EPC STORMWATER REVIEW COMMENTS
IN ORANGE BOXES WITH BLACK TEXT

NOTED

See comment on GEC Plan Drawing in regards to the need for a permanent WQ facility

ADDRESSED UTIL 2.1.4 HID (UD-BMP) REDUCTION TECHNIQUE

PRELIMINARY/FINAL DRAINAGE REPORT FOR PINE VIEW ESTATES

JUNE 2020

Prepared for:

Alice Owens
18430 Lost Ranger Road
Peyton, CO 80831

Prepared By:

CATAMOUNT ENGINEERING
321 W. Henrietta Ave, Suite A
Woodland Park, CO 80863
719-426-2124

SP-20-004

PCD FILE NO's: SP-20-___
SF-20-___

SF-20-019

PRELIMINARY/FINAL DRAINAGE REPORT
PINE VIEW ESTATES

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 the criteria established 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.

Certification Statement:
This report and plan for the preliminary and final drainage design for the PINE VIEW ESTATES was prepared by me (or under my direct supervision) in accordance with the provisions of City of Colorado Springs/El Paso County Drainage Criteria Manual Volumes 1 and 2 Drainage Design and Technical Criteria for the owners thereof. I understand that El Paso County does not and will not assume liability for drainage facilities designed by others.

_____ _____
David L. Mijares, Colorado PE #40510 Date
For and on behalf of Catamount Engineering

REVISED

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

John Jennings hereby certifies that the drainage facilities for PINE VIEW ESTATES shall be constructed according to the design presented in this report. I understand that El Paso County does not and will not assume liability for the drainage facilities designed and or certified by my engineer and that the El Paso County reviews drainage plans pursuant to Colorado Revised Statues, Title 30, Article 28; but cannot, on behalf of PINE VIEW ESTATES, guarantee that final drainage design review will absolve ALICE OWENS and/or their successors and/or assigns of future liability for improper design. I further understand that approval of the final plat does not imply approval of my engineer's drainage design.

Alice Owens
Business Name

By: _____

Title: _____

Address: 18430 Lost Ranger Road

Peyton, CO 80831

REVISED

Please revise to indicate "as amended".

El Paso County:
Filed in accordance with the requirements of the El Paso County land Development Code and the Drainage Criteria manual Volumes 1 and 2, and the El Paso County Engineering Criteria Manual, latest revision.

_____ _____
Jennifer Irvine, PE Date
County Engineer/ECM Administrator

Conditions:

PRELIMINARY/FINAL DRAINAGE REPORT for PINE VIEW ESTATES

PURPOSE

The purpose of this drainage report is to identify existing drainage patterns, quantify developed storm water runoff, and establish outfall scenarios from the proposed development.

GENERAL LOCATION AND DESCRIPTION

The subject 38.828 acres consists of unplatted land to be developed into 7 rural residential lots (RR-5 zoning) located within the SW ¼ of the NW ¼ of Section 13, Township 11 South, Range 64 West of the 6th principal meridian in unincorporated El Paso County. The parcel is bounded to the north by unplatted land, to the east and south by platted RR-5 residential lots within Peyton Pines Filing No. 4, and to the west by unplatted agricultural land. Access to the parcel is from existing Red Barn Road to the east of the parcel, a gravel county local roadway.

The parcel is located on a ridge within the Bijou Creek drainage. The westerly portion of the parcel sheet flows west to an unnamed tributary of West Bijou Creek within the adjacent agriculturally zoned unplatted parcel at slopes between 2% and 6%. The southeasterly portion of the parcel sheet flows east to an unnamed tributary of West Bijou Creek within adjacent 5-acre residential parcels at slopes between 2% and 5%. The northeasterly portion of the parcel sheet flows north at slopes between 2% and 5% through a historic stock pond and continues north to an unnamed tributary of West Bijou Creek. The site is located within the Bijou Creek Basin.

