FINAL DRAINAGE REPORT

FOR

PADMARK BUSINESS PARK FILING NO. 1

(LOT 44 OF CLAREMONT BUSINESS PARK FILING NO. 2)
EL PASO COUNTY, COLORADO

May 2017

Prepared for:

Hammers Construction, Inc.
1411 Woolsey Heights
Colorado Springs, CO 80915

Prepared by:

CIVIL CONSULTANTS, INC.

20 Boulder Crescent, Suite 110
Colorado Springs, CO 80903
(719) 955-5485

Project #44-025
DSD Project #PPR-17-004

FINAL DRAINAGE REPORT
FOR
PADMARK BUSINESS PARK FILING NO. 1
(Lot 44 of Claremont Business Park Filing No. 2)

DRAINAGE PLAN STATEMENTS

ENGINEERS STATEMENT

The attached drainage plan and report was 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 acceptable to the City of Colorado Springs. I accept responsibility for any liability caused by any negligent acts, errors of omission on my part in preparing this report.

_____
Virgil A. Sanchez, P.E. #37160
For and on Behalf of M&S Civil Consultants, Inc

DEVELOPER'S STATEMENT

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

BY:_____

TITLE:_____
DATE:_____

ADDRESS: Hammers Construction, LLC
1411 Woolsey Heights
Colorado Springs, CO80915

EL PASO COUNTY'S STATEMENT

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

BY:_____ DATE:_____
Jennifer Irvine, P.E.
County Engineer

CONDITIONS:

FINAL DRAINAGE REPORT
FOR
PADMARK BUSINESS PARK FILING NO. 1
(Lot 44 of Claremont Business Park Filing No. 2)

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APPENDIX

FINAL DRAINAGE REPORT
FOR
PADMARK BUSINESS PARK FILING NO. 1
(Lot 44 of Claremont Business Park Filing No. 2)

PURPOSE

This document is intended to serve as the Final Drainage Report for PADMARK BUSINESS PARK FILING NO. 1 (Lot 44 of Claremont Business Park Filing No. 2). The purpose of this document is to identify and analyze the on and offsite drainage patterns and to ensure that post development runoff is routed through the site safely and in a manner that satisfies the requirements set forth by the El Paso County Drainage Criteria Manual. The proposed principal use for the three lots site consist of all infrastructure typically associated with three commercial building structures. The majority of the site will consist of asphalt, curb, lighting, a storm water quality facility and landscaping. The proposed use is a permissible use within the Commercial Service zoning criteria.

GENERAL LOCATION AND DESCRIPTION

PADMARK BUSINESS PARK FILING NO. 1 is located in the northeast quarter of the northeast quarter of Section 8, Township 14 South, Range 65 West of the 6th P.M. in El Paso County, Colorado. The site is bound on the northeast by a vacant parcel of land that is anticipated to be developed in the near future as the Claremont Business Park continues to build out. The site is bound on the northwest by the East Fork Sand Creek Channel. The property is bound to the southwest by an existing development of an office/warehouse/storage yard with an access road and bound to the southeast by the existing Meadowbrook Parkway. The site lies within the Sand Creek Drainage Basin. Flows from this site are tributary to Sand Creek.

Lot 44 of the Claremont Business Park consist of 3.851 acres in which is presently undeveloped. Vegetation is sparse, consisting of native grasses. The site had experienced overlot grading activities within the last ten years. Existing site terrain generally slopes from north to south at grade rates that vary between 2% and 10%.The proposed project consists of replatting Lot 44 site into (3) commercial lots.

The PADMARK BUSINESS PARK FILING NO. 1 site is currently zoned "CS" and the proposed principal uses for the (3) lots will be an office/warehouse/light manufacturing. The majority of each lot shall consist of warehouse building, asphalt, curb, lighting, a storm water quality facility and landscaping. Each lot shall provide a sand filter basin to be constructed at the southwest end of each lot, which will function to provide water quality treatment for the site's and eventually outfall directly to East Fork Sand Creek.

SOILS

Soils for this project are delineated by the map in the appendix as Ellicott Loamy Course Sand (28) and Blendon Sandy Loam (10) and Blakeland Loamy Sand (8) is characterized as Hydrologic Soil Types "A" &"B". Soils in the study area are shown as mapped by S.C.S. in the "Soils Survey of El Paso County Area". Vegetation is sparse, consisting of native grasses and weeds.

HYDROLOGIC CALCULATIONS

Hydrologic calculations were performed using the El Paso County and City of Colorado Springs Storm Drainage Design Criteria manual and where applicable the Urban Storm Drainage Criteria Manual. The Rational Method was used to estimate stormwater runoff anticipated from design storms with 5-year and 100-year recurrence intervals.

HYDRAULIC CALCULATIONS

Hydraulic calculations were estimated using the Manning's Formula and the methods described in the El Paso County and City of Colorado Springs Storm Drainage Design Criteria manual. The relevant data sheets are included in the appendix of this report.

FLOODPLAIN STATEMENT

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel No. 08041C0756 F and Panel No. 08041C0752 F, effective date March 17, 1997 and revised to reflect LOMR, 06-08-B137P, dated December 13, 2006, the site lies adjacent to and is NOT impacted by a Zone "AE". An annotated FIRM Panel is included in the Appendix. The approximate BFE of the East Fork Creek adjacent to the proposed pond is 6353. The proposed sand filter pond is designed above the East Sand Creek BFE.

DRAINAGE CRITERIA

This drainage analysis has been prepared in accordance with the current City of Colorado Springs/El Paso County Drainage Criteria Manual. Calculations were performed to determine runoff quantities for the 5-year and 100-year frequency storms for developed conditions using the Rational Method as required for basins having areas less than 100 acres.

FOUR STEP PROCESS

Step1 Employ Runoff Reduction Practices – Approx. 0.80 ac of the proposed developed 3.851 ac of ground within the project is being set aside for Open Space/WQ facility. Roof drains will be directed to property lines swales to minimize direct connection of impervious surfaces.

Step 2 Stabilize Drainageways – The site is directly adjacent to the Sand Creek Channel. The "Final Drainage Report for Claremont Business Park Filing No. 2", dated November 2006, by Matrix Design Group, Inc. (hence for referred to as "MDDP") has been designed to discharge developed flows via a 48" RCP directly to the East Fork Sand Creek. The HALLGREN site proposed a Sand Filter Water Quality Facility before discharging to the 48" RCP pipe. The outlet underdrain has been designed to drain the pond in a peak event within 12 hours, therefore is not anticipated to have negative effects on downstream drainageways.A Sand Filter Basin water quality facilities is proposed to provide WQCV.

Step 3 Provide Water Quality Capture Volume – A Sand Filter Basin water quality facility is proposed to provide WQCV.

Step4 Consider Need for Industrial and Commercial BMP's – This submittal provides a final grading and erosion control plans with BMPs in place. The proposed project will use silt fence, a vehicle tracking control pad, concrete washout area, mulching and reseeding to mitigate the potential for erosion across the site.

EXISTING DRAINAGE CONDITIONS

The PADMARK BUSINESS PARK FILING NO. 1 site (Lot 44) consists of 3.851 acres and is situated east of the East Fork Reach of the Sand Creek Watershed. This area was previously studied in the "Final Drainage Report for Claremont Business Park Filing No. 2", dated November 2006, by Matrix Design Group, Inc. (hence for referred to as "MDDP") and was included within Sub-basin B5 (Lot 44). The MDDP calculations indicate that the total tributary area of Sub-basin B5 (4.0acres) would produce runoff of approximately Q5=12.0 cfs and Q100=24.1cfs. The MDDP illustrated that the basin watershed would drain and be collected by a10' Type R sump inlet which was proposed to be located at the southwest corner of the Lot 44. In the existing condition, Lot 44 is currently undeveloped.

The adjacent developed site to the southwest collects the runoff from the asphalt parking area via area inlets and then outfalls to Sand Creek via an existing 48" storm sewer within the access road to the south of the proposed site. The runoff from the adjacent existing Meadowbrook Parkway roadway is collected via curb inlets and outfalls to Sand Creek via the existing 48" storm sewer within the access road to the south of the proposed site. 0.77 acres of existing undeveloped offsite runoff shall be collected within the PADMARK BUSINESS PARK FILING NO. 1 project site.

A sand filter basin is proposed to be constructed at the southwest end of each of the (3) commercial lots, and which will function to provide water quality treatment for each development and eventually outfall directly to East Fork Sand Creek.

PROPOSED DRAINAGE CHARACTERISTICS (Lot 1)

General Concept Drainage Discussion

Runoff tributary to the southwestern boundary and sand filter basin of the PADMARK BUSINESS PARK FILING NO. 1 site is produced within Basin A (See Proposed Drainage Map in the appendix). This tributary basin consists of approximately (Lot 1) 1.291 commercial developed ac and have been estimated to generate runoff of approximately Q_5=5.4cfs & Q_{100}=9.9 cfs during the 5 and100-year events, respectively, (rational method). Existing offsite flows traveling, from the north to the south, enter into the sand filter basin via a swale along the northern boundary of the Hallgren site. These existing offsite flows are attributed from the 0.77 ac of Basin EX with runoff of approximately Q_5=0.3cfs & Q_{100}=1.8 cfs. It is planned that Lot 44 will be replatted in to (3) lots in the future. It is important to note that the proposed Sand Filter Basin functions to provide water quality for the 100 year event for runoff produced onsite and existing offsite flows (Basin EX) traveling along the northern boundary of the Hallgren site . The remaining 2.560 ac of Lot 44 of Claremont Business Park has been delineated into Basin FR and future development within that basin will be required to provide individual water quality treatment for all onsite flows.

