PRELIMINARY DRAINAGE REPORT

FOR

CLAREMONT COMMERCIAL SUBDIVISION FIL NO. 2 A RESUBDIVSION OF TRACT C OF CLAREMONT BUISNESS PARK FILING NO. 2

EL PASO COUNTY, COLORADO

MARCH 2018

Prepared for:

Ron Waldthausen
Land First, Inc.
1378 Promontory Bluff View
Colorado Springs, CO 80921
(719) 491-0801

Prepared by:

CIVIL CONSULTANTS, INC.

20 Boulder Crescent, Suite 110
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Project #42-008
PCD - SP-17-004

PRELIMINARY DRAINAGE REPORT FOR
CLAREMONT COMMERCIAL SUBDIVISION FIL NO. 2
A RESUBDIVSION OF TRACT C OF
CLAREMONT BUISNESS 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 established by the County for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

_____
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: Ron Waldthausen
Land First, Inc.
1378 Promontory Bluff View
Colorado Springs, CO 80921

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 Irvin, P.E.
County Engineer / ECM Administrator

CONDITIONS:

PRELIMINARY DRAINAGE REPORT FOR CLAREMONT COMMERCIAL SUBDIVISION FIL NO. 2 A RESUBDIVSION OF TRACT C OF CLAREMONT BUISNESS PARK FILING NO. 2

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Hydrologic Calculations
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PRELIMINARY DRAINAGE REPORT FOR CLAREMONT COMMERCIAL SUBDIVISION FIL NO. 2 A RESUBDIVSION OF TRACT C OF CLAREMONT BUISNESS PARK FILING NO. 2

PURPOSE

This document is intended to serve as the Preliminary Drainage Report for CLAREMONT COMMERCIAL SUBDIVISION FIL NO. 2. The purpose of this document is to identify and analyze the onsite 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 and City of Colorado Springs Drainage Criteria Manual. The proposed principal use for the site will be neighborhood commercial and light industrial. The parcel is zoned by El Paso County for commercial service as CS. A final drainage report is required with the final plat. A drainage letter will be required with the development of individual lots provided significant changes from the approved final drainage report is not proposed.

GENERAL LOCATION AND DESCRIPTION

CLAREMONT COMMERCIAL Filing No. 2 is located in the Northeast ¼ of the Northeast ¼ of Section 8, and the Southeast ¼ of the Southeast ¼ of Section 5, Township 14 South, Range 65 West of the 6th P.M. in El Paso County, Colorado. The site is bordered to the southeast by U.S. Highway 24 and to the northeast by N. Marksheffel Road, to the north and west by Meadowbrook Parkway, and to the south by a vacant lot. The site lies within the Sand Creek Drainage Basin. Flows from this site are tributary to Sand Creek.

The site consists of 13.7 acres in which is presently undeveloped. Vegetation is sparse, consisting of native grasses and weeds. Existing site terrain generally slopes from north to southwest at grade rates that vary between 1.2% and 2%. A soil retention wall runs along the eastside of the proposed site, next to U.S. Highway 24 and N. Marksheffel Road, and borders the back of Lots 10-16. The Claremont Commercial site is currently zoned "CS" and the proposed principal use for the site will be neighborhood commercial and light industrial.

A sand filter basin will provide water quality treatment for the development and is proposed to be constructed at the south end of the site. The outlet structure of the proposed water quality pond will tie into an existing 42” storm sewer, which will route the treated runoff to Sand Creek. See Appendix for details.

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 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. See Appendix for soils report.

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. 08041C0752 F, effective date March 17, 1997, LOMR 06-08-B137P dated November 13, 2006 and Panel No. 08041C0756 F, effective date March 17, 1997, LOMR 08-08-0630P dated September 24, 2008. No portion of this site is located within the 100 year floodplain.

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. See Appendix for calculations.

FOUR STEP PROCESS

Step1 Employ Runoff Reduction Practices – Approx. 13.7 of the proposed developed 6.8+/- acres 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 upstream of an existing 42"/48" RCP the directly discharges to Sand Creek Channel via an outlet structure with wingwalls. 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 Claremont Commercial Filing No. 2 site proposes a Sand Filter Water Quality Facility before discharging to the private 42" RCP pipe East of Meadowbrook Parkway. 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 facility 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 CLAREMONT COMMERCIAL Filing No, 2 site consists of 13.7 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.

(hencefore referred to as "MDDP"). The MDDP calculations indicate that, under fully developed conditions, the total tributary area of Sub-basins B1, B2, and B3 (18.1 acres), with basin B3 including the eastern half of Meadowbrook Parkway, would produce a cumulative runoff of approximately Q5=86.6 cfs and Q100=42.6 cfs (Design Point 2). The MDDP illustrated that the watershed would drain from east to southwest towards Meadowbrook Parkway. As stated in the MDDP, overlot grading activities for the entire site have been completed. Per Resolution 16-426 of the BoCC, on-site WQCV is required but on-site stormwater detention is not required per the FDR for Claremont Business Park Fil. 2.

A 48” public storm sewer runs along Woolsey Heights and is routed to the Sand Creek channel. Two 10’ Type R at grade inlets exist at the intersection of Woolsey Heights and Meadowbrook Parkway, one on the northwest and the other on the northeast corner of the intersection. Runoff from the site and the two surrounding streets, Meadowbrook Parkway and Woolsey Heights, is intercepted by these inlets and conveyed to the Sand Creek channel via the existing 48" public storm sewer.

Refer to the drainage basin descriptions that follow for additional information as well as the Drainage Map located within the Appendix of this report.

