

Drainage Letter Report

0 ROCKBROOK ROAD
PALMER LAKE, COLORADO
80133

PREPARED FOR: MR. RICK YARBROUGH
5180 MEADOWGREEN DRIVE
COLORADO SPRINGS, CO 80919

September 18, 2018

Prepared by
Richard Lyon, P.E.
Rocky Mountain Group
19375 Beacon Lite Rd. | Monument, CO 80132



Drainage Report Statements

1. 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 City/County for drainage reports and said report is in conformity with the master plan for the drainage basin. I accept responsibility for liability caused by negligent acts, errors or omissions on my part in preparing this report:



Richard D. Lyon

Colorado P.E. No. 53921



2. Developer's Statement:

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

Business Name _____

Provide

By: _____

Title: _____

Address: _____

3. EL PASO COUNTY:

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.

Jennifer Irvine, P.E.
County Engineer / ECM Administrator

Date

Conditions:

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And D1 Drainage Basin Map (Updated By RDL)

1.0 Existing Conditions

1.1 Existing Site

The Yarbrough Subdivision, preliminarily addressed as 0 Rockbrook Road and referred to as Lot 1, is a proposed minor subdivision consisting of a single 1.58 acre residential lot located in the Palmer Lake area of northern El Paso County, Colorado. The parcel number is 71090-00-053 and is currently vacant and unplatted. A vicinity map, survey maps with the legal description of the parcel and topography is provided in Appendix A.

Lot 1 consists of 1.58 acres with a dedicated 0.13 acre area to the northwest shown as Tract A at the end of the cul-de-sac of Rockbrook Road. The lot is west of and adjacent to Cloven Hoof Estates and just over 200 feet east of Monument Creek. As shown in Appendix A, the lot consists of a 0.48 acre No-Build Area for a Drainage Area and setbacks for Drainage and Public Utility Easements and right-of-way for ingress and egress.

An existing shared driveway follows the west boundary of the property, providing access to the existing residence south of Lot 1. Rockbrook Road is an existing gravel public road which currently terminates in a non-standard cul-de-sac at the north end of the Yarbrough property. Based on previous correspondence with the County and Tri-Lakes Fire Protection District, the proposed subdivision will include an upgrade of Rockbrook Road for a firetruck turnaround.

The Owners plan to build a single-family residence on the property and a minor subdivision is required by El Paso County prior to obtaining a building permit.

1.2 Existing Drainage Conditions

The major drainage channel of Monument Creek flows through the adjacent property to the west, and the FEMA floodplain of Monument Creek impacts the west side of this property. The criteria used to analyze the existing drainage conditions is the rational method for the 5-year and 100-year storm event. The major drainage basin is Monument Creek and it is also the downstream point of concentration for drainage from this parcel. The City of Colorado Springs and El Paso County Drainage Criteria Manual, Volumes 1 and 2, were used for hydrologic and hydraulic calculations. FEMA Floodplain maps are provided in Appendix B.

The site slopes downward to the west with average grades of 4-20 percent. According to the USDA Soil Conservation Service (SCS) "Soil Survey of El Paso County", the soils on site consist primarily of Type 41, "Kettle gravelly loamy sand" soils (see Appendix C). These soils are classified as deep, well-drained soils formed in sandy arkosic deposits on uplands. These soils have rapid permeability and slow surfaces runoff characteristics, and the hazard of erosion is moderate. The soils are classified as hydrologic soils group B.

A Drainage Letter Report dated May 5, 2010 was developed by JPS Engineering (JPS Project No. 031004). This Drainage Letter Report serves as a revised and updated version of the previous Drainage Report, particularly regarding hydrological and hydraulic calculations as certain County criteria has been updated since that time. The delineated basins and sub-basins remain the same and the drainage patterns of the parcel and off-site drainage basins have not changed. To remain consistent with previous terminology and designations/delineations, this report will use the same basins and sub-basins as well as the reference exhibits produced by JPS Engineering in 2010 in Appendix E. The updated calculations reflect the updated City of Colorado Springs and El Paso County Drainage Criteria Manual Volumes 1 and 2 dated May 2014 with Resolution No. 15-042 dated January 2015.

The parcel is delineated in two on-site drainage basins (Basins A and B). The north end of the site is impacted by a small off-site basin to the northeast (Basin OA1). These basins sheet flow to the southwest to the adjacent major drainage channel of Monument Creek. The majority of the subdivision area has been delineated as Basin A. Off-site flows from Basin OA1 combine with on-site flow within Basin A, and these combined flows drain westerly to the existing drainage channel at the west boundary of the site (Design Point #1). The calculated historic peak flows at Design Point #1 are $Q_5 = 1.07$ cfs (cubic feet per second) and $Q_{100} = 4.96$ cfs. The southeast part of the site has been delineated as Basin B, which sheet flows southwesterly towards the Monument Creek channel. The calculated historic peak flows at Design Point #2 are $Q_5 = 0.12$ cfs and $Q_{100} = 0.87$ cfs. This totals a **Q_5 runoff of 1.19 cfs** and a **Q_{100} runoff of 5.82 cfs**.

According to the FEMA Flood Insurance Study, the adjacent major drainage channel of Monument Creek experiences 100-year storm event flows of approximately 13,850 cfs at "Section CV" downstream of this site. The proposed drainage conditions and calculations in following section shows a small, negligible increase in the percentage of total 100-year storm flow in this main channel, 0.00585 percent to be exact.

2.0 Proposed Conditions

The parcel is zoned RR-0.5 (rural residential – 0.50 acre minimum lots), and the proposed minor subdivision is consistent with the existing zoning of this site. The proposed minor subdivision will create a single residential building lot. A site development plan for a single-family residence is not yet developed for this parcel. As such, a typical value of percent impervious and its corresponding runoff coefficient for a single-family lot for the buildable zone of Lot 1 is applied using Table 6-6. Runoff Coefficients for Rational Method (EPC Drainage Criteria Manual, Volume 1 Updated Resolution No. 15-042, Dated January 27, 2015) from UDFCD 2001. The table is shown in Appendix D and the selected values for a pasture/meadow surface are a percent imperviousness of 20 percent and corresponding runoff coefficient (C) of 0.20 for the 5-year storm event and 0.44 for the 100-year event.

The developed drainage concept will be to provide positive drainage away from proposed structures and generally conform to historic drainage patterns. The low density of the proposed

development will result in a minimal impact to downstream facilities. Based on the small size of the developed drainage area in comparison to the large off-site drainage basin area of the Monument Creek, the developed drainage impact is negligible. Developed peak flows at Design Point #1 are calculated as $Q_5 = 1.48$ cfs and $Q_{100} = 5.48$ cfs and developed peak flows at Design Point #2 are calculated as $Q_5 = 0.31$ cfs and $Q_{100} = 1.15$ cfs. These total to a **Q_5 of 1.80 cfs and a Q_{100} of 6.63 cfs. This results in a 0.61 cfs increase for the Q_5 storm event and a 0.81 cfs increase for the Q_{100} storm event from developed to pre-developed conditions.** This is a negligible flow increase to the Monument Creek drainage basin which experiences a flow of 13,850 cfs for a 100-year storm at the downstream section.

The development will include construction of a firetruck turnaround in the form of either a cul-de-sac or hammerhead at the southern termination of Rockbrook Road. A widening of the existing shared driveway along the west boundary of the property is also required for fire suppression access.

As part of a future building permit application, a finalized site plan, grading and drainage plan, and erosion and sediment control plan will be submitted. Proper erosion control measures will be required for development of the site, including silt fencing along downstream limits of disturbance to minimize off-site transport of construction sediment. Other BMP's such as wattles along channelized flow areas, if any, a standard construction entrance, and erosion blankets are to be installed in appropriate areas.

The Developed Drainage Plan includes the following notes for Builders and Property Owners:

1. Proposed site conditions shall not significantly vary from the conditions presented in this report. The degree to which variance from the proposed conditions is allowed is at the discretion of the County. The most critical variable is the percent impervious of the site.
2. Individual builders shall provide positive drainage away from structures and account for potential cross-lot drainage impacts within each lot.
3. Builders and property owners shall implement and maintain erosion control best management practices for protection of downstream properties and facilities.
4. Recognizing the location of this subdivision adjacent to the major drainage channel of Monument Creek, individual builders and owners shall take extra care in providing and maintaining erosion control BMP's at downstream property boundaries.

3.0 Floodplain Impacts

According to the FEMA floodplain map for this area, El Paso County FIRM Panel No. 08041C0260F, dated March 17, 1997 (see Appendix B), the west boundary of the site is impacted by the delineated FEMA 100-year floodplain limits. The proposed shared driveway improvements are not to include any fill within the floodplain, to ensure zero rise within the floodplain.