This project site development of Lot 1 consists of 1.291acres within Sub-Basin B5 (4.0 AC) of the previously mentioned Final Drainage Report for Claremont Business Park Filing No. 2. The MDDP illustrates that the Sub-Basin B5 watershed would drain to the southwest corner of Lot 44 and would be collected by a 10' Type R sump inlet and carried to the existing 48" storm sewer before outfalling into East Fork Sand Creek. A 30" RCP storm sewer has been proposed to carry all flows produced by Basin FR upon future development and has been designed for commercial runoff within that basin, up to the 100 year event. It will be capped at Design Point 1 to be available upon future development.

Runoff collected and conveyed to the water quality facility are discharged from a proposed sand filter basin via a 4' CDOT inlet box & a 24" RCP. The proposed 24" RCP outlet pipe from the sand filter basin shall tie into the same 30" RCP storm sewer, which will tie into the existing 48" storm sewer. An emergency overflow spillway section has been proposed in the event of blockage of the 4' inlet. All flows generated by Lot 44 of Claremont Business Park will be conveyed to the southwest corner as was originally illustrated by the MDDP.

Detailed Drainage Discussion

Basin A, 1.291 acres, (Q_5=5.4 cfs, Q_{100}=9.9 cfs), consists of office/warehouse/light manufacturing with a contractors supply and construction vehicle storage yard (1.291 ac of the currently platted 3.851 ac Lot 44) currently zoned Commercial Service. Runoff of Q5=5.9 cfs and Q100=10.4 cfs has been calculated to be produced by the basin. Flows produced within the watershed are routed as surface runoff to DP2 where they are conveyed to the onsite Sand Filter Basin water quality pond via curb and gutter on the north and south side of the development.

Basin EX, 0.77 acre,(Q_5=0.3 cfs, Q_{100}=1.8 cfs), consists of existing offsite flows that are tributary to the proposed sand filter basin during the interim condition when the Hallgren site is developed and the remaining land north if it is undeveloped.

Basin FR, 2.56 acres, (Q_5=10.7 cfs, Q_{100}=19.6 cfs), consists of all future development north of the proposed Hallgren site. Hydrologic calculations for Basin FR take into account anticipated future commercial development. Upon development of Basin FR all storm sewer conveying runoff from future water quality facilities will connect to the proposed 30" RCP storm sewer located at Design Point 1. Each future lot shall provide an emergency overflow spillway to Sand Creek within the design of its water quality treatment system.

There are no planned or required improvements to the Sand Creek Drainage Channel with the development of the PADMARK BUSINESS PARK FILING NO. 1 site.

Further analysis for Lots 2 & 3 shall be required in the future at the time of proposed development.

WATER QUALITY PROVISIONS AND MAINTENANCE

The proposed Sand Filter Basin functions to provide water quality for runoff produced on the PADMARK BUSINESS PARK FILING NO. 1 site (Lot 1) and by Basin EX (see Proposed Drainage Map). The remaining balance of Lot 44 shall remain undisturbed. It is planned that Lot 44 will be replatted in to (3) lots. Each of the 3 lots shall be responsible for each respective generated runoff. This water quality pond is designed to treat approx 2.061 (Basin A and Basin EX) ac, and provide 1,616 cubic-feet of water quality storage. The water quality basin will be private and shall be maintained by the property owner. Access shall be granted to the owner and El Paso County for access and maintenance of the private WQCV facility. A private maintenance agreement document shall accompany the submittal.

The water quality volume required for the site has been determined using the guidelines set forth in the City of Colorado Springs/El Paso County Drainage Criteria Manual - Volume II. Refer to the water quality facility sizing calculations located within the appendix of this report.

EROSION CONTROL

It is the policy of the El Paso County that we submit a grading and erosion control plan with the drainage report. Proposed silt fence, vehicle traffic control, and concrete washout area are proposed as erosion control measures.

CONSTRUCTION COST OPINION (Lot 1) Only

Private Drainage Facilities NON-Reimbursable:

Item	Description	Quantity	Unit Cost	Cost
1.	24" RCP	8LF	$58/LF	$ 464.00
2.	30" RCP	147 LF	$65/LF	$ 9,555.00
3.	Concrete Spillway Wall	1 EA	$500/EA	$ 500.00
4.	SC250 Spillway Mat	10/SY	$10/SY	$ 210.00
5.	WQCV Sand Filter Pond	1EA	$6,000/EA	$ 6,000.00
6.	Pond Outlet Structure	1 EA	$5,000/EA	$ 5,000.00
			Total	**$ 21,729.00**

DRAINAGE & BRIDGE FEES

No drainage fees are due as the site has been previously platted.

See Appendix L Section 3.13a regarding fee calculation for vacation/replats and revise the statement accordingly.

M &S Civil Consultants, Inc. (M &S) cannot and does not guarantee the construction cost will not vary from these opinions of probable costs. These opinions represent our best judgment as design professionals familiar with the construction industry and this development in particular. The above is only an estimate of the facility cost and drainage basin fee amounts in 2017.

SUMMARY

Development of the PADMARK BUSINESS PARK FILING NO. 1 (Lot 1) site will not adversely affect the surrounding development per this final drainage report with no negative impact of the existing development to the south of this project site of the Claremont Business Park Filing No. 2. The proposed drainage facilities will adequately convey, detain and route runoff from the tributary onsite and existing offsite flows to the Sand Creek Drainage channel. All drainage facilities described herein and shown on the included drainage map are subject to change due to formal design considerations during the construction document preparation stage. Care will be taken to accommodate overland emergency flow routes on site and temporary drainage conditions. The development of the PADMARK BUSINESS PARK FILING NO. 1, project shall not adversely affect adjacent or downstream property.

REFERENCES

1.) "El Paso County and City of Colorado Springs Drainage Criteria Manual".

2.) "Urban Storm Drainage Criteria Manual"

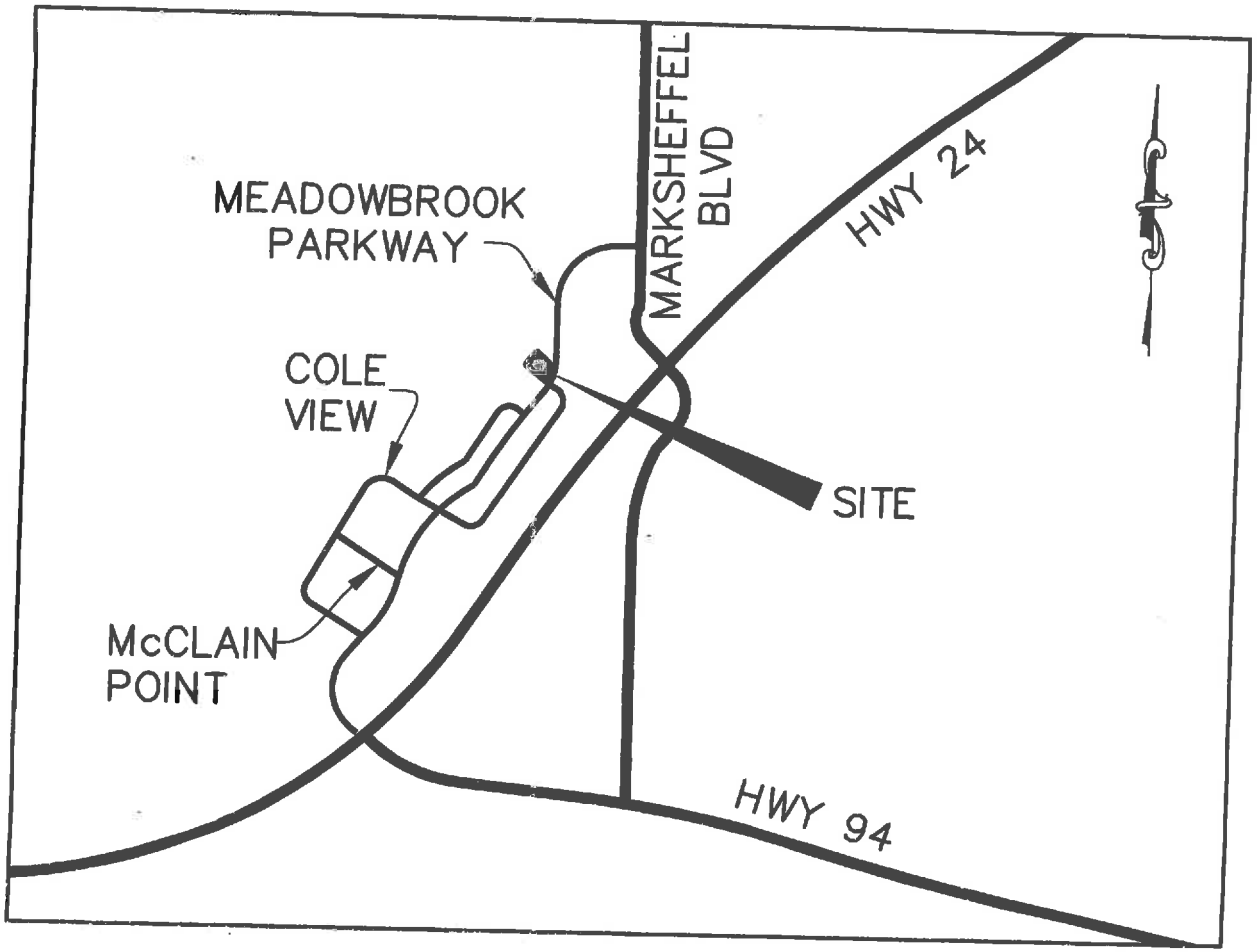
3.) SCS Soils Map for El Paso County.

