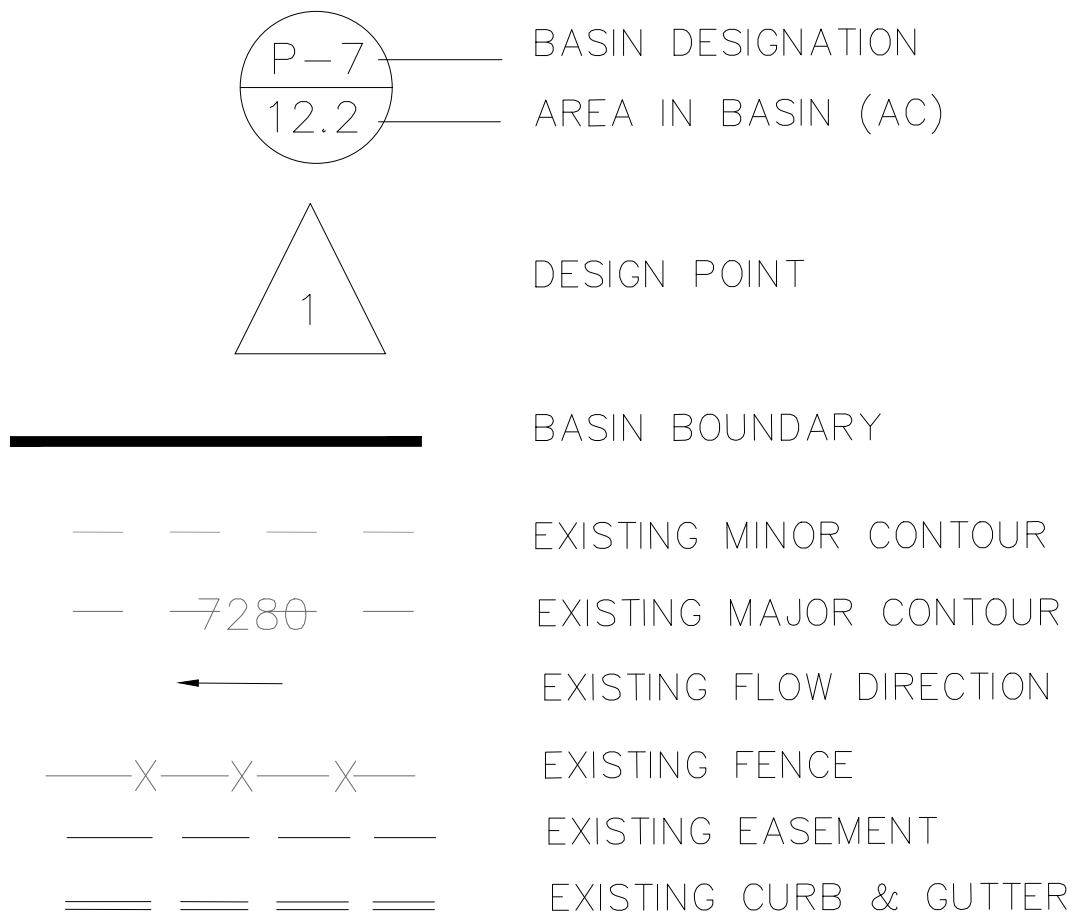
HEADWATER SCALES 2&3
REVISED MAY 1964

BUREAU OF PUBLIC ROADS JAN. 1963

DRAINAGE PLANS

TIMBER RIDGE WEST
COLORADO SPRINGS, CO
EXISTING DRAINAGE MAP
APRIL 2019

LEGEND

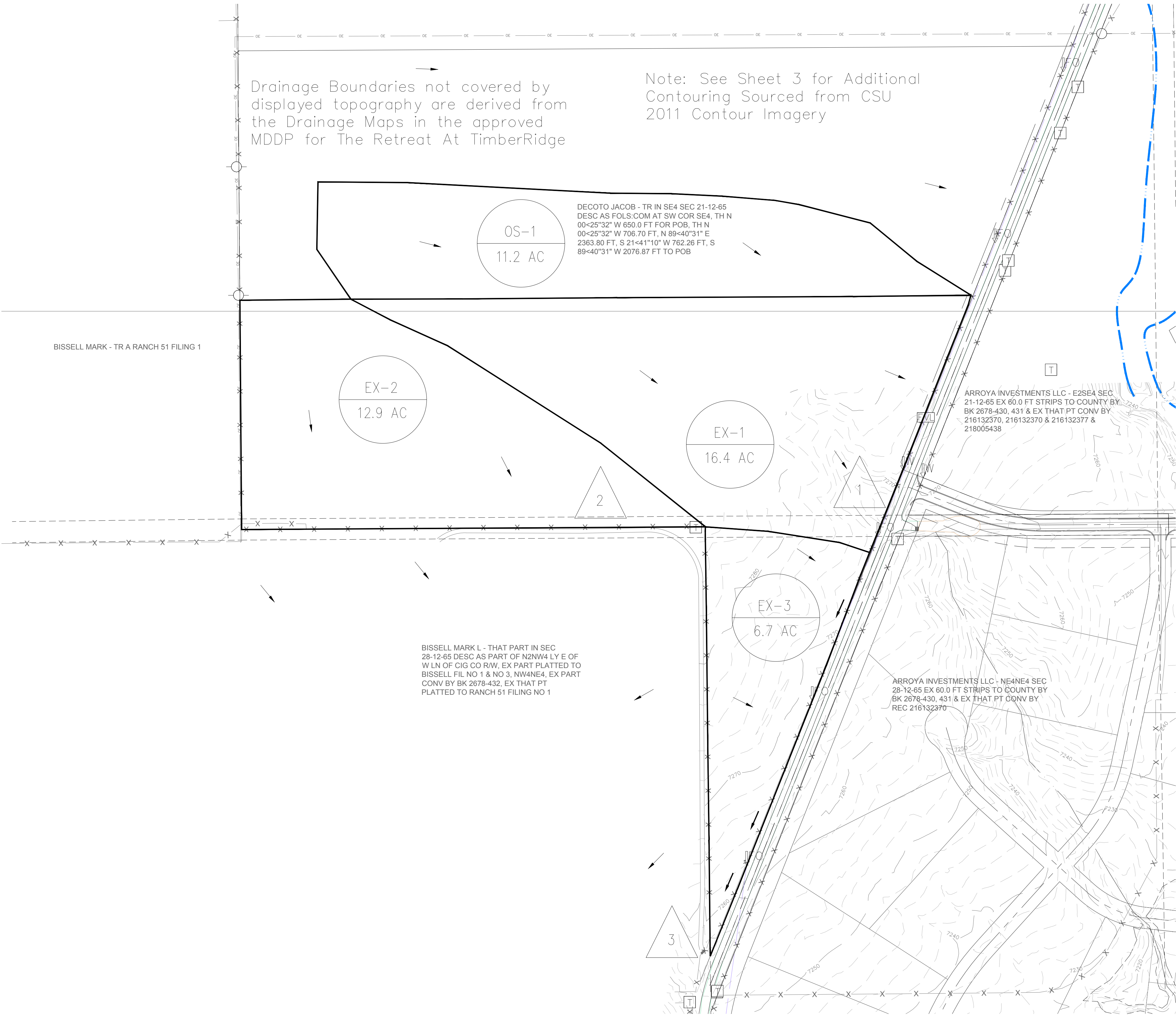
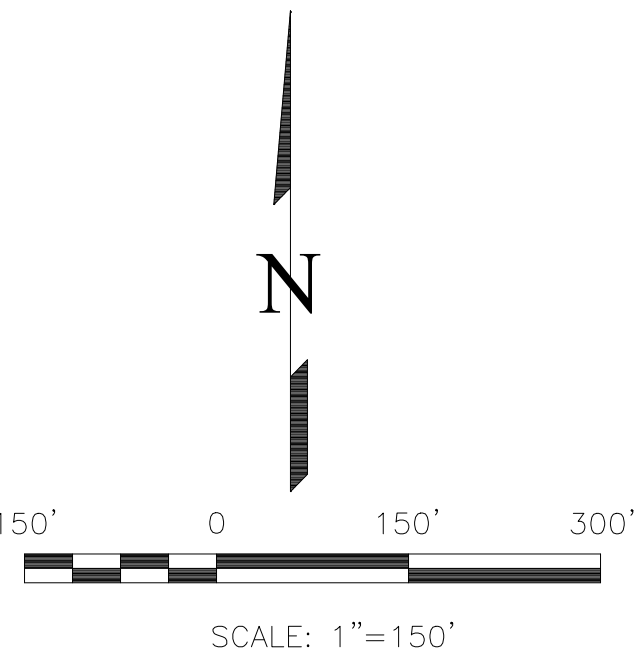


BASIN SUMMARY

BASIN	ACRES	Q5 CFS	Q100 CFS
EX-1	16.4	2.9	20.7
EX-2	12.9	2.8	20.0
EX-3	6.7	1.1	8.1
OS-1	11.2	1.9	13.3

DESIGN POINT SUMMARY

DESIGN POINT	BASINS	ACRES	Q5 CFS	Q100 CFS
1	EX-1, OS-1	27.6	4.6	32.7
2	EX-2	12.9	2.8	20.0
3	EX-3	6.7	1.1	8.1




REVISIONS

NO.	DESCRIPTION	DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, THIS DRAWING IS NOT TO BE USED FOR ANY PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR: XX
ATTN: XX
XX
XX
XX