4.0 Public Improvements / Drainage Basin Fee

No public drainage improvements are required or proposed for this project. According to El Paso County policies, drainage basin fees are due based on the impervious area projected for the new subdivision.

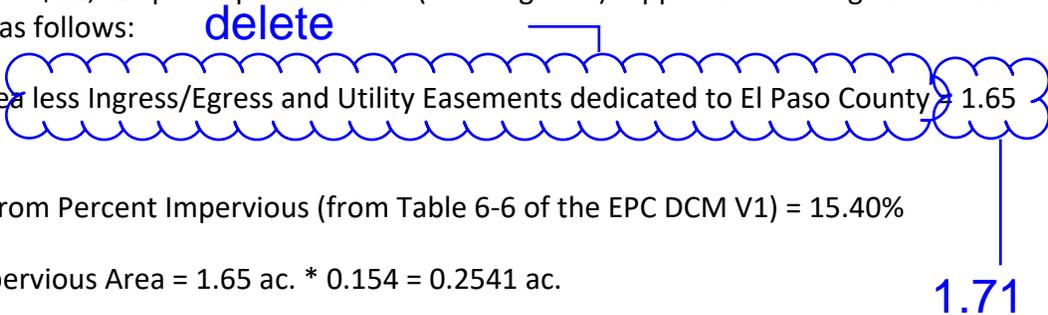
This parcel is located entirely within the Palmer Lake Drainage Basin (FOM 05400) which has a 2018 basin fee of \$11,919 per impervious acre (no bridge fee). Applicable drainage basin fees are calculated as follows:

Subdivision Area less Ingress/Egress and Utility Easements dedicated to El Paso County = 1.65 acres

Interpolation from Percent Impervious (from Table 6-6 of the EPC DCM V1) = 15.40%

Calculated Impervious Area = 1.65 ac. * 0.154 = 0.2541 ac.

Drainage Basin Fee = 0.2541 ac. * \$11,919/ac. = \$3,028.61



5.0 Summary

The proposed drainage patterns for the Yarbrough Subdivision will remain consistent with historic conditions and the overall drainage plan for the area. The proposed minor subdivision to create a single platted rural residential lot will result in a negligible impact on downstream facilities. Should the proposed site plan for this lot vary significantly from the assumptions made in this Drainage Letter Report, a revised report with updated calculations shall be required. Additionally, should the proposed development vary and cause an increase in storm runoff volumes and result in significant impacts to downstream facilities, the proposed development shall be subject to detention and water quality requirements. Installation and maintenance of proper erosion control practices during and after construction will ensure that this developed site will not adversely affect downstream or surrounding areas.

Appendix A

Existing Conditions

Existing Conditions Topographic Survey

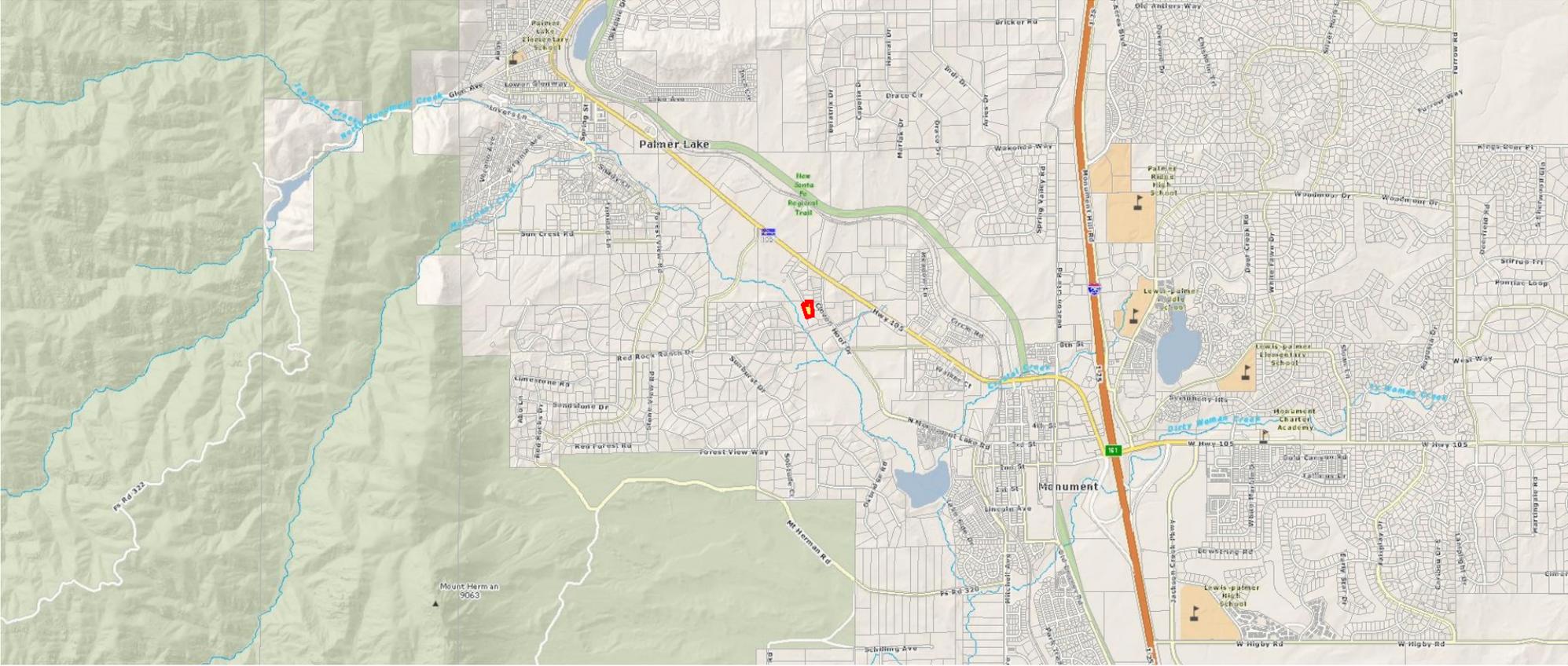
El Paso County Assessor's Office

0 09-11-67

SCHEDULE: 7109000053

OWNER: YARBROUGH AMY M
YARBROUGH RICHARD D

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YARBROUGH SUBDIVISION

A PORTION OF THE SOUTH ONE-HALF OF THE SOUTHEAST ONE-QUARTER (S1/2 SE1/4) OF SECTION 9, T. 11 S., R. 67 W. OF THE 6th P.M., EL PASO COUNTY, COLORADO

KNOW ALL MEN BY THESE PRESENTS:

THAT AMY M. YARBROUGH AND RICHARD D. YARBROUGH, BEING THE OWNERS OF THE FOLLOWING DESCRIBED TRACT OF LAND:

TO WIT:

A TRACT OF LAND IN THE SOUTHEAST 1/4 OF SECTION 9, TOWNSHIP 11 SOUTH, RANGE 67 WEST OF THE 6th PRINCIPAL MERIDIAN DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF THE NORTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SAID SECTION 9;
 THENCE NORTH 89°52'40" EAST ALONG THE SOUTH LINE OF SAID NORTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SAID SECTION 9, 115.00 FEET TO THE NORTHWEST CORNER OF LOT 2 IN CLOVEN HOOF ESTATES, 2nd FILING ACCORDING TO THE PLAT THEREOF RECORDED IN PLAT BOOK D-2 AT PAGE 43; UNDER RECEPTION NO. 240574;
 THENCE ANGLE RIGHT SOUTH 00°35'37" EAST ALONG THE WESTERLY LINE OF LOTS 2 AND 3 OF SAID SUBDIVISION, 369.01 FEET TO THE MOST NORTHERLY CORNER OF THAT TRACT OF LAND CONVEYED TO OWEN C. HASSLER BY DEED RECORDED IN BOOK 2608 AT PAGE 954 UNDER RECEPTION 02938;
 THENCE ANGLE RIGHT SOUTH 74°04'20" WEST, ALONG THE NORTHERLY LINE OF SAID HASSLER TRACT, 159.41 FEET;
 THENCE ANGLE RIGHT NORTH 16°15'37" WEST, 357.85 FEET;
 THENCE ANGLE RIGHT NORTH 62°43'23" EAST 25 FEET TO A POINT IN THE BOUNDARY LINE OF THE CUL-DE-SAC IN ROCKBROOK ROAD ACCORDING TO THE PLAT THEREOF RECORDED IN PLAT BOOK P-2 AT PAGE 23 UNDER RECEPTION NO. 774171;
 THENCE ANGLE RIGHT AND FOLLOW THE BOUNDARY LINE OF SAID CUL-DE-SAC 171.37 FEET TO INTERSECT THE NORTH LINE OF THE SOUTHWEST 1/4 OF THE SOUTHEAST 1/4 OF THE AFORESAID SECTION 9;
 THENCE ANGLE RIGHT NORTH 89°52'42" EAST ALONG SAID NORTH LINE 31.83 FEET TO THE POINT OF BEGINNING, SUBJECT, HOWEVER TO A NON-EXCLUSIVE RIGHT OF WAY FOR INGRESS AND EGRESS DESCRIBED AS FOLLOWS:
 A STRIP OF LAND 15 FEET IN WIDTH LYING EASTERLY AND ADJACENT TO A LINE BEGINNING AT THE SOUTHWEST CORNER OF THE ABOVE DESCRIBED TRACT RUNNING NORTH 16°15'37" WEST 357.85 FEET;
 THENCE NORTH 62°43'23" EAST 25 FEET TO A POINT IN THE BOUNDARY LINE OF THE CUL-DE-SAC IN ROCKBROOK ROAD ACCORDING TO THE PLAT THEREOF RECORDED IN PLAT BOOK P-2 AT PAGE 23 UNDER RECEPTION NO. 774171 AND THE POINT OF TERMINATION OF SAID LINE, COUNTY OF EL PASO, STATE OF COLORADO.