Existing soils on the site consist of Brusset loam, hydrologic soil group B (86.8%), and Peyton - Pring complex, hydrologic soil group B (13.2%) as determined by the Natural Resources Conservation Service Web Soil Survey. The site is vegetated with native grasses. Moderate shrub and tree cover are evident and increases within the westerly portions of the site

No portion of the site lies within an F.E.M.A. designated floodplain per FIRM 08041C0350 G, effective December 07, 2018. A firmette exhibiting the parcel has been included in the appendix of this report.

EXISTING DRAINAGE CONDITIONS

No existing studies on the site or overall basin have been identified. The parcel exists on a minor ridge between two unnamed tributaries of West Bijou Creek generally draining to the north. Parcel was historically used for agricultural grazing and an existing minor stock pond exists within the northerly reach of Basin E1. The stock pond was not used in hydrologic calculations. As the parcel is located on a ridge between minor tributaries, no significant offsite runoff enters the parcel.

per your drainage plan it appears to flow to the northwest. Please revise

REVISED

REVISED northeasterly per the drainage plan

Basin E1 (11.5 Acres, Q_2=0.7 cfs, Q_5=2.5 cfs, Q_{10}=5.5 cfs, Q_{25}=9.6 cfs, Q_{50}=12.9 cfs, and Q_{100}=16.7 cfs) consists of that portion within the westerly portion of the parcel that sheetflow west to the westerly unnamed tributary of West Bijou Creek.

Basin E2 (12.47 Acres, Q_2=0.6 cfs, Q_5=2.4 cfs, Q_{10}=5.2 cfs, Q_{25}=9.1 cfs, Q_{50}=12.2 cfs, and Q_{100}=15.9 cfs) consists of the southeasterly portion of the parcel that sheet flows easterly to the easterly unnamed tributary of West Bijou Creek.

Basin E3 (14.77 Acres, Q_2=0.8 cfs, Q_5=2.9 cfs, Q_{10}=6.4 cfs, Q_{25}=11.2 cfs, Q_{50}=15.1 cfs, and Q_{100}=19.6 cfs) consists of the central and northerly portion of the parcel that flows northerly to the historic stock pond prior to release to the easterly unnamed tributary of West Bijou Creek.

REVISED northwest

DEVELOPED DRAINAGE BASINS

The majority of the area within developed basins was modeled as agricultural land. A 1 acre developed area was assumed for each lot located in respective basins. Proposed roadway and shoulders were modeled as gravel where proposed.

Basin A1 (11.57 Acres, Q_2=1.1 cfs, Q_5=3.3 cfs, Q_{10}=6.6 cfs, Q_{25}=11.0 cfs, Q_{50}=14.7 cfs, and Q_{100}=18.8 cfs) represents portions of the proposed residential lots within the westerly portion of the parcel (Historic Basin E1). Runoff generated within the basin will sheetflow east in the historic pattern.

Basin A2 (14.42 Acres, Q_2=1.5 cfs, Q_5=4.0 cfs, Q_{10}=7.5 cfs, Q_{25}=12.4 cfs, Q_{50}=16.3 cfs, and Q_{100}=20.8 cfs) represents portions of the proposed residential lots and the southerly half of the proposed roadway within the southeasterly portion of the parcel (Historic Basin E2). Runoff generated within the basin will sheetflow north and be conveyed in the proposed roadside ditch easterly to the existing roadside ditch within the ROW of existing Red Barn Road. Runoff will be conveyed in the ditch to the easterly unnamed tributary of West Bijou Creek.

Basin A3 (11.34 Acres, Q_2=1.2 cfs, Q_5=3.1 cfs, Q_{10}=6.1 cfs, Q_{25}=10.1 cfs, Q_{50}=13.4 cfs, and Q_{100}=17.1 cfs) represents portions of the proposed residential lots and the westerly portion of the northern half of the proposed roadway within the central and northern portion of the parcel (Historic Basin E3). Runoff generated within the basin will sheetflow north to the existing stock pond within the northerly portion of the development. Runoff from Basin A3 will continue to the existing easterly reach of the unnamed tributary of West Bijou Creek.