721 S. 23RD STREET
COLORADO SPRINGS, CO 80904
OFFICE: 719-635-6422
FAX: 719-635-6426
www.terra-nova.com

TIMBER RIDGE WEST

EXISTING DRAINAGE MAP

DESIGNED BY LD

DRAWN BY JGF

CHECKED BY LD

H-SCALE AS NOTED

V-SCALE N/A

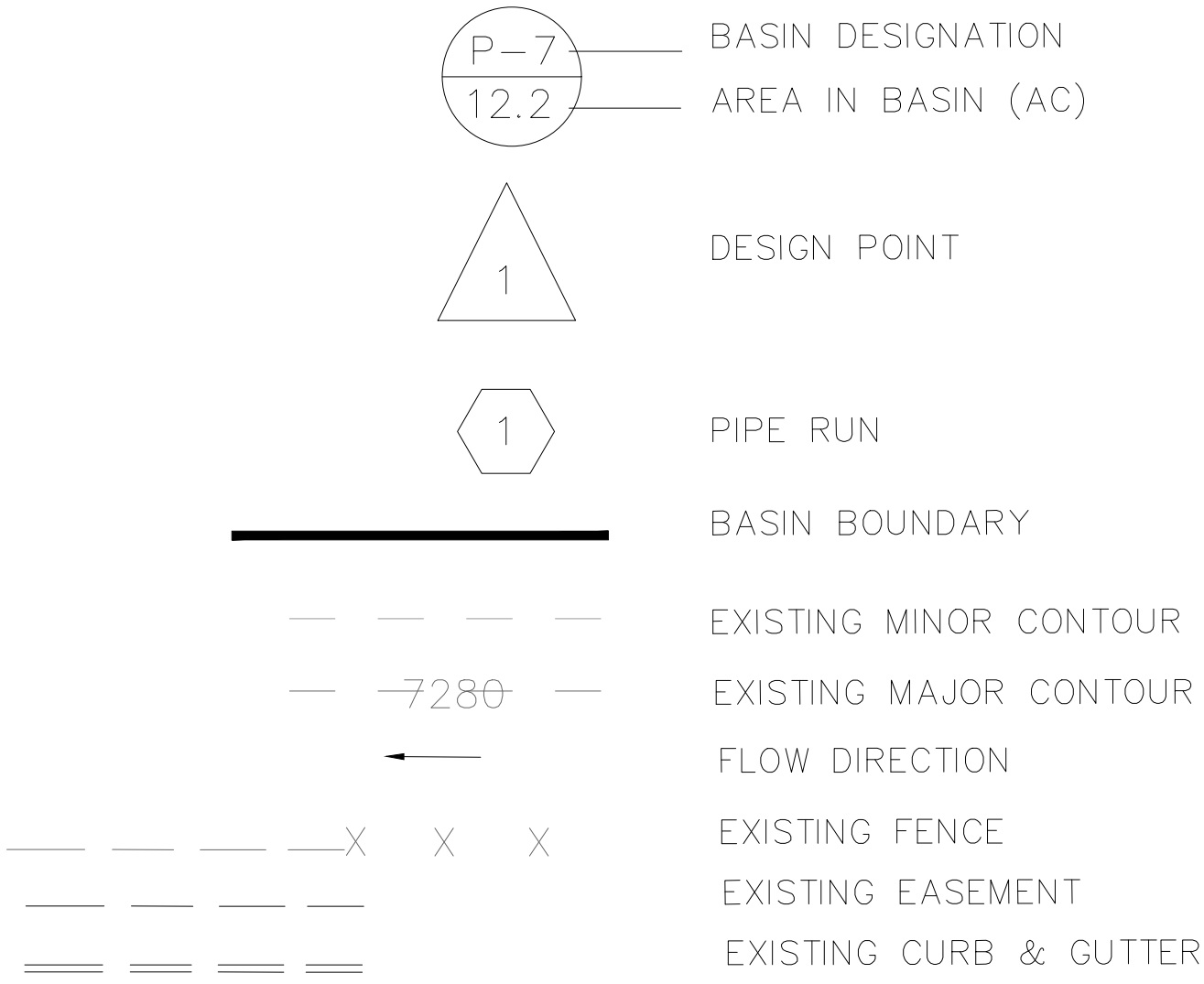
JOB NO. 1752.00

DATE ISSUED 4/3/19

SHEET NO. 1 OF 3

TIMBER RIDGE WEST
COLORADO SPRINGS, CO
PROPOSED DRAINAGE MAP
APRIL 2019

LEGEND



BASIN SUMMARY

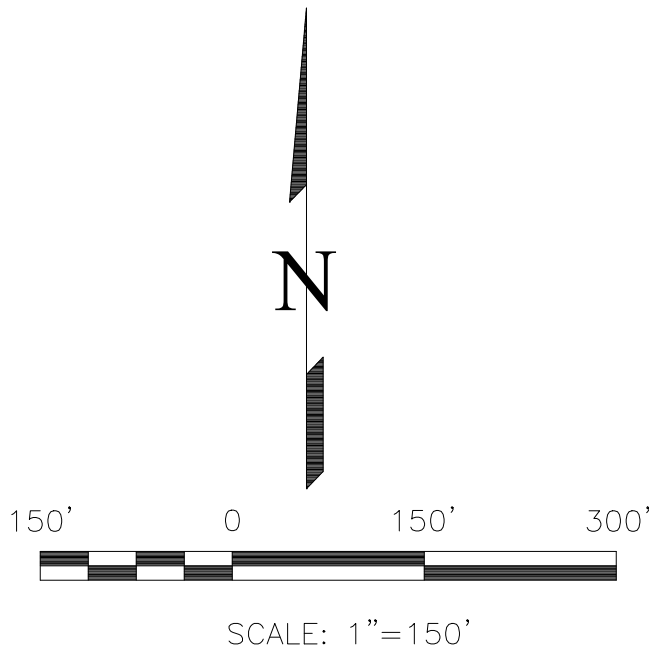
BASIN	ACRES	Q5 CFS	Q100 CFS
EX-1	16.4	2.9	20.7
EX-2	12.9	2.8	20.0
PR-3a	2.9	1.0	4.9
PR-3b	3.8	1.1	5.3
OS-1	11.2	1.9	13.3