SAID TRACT CONTAINS 1.71 ACRES OF LAND, MORE OR LESS.

OWNERS CERTIFICATE:

THE UNDERSIGNED, BEING ALL THE OWNERS AND HOLDERS OF OTHER INTERESTS IN THE LAND DESCRIBED HEREIN, HAVE LAID OUT, SUBDIVIDED AND PLATTED SAID LANDS INTO A LOT AND EASEMENTS AS SHOWN HEREON UNDER THE NAME AND SUBDIVISION OF "YARBROUGH SUBDIVISION". ALL PUBLIC IMPROVEMENTS SO PLATTED ARE HEREBY DEDICATED TO PUBLIC USE AND SAID OWNER DOES HEREBY COVENANT AND AGREE THAT THE PUBLIC IMPROVEMENTS WILL BE CONSTRUCTED TO EL PASO COUNTY STANDARDS AND THAT PROPER DRAINAGE AND EROSION CONTROL FOR SAME WILL BE PROVIDED AT SAID OWNER'S EXPENSE, ALL TO THE SATISFACTION OF THE BOARD OF COUNTY COMMISSIONERS OF EL PASO COUNTY, COLORADO. UPON ACCEPTANCE BY RESOLUTION, ALL PUBLIC IMPROVEMENTS SO DEDICATED WILL BECOME MATTERS OF MAINTENANCE BY EL PASO COUNTY, COLORADO. 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.

AMY M. YARBROUGH, OWNER

RICHARD D. YARBROUGH, OWNER

STATE OF COLORADO }
 COUNTY OF EL PASO } ss

ACKNOWLEDGED BEFORE ME THIS _____ DAY OF _____, 2018, A.D., BY AMY M. YARBROUGH AND RICHARD D. YARBROUGH AS OWNERS.

MY COMMISSION EXPIRES: _____

WITNESS MY HAND AND OFFICIAL SEAL: _____
 NOTARY PUBLIC

BOARD OF COUNTY COMMISSIONERS CERTIFICATE:

THIS PLAT FOR YARBROUGH SUBDIVISION WAS APPROVED FOR FILING BY THE EL PASO COUNTY, COLORADO BOARD OF COUNTY COMMISSIONERS ON THE _____ DAY OF _____, 2018, SUBJECT TO ANY NOTES SPECIFIED HEREON AND ANY CONDITIONS INCLUDED IN THE RESOLUTION OF APPROVAL. THE DEDICATIONS OF LAND TO THE PUBLIC (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.

PRESIDENT, BOARD OF COUNTY COMMISSIONERS _____ DATE _____

PCD DIRECTOR CERTIFICATE:

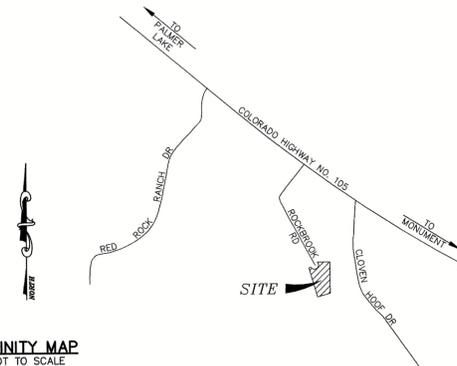
THIS PLAT FOR YARBROUGH SUBDIVISION WAS APPROVED FOR FILING BY THE EL PASO COUNTY, COLORADO PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT DIRECTOR ON THE _____ DAY OF _____, 2018, SUBJECT TO ANY NOTES OR CONDITIONS SPECIFIED HEREON. PREVIOUS LEGAL DESCRIPTION IN ENTIRETY IS AMENDED FOR THE AREAS DESCRIBED BY THIS FINAL PLAT SUBJECT TO ALL CONDITIONS AND RESTRICTIONS RECORDED AGAINST AND APPURTENANT TO THE QUIT CLAIM DEED RECORDED IN THE OFFICE OF THE EL PASO COUNTY CLERK AND RECORDER, RECEPTION NO. 211047931.

EXECUTIVE DIRECTOR, PLANNING AND COMMUNITY DEVELOPMENT _____ DATE _____

SUMMARY:

1 LOT	1.71 ACRES	100%
TOTAL	1.71 ACRES	100%

VICINITY MAP
 NOT TO SCALE



SURVEYOR'S CERTIFICATION:

I, KEVIN F. LLOYD, 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 MARCH 31, 2010, 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.

I ATTEST THE ABOVE ON THIS _____ DAY OF _____, 2018.

KEVIN F. LLOYD, COLORADO PLS NO. 26965 _____ DATE _____
 FOR AND ON BEHALF OF:
 RAMPART SURVEYS, LLC
 P.O. BOX 5101
 WOODLAND PARK, CO 80866
 (719) 687-0920

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.

FEES:

DRAINAGE FEE: _____
 BRIDGE FEE: _____
 SCHOOL FEE: _____
 PARK FEE: _____

RECORDING:

STATE OF COLORADO }
 COUNTY OF EL PASO } ss

I HEREBY CERTIFY THAT THIS INSTRUMENT WAS FILED FOR RECORD AT MY OFFICE AT _____ O'CLOCK _____ M., THIS _____ DAY OF _____, 2018, A.D., AND IS DULY RECORDED UNDER RECEPTION NUMBER _____ OF THE RECORDS OF EL PASO COUNTY, COLORADO.

CHUCK BROERMAN, RECORDER

BY: _____
 DEPUTY

NOTES:

- ALL BEARINGS USED HEREIN ARE BASED ON AN ASSUMED BEARING OF N16°15'37"W (PER THE RECORDED DEED). A DISTANCE OF 357.51 FEET (357.85 FEET OF RECORD), BETWEEN A REBAR AND RED CAP STAMPED "CONARD" AT THE SOUTHWEST CORNER OF THAT TRACT AS RECORDED UNDER RECEPTION NO. 206049118 OF THE RECORDS OF THE EL PASO COUNTY CLERK AND RECORDER, SAID POINT ALSO BEING THE NORTHWEST CORNER OF THE HASSLER TRACT AS DESCRIBED IN BOOK 2608 PAGE 954, UNDER RECEPTION NO. 205093629 OF THE RECORDS OF EL PASO COUNTY AND A REBAR AND RED CAP STAMPED "PLS 23875" AT AN ANGLE POINT IN THE EASTERLY LINE OF THE NEVINS PARCEL, AS DESCRIBED UNDER RECEPTION NO. 206043871 OF SAID COUNTY RECORDS.
- THIS PLAT DOES NOT CONSTITUTE A TITLE SEARCH BY RAMPART SURVEYS FOR EITHER OWNERSHIP OR EASEMENTS OF RECORD. FOR EASEMENTS OF RECORD SHOWN HEREON RAMPART SURVEYS RELIED ON A TITLE POLICY ISSUED BY GUARDIAN TITLE AGENCY, LLC, FILE NO. 7417-52056 (EFFECTIVE DATE: OCTOBER 27, 2017 AT 7:00 A.M.), AS PROVIDED TO RAMPART SURVEYS BY THE CLIENT. NO OTHER EASEMENTS OF RECORD ARE SHOWN EXCEPT AS FOUND THEREIN. THE NUMBERS USED BELOW CORRESPOND WITH THE NUMBERS USED IN SCHEDULE B - SECTION II EXCEPTIONS IN THE ABOVE REFERENCED POLICY.
 - RAMPART SURVEYS DID NOT ADDRESS THESE ITEMS.
 - THE PROPERTY IS SUBJECT TO RIGHTS OF WAY AS CURRENTLY EXIST AND OR USED.
- ALL STRUCTURAL FOUNDATIONS SHALL BE LOCATED AND DESIGNED BY A PROFESSIONAL ENGINEER, CURRENTLY REGISTERED IN THE STATE OF COLORADO.
- THE FOLLOWING REPORTS HAVE BEEN SUBMITTED AND ARE ON FILE AT THE EL PASO COUNTY PLANNING DEPARTMENT; SOILS AND GEOLOGICAL STUDY, COLORADO GEOLOGY SURVEY, DRAINAGE REPORT, WATER RESOURCES REPORT AND FIRE PROTECTION REPORT.
- NO STRUCTURES OR MATERIAL STORAGE ACTIVITIES ARE PERMITTED WITHIN DESIGNATED DRAINAGE EASEMENTS, FLOODPLAIN, OR PARK AND OPEN SPACE AREAS. FENCES SHALL NOT IMPEDE RUNOFF FROM REACHING DRAINAGE SWALES.
- WATER SERVICE FOR THIS SUBDIVISION IS PROVIDED BY THE FOREST VIEW ACRES WATER DISTRICT, SUBJECT TO THE DISTRICT'S RULES, REGULATIONS AND SPECIFICATIONS.
- WASTEWATER SERVICE FOR THIS SUBDIVISION IS PROVIDED BY THE PALMER LAKE SANITATION DISTRICT, SUBJECT TO THE DISTRICT'S RULES, REGULATIONS AND SPECIFICATIONS.
- THE ADDRESSES EXHIBITED ON THIS PLAT ARE FOR INFORMATIONAL PURPOSES ONLY. THEY ARE NOT THE LEGAL DESCRIPTION AND ARE SUBJECT TO CHANGE.
- ALL PROPERTY OWNERS ARE RESPONSIBLE FOR MAINTAINING PROPER STORM WATER DRAINAGE IN AND THROUGH THEIR PROPERTY.
- MAILBOXES SHALL BE INSTALLED IN ACCORDANCE WITH ALL EL PASO COUNTY DEPARTMENT OF TRANSPORTATION AND UNITED STATES POSTAL SERVICE REGULATIONS.
- 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 PARKS AND WILDLIFE, COLORADO DEPARTMENT OF TRANSPORTATION, U.S. ARMY CORP. OF ENGINEERS, THE U.S. FISH AND WILDLIFE SERVICE AND/OR COLORADO DEPARTMENT OF WILDLIFE REGARDING THE ENDANGERED SPECIES ACT, PARTICULARLY AS IT RELATES TO THE PREBLE'S MEADOW JUMPING MOUSE AS A LISTED THREATENED SPECIES.
- THERE IS 1 LOT PLATTED IN THIS SUBDIVISION.
- EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT ENGINEERING MUST BE CONTACTED PRIOR TO THE ESTABLISHMENT OF ANY DRIVEWAY.
- NO DRIVEWAY SHALL BE ESTABLISHED UNLESS AN ACCESS PERMIT HAS BEEN GRANTED BY EL PASO COUNTY.
- ELECTRIC SERVICE TO BE PROVIDED BY IREA. GAS SERVICE TO BE PROVIDED BY BLACK HILLS ENERGY.
- AN ADMINISTRATIVE PLOT PLAN CONFORMING TO THE STANDARDS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE DESIGNED BY A PROFESSIONAL ENGINEER SHALL BE REVIEWED AND APPROVED BY THE EL PASO COUNTY DEVELOPMENT SERVICES DEPARTMENT PRIOR TO THE ISSUANCE OF ANY BUILDING PERMITS FOR ANY OF THE LOTS CONTAINED WITHIN THIS PROPOSED SUBDIVISION. ALL PLOT PLAN SUBMITTALS SHALL CONFORM TO THE REQUIREMENTS IN EFFECT AT THE TIME OF SUBMITTAL.
- THE PROPERTY IS LOCATED WITHIN AND SERVICED BY THE FOLLOWING DISTRICTS:
 LEWIS-PALMER SCHOOL NO. 38
 TRI-LAKES MONUMENT FIRE
 PALMER LAKE SANITATION DISTRICT
 FOREST VIEW ACRES WATER DISTRICT
 EL PASO COUNTY CONSERVATION DISTRICT
- NO STRUCTURES OR BUILDINGS SHALL BE ALLOWED WITHIN TWENTY (20) FEET OF THE "NO BUILD" ZONES, FENCES, DRIVEWAYS, AND LANDSCAPE FEATURES SHALL BE ALLOWED WITHIN THE "NO BUILD" AREAS SUBJECT TO PLOT PLAN APPROVAL BY THE EL PASO COUNTY DEVELOPMENT SERVICES DEPARTMENT.
- DRAINAGE EASEMENTS ARE HEREBY DESIGNATED AS NO-BUILD AREAS, TO BE OWNED AND MAINTAINED BY THE INDIVIDUAL LOT OWNER. THE LOCATIONS OF THESE AREAS ARE SHOWN ON SHEET 2 OF THE PLAT. LOT OWNERS ARE ALSO HEREBY NOTIFIED THAT OTHER AREAS OF GEOLOGIC CONCERN MAY EXIST WITHIN THIS SUBDIVISION. PROSPECTIVE LOT OWNERS SHOULD REVIEW ANY AND ALL REPORTS ON FILE WITH EL PASO COUNTY TO FAMILIARIZE THEMSELVES OF ANY CONDITIONS THAT MAY EFFECT BUILDING.
- AS SHOWN HEREON: ADDITIONAL INGRESS, EGRESS AND UTILITY EASEMENT FOR THE BENEFIT OF THAT TRACT OF LAND AS DESCRIBED IN DEED RECORDED IN BOOK 2608 AT PAGE 954 UNDER RECEPTION NO. 205093629 OF THE RECORDS OF THE EL PASO COUNTY CLERK AND RECORDER, LOCATED TO THE SOUTH OF LOT 1, YARBROUGH SUBDIVISION.

FLOOD PLAIN CERTIFICATION:

ACCORDING TO NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP NUMBER 08041C0280 F (EFFECTIVE DATE: MARCH 17, 1997), THE MAJORITY OF THE SUBJECT PROPERTY LIES WITHIN OTHER AREAS, ZONE X - AREAS DETERMINED TO BE OUTSIDE 500-YEAR FLOODPLAIN, THE WESTERLY PORTION OF THE SUBJECT PROPERTY LIES WITHIN OTHER FLOOD AREAS, ZONE X - AREAS OF 500-YEAR FLOOD; AREAS OF 100-YEAR FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 100-YEAR FLOOD AND A SMALL AREA ALONG THE WESTERLY BOUNDARY LIES WITHIN THE SPECIAL FLOOD HAZARD AREAS INUNDED BY 100-YEAR FLOOD, ZONE AE - BASE FLOOD ELEVATIONS DETERMINED.

EASEMENTS:

UNLESS OTHERWISE SHOWN, ALL SIDE LOT LINES ARE HEREBY PLATTED WITH A FIVE FOOT (5') DRAINAGE AND PUBLIC UTILITY EASEMENT, ALL REAR LOT LINES ARE HEREBY PLATTED WITH A TEN FOOT (10') DRAINAGE AND PUBLIC UTILITY EASEMENT, ALL FRONT LOT LINES ARE HEREBY PLATTED WITH A TEN FOOT (10') DRAINAGE AND PUBLIC UTILITY EASEMENT. THE SOLE RESPONSIBILITY FOR MAINTENANCE OF ALL HEREIN DESCRIBED EASEMENTS IS VESTED WITH THE INDIVIDUAL PROPERTY OWNERS.