4.) Flood Insurance Rate Map (FIRM), Federal Emergency Management Agency, Effective date March 17, 1997.

5.) "Final Drainage Report for Claremont Business Park Filing No. 2", dated November 2006, by Matrix Design Group, Inc.

APPENDIX

VICINITY MAP

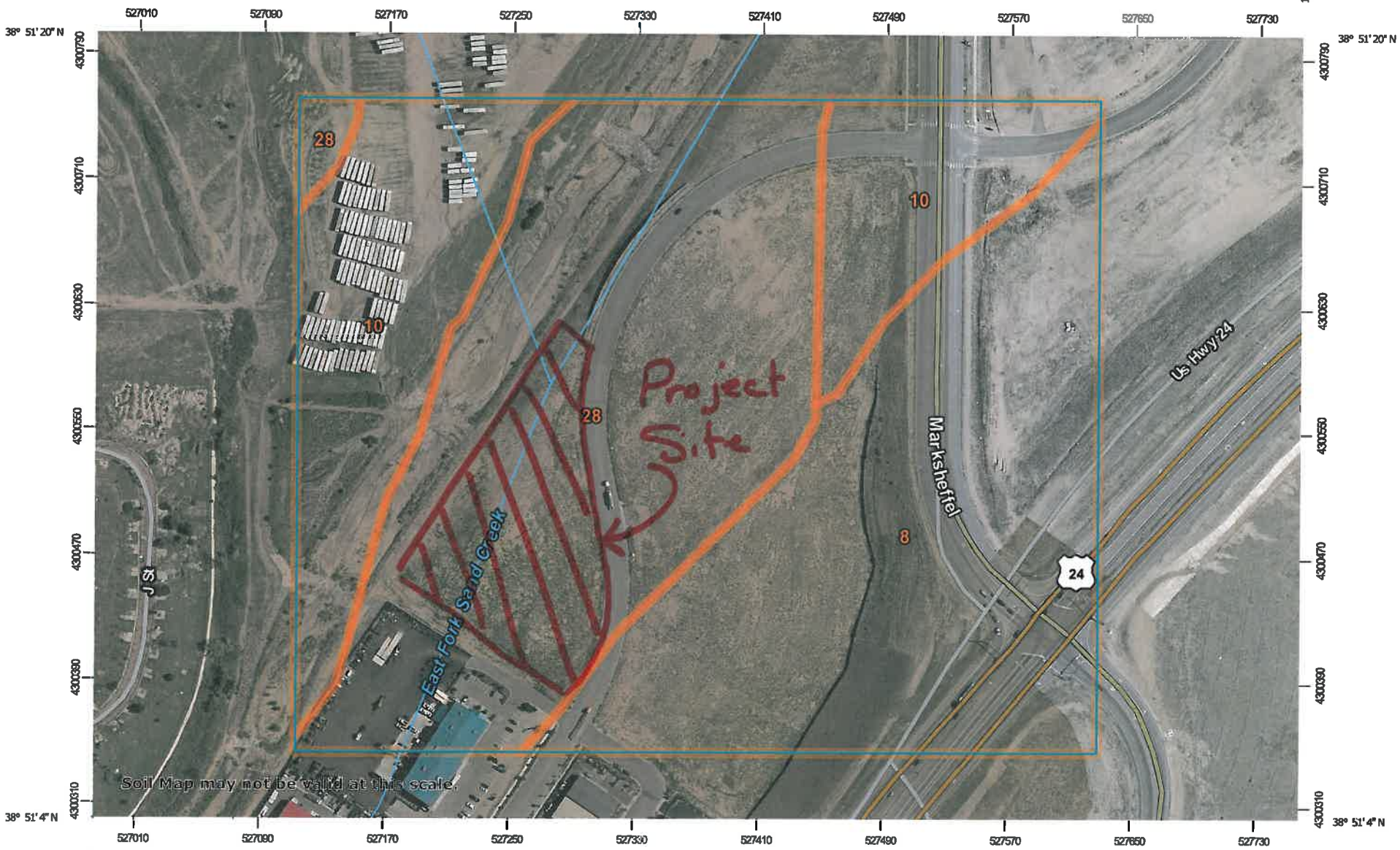


VICINITY MAP

N.T.S.

SOILS MAP

Soil Map—El Paso County Area, Colorado



Map Scale: 1:3,540 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

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 14, Sep 23, 2016

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

Date(s) aerial images were photographed: Apr 15, 2011—Jun 17, 2014

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

El Paso County Area, Colorado (CO625)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	19.3	36.1%
10	Blendon sandy loam, 0 to 3 percent slopes	12.5	23.3%
28	Ellicott loamy coarse sand, 0 to 5 percent slopes	21.7	40.6%
Totals for Area of Interest		53.5	100.0%

FIRM PANEL W/ REVISED LOMR

Federal Emergency Management Agency

Washington, D.C. 20472

NOV 13 2006

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Sallie Clark
Chair, El Paso County
Board of Commissioners
27 East Vermijo Avenue
Colorado Springs, CO 80903

IN REPLY REFER TO:
Case No.: 06-08-B137P
Follows Conditional
Case No.: 04-08-0469R
Community Name: El Paso County, CO
Community No.: 080059
Effective Date of
This Revision: DEC 13 2006

Dear Ms. Clark:

The Flood Insurance Study Report and Flood Insurance Rate Map for your community have been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Federal Insurance and Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Denver, Colorado, at (303) 235-4830, or the FEMA Map Assistance Center, toll free, at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Sincerely,

Kevin C Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

For: William R. Blanton Jr., CFM, Chief
Engineering Management Section
Mitigation Division

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map
Annotated Flood Insurance Study Report

cc: Mr. Kevin Stilson, P.E., CFM
Regional Floodplain Administrator

[redacted]
Central Marksheffel Business District

[redacted]
Matrix Design Group

 | Issue Date: NOV 13 2006 | Effective Date: NOV 13 2006 | Case No.: 06-08-B137P | LOMR-APP

Follows Conditional Case No.: 04-08-0469R

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	El Paso County Colorado (Unincorporated Areas)	CHANNELIZATION	FLOODWAY HYDRAULIC ANALYSIS NEW TOPOGRAPHIC DATA
	COMMUNITY NO.: 080059		
IDENTIFIER	Marksheffel Business District	APPROXIMATE LATITUDE & LONGITUDE: 38.863, -104.674 SOURCE: USGS QUADRANGLE DATUM: NAD 27	

ANNOTATED MAPPING ENCLOSURES			ANNOTATED STUDY ENCLOSURES
TYPE: FIRM*	NO.: 08041C0752F	DATE: March 17, 1997	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: August 23, 1999 PROFILE: 212P FLOODWAY DATA TABLE 5
TYPE: FIRM*	NO.: 08041C0756F	DATE: March 17, 1997	

Enclosures reflect changes to flooding sources affected by this revision.
* FIRM - Flood Insurance Rate Map; ** FBFM - Flood Boundary and Floodway Map; *** FHBM - Flood Hazard Boundary Map

FLOODING SOURCE(S) & REVISED REACH(ES)

East Fork Sand Creek - from approximately 5,250 feet downstream to just upstream of Marksheffel Road

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
East Fork Sand Creek	Floodway	Floodway	YES	YES
	Zone AE	Zone AE	YES	YES
	BFEs	BFEs	NONE	YES
	Zone X (Shaded)	Zone X (Unshaded)	NONE	YES

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at http://www.fema.gov/nfip.

Kevin C. Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

109770 10.3.1.0608B137 102-I-A-C

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

We provide the floodway designation to your community as a tool to regulate floodplain development. Therefore, the floodway revision we have described in this letter, while acceptable to us, must also be acceptable to your community and adopted by appropriate community action, as specified in Paragraph 60.3(d) of the NFIP regulations.

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the altered or relocated watercourse, including any related appurtenances such as bridges, culverts, and other drainage structures, rests with your community. We may request that your community submit a description and schedule of maintenance activities necessary to ensure this requirement.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance flood discharges computed in the FIS for your community without considering subsequent changes in watershed characteristics that could increase flood discharges. Future development of projects upstream could cause increased flood discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on flood discharges subsequent to the publication of the FIS report for your community and could, therefore, establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Kevin C. Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Ms. Jeanine D. Petterson
Director, Federal Insurance and Mitigation Division
Federal Emergency Management Agency, Region VIII
Denver Federal Center, Building 710
P.O. Box 25267
Denver, CO 80225-0267
(303) 235-4830

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Kevin C. Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

PUBLIC NOTIFICATION OF REVISION

PUBLIC NOTIFICATION

FLOODING SOURCE	LOCATION OF REFERENCED ELEVATION	BFE (FEET NGVD 29)		MAP PANEL NUMBER(S)
		EFFECTIVE	REVISED	
East Fork Sand Creek	Approximately 5,150 feet downstream of Marksheffel Road	6,316	6,315	08041C0752F
	Approximately 210 feet downstream of Marksheffel Road	6,381	6,379	08041C0756F

Within 90 days of the second publication in the local newspaper, a citizen may request that we reconsider this determination. Any request for reconsideration must be based on scientific or technical data. This revision will become effective 30 days from the date of this letter. However, until the 90-day period has elapsed, the revised BFEs presented in this LOMR may be changed.