DESIGN POINT SUMMARY

DESIGN POINT	BASINS	ACRES	Q5 CFS	Q100 CFS
1	EX-1, OS-1	27.6	4.6	32.7
2	EX-2	16.4	2.8	20.0
3a	PR-3a	2.9	1.0	4.9
3b	PR-3A, PR-3b	6.7	2.0	9.5

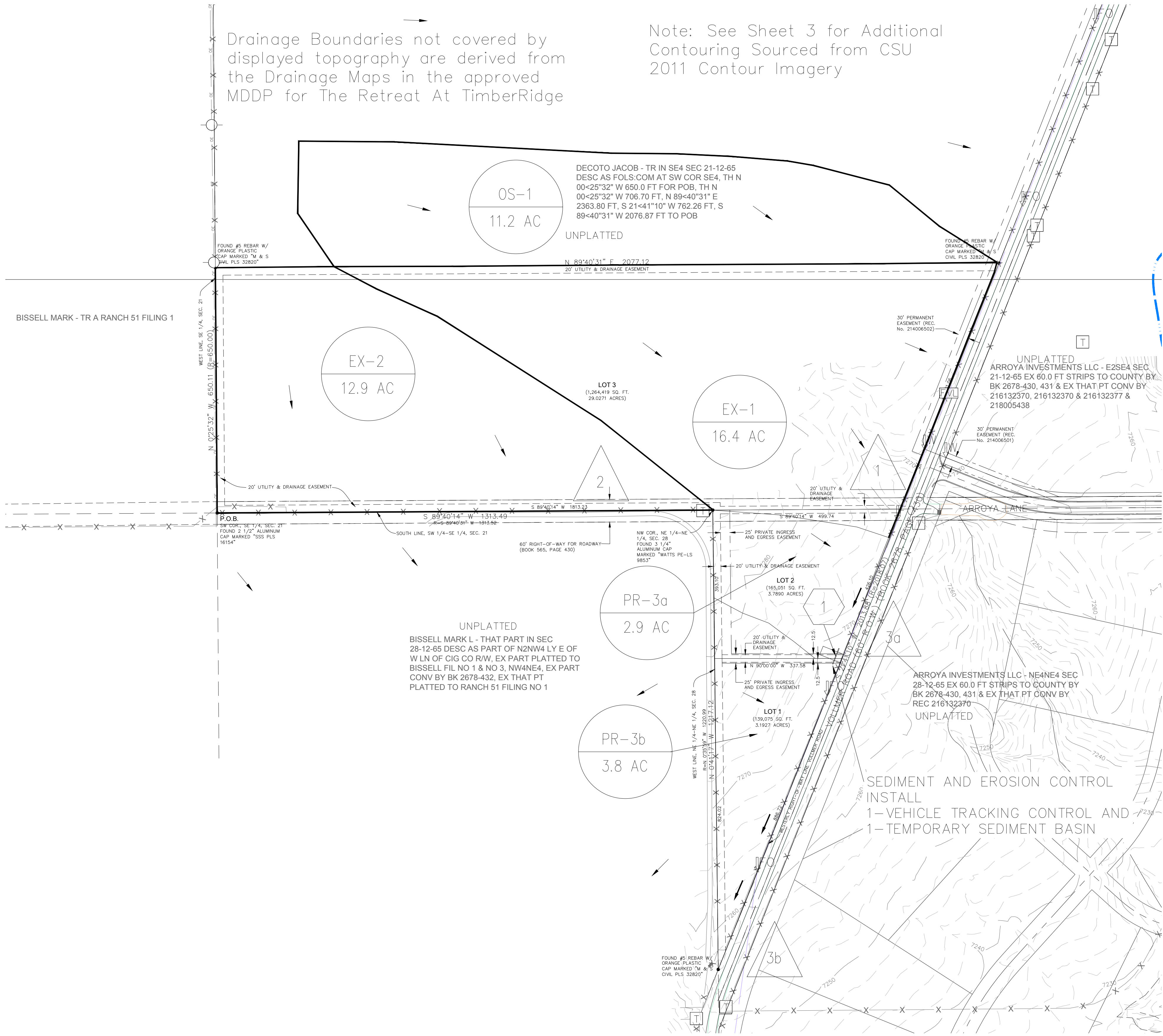
PIPE RUN SUMMARY

PIPE RUN	DESIGN PT	Q5 CFS	Q100 CFS
1	3a	1.0	4.9



EROSION CONTROL LEGEND

KEY	TITLE
	STRAW BALE BARRIER
	VEHICLE TRACKING CONTROL



Note: See Sheet 3 for Additional Contouring Sourced from CSU 2011 Contour Imagery

DATE

REVISIONS

NO.