REVISION DATE: SEPTEMBER 13, 2018 (PER COUNTY COMMENTS)
 DATE OF PREPARATION: JULY 5, 2018

YARBROUGH SUBDIVISION - PT. S1/2 SE1/4 SEC. 9
 T11S, R67W OF THE 6th P.M., EL PASO COUNTY, COLORADO

RAMPART
 SURVEYS, LLC

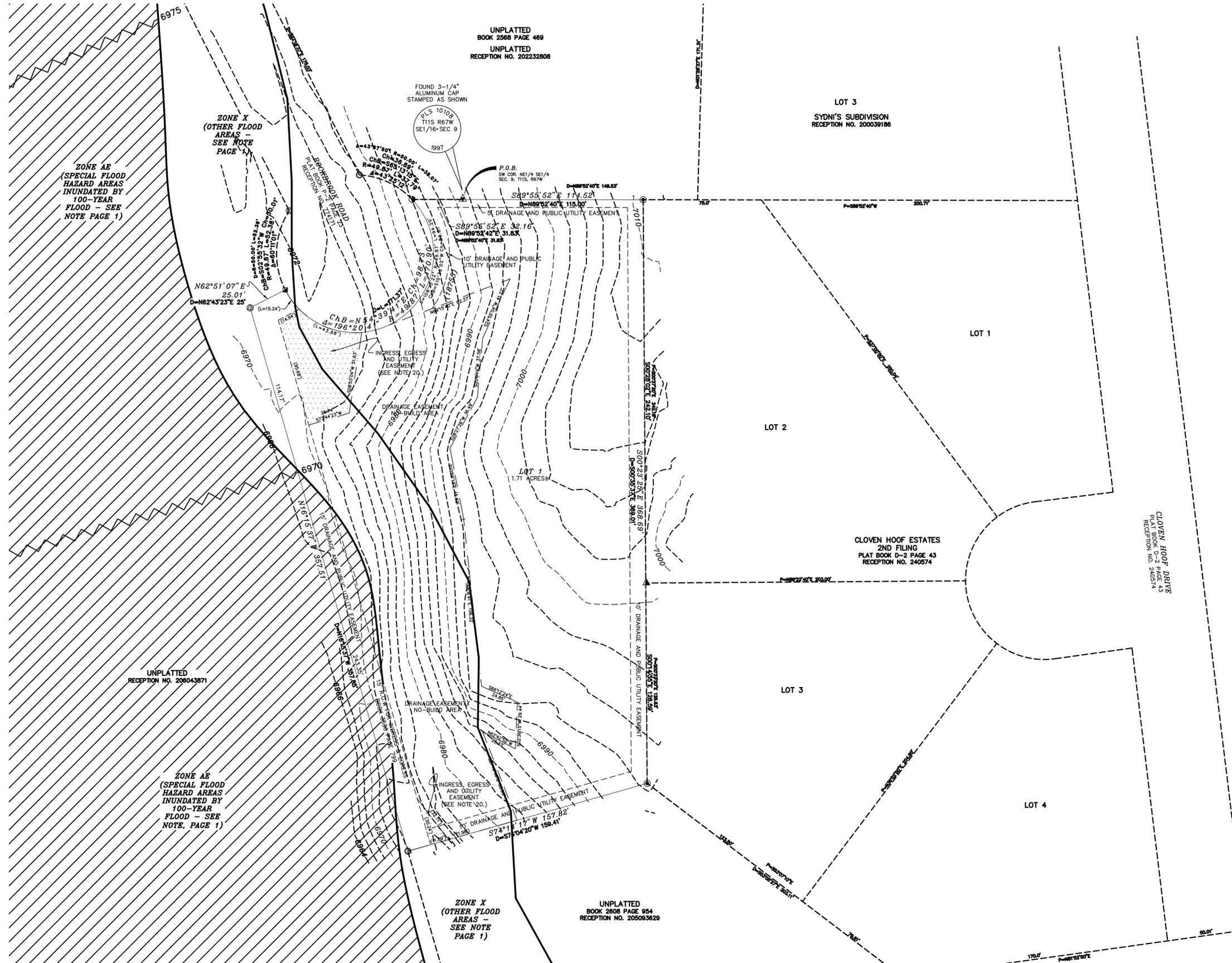
P.O. Box 5101 Woodland Park, CO. 80866 (719) 687-0920

DRAWING: 18228FP.DWG

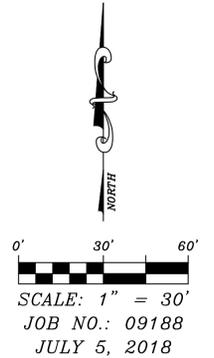
PAGE 1 OF 2

YARBROUGH SUBDIVISION

A PORTION OF THE SOUTH ONE-HALF OF THE SOUTHEAST ONE-QUARTER (S1/2 SE1/4) OF SECTION 9, T. 11 S., R. 67 W. OF THE 6th P.M., EL PASO COUNTY, COLORADO



- LEGEND:
- SET REBAR AND ORANGE CAP STAMPED "RAMPART PLS 26965"
 - ⊙ FOUND 7/8" O.D. IRON PIPE
 - ▲ FOUND 1" O.D. IRON PIPE
 - ⊗ FOUND REBAR AND RED CAP STAMPED "PLS 23875"
 - FOUND REBAR AND RED CAP STAMPED "CONARD"
 - ⊠ FOUND REBAR AND RED CAP STAMPED "PLS 2_875"
 - ⊕ FOUND REBAR AND YELLOW CAP STAMPED "CORNERSTONE PLS 25875"
 - ▲ FOUND 3-1/4" ALUMINUM CAP STAMPED "PLS 10108"



REVISION DATE: SEPTEMBER 13, 2018 (PER COUNTY COMMENTS)
 DATE OF PREPARATION: JULY 5, 2018

YARBROUGH SUBDIVISION - PT. S1/2 SE1/4 SEC. 9
 T11S, R67W OF THE 6th P.M., EL PASO COUNTY, COLORADO

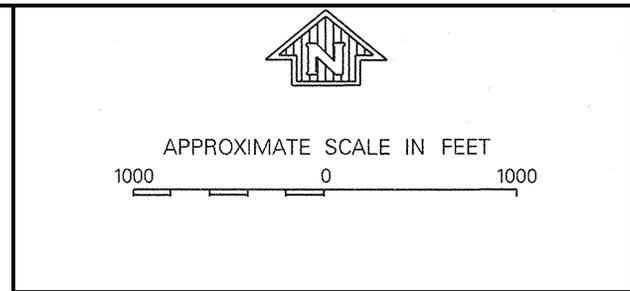
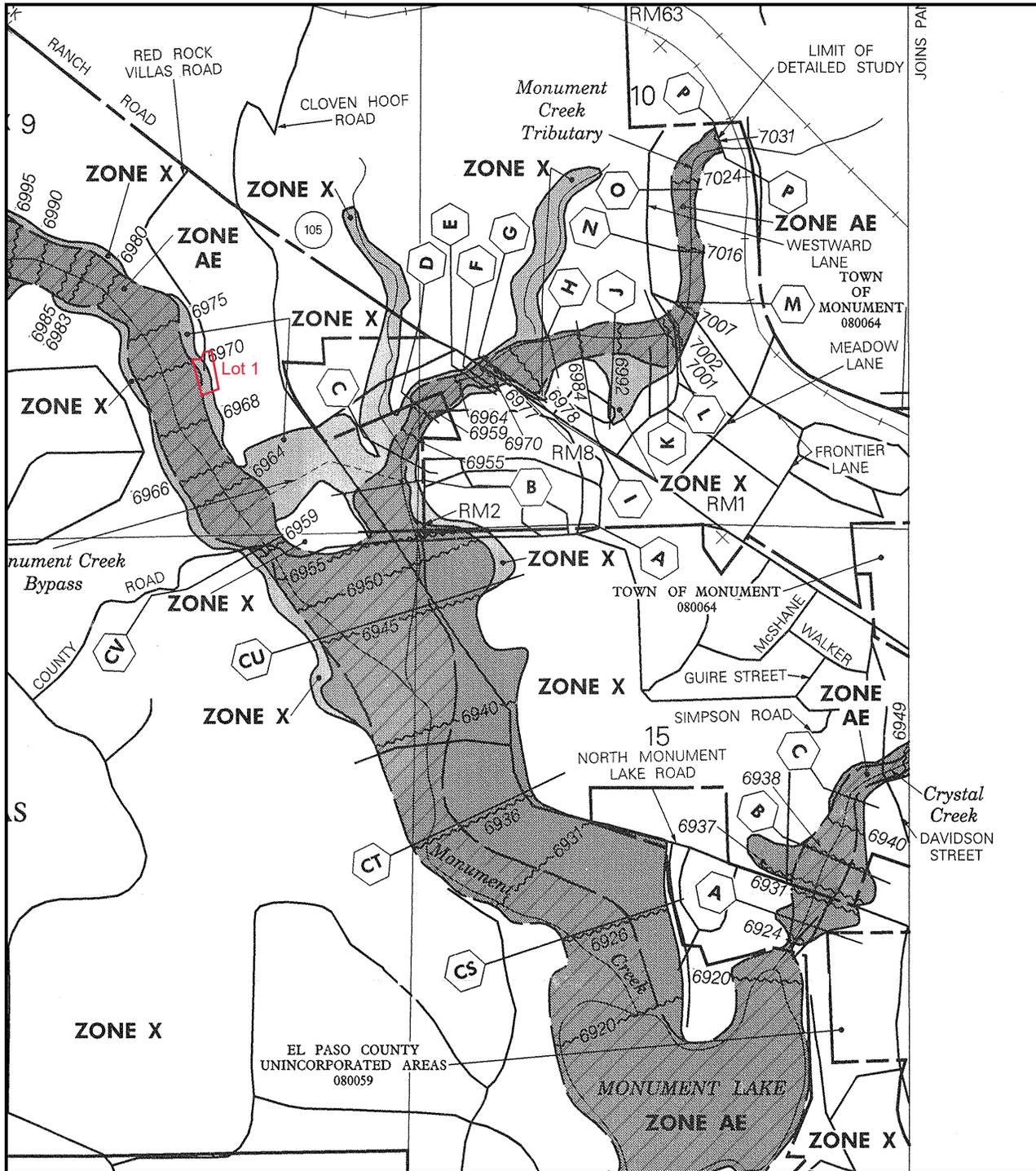
RAMPART SURVEYS, LLC