A notice of changes will be published in the *Federal Register*. This information also will be published in your local newspaper on or about the dates listed below.

LOCAL NEWSPAPER Name: *El Paso County News*
Dates: 11/29/2006 and 12/06/2006

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at http://www.fema.gov/nfip.

Kevin C. Long

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

CHANGES ARE MADE IN DETERMINATIONS OF BASE FLOOD ELEVATIONS FOR THE UNINCORPORATED AREAS OF EL PASO COUNTY, COLORADO, UNDER THE NATIONAL FLOOD INSURANCE PROGRAM

On March 17, 1997, the Department of Homeland Security's Federal Emergency Management Agency identified Special Flood Hazard Areas (SFHAs) in the unincorporated areas of El Paso County, Colorado, through issuance of a Flood Insurance Rate Map (FIRM). The Mitigation Division has determined that modification of the elevations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) for certain locations in this community is appropriate. The modified Base Flood Elevations (BFEs) revise the FIRM for the community.

The changes are being made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and are in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65.

A hydraulic analysis was performed to incorporate the effects of channel improvements along Sand Creek East Fork from approximately 5,250 feet downstream to just upstream of Marksheffel Road, and has resulted in a revised delineation of the regulatory floodway, an increase in SFHA width, a decrease in SFHA width, and decreased BFEs for Sand Creek East Fork. The aforementioned channelized portion of Sand Creek East Fork contains the base flood. The table below indicates existing and modified BFEs for selected locations along the affected lengths of the flooding source(s) cited above.

Location	Existing BFE (feet)*	Modified BFE (feet)*
Sand Creek East Fork		
Approximately 5,150 feet downstream of Marksheffel Road	6,316	6,315
Approximately 210 feet downstream of Marksheffel Road	6,381	6,379

*National Geodetic Vertical Datum, rounded to nearest whole foot

Under the above-mentioned Acts of 1968 and 1973, the Mitigation Division must develop criteria for floodplain management. To participate in the National Flood Insurance Program (NFIP), the community must use the modified BFEs to administer the floodplain management measures of the NFIP. These modified BFEs will also be used to calculate the appropriate flood insurance premium rates for new buildings and their contents and for the second layer of insurance on existing buildings and contents.

Upon the second publication of notice of these changes in this newspaper, any person has 90 days in which he or she can request, through the Chief Executive Officer of the community, that the Mitigation Division reconsider the determination. Any request for reconsideration must be based on knowledge of changed conditions or new scientific or technical data. All interested parties are on notice that until the 90-day period elapses, the Mitigation Division's determination to modify the BFEs may itself be changed.

Any person having knowledge or wishing to comment on these changes should immediately notify:

The Honorable Sallie Clark
Chair, El Paso County
Board of Commissioners
27 East Vermijo Avenue
Colorado Springs, CO 80903

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					FEET (NGVD)			
Sand Creek East Fork					REVISED BY LOMR DATED OCTOBER 07, 2004			
A	1,100	100	455	11.9	6,038.7	6,038.7	6,038.7	0.0
B	2,400	100	446	12.2	6,054.3	6,054.3	6,054.3	0.0
C	3,330	100	450	12.0	6,069.9	6,069.9	6,069.9	0.0
D	4,240	100	449	12.1	6,085.1	6,085.1	6,085.1	0.0
E	4,870	100	451	12.0	6,095.2	6,095.2	6,095.2	0.0
F	5,820	250	602	8.9	6,118.4	6,118.4	6,118.9	0.5
G	6,690	150	518	10.3	6,128.1	6,128.1	6,129.1	1.0
H	7,795	125	477	11.2	6,155.2	6,155.2	6,155.2	0.0
I	8,665	150	505	10.6	6,168.8	6,168.8	6,168.8	0.0
J	9,675	100	443	12.0	6,188.4	6,188.4	6,188.4	0.0
K	10,565	115	465	11.5	6,196.2	6,196.2	6,196.2	0.0
L	11,325	166	525	10.2	6,207.3	6,207.3	6,207.3	0.0
M	11,375	173	632	8.4	6,207.9	6,207.9	6,207.9	0.0
N	12,610	367	699	7.6	6,228.8	6,228.8	6,228.8	0.1
O	13,720	188	570	10.0	6,241.7	6,241.7	6,241.7	0.0
P	14,805	125	479	11.1	6,257.9	6,257.9	6,257.9	0.0
Q	14,885	125	601	8.9	6,259.9	6,259.9	6,259.9	1.0
R	15,850	228	582	9.2	6,268.7	6,268.7	6,268.7	0.0
S	16,325	300	678	7.9	6,277.3	6,277.3	6,277.5	0.2
T	16,995	321	690	7.7	6,291.4	6,291.4	6,292.0	0.6
U	17,065	326	667	8.0	6,291.4	6,291.4	6,292.1	0.7
V	17,915	388	1,598	3.3	6,293.4	6,293.4	6,294.0	0.6
W	18,995	367	683	7.8	6,307.2	6,307.2	6,307.6	0.4
X	20,730	103	575	11.7	6,327.8	6,327.8	6,328.4	0.6
Y	22,560	142	506	11.0	6,348.8	6,348.8	6,349.4	0.6
Z	23,060	145	503	11.0	6,358.0	6,358.0	6,358.0	0.0
AA	24,835	418	3,156	7.0	6,383.5	6,383.5	6,383.5	0.0
AB	26,470	132	452	10.0	6,402.7	6,402.7	6,402.7	0.0
AC	27,715	112	419	10.8	6,416.6	6,416.6	6,416.6	0.0