DESCRIPTION

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, INC. APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR:

XXX

ATTN:

XXX

XXX

XXX

721 S. 23RD STREET
COLORADO SPRINGS, CO 80904
OFFICE: 719-635-6422
FAX: 719-635-6426
www.terra-nova.com

TIMBER RIDGE WEST

PROPOSED DRAINAGE MAP

DESIGNED BY LD

DRAWN BY JGF

CHECKED BY LD

H-SCALE AS NOTED

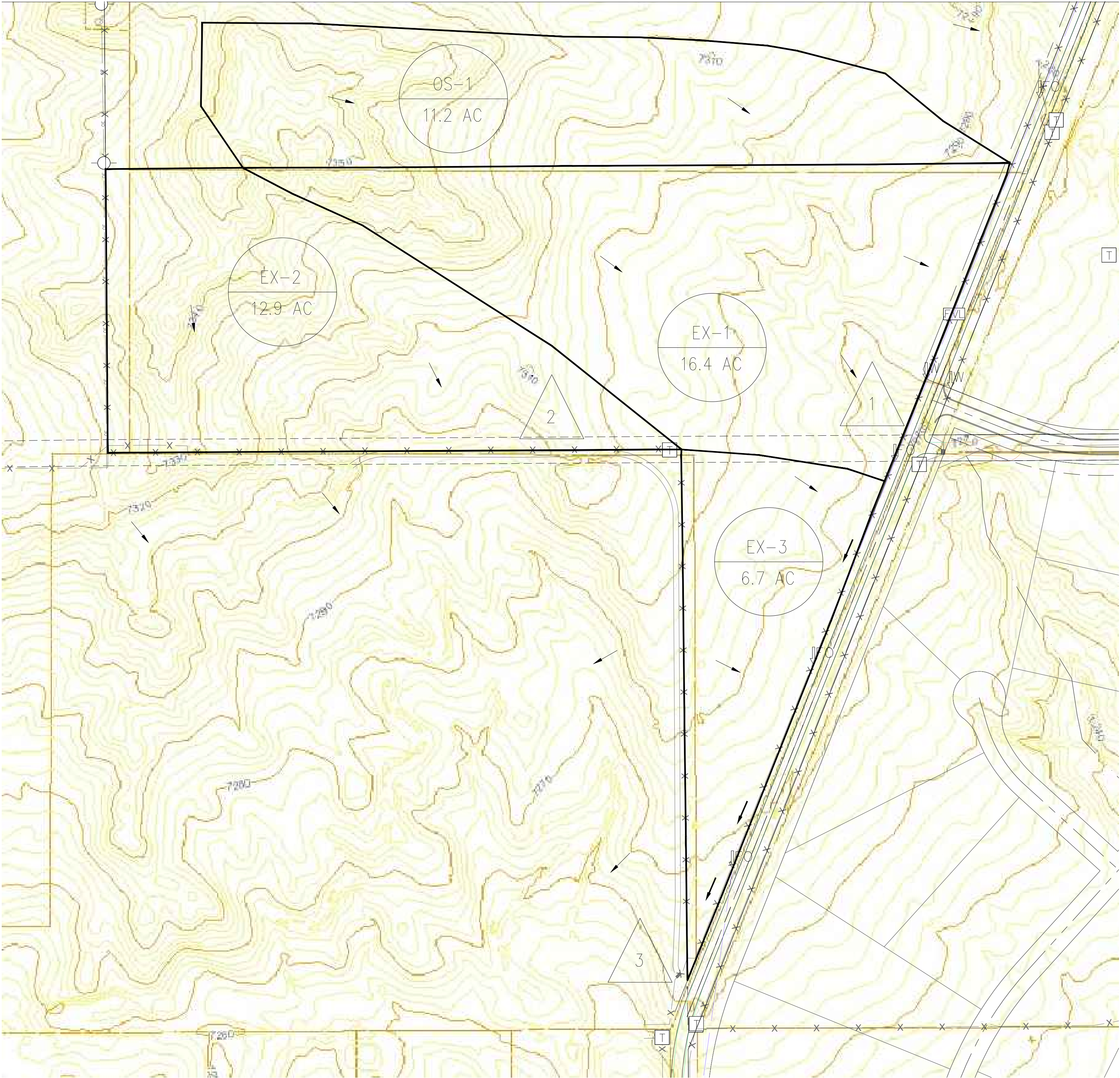
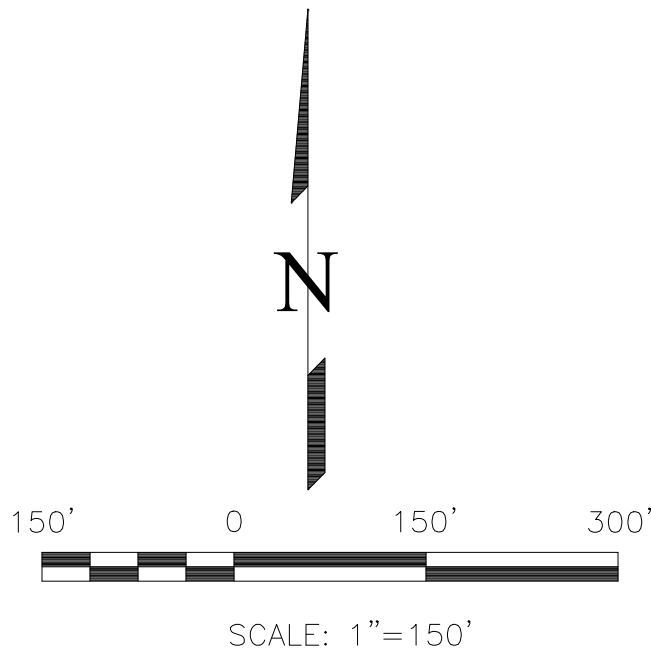
V-SCALE N/A