Basin A4 (1.48 Acres, Q_2=0.3 cfs, Q_5=0.6 cfs, Q_{10}=1.1 cfs, Q_{25}=1.8 cfs, Q_{50}=2.3 cfs, and Q_{100}=2.9 cfs) represents portions of the proposed residential lots and the easterly portion of the northerly half of the proposed roadway within the easterly portion of the ROW and represents the portion of historic Basin E2 truncated by the proposed roadway. Runoff generated within the basin will sheetflow northeasterly to the unnamed easterly tributary of West Bijou Creek.

The rational methodology was utilized in analyzing on-site basins for development of on-site improvements. The minor increase in impervious area due to roadway and homesite development within the 38.83-acre subdivision would not substantially impact historic drainage

The northern half of the roadway will flow to the roadside ditch and flow easterly. Revise accordingly.

ROADWAY RAISED TO ALLOW SHEETFLOW (NO DITCH)

patterns. Detention is not typically pursued in rural development scenarios unless undetained upstream development would negatively affect the development. A significant portion of runoff generated within typical rural development does not flow directly into County stormwater systems, but leaves improved areas as sheetflow into undeveloped and vegetated portions of lots and infiltrates into the ground. The site was analyzed for Site-Level Low Impact Development (LID) Design Credit by Impervious Reduction Factor (IRF) exhibiting reductions from proposed building site, assuming a 5,000-sf impervious footprint per lot, and gravel roadways outfalling to substantial receiving pervious areas.

ADDED DISCUSSION OF COMPARISON FLOWS

Please include a comparison of the developed flows to the historic flows to show that the flows are minor increases. Flows from basin A2 which are conveyed to the roadside ditch and flow from the northern section of the proposed roadway in basin A4 have been re-routed to the east and do not follow historic conditions. Provide discussion & analysis on the flows in the roadside ditch as these developed flows will be conveyed to the existing roadside ditch. What is the change/increase in flow that these existing roadside ditches will receive? Are the ditches adequate? do they have the capacity for this flow? Are any improvements required to the ditches? What are the conditions/characteristics of the existing roadside ditches? Please address.

impervious roadways.

Step 1-Employ Runoff Reduction Practices

Impervious areas generated within the development will flow across pervious disconnected areas prior to offsite discharge. Runoff generated within roadway improvements will be directed to grassed roadside ditches and conveyed to grassed channels no curb or storm sewer improvements are proposed with the development.

There is no mention of channel improvements in your narrative or shown on the drainage plan. Please revise.

REFERENCE TO CHANNELS REMOVED

Step2-Stabilize Drainageway

Proposed channel improvements are designed at sizes and grades allowing development as grass lined swales rather than hard-sided improvements. The unnamed tributaries of West Bijou Creek adjacent to the project are not directly adjacent to the parcel and reduced runoff due to substantial conveyance across both onsite and offsite pervious area at relatively flat grades will mitigate minor increases in impervious area with 5-acre lot development prior to affecting the drainageways.

Step3-Provide Water Quality Capture Volume

Permanent water quality facility is not proposed for development of 5 acre lots per the requirements of El Paso County Engineering Criteria Manual Section I.7.1B. Runoff reduction (IRF) indicates effective site imperviousness of 0.7%.

Step4-Consider Need for Industrial and Commercial BMP's

A Grading, Erosion Control, and Stormwater Quality Plan and narrative have been submitted concurrently for the development and will be subject to county approval prior to any soil disturbance. The erosion control plan included specific source control BMP's as well as defined overall site management practices for the construction period. No industrial or Commercial density development is proposed.

PROVIDED DISCUSSION OF RUNOFF REDUCTION CALCULATIONS IN APPENDIX

Although although Large Lot single Family lots may be excluded per I.7.1.B, the roadway is not. Please see comments from the DPW stormwater engineer regarding water quality for the roadway.

patterns. Detention is not typically pursued in rural development scenarios unless undetained upstream development would negatively affect the development. A significant portion of runoff generated within typical rural development does not flow directly into County stormwater systems, but leaves improved areas as sheetflow into undeveloped and vegetated portions of lots and infiltrates into the ground. The site was analyzed for Site-Level Low Impact Development (LID) Design Credit by Impervious Reduction Factor (IRF) exhibiting reductions from proposed building site, assuming a 5,000-sf impervious footprint per lot, and gravel roadways outfalling to substantial receiving pervious areas.