REVISED AREA

[1]Feet Above Confluence With Sand Creek

REVISED BY LOMR DATED OCTOBER 30, 2006

REVISED TO REFLECT LOMR EFFECTIVE DEC 13 2006

TABLE 5

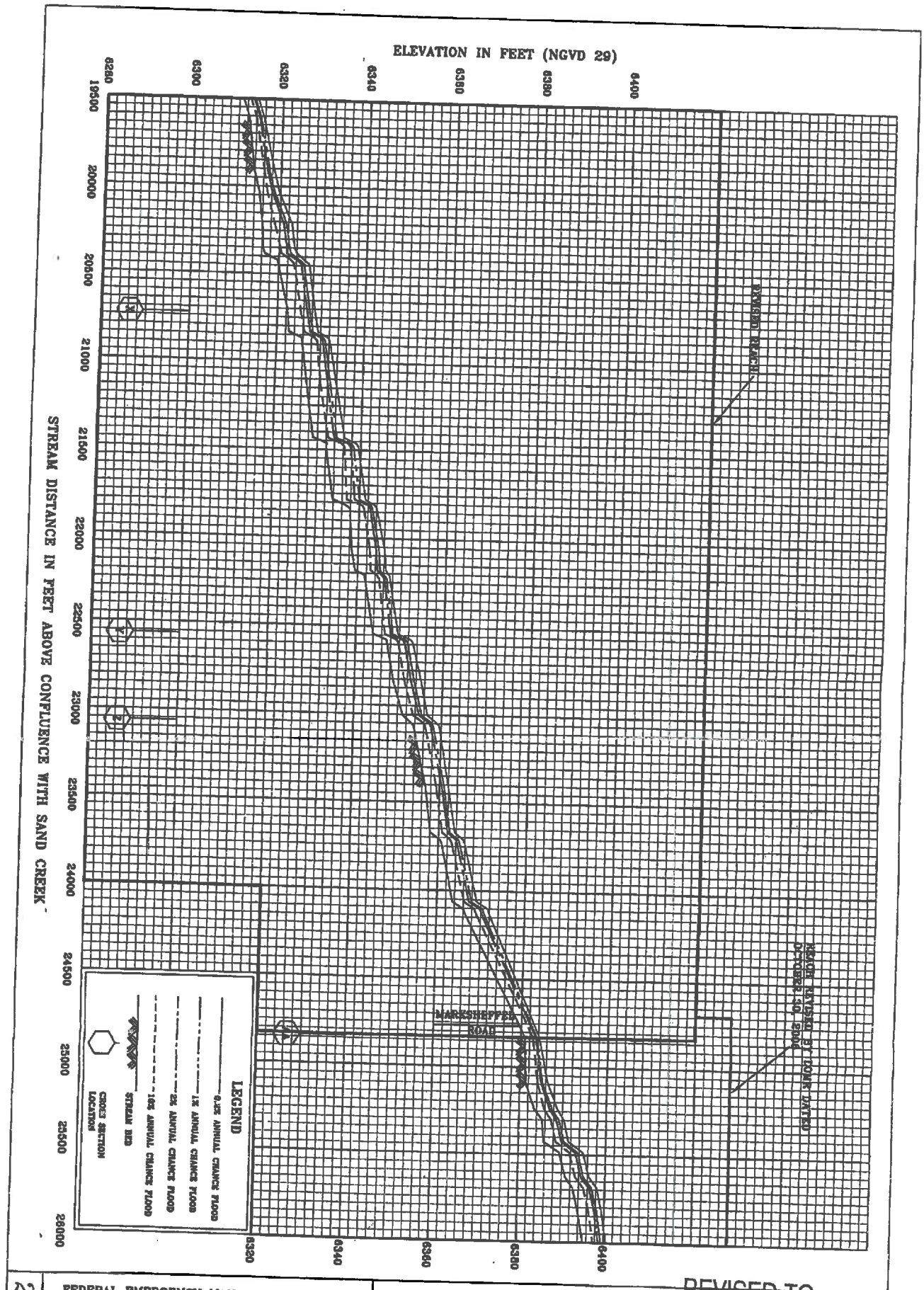
FEDERAL EMERGENCY MANAGEMENT AGENCY

EL PASO COUNTY, CO

AND INCORPORATED AREAS

FLOODWAY DATA

SAND CREEK EAST FORK



212P

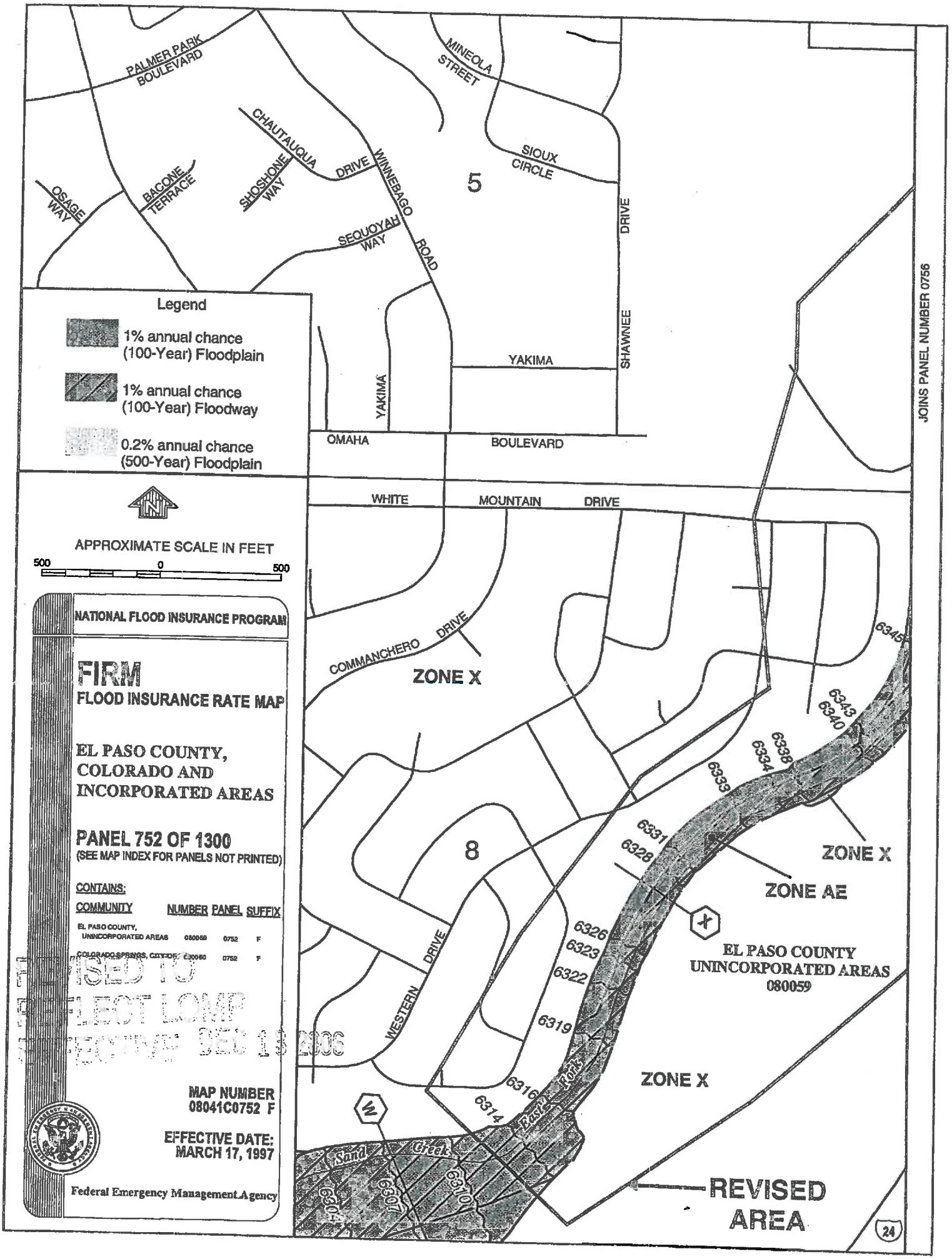
FEDERAL EMERGENCY MANAGEMENT AGENCY

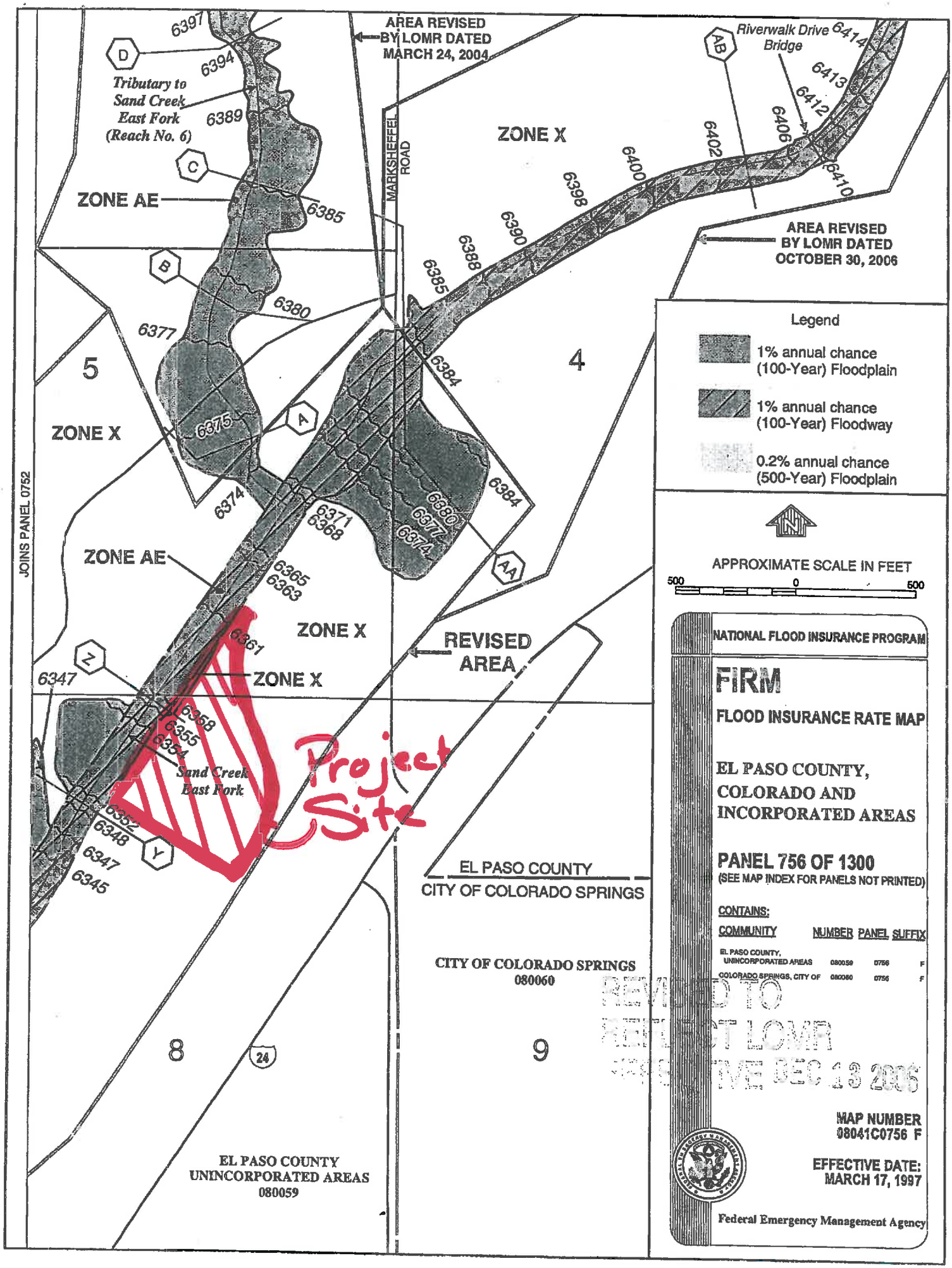
EL PASO COUNTY, CO
AND INCORPORATED AREAS

FLOOD PROFILES

SAND CREEK EAST REACH

REVISED TO REFLECT LOMR EFFECTIVE DEC 13 2006


PALMER PARK BOULEVARD
MINEOLA STREET
CHAUTAUQUA DRIVE
WINNEBAGO ROAD
SIOUX CIRCLE
DRIVE
OSAGE WAY
BACONE TERRACE
SHOSHONE WAY
SEQUOYAH WAY
5
YAKIMA
SHAWNEE
OMAHA BOULEVARD
JOINS PANEL NUMBER 0756
WHITE MOUNTAIN DRIVE
COMMANCHERO DRIVE
ZONE X
6345
6343
6340
6338
6334
6333
6331
6328
8
ZONE X
ZONE AE
6326
6323
6322
EL PASO COUNTY
UNINCORPORATED AREAS
080059
WESTERN DRIVE
6319
6316
6314
ZONE X
East Fork
Sand Creek
6307
6310
REVISED AREA
24
Legend
1% annual chance (100-Year) Floodplain
1% annual chance (100-Year) Floodway
0.2% annual chance (500-Year) Floodplain
APPROXIMATE SCALE IN FEET
500 0 500
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY, COLORADO AND INCORPORATED AREAS
PANEL 752 OF 1300
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
EL PASO COUNTY, UNINCORPORATED AREAS 080059 0752 F
COLORADO SPRINGS, CITY OF 080060 0752 F
REVISED TO REFLECT LOMR EFFECTIVE DEC 18 2006
MAP NUMBER 08041C0752 F
EFFECTIVE DATE: MARCH 17, 1997
Federal Emergency Management Agency