JOB NO. 1752.00

DATE ISSUED 4/3/19

SHEET NO. 2 OF 3


TIMBER RIDGE WEST
COLORADO SPRINGS, CO
EXISTING DRAINAGE MAP
APRIL 2019



NOTE: ADDITIONAL CONTOURING SOURCED FROM CSU 2011 IMAGERY

DESIGNED BY LD		REVISIONS NO. DESCRIPTION DATE
DRAWN BY JGF		
CHECKED BY LD		
H-SCALE AS NOTED V-SCALE N/A		
JOB NO. 1752.00		UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, TERRA NOVA ENGINEERING, INC. APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.
DATE ISSUED 4/3/19		
SHEET NO. 3 OF 3		

TIMBER RIDGE WEST	PREPARED FOR:	XX
	ATTN:	XX XX XX XX



721 S. 23RD STREET
COLORADO SPRINGS, CO 80904
OFFICE: 719-635-6422
FAX: 719-635-6426
www.tnec.com

FINAL PLAT

Timber Ridge West

A SUBDIVISION OF PORTIONS OF THE SOUTHEAST QUARTER OF SECTION 21,
AND OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 28,
TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE 6TH P.M.,
EL PASO COUNTY, COLORADO

KNOW ALL MEN BY THESE PRESENTS:

That Jacob Decoto, being the owner of the following described tract of land to wit:

A parcel of land located in a portion of the Southeast One-Quarter (SE1/4) of Section 21 and a portion of the Northeast One-Quarter (NE1/4) of Section 28, Township 12 South, Range 65 West of the 6th P.M., El Pso County, Colorado, being more particularly described as follows:

Basis of bearings: The west line of the Southeast One-Quarter (SE1/4) of Section 21, Township 12 South, Range 65 West is assumed to bear N00°25'32"W, a distance of 2638.67 feet;

Commencing at the southwest corner of said Southeast One-Quarter (SE1/4) said point also being the point of beginning of the parcel of land herein described;
Thence N00°25'32"W along the west line of said Southeast One-quarter (SE1/4), a distance of 650.00 feet;
thence N89°40'31"E, a distance of 2076.87 feet to a point on the westerly right-of-way line of Vollmer Road as described in the document recorded in Book 2678 at Pge 430 of the records of the El Paso County Clerk and Recorder;
thence S21°41'10"W along said westerly right-of-way line, a distance of 2018.07 feet to a point on the east line of the Northwest One-Quarter of the Northeast One-Quarter (NW1/4 NE4) of said Section 28;
thence N00°35'59"W along said east line, a distance of 1220.99 feet to the southeast corner of the Southwest One-Quarter of the Southeast One-Quarter (SW1/4 SE1/4) of said Section 21;
thence S89°40'31"W along the south line of said Southwest One-Quarter of the Southeast One-Quarter (SW1/4 SE1/4), a distance of 1313.52 feet to the point of beginning.

Containing a calculated area of 1,568,545 square feet (36.0088 acres), more or less.

OWNERS CERTIFICATION:

The undersigned, being all the owners, mortgages, beneficiaries of deeds of trust and holders of other interests in the land described herein, have laid out, subdivided, and platted said lands into lots and easements as shown hereon under the name and subdivision of **TIMBER RIDGE WEST**. The utility easements shown hereon are hereby dedicated for public utilities and communication systems and other purposes as shown hereon. The entities responsible for providing the services for which the easements are established are hereby granted the perpetual right of ingress and egress from and to adjacent properties for installation, maintenance, and replacement of utility lines and related facilities.

Jacob Decoto Date

STATE OF COLORADO }
COUNTY OF EL PASO } SS

Acknowledged before me this ____ day of _____, 2019 by Jacob Decoto

My commission expires _____

Witness my hand and official seal _____
Notary Public

BOARD OF COUNTY COMMISSIONERS CERTIFICATE:

This plat for **TIMBER RIDGE WEST** was approved for filing by the El Paso County, Colorado Board of County Commissioners on the ____ day of _____, 200____ subject to any notes specified hereon and any conditions included in the resolution of approval. The dedications of land to the public (Public Utility Easements) are accepted, but public improvements thereon will not become the maintenance responsibility of El Paso County until preliminary acceptance of the public improvements in accordance with the requirements of the Land Development Code and Engineering Criteria Manual, and the Subdivision Improvements Agreement.