See Appendix for Calculations.

WATER QUALITY/4-STEP PROCESS

The development addresses Low Impact Development strategies primarily through the utilization of large impervious areas and utilization of landscape swales receiving runoff generated within impervious roadways.

Step 1-Employ Runoff Reduction Practices
Impervious areas generated within the development will flow across pervious disconnected areas prior to offsite discharge. Runoff generated within roadway improvements will be directed to grassed roadside ditches and conveyed to grassed channels no curb or storm sewer improvements are proposed with the development.

Step2-Stabilize Drainageway
Proposed channel improvements are designed at sizes and grades allowing development as grass lined swales rather than hard-sided improvements. The unnamed tributaries of West Bijou Creek adjacent to the project are not directly adjacent to the parcel and reduced runoff due to substantial conveyance across both onsite and offsite pervious area at relatively flat grades will mitigate minor increases in impervious area with 5-acre lot development prior to affecting the drainageways.

Step3-Provide Water Quality Capture Volume
Permanent water quality facility is not proposed for development of 5 acre lots per the requirements of El Paso County Engineering Criteria Manual Section I.7.1B. Runoff reduction (IRF) indicates effective site imperviousness of 0.7%.

Step4-Consider Need for Industrial and Commercial BMP's
A Grading, Erosion Control, and Stormwater Quality Plan and narrative have been submitted concurrently for the development and will be subject to county approval prior to any soil disturbance. The erosion control plan included specific source control BMP's as well as defined overall site management practices for the construction period. No industrial or Commercial density development is proposed.

RUNOFF REDUCTION DETAILED IN REPORT. CALCULATIONS / MAP PROVIDED.

Per comments on Review 1:
Per direction from the State, subdivision developments that include impervious pavement roads do not qualify for Exclusion E (Large Lot Single-Family Site) Exclusion on the PBMP form. Therefore, some sort of permanent WQ facility should be included in design.

If Runoff Reduction is the desired SW quality control measure, you will need to add a discussion of how this will be implemented (including which areas of the site will be utilized for runoff reduction) and supporting calculations.

COST ESTIMATE

No drainage improvements are proposed with development of 5-acre residential lots.

DRAINAGE FEE CALCULATION

The development proposes to plat 38.828 acres within El Paso County, all contained within the Bijou Creek Drainage Basin. The Bijou Creek Drainage Basin has not been studied and no drainage or bridge fees have been adopted.

DRAINAGE METHODOLOGY

This drainage report was prepared in accordance to the criteria established in the El Paso County Drainage Criteria Manual Volumes 1 and 2, as revised May 2014.

The rational method for drainage basin study areas of less than 100 acres was utilized in the on-site analysis. For the Rational Method, flows were calculated for the 2, 5, 10, 25, 50, and 100-year recurrence intervals. The average runoff coefficients, 'C' values, are taken from Table 6-6 and the Intensity-Duration-Frequency curves are taken from Figure 6-5 of the City Drainage Criteria Manual. Time of concentration for overland flow and storm drain or gutter flow are calculated per Section 3.2 of the City Drainage Criteria Manual. Calculations for the Rational Method are shown in the Appendix of this report.

There is no storm drains/gutters proposed on the plans. Please revise.

REMOVED REFERENCE

SUMMARY

The Pine View Estates development consists of large lot development with minor increases in impervious areas consistent with surrounding development. The development will not adversely affect downstream properties or facilities.

REFERENCES:

County of El Paso Drainage Criteria Manual Volumes 1 and 2, revised May 2014

Flood Insurance rate map 08041C00350 G, December 07. 2018

Natural Resources Conservation Service Web Soil Survey