AREA REVISED BY LOMR DATED MARCH 24, 2004
AREA REVISED BY LOMR DATED OCTOBER 30, 2006
Riverwalk Drive Bridge
Tributary to Sand Creek East Fork (Reach No. 6)
MARKSHEFFEL ROAD
ZONE X
ZONE AE
ZONE X
ZONE AE
ZONE X
ZONE X
REVISED AREA
JOINS PANEL 0752
5
4
8
9
24
Sand Creek East Fork
Project Site
EL PASO COUNTY
CITY OF COLORADO SPRINGS
CITY OF COLORADO SPRINGS
080060
EL PASO COUNTY
UNINCORPORATED AREAS
080059
Legend
1% annual chance (100-Year) Floodplain
1% annual chance (100-Year) Floodway
0.2% annual chance (500-Year) Floodplain
APPROXIMATE SCALE IN FEET
500
0
500
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY, COLORADO AND INCORPORATED AREAS
PANEL 756 OF 1300
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
EL PASO COUNTY, UNINCORPORATED AREAS 080059 0756 F
COLORADO SPRINGS, CITY OF 080060 0756 F
REVISED TO REFLECT LOMR EFFECTIVE DEC 13 2006
MAP NUMBER 08041C0756 F
EFFECTIVE DATE: MARCH 17, 1997
Federal Emergency Management Agency

HYDROLOGIC CALCULATIONS

HALLGREN
DRAINAGE CALCULATIONS
(Area Runoff Coefficient Summary)

			STREETS / DEVELOPED					*OVERLAND / UNDEVELOPED*					*WEIGHTED*			
BASIN	**TOTAL AREA** *(SF)*	**TOTAL AREA** *(Acres)*	**AREA** *(Acres)*	C_2	C_5	C_{10}	C_{100}	**AREA** *(Acres)*	C_2	C_5	C_{10}	C_{100}	C_2	C_5	C_{10}	C_{100}
A	*56253.85*	1.29	1.29	0.79	0.81	0.83	0.88	0.00	0.03	0.09	0.17	0.36	*0.79*	*0.81*	*0.83*	*0.88*
EX	*33614.28*	0.77	0.00	0.79	0.81	0.83	0.88	0.77	0.03	0.09	0.17	0.36	*0.03*	*0.09*	*0.17*	*0.36*
FR	*111513*	2.56	2.56	0.79	0.81	0.83	0.88	0.00	0.03	0.09	0.17	0.36	*0.79*	*0.81*	*0.83*	*0.88*

HALLGREN
FINAL DRAINAGE REPORT
(Area Drainage Summary)

From Area Runoff Coefficient Summary				*OVERLAND*				*STREET / CHANNEL FLOW*				*Time of Travel (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)	CHECK (min)	I_5 (in/hr)	I_{100} (in/hr)	Q_5 (c.f.s.)	Q_{100} (c.f.s.)
		From DCM Table 5-1															
A	1.29	0.81	0.88	0.81	40	1.5	2.1	330	1.6%	2.5	2.2	4.3	12.1	5.2	8.7	*5.4*	*9.9*
EX	0.77	0.09	0.36	0.09	60	2	9.5	255	3.3%	1.3	3.3	12.8	11.8	3.9	6.5	*0.3*	*1.8*
FR	2.56	0.81	0.88	0.81	50	2	2.3	300	3.8%	3.9	1.3	3.6	11.9	5.2	8.7	*10.7*	*19.6*

* Intensity equations assume a minimum travel time of 5 minutes.

Calculated by: CMN
Date: 3/27/2017
Checked by: _____

HALLGREN
FINAL DRAINAGE REPORT
(Basin Routing Summary)

From Area Runoff Coefficient Summary				OVERLAND				PIPE / CHANNEL FLOW				Time of Travel (T_c)	INTENSITY *		TOTAL FLOWS		COMMENTS
DESIGN POINT	CONTRIBUTING BASINS	CA_5	CA_{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.)	
1	FR	2.07	2.25	Uses time of concentration of Basin FR with minimum of 5 minutes								5.0	5.2	8.7	10.7	19.6	
2	A_2 EX	1.12	1.41	0.43	60	2	6.3	280	3.2%	2.7	1.7	8.0	4.5	7.5	5.0	10.6	

* Intensity equations assume a minimum travel time of 5 minutes.

A_2

Calculated by: CMN
Date: 3/27/2017
Checked by: 0.0

HYDRAULIC CALCULATIONS / SFB WQCV CALCULATIONS

HALLGREN
FINAL DRAINAGE REPORT
(Storm Sewer Routing Summary)

PIPE RUN	Contributing Pipes/Design Points	Equivalent CA_5	Equivalent CA_{100}	Maximum T_C	Intensity*		Flow	
					I_5	I_{100}	Q_5	Q_{100}
1	DP1 (Basin FR)	2.07	2.25	5.0	5.2	8.7	10.7	19.6
2	DP2 (Outlet Structure)	1.12	1.41	8.0	4.5	7.5	5.0	10.6
3	PR1, PR2	3.19	3.67	7.0	4.7	7.8	14.9	28.7

* Intensity equations assume a minimum travel time of 5 minutes.

DP - Design Point
PR - Pipe Run

FB- Flow By from Design Point
INT- Intercepted Flow from Design Point

Calculated by: CMN
Date: 3/27/2017
Checked by: _____

Weighted Percent Imperviousness of Sand Filter Basin				
Contributing Basins	Area (Acres)	C_5	Impervious % (I)	(Acres)*(I)
A	1.29	0.81	95	122.68
EX	0.77	0.09	2	1.54
Totals	2.06			124.23
Imperviousness of SFB	60.2			

Hallgren
DRAINAGE REPORT DRAINAGE CALCULATIONS
(Pond Volume/Storage Calculation)

SAND FILTER BASIN

Elevation	SF	CF	Storage AF	Storage Sum
6353.50	806.62			0
6354.00	1,142.11	487.18	0.01	0.01
6355.00	1,867.07	1,504.59	0.03	0.05
6355.16	1,989.75	308.55	0.01	0.05

Total = 2,300 CF

Total = 0.1 Ac-ft

At top of WQCV Elevation = 6354.75 , the Volume is 1616 CF

At 100 Year Spillway Elevation = 6355.16, the Volume is 2300 CF

Calculated by: CMN

Date: 3/30/2017

Checked by: _____

EMERGENCY SPILLWAY CALCULATIONS

Horizontal Broad-Crested Weir (Eqn 12-20 UDFCD)

Variable			Solve For		
			L (ft)	H (ft)	Q (cfs)
C	3.00		0.0	0.0	10.2
L	12.00	ft			
H	0.43	ft			
Q		cfs			

Total Q	11.02

Equation 12-20

$$Q = C_{BCW} L H^{1.5}$$

Sloping Broad-Crested Weir (Eqn 12-21 UDFCD)

Variable			Solve For		
			Z (ft)	H (ft)	Q (cfs)
C	3.00		0.0	0.0	0.4
Z	3.00	ft			
H	0.43	ft			
Q		cfs			

Equation 12-21

$$Q = \left(\frac{2}{5}\right) C_{BCW} Z H^{2.5}$$

Where:

Q = discharge (cfs)

C_{BCW} = broad-crested weir coefficient (This ranges from 2.6 to 3.0. A value of 3.0 is often used in practice.) See Hydraulic Engineering Circular No. 22 for additional information.