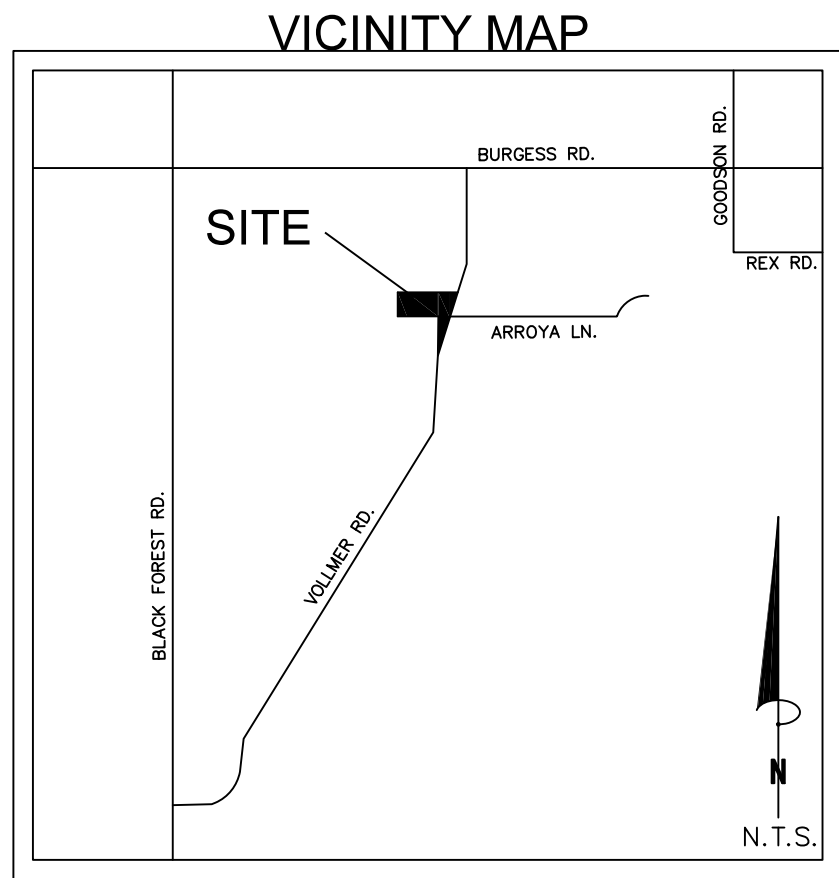
Chair, Board of County Commissioners Date

COUNTY APPROVAL:

Approval is granted for this plat of **TIMBER RIDGE WEST** this ____ day of _____, 2019, A.D.

El Paso County Director of Planning and Community Development

El Paso County Assessor



NOTES:

- This survey does not constitute a title search by Compass Surveying & Mapping, LLC to determine ownership or easements of record. For all information regarding easements, rights of way and title of record, Compass Surveying & Mapping, LLC relied upon a Commitment for Title Insurance issued by Westcor Land Title Insurance, File No. 57210UTC Amendment No. 1 with an effective date of November 28, 2018 at 7:30 am.
- Basis of bearings is the north line of the property, monumented as shown and assumed to bear North 89 degrees 40 minutes 31 seconds East, 2077.12 feet.
- This property is located within Zone X (areas determined to be outside the 500-year floodplain) as established by FEMA per FIRM panel 08041C0535 G, effective date, December 7, 2018.
- 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.
- The linear units used in this drawing are U.S. Survey feet.
- El Paso County Planning and Community Development Department Engineering must be contacted prior to the establishment of any driveway.
- The following reports have been submitted in association with the Preliminary Plan or Final Plat for this subdivision and are on file at the County Planning and Community Development Department: Transportation Impact Study; Drainage Report; Water Resources Report; Wastewater Disposal Report; Geology and Soils Report; Fire Protection Report; Wildfire Hazard Report; Natural Features Report.
- All property owners are responsible for maintaining proper storm water drainage in and through their property. Public drainage easements as specifically noted on the plat shall be maintained by the individual lot owners unless otherwise indicated. Structures, fences, materials or landscaping that could impede the flow of runoff shall not be placed in drainage easements.
- The addresses (10620) exhibited on this plat is for informational purposes only. They are not the legal description and are subject to change.
- This plat is regulated by a P.U.D. Development Plan as recorded under Reception No. 218040692.
- Easements are as shown, with the sole responsibility for maintainance of these easements is hereby vested with the adjacent property owners.
- Developer shall comply with federal and state laws, regulations, ordinances, review and permit requirements, and other agency requirements, if any, of applicable agencies including, but not limited to, the Colorado Division of Wildlife, Colorado Department of Transportation, US Army Corps of Engineers and the US Fish and Wildlife Service regarding the Endangered Species Act, particularly as it relates to the listed species (e.g. Prebles Meadow Jumping Mouse).
- Mailboxes shall be installed in accordance with all El Paso County and United States Postal Service regulations. Mailboxes for Lots 1 and 2 shall be mounted two to a post and be set back from Vollmer Road.
- Property within this subdivision is subject to the terms and provisions of the El Paso County Road Impact Fee Program (Resolution 18-471) and any subsequent amendments. Fees for each lot within this subdivision shall be paid in full at the time of building permit issuance.
- Individual lot purchasers are responsible for constructing driveways including necessary drainage culverts from Vollmer Road per Land Development Code Section 6.3.3.c.2 and 6.3.3.c.3.
- Water Supply: Water service for this subdivision is provided by individual wells are the responsibility of each property owner. Permits for individual wells must be obtained from the State Engineer who by law has the authority to set conditions for the issuance of these permits.