P.O. Box 5101 Woodland Park, CO, 80866 (719) 687-0920

DRAWING: 18228FP.DWG PAGE 2 OF 2

Appendix B

FEMA Maps



NATIONAL FLOOD INSURANCE PROGRAM

**FIRM
FLOOD INSURANCE RATE MAP**

**EL PASO COUNTY,
COLORADO AND
INCORPORATED AREAS**

PANEL 260 OF 1300
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY, UNINCORPORATED AREAS	080059	0260	F
MONUMENT, TOWN OF	080064	0260	F
PALMER LAKE, TOWN OF	080065	0260	F

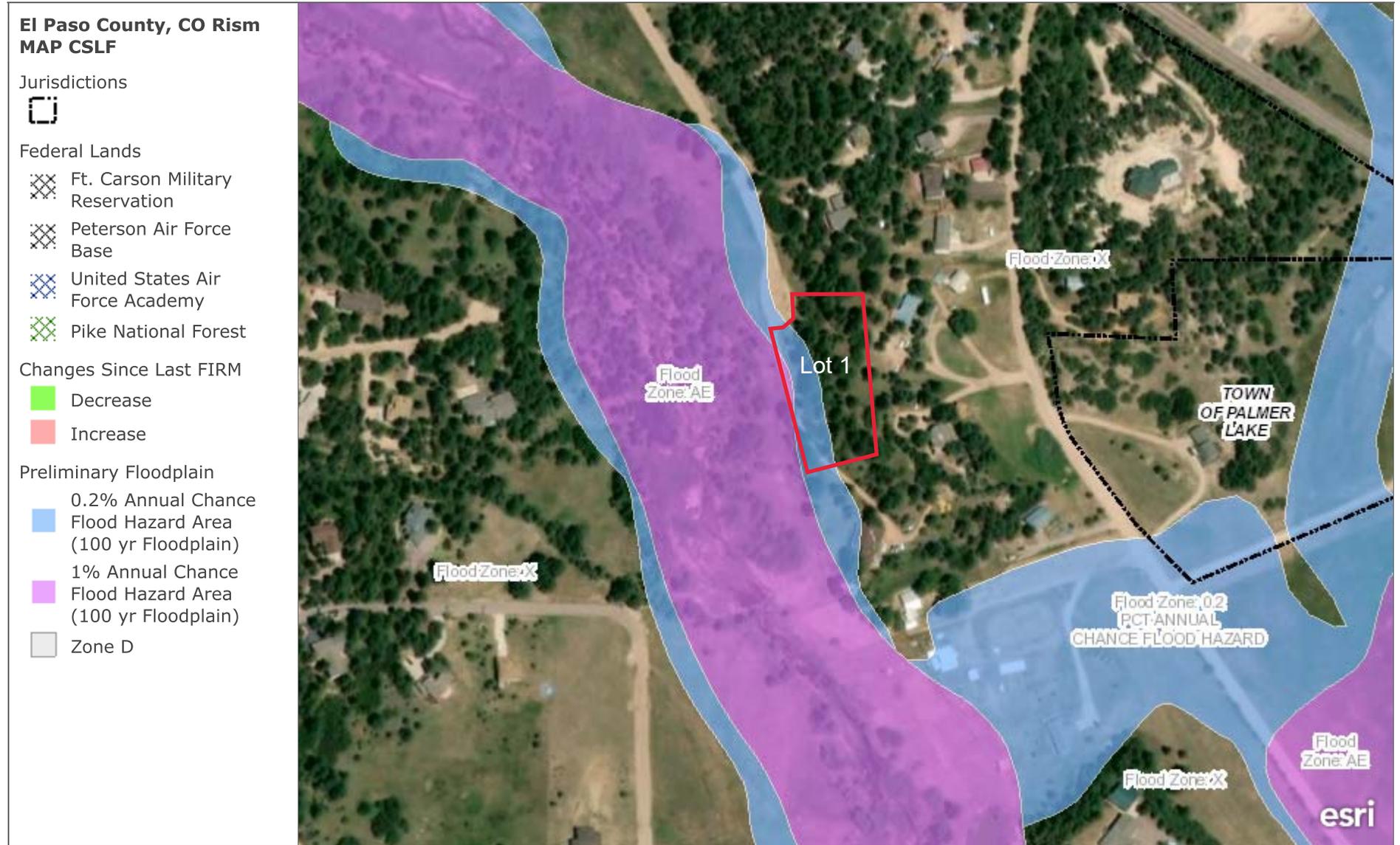
**MAP NUMBER
08041C0260 F**

**EFFECTIVE DATE:
MARCH 17, 1997**


Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

El Paso County, CO Risk MAP CSLF



The El Paso County, CO CSLF viewer displays data related to flood risk in El Paso County and all Jurisdictions within.

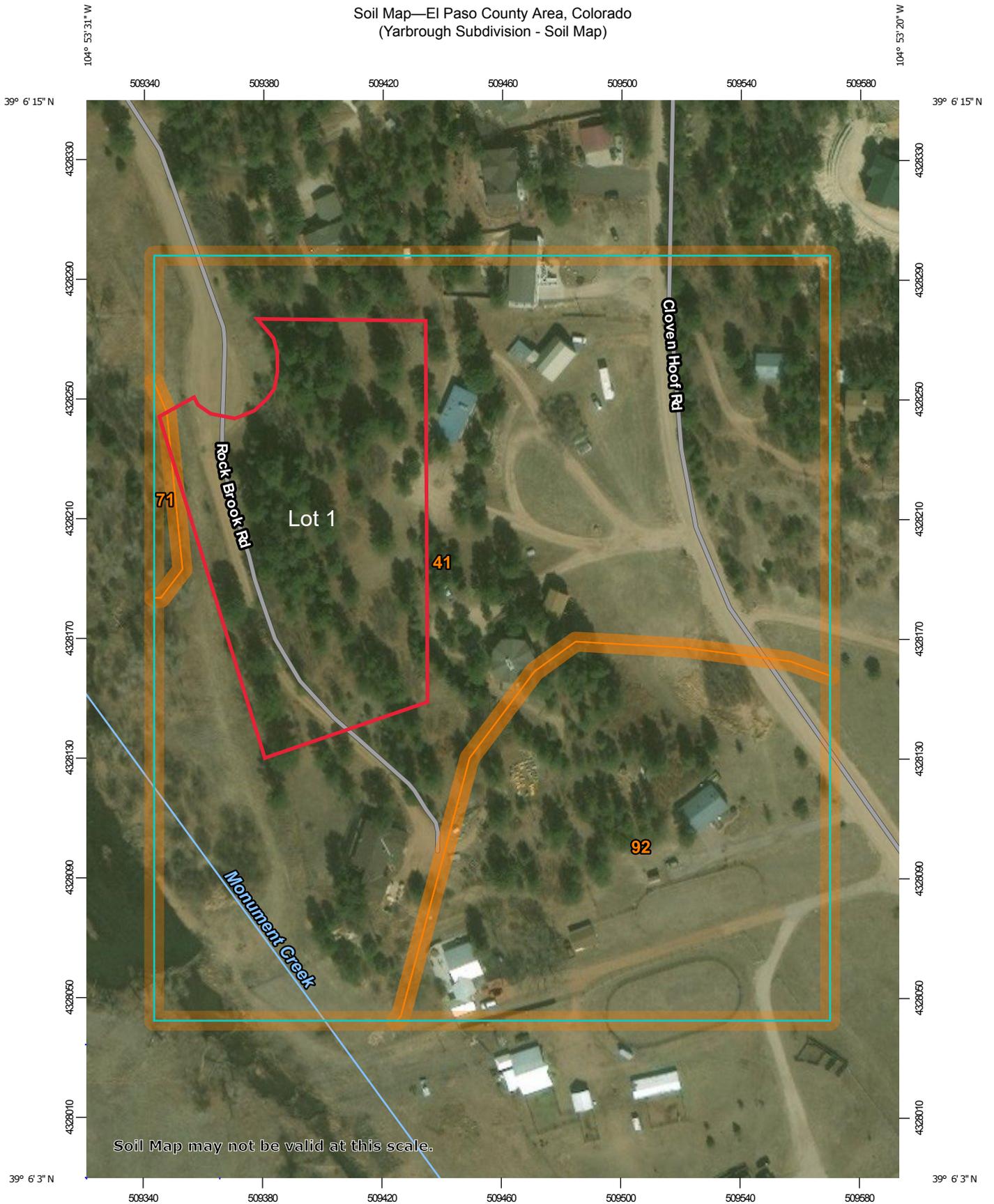
300ft

USDA FSA

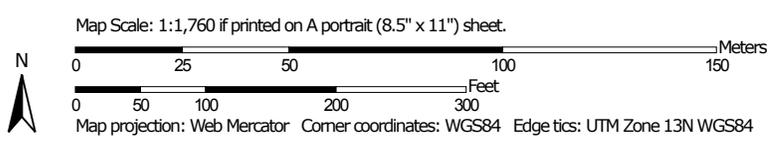
Appendix C

Soil Information

Soil Map—El Paso County Area, Colorado
(Yarbrough Subdivision - Soil Map)