L = broad-crested weir length (ft)

H = head above weir crest (ft)

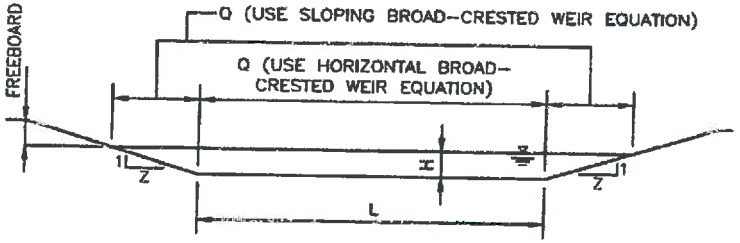


Figure 12-20. Sloping broad-crest weir

Design Procedure Form: Sand Filter (SF)

Designer: Georgianne Willard
Company: M&S Civil Consultants
Date: April 3, 2017
Project: Lot 44A, Claremont Business Park Filing No. 2
Location: MeadowBrook Parkway and Hwy 24

1. Basin Storage Volume	
A) Effective Imperviousness of Tributary Area, I_a (100% if all paved and roofed areas upstream of sand filter)	I_a = 60.2 %
B) Tributary Area's Imperviousness Ratio (i = I_a/100)	i = 0.602
C) Water Quality Capture Volume (WQCV) Based on 12-hour Drain Time WQCV= 0.9 * (0.91* i^3 - 1.19 * i^2 + 0.78 * i)	WQCV = 0.21 watershed inches
D) Contributing Watershed Area (Including sand filter area)	Area = 89,868 sq ft
E) Water Quality Capture Volume (WQCV) Design Volume V_{WQCV} = WQCV / 12 * Area	V_{WQCV} = 1,596 cu ft
F) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm	d_6 = ____ in
G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume	$V_{WQCV\ OTHER}$ = ____ cu ft
H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired)	$V_{WQCV\ USER}$ = ____ cu ft
2. Basin Geometry	
A) WQCV Depth	D_{WQCV} = 1.5 ft
B) Sand Filter Side Slopes (Horizontal distance per unit vertical, 4:1 or flatter preferred). Use "0" if sand filter has vertical walls.	Z = 4.00 ft / ft
C) Minimum Filter Area (Flat Surface Area)	A_{Min} = 676 sq ft
D) Actual Filter Area	A_{Actual} = 806 sq ft
E) Volume Provided	V_T = 2300 cu ft
3. Filter Material	Choose One: (●) 18" CDOT Class B or C Filter Material ( ) Other (Explain):
4. Underdrain System	
A) Are underdrains provided?	Choose One: (●) YES ( ) NO
B) Underdrain system orifice diameter for 12 hour drain time	
i) Distance From Lowest Elevation of the Storage Volume to the Center of the Orifice	y= 2.3 ft
ii) Volume to Drain in 12 Hours	Vol_{12} = 1,596 cu ft
iii) Orifice Diameter, 3/8" Minimum	D_O = 7 / 8 in

Design Procedure Form: Sand Filter (SF)

Sheet 2 of 2

Designer: Georgianne Willard
Company: M&S Civil Consultants
Date: April 3, 2017
Project: Lot 44A, Claremont Business Park Filing No. 2
Location: MeadowBrook Parkway and Hwy 24

5. Impermeable Geomembrane Liner and Geotextile Separator Fabric A) Is an impermeable liner provided due to proximity of structures or groundwater contamination?	Choose One ○ YES ◉ NO
6-7. Inlet / Outlet Works A) Describe the type of energy dissipation at inlet points and means of conveying flows in excess of the WQCV through the outlet	

Notes:

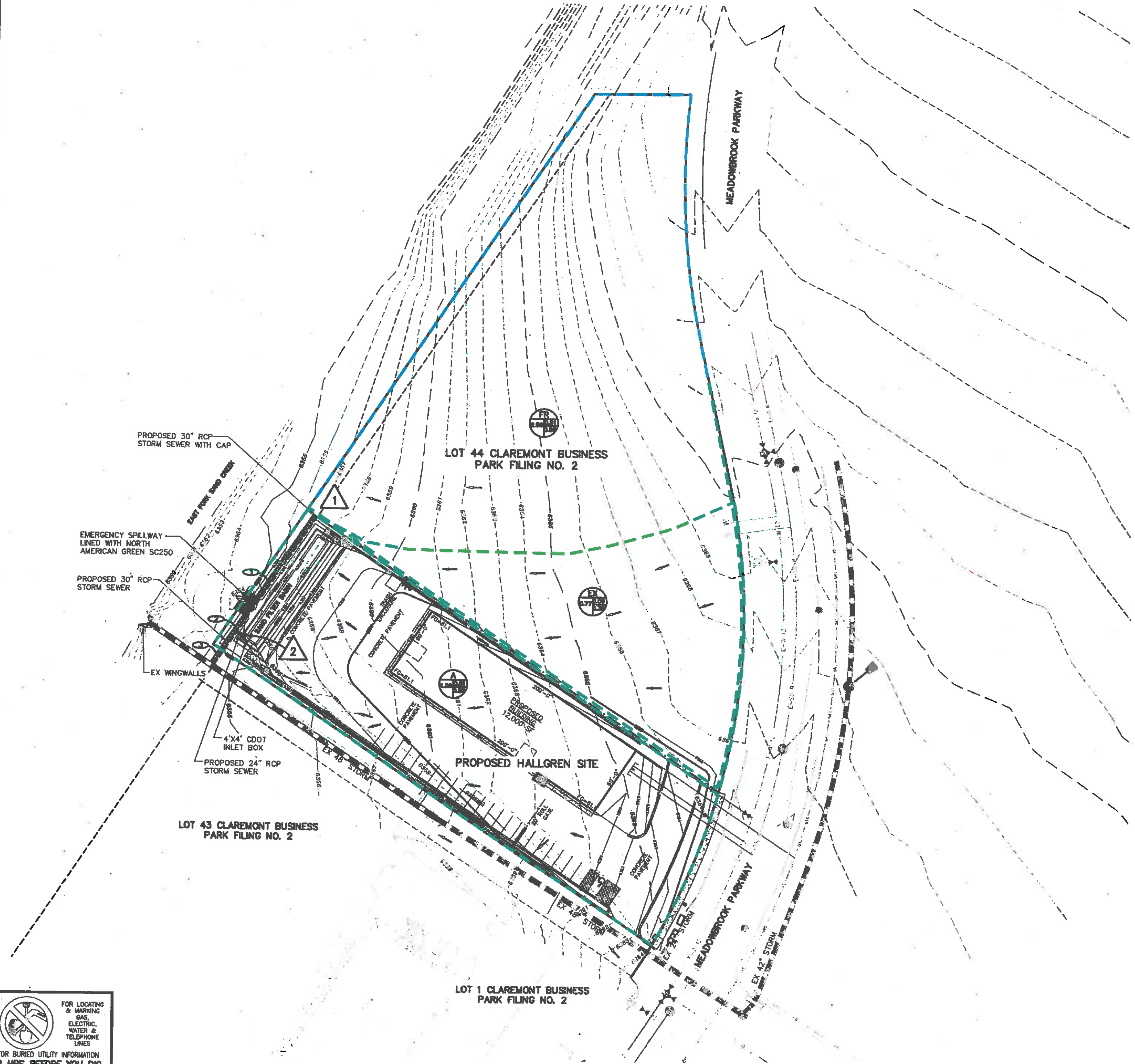
PROPOSED DRAINAGE MAP

HALLGREN

COUNTY OF EL PASO, STATE OF COLORADO

PROPOSED DRAINAGE MAP

APRIL 2017



LEGEND

- BASIN DESIGNATION — ACRES — C5 — C100
- PIPE RUN REFERENCE LABEL
- SURFACE DESIGN POINT
- CURRENT DEVELOPMENT BASIN BOUNDARY
- FUTURE DEVELOPMENT BASIN BOUNDARY
- (6920) EXISTING CONTOUR
- 6920 PROP CONTOUR
- PROPOSED STORM SEWER PIPE
- EXISTING STORM SEWER PIPE
- CROSSPAN
- INLET BOX
- EXISTING FLOW DIRECTION ARROW
- EMERGENCY OVERFLOW DIRECTION
- FLOW DIRECTION
- H.P. HIGH POINT
- L.P. LOW POINT

BASIN SUMMARY

BASIN	AREA (ACRES)	Q_5	Q_{100}
A	1.29	5.4	9.9
EX	0.77	0.3	1.8
FR	2.56	10.7	19.6

DESIGN POINT SUMMARY

DESIGN POINT	Q_5	Q_{100}	BASIN	STRUCTURE
1	10.7	19.6	FR	30" RCP PIPE STUB TIE-IN
2	5.0	10.8	A, EX	SAND FILTER BASIN OUTLET STRUCTURE

WQCV SUMMARY

EPC/URBAN DRAINAGE SAND FILTER BASIN-SEE STD. DET.	
WQCV REQUIRED	1,598 CF
WQCV PROVIDED	1,616 CF
AREA REQUIRED	676 SF
AREA PROVIDED	806 SF
100YR W.S. ELEV. AND SPILLWAY CREST ELEV.	6355.16 FT
TOP OF POND	6356.20 FT

STORM SEWER SUMMARY

PIPE RUN	Q_5	Q_{100}	PIPE SIZE	CONTRIBUTING PIPE RUN/DESIGN POINTS
1	10.7	19.6	30" RCP	DP1
2	5.0	10.6	24" RCP	DP2 (OUTLET STRUCTURE)
3	14.9	28.7	30" RCP	PR1, PR2

1" = 40'

0 10 20 40 80

Scale in Feet

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES

FOR BURIED UTILITY INFORMATION 48 HRS BEFORE YOU DIG CALL 1-800-922-1987

M&S CIVIL CONSULTANTS, INC.
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

HALGREN			
PROPOSED DRAINAGE MAP			
PROJECT NO. 44-025	SCALE: HORIZONTAL: 1"=30' VERTICAL: N/A	DATE: 4/13/2017	
DESIGNED BY: CMN DRAWN BY: CMN CHECKED BY: ####		SHEET 1 OF 1	PDM

EXISTING DRAINAGE MAP

NEW DOC

FINAL DRAINAGE REPORT

For

"Claremont Business Park Filing No. 2"

Prepared for:
El Paso County
Department of Public Works
Engineering Division

On Behalf of:
Claremont Development, Inc.