NOTES (continued):

- Wastewater: Wastewater service for this subdivision is provided by individual septic systems. Sewage treatment is the responsibility of each individual property owner. The El Paso County Department of Health and Environment must approve each system and, in some cases the Department may require an engineer designed system prior to permit approval. These systems may cost more to design, install, and maintain.
- Utility providers are: Black Hills Energy, Colorado Springs Utilities, Century Link Communications, Falcon Broadband.
- This property has been incorporated into the Black Forest Fire/Rescue Protection District.
- Sediment control is to be provided on each lot and the minimal developed conditions runoff shall be maintained per the El Paso County Drainage Criteria Manual.
- The shared access to Vollmer Road for Lots 1 and 2 is temporary. Permanent access to Vollmer Road for all lots will be located on Lot 3. This permanent access will be constructed by the owner of Lot 3 upon further development of Lot 3.
- Geologic Hazard Note: Lots 1 and 2 have been found to be impacted by geologic hazards. Mitigation measures and a map of the hazard area can be found in the report Soil, Geology and Geologic Hazard The Retreat At Timber Ridge by Entech Engineering, Inc., dated April 12, 2017 in file 170209 available at the El Paso County Planning and Community Development Department: Shallow Bedrock, Expansive Soils, Artificial Fill, Seasonal Shallow Groundwater and Potentially Seasonal Groundwater.
- Prior to the Planning Division's authorization of the issuance of building permits on Lots 1 and 2 an approved engineered lot plan will be required, addressing legal locations of all easements and no-build geologic hazard areas in addition to grading and drainage for each lot. The engineered plot plan is required to be signed and sealed by a Professional Engineer, licensed in the state of Colorado and reviewed and approved by the El Paso County Planning and Community Development Department Engineering Division. Prior to the Planning Departments authorization of the issuance of a Certificate of Occupancy, the Engineer shall certify that the builder has complied with the approved building location, drainage and grading plan and the resulting drainage easement(s) have been found acceptable by the Engineering Division and a Drainage Easement document has been properly executed and recorded in the records of the Clerk and Recorder's office Of El Paso County, Colorado.

SURVEYOR'S CERTIFICATION:

I Mark S. Johannes, a duly registered Professional Land Surveyor in the State of Colorado, do hereby certify that this plat truly and correctly represents the results of a survey made on the date of survey shown hereon, by me or under my direct supervision and that all monuments exist as shown hereon; that mathematical closure errors are less than 1:10,000; and that said plat has been prepared in full compliance with all applicable laws of the State of Colorado dealing with monuments, subdivision, or surveying of land and all applicable provisions of the El Paso County Land Development Code.

This certification is neither a warranty nor guarantee, either expressed or implied.

Mark S. Johannes
Colorado Professional Land Surveyor No. 32439
For and on behalf of Compass Surveying and Mapping, LLC

FEES:

Drainage Fee: _____ School Fee: _____

Bridge Fee: _____ Park Fee: _____

RECORDING:

STATE OF COLORADO }
COUNTY OF EL PASO } SS

I hereby certify that this instrument was filed for record in my office at ____ o'clock ____M., this ____ day of _____, 2019, A.D., and is duly recorded under Reception No. _____ of the records of El Paso County, Colorado.

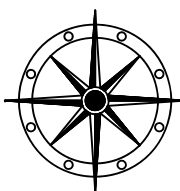
CHUCK BROERMAN, RECORDER

BY: _____
Deputy

SURCHARGE: _____

FEE: _____

DSD FILE NO: MS 19-1

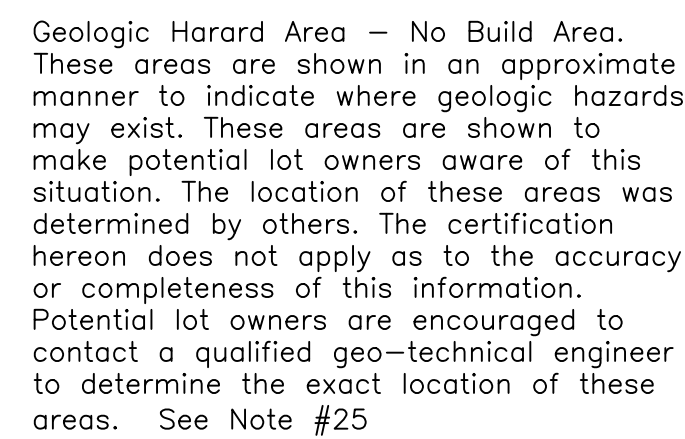


COMPASS SURVEYING & MAPPING, LLC
721 SOUTH 23RD STREET, SUITE B
COLORADO SPRINGS, CO 80904
719-354-4120
WWW.CSAMLLC.COM

REVISIONS:		
1	2/07/19	County comments.
2	4/04/19	County comments.

PROJECT No. 18222
OCTOBER 3, 2018
SHEET 1 OF 2

A SUBDIVISION OF PORTIONS OF THE SOUTHEAST QUARTER OF SECTION 21,
AND OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 28,
TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE 6TH P.M.,
EL PASO COUNTY, COLORADO



PROJECT No. 18222
OCTOBER 3, 2018
SHEET 2 OF 2