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

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 15, Oct 10, 2017

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

Date(s) aerial images were photographed: Feb 22, 2014—Mar 9, 2017

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
41	Kettle gravelly loamy sand, 8 to 40 percent slopes	10.4	72.6%
71	Pring coarse sandy loam, 3 to 8 percent slopes	0.1	0.8%
92	Tomah-Crowfoot loamy sands, 3 to 8 percent slopes	3.8	26.6%
Totals for Area of Interest		14.4	100.0%

Appendix D

Drainage Calculations

City of Colorado Springs and El Paso County Drainage Criteria Manual Excerpts



NOAA Atlas 14, Volume 8, Version 2
Location name: Palmer Lake, Colorado, USA*
Latitude: 39.1035°, Longitude: -104.8917°
Elevation: 6979.94 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

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

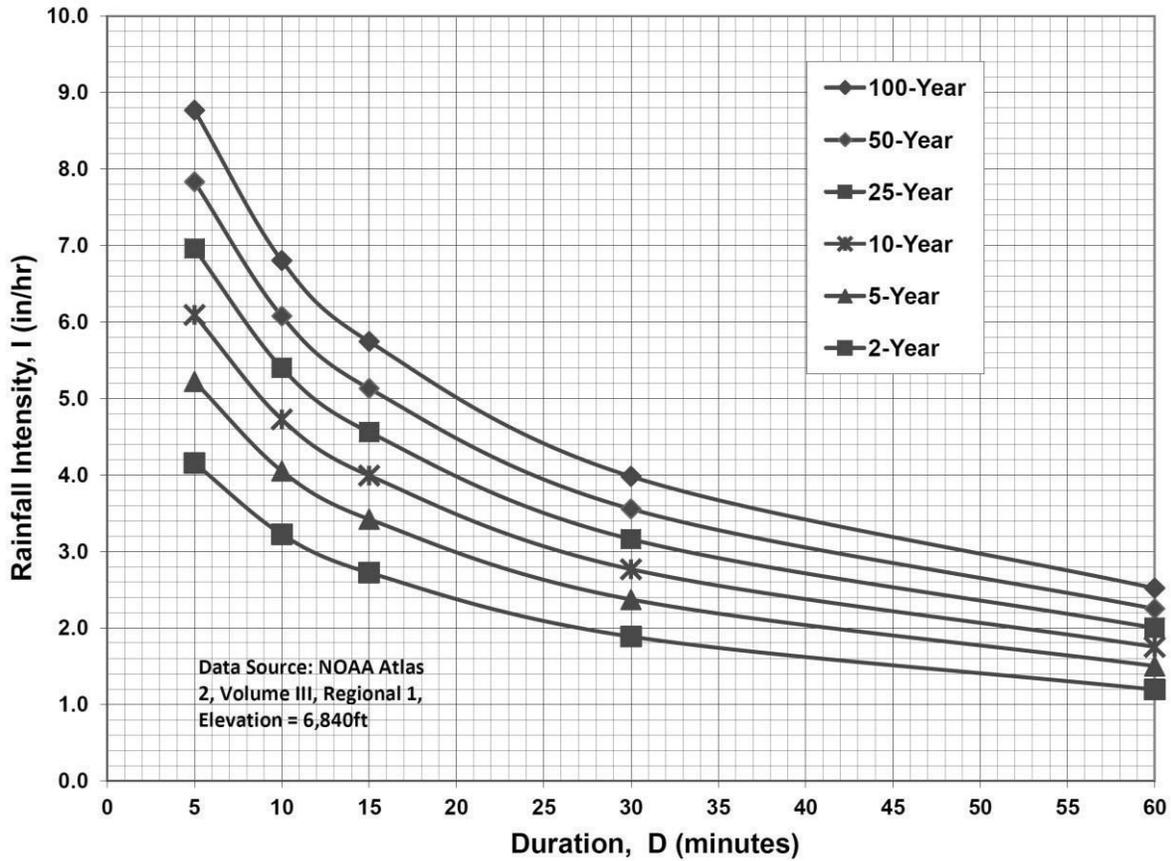
NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerials](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.244 (0.200-0.296)	0.315 (0.258-0.382)	0.433 (0.353-0.527)	0.534 (0.432-0.651)	0.674 (0.527-0.846)	0.784 (0.599-0.993)	0.897 (0.661-1.16)	1.01 (0.715-1.33)	1.17 (0.793-1.57)	1.29 (0.852-1.75)
10-min	0.357 (0.293-0.433)	0.461 (0.377-0.560)	0.635 (0.517-0.771)	0.781 (0.633-0.953)	0.987 (0.772-1.24)	1.15 (0.877-1.45)	1.31 (0.968-1.69)	1.48 (1.05-1.95)	1.71 (1.16-2.30)	1.89 (1.25-2.56)
15-min	0.436 (0.357-0.528)	0.563 (0.460-0.683)	0.774 (0.631-0.941)	0.953 (0.772-1.16)	1.20 (0.941-1.51)	1.40 (1.07-1.77)	1.60 (1.18-2.07)	1.81 (1.28-2.38)	2.09 (1.42-2.80)	2.30 (1.52-3.13)
30-min	0.566 (0.463-0.686)	0.733 (0.600-0.889)	1.01 (0.824-1.23)	1.24 (1.01-1.52)	1.57 (1.23-1.97)	1.83 (1.40-2.31)	2.09 (1.54-2.69)	2.36 (1.66-3.10)	2.72 (1.84-3.65)	3.00 (1.98-4.07)
60-min	0.717 (0.587-0.869)	0.891 (0.729-1.08)	1.19 (0.972-1.45)	1.46 (1.18-1.78)	1.85 (1.46-2.35)	2.18 (1.67-2.77)	2.52 (1.86-3.27)	2.88 (2.04-3.81)	3.39 (2.31-4.57)	3.79 (2.51-5.15)
2-hr	0.868 (0.716-1.04)	1.05 (0.864-1.26)	1.38 (1.13-1.66)	1.68 (1.37-2.03)	2.14 (1.70-2.70)	2.53 (1.96-3.21)	2.95 (2.20-3.81)	3.41 (2.44-4.49)	4.06 (2.79-5.46)	4.59 (3.05-6.19)
3-hr	0.984 (0.814-1.18)	1.15 (0.953-1.38)	1.48 (1.22-1.77)	1.79 (1.47-2.15)	2.29 (1.84-2.90)	2.73 (2.13-3.46)	3.21 (2.41-4.15)	3.75 (2.70-4.94)	4.53 (3.13-6.09)	5.18 (3.45-6.95)
6-hr	1.21 (1.01-1.43)	1.39 (1.16-1.65)	1.76 (1.46-2.09)	2.13 (1.75-2.53)	2.72 (2.21-3.42)	3.24 (2.55-4.10)	3.83 (2.90-4.92)	4.48 (3.25-5.88)	5.45 (3.79-7.28)	6.25 (4.20-8.34)
12-hr	1.47 (1.23-1.72)	1.73 (1.45-2.04)	2.23 (1.86-2.62)	2.69 (2.23-3.18)	3.41 (2.77-4.22)	4.02 (3.18-5.01)	4.70 (3.57-5.96)	5.43 (3.96-7.04)	6.50 (4.54-8.60)	7.37 (4.98-9.78)
24-hr	1.78 (1.50-2.06)	2.11 (1.78-2.46)	2.71 (2.28-3.16)	3.26 (2.72-3.81)	4.08 (3.32-4.98)	4.77 (3.78-5.87)	5.50 (4.21-6.91)	6.30 (4.61-8.08)	7.43 (5.22-9.73)	8.34 (5.68-11.0)
2-day	2.11 (1.79-2.43)	2.47 (2.09-2.84)	3.10 (2.62-3.58)	3.68 (3.09-4.26)	4.55 (3.73-5.50)	5.27 (4.21-6.43)	6.05 (4.66-7.53)	6.90 (5.08-8.77)	8.09 (5.72-10.5)	9.05 (6.20-11.9)
3-day	2.28 (1.95-2.61)	2.67 (2.27-3.06)	3.35 (2.85-3.85)	3.97 (3.35-4.57)	4.88 (4.01-5.86)	5.64 (4.51-6.83)	6.45 (4.97-7.97)	7.31 (5.40-9.25)	8.53 (6.05-11.0)	9.52 (6.55-12.4)
4-day	2.42 (2.07-2.76)	2.83 (2.42-3.24)	3.55 (2.98-4.12)	4.19 (3.51-4.87)	5.14 (4.21-6.07)	5.93 (4.71-7.15)	6.76 (5.11-8.61)	7.65 (5.63-9.67)	8.90 (6.33-11.5)	9.89 (6.83-12.9)