Prepared by:

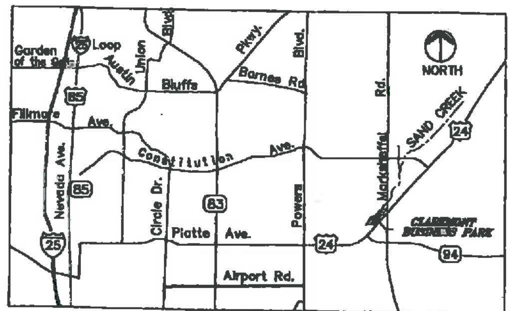
Matrix Design Group, Inc.
Integrated Design Solutions
Infrastructure Engineering
Community Development
Program Management

2435 Research Parkway, Suite 300
Colorado Springs, CO 80920
(719) 575-0100
fax (719) 572-0208

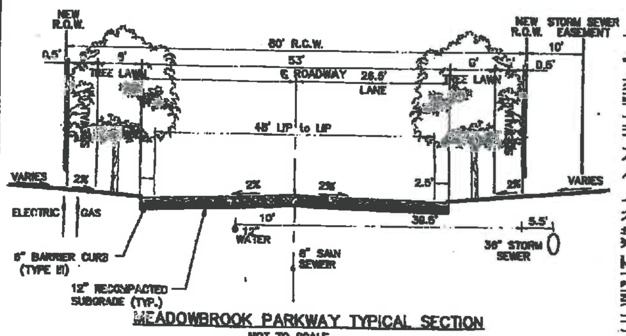
Revised November 2006

05.151.006

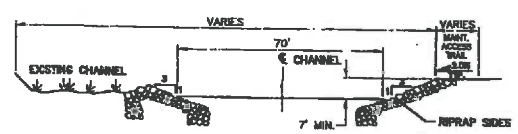
DRAINAGE PLAN
CLAREMONT BUSINESS PARK FILING NO. 2



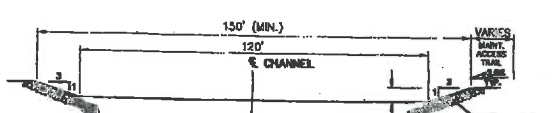
LOCATION MAP
NTS



MEADOWBROOK PARKWAY TYPICAL SECTION
NOT TO SCALE

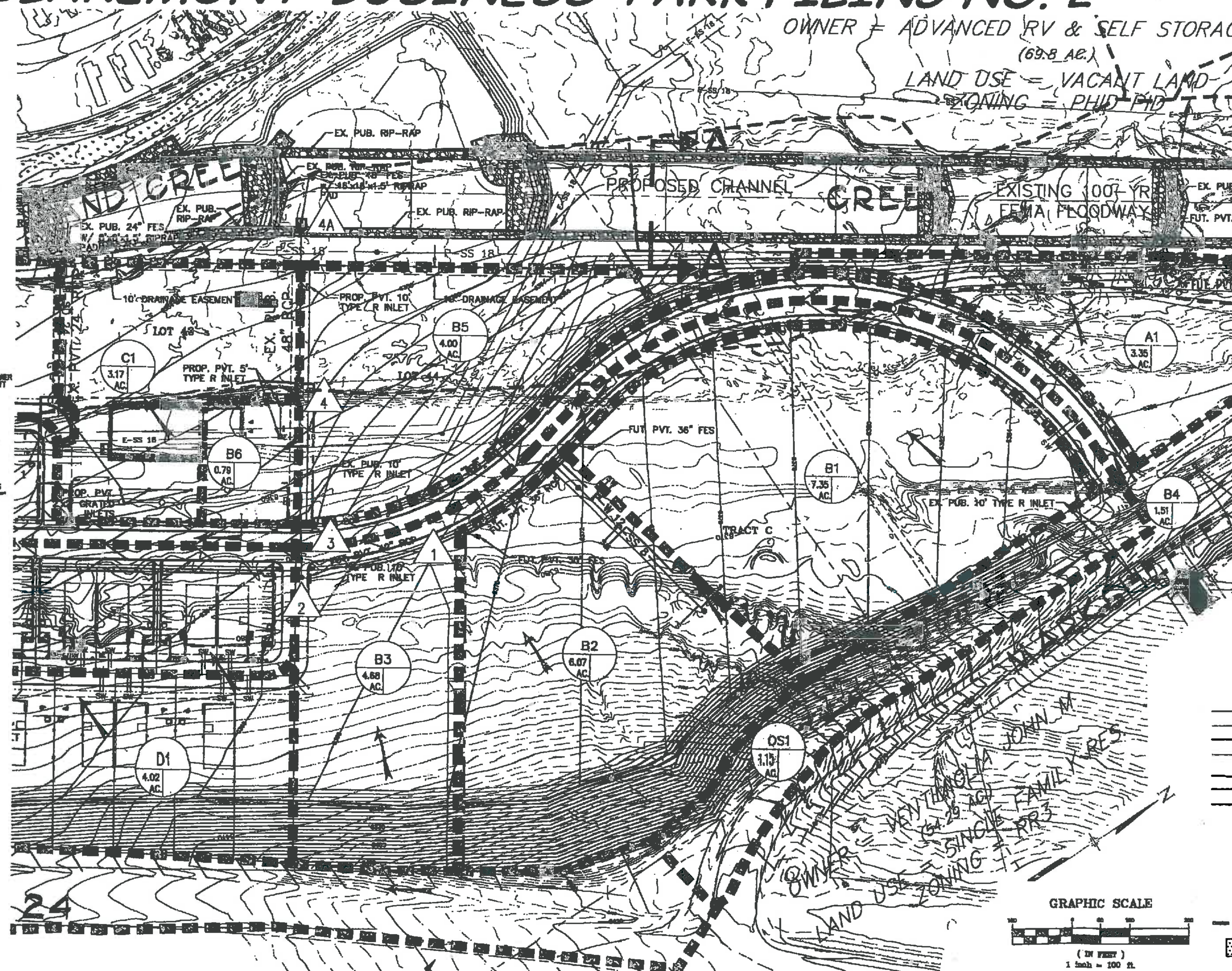


EAST FORK SAND CREEK
SECTION B-B
N.T.S.
FOR INFORMATION ONLY



EAST FORK SAND CREEK
SECTION A-A
N.T.S.
FOR INFORMATION ONLY

NOTE:
CONSTRUCTION OF THE EAST FORK SAND CREEK CHANNEL IMPROVEMENTS WILL BE REQUIRED TO REMOVE A PORTION OF CLAREMONT BUSINESS PARK FILING No. 1 FROM THE EXISTING 100-YEAR FLOODPLAIN (PER FEMA FLOOD INSURANCE RATE MAPS 752F AND 756F)



D.P.	SUB-BASINS	Q(5)	Q(100)
1	B1, B2	[illegible]	[illegible]
2	1, B3, OS1(flow by)	42.8	[illegible]
3	2(...), B4(flow by)	43.1	[illegible]
4	3, B6	44.1	90.1
4A	4, B5	[illegible]	107.5
5	B1(flow by), D3	13.5	25.9
6	5, D4	24.1	[illegible]
7	6, D5	40.8	[illegible]
8	7, D6, B4(flow by)	53.1	107.8
9	8, D7	61.6	124.5
10	D1(flow by), D2, E1, E2	19.4	40.8
11	10, E4	27.7	57.1
12	11, E5	[illegible]	74.3
13	12, E3	41.8	85.3

DESIGN POINT SUMMARY

LEGEND

- PROPOSED CONTOUR
- EXISTING CONTOUR
- PROPOSED STORM DRAIN PIPE
- EXISTING STORM DRAIN PIPE
- DRAINAGE CHANNEL
- PROPOSED TYPE 'R' INLET
- PROPOSED TYPE I OR II MANHOLE
- FLOW ARROW
- BASIN DESIGNATION
- "C" COEFFICIENT (100 YR)
- BASIN AREA (ACRES)
- FILING 1 LIMITS
- DRAINAGE BASIN BOUNDARY
- FILING NO. 2

REFERENCE DRAWINGS
X-BASE-04.052.001
X-util
X-TOPO
X-ROAD
X-BASE
X-TOPO-03-01-05-bas

NO.	DATE	DESCRIPTION	BY
		REVISIONS	

S:\05.151.006(FILING2)\300 Water Resources\302-FDR\DR01-02.dwg
PLOT DATE: Nov 27, 2006 2:55pm

BENCHMARK DATA(ELEV.)
(DATUM)
(DESCRIPTION/LOCATION)

SUBDIVIDER
HAMMERS CONSTRUCTION INC.
3460 CAPITAL DRIVE
COLORADO SPRINGS, CO 80915-9710

FOR AND ON BEHALF OF MATRIX DESIGN GROUP, INC.

Matrix Design Group, Inc.
Integrated Design Solutions 2435 Research Parkway, Suite 300
Colorado Springs, CO 80920
Phone 719-575-0100
Fax 719-575-0208

CLAREMONT BUSINESS PARK

FINAL DRAINAGE PLAN

MASTER DEVELOPMENT DRAINAGE PLAN
FINAL DRAINAGE PLAN
FILING NO. 2

DESIGNED BY: RGC	SCALE	DATE ISSUED: SEPTEMBER 2006
DRAWN BY: GES	HORIZ: 1"= 100'	
CHECKED BY: JPL	VERT: N/A	SHEET NO. 1 OF 2 SHEETS

DR01

Markup Summary

dsdlaforce (1)

Subject: Cloud+
Page Label: 8
Lock: Unlocked
Author: dsdlaforce

See Appendix L Section 3.13a regarding fee calculation for vacation/replats and revise the statement accordingly.