Figure 6-5. Colorado Springs Rainfall Intensity Duration Frequency



IDF Equations

$$I_{100} = -2.52 \ln(D) + 12.735$$

$$I_{50} = -2.25 \ln(D) + 11.375$$

$$I_{25} = -2.00 \ln(D) + 10.111$$

$$I_{10} = -1.75 \ln(D) + 8.847$$

$$I_5 = -1.50 \ln(D) + 7.583$$

$$I_2 = -1.19 \ln(D) + 6.035$$

Note: Values calculated by equations may not precisely duplicate values read from figure.

YARBROUGH SUBDIVISION

No.	REVISION	BY	DATE

**MAJOR BASIN/HISTORIC
DRAINAGE PLAN**

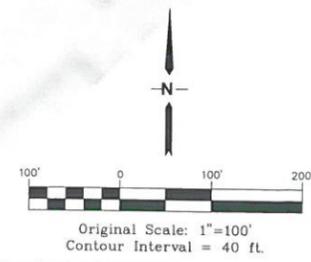
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VERT. SCALE: N/A	DESIGNED: JPS
SURVEYED: RAMPART	CHECKED: JPS
CREATED: 3/31/10	LAST MODIFIED: 4/26/10
PROJECT NO: 031004	MODIFIED BY: BJJ
SHEET:	

EX1



DRAINAGE LEGEND

- RIPRAP
- FLOW DIRECTION ARROW
- FLOWLINE
- DRAINAGE BASIN BOUNDARY
- DEVELOPED BASIN DESIGNATION
- DEVELOPED BASIN AREA (ACRES)
- DESIGN POINT
- Q_s (cfs)
- Q₁₀₀ (cfs) (DEVELOPED FLOW)

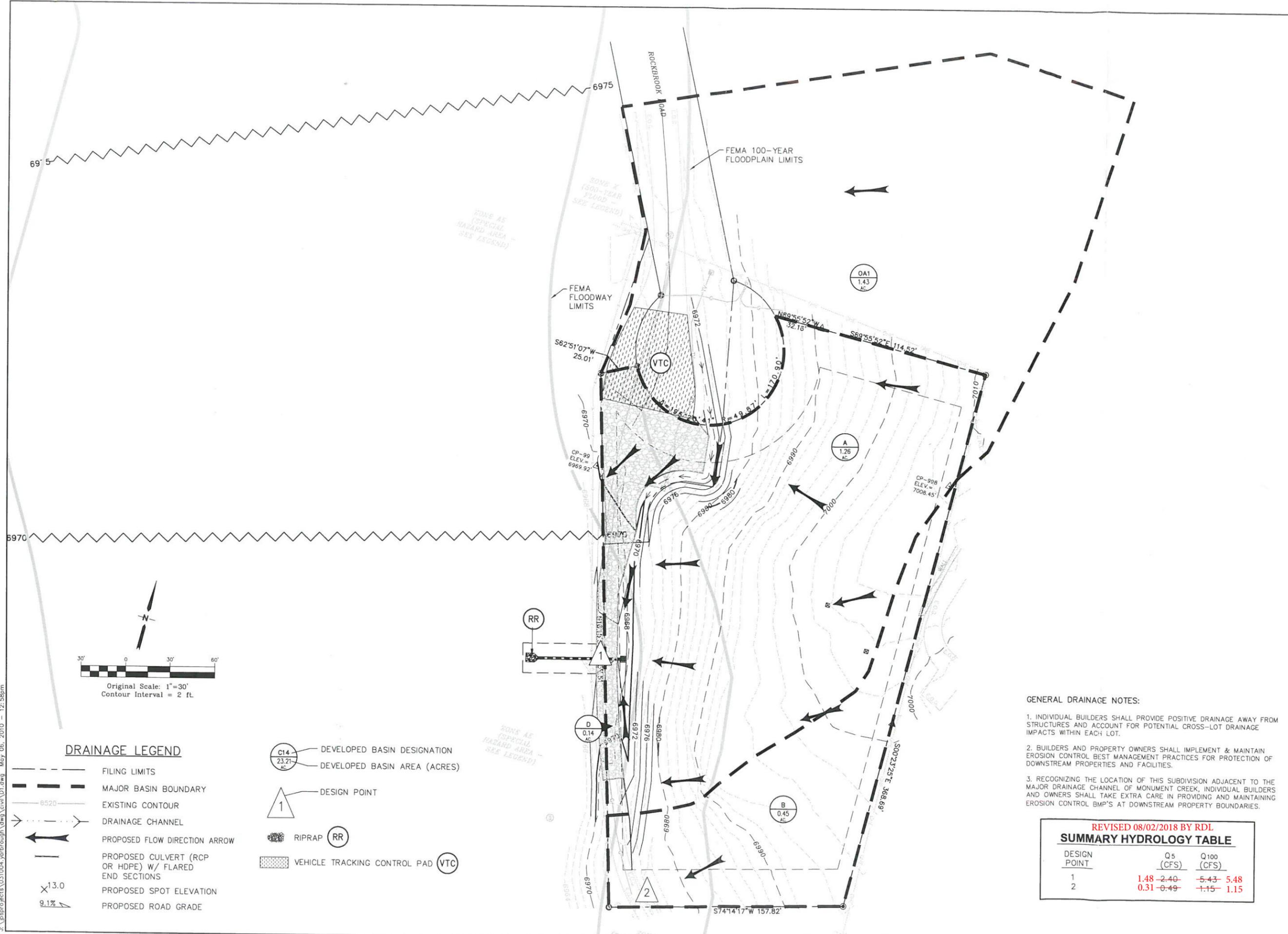


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YARBROUGH SUBDIVISION

DEVELOPED DRAINAGE & EROSION CONTROL PLAN

No.	REVISION	BY	DATE



GENERAL DRAINAGE NOTES:

- INDIVIDUAL BUILDERS SHALL PROVIDE POSITIVE DRAINAGE AWAY FROM STRUCTURES AND ACCOUNT FOR POTENTIAL CROSS-LOT DRAINAGE IMPACTS WITHIN EACH LOT.
- BUILDERS AND PROPERTY OWNERS SHALL IMPLEMENT & MAINTAIN EROSION CONTROL BEST MANAGEMENT PRACTICES FOR PROTECTION OF DOWNSTREAM PROPERTIES AND FACILITIES.
- RECOGNIZING THE LOCATION OF THIS SUBDIVISION ADJACENT TO THE MAJOR DRAINAGE CHANNEL OF MONUMENT CREEK, INDIVIDUAL BUILDERS AND OWNERS SHALL TAKE EXTRA CARE IN PROVIDING AND MAINTAINING EROSION CONTROL BMP'S AT DOWNSTREAM PROPERTY BOUNDARIES.

REVISED 08/02/2018 BY RDL

DESIGN POINT	Q5 (CFS)	Q100 (CFS)
1	1.48 - 2.40	5.43 - 5.48
2	0.31 - 0.49	1.15 - 1.15

DRAINAGE LEGEND

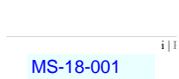
- FILING LIMITS
- MAJOR BASIN BOUNDARY
- EXISTING CONTOUR
- DRAINAGE CHANNEL
- PROPOSED FLOW DIRECTION ARROW
- PROPOSED CULVERT (RCP OR HDPE) W/ FLARED END SECTIONS
- PROPOSED SPOT ELEVATION
- PROPOSED ROAD GRADE
- DEVELOPED BASIN DESIGNATION
- DEVELOPED BASIN AREA (ACRES)
- DESIGN POINT
- RIPRAP
- VEHICLE TRACKING CONTROL PAD

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VERT. SCALE: N/A	DESIGNED: JPS
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PROJECT NO: 031004	MODIFIED BY: BJJ
SHEET:	

Markup Summary

dsdrice (5)



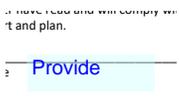
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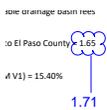
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