PROPOSED DRAINAGE CHARACTERISTICS

General Concept Drainage Discussion

The majority of the site will consist of neighborhood commercial and light industrial, asphalt, curb, a storm water quality sand filter basin, and landscaping. The site will drain, across asphalt and impermeable surfaces, to the south and southwest. Channelized flow will be conveyed via curb and gutter to the Design Points shown on the drainage map. Cumulative runoff of Q5=38.5 cfs and Q100=75.6 cfs has been calculated for the 13.720 acre site. These values are very similar to the previously mentioned MDDP study values (Q5=45.0 cfs, Q100=91.0 cfs), with the MDDP including runoff from the eastern half of Meadowbrook Parkway. A storm water quality sand filter basin is proposed to be constructed at the south end of the site and treat all onsite runoff with contributing nominal offsite flows from portions of Basin A and Basin B outside of the site boundary. The outlet structure of the proposed water quality pond will release into an existing manhole and to the private 42” storm sewer (Pipe Run 6) (Approximately 182’ feet of the existing private 42” storm sewer north of the ex manhole MAY NEED to be removed for the proposed storm pipe runs PR2, PR3, PR4 to be installed, OR it may be possible to utilize the existing pipe for these pipe runs to discharge into the WQ Pond. Upon final design for this project, research and surveying will determine the above condition. The existing private 42” storm sewer ties into an existing public 48” storm sewer which will route the treated runoff to Sand Creek. For more information of drainage basins, existing and proposed structures refer to the Drainage Map located within the Appendix of this report.

Detailed Drainage Discussion

Basin A, 2.46 acres, consists of steep slopes of 32% adjacent to U.S Highway 24 and N. Marksheffel Rd. The roadway embankment slopes into a soil retention wall that runs along the west boundary of Basin A. Runoff of Q5=1.1 cfs and Q100=7.7 cfs has been calculated to be produced by the basin. Flows produced within the basin will be conveyed westward into Basin B as sheet flow.

Basin B, 7.67 acres, consists of ten lots on the eastern portion of proposed site and two streets, El Jefe Lane and Mogul Drive. Runoff produce by the basin of Q5=25.6 cfs and Q100=46.5 cfs will travel south as sheet flow and conveyed as concentrated flow in El Jefe Lane and Mogul Drive to Design Point 2. All flows reaching Design Point 2 will by collected by a 15' sump inlet at the end of the cul-de-sac and conveyed to the proposed water quality pond located at the south end of the site. Runoff produced by Lots 1, 2, and Lots 11-14 shall sheet flow directly to Mogul Drive. Runoff produced by Lot 16 shall flow to Lot 15 and then shall be conveyed to Mogul Drive via a curb, swale etc, the conveyance source shall be

determined at the time of development. Runoff produced by Lot 10 shall flow to Lot 9 and then shall be conveyed directly to the proposed water quality pond via a curb, swale etc, the conveyance source shall be determined at the time of development.

Basin B1, 2.33acres, consists of Lots 3-6 located between Mogul Drive and Meadowbrook Parkway. Runoff produce by the basin of Q5=8.3 cfs and Q100=15.1 cfs will travel south to a curb, swale etc, the conveyance source shall be determined at the time of development where flows will be routed to a low point located in the southwest corner of the basin of Lot and collected by an area inlet at Design Point 1. Flows will continue via storm pipe to the proposed water quality pond located at the south end of the site.

Basin B2, 0.19 acres, consists entirely of Rey Pez Street. Runoff produce by the basin of Q5=0.9 cfs and Q100=1.6 cfs will travel west to two proposed At-Grade inlets located at the east end of the street. The total calculated runoff values for Basin B2 will be divided in half, representing the north and south halves of the street. Flows will be conveyed to the At-Grade inlets at Design Point 3 and Design Point 3A.

Basin B3, 0.73 acres, consists of Lots 7 and 8 located south of Rey Pez Street and north of the proposed water quality pond. Runoff produce by the basin of Q5=3.1 cfs and Q100=5.6 cfs will travel south to a curb, swale etc, the conveyance source shall be determined at the time of development where flows will be routed to a low point located in the southwest corner of the basin and collected by an area inlet at Design Point 4. Flows will continue via storm pipe to the proposed water quality pond located at located at the south end of the site. Lot 7 shall determine at the time of developed if the runoff would be beneficial to be routed directly to the WQ pond rather than through Lot 8.

Basin C, 0.68 acres, consists of the area proposed for the onsite Sand Filter Basin water quality pond. Runoff of Q5=0.7 cfs and Q100=2.4 cfs produced within the basin will ultimately combine with flows entering the pond from Design Points 1, 2, 3, 3A, and Design Point 4. The flows from the basin and two proposed 42” and 36” private storm sewers will reach Design Point 5 with values of Q5=38.5 cfs and Q100=75.6 cfs. Flows from the Sand Filter Basin are discharged through an outlet structure and proposed private 42” (Pipe Run 6) to an existing storm manhole and then routed to an existing private 42” storm, where flows are conveyed into the backside of the existing 10’ Type R at grade inlet

Basin D, 0.94 acres, consists of a landscaping strip running alongside and adjacent to Meadowbrook Parkway. The basin will most likely be composed of trees, bushes/grasses, and decorative ground cover. Low runoff values produced by Basin D of Q5=0.4 cfs and Q100=2.2 cfs will travel as sheet flow into Meadowbrook Parkway.

There are no planned or required improvements to the Sand Creek Drainage Channel with the development of the CLAREMONT COMMERCIAL site.

WATER QUALITY PROVISIONS AND MAINTENANCE

The proposed Sand Filter Basin functions to provide water quality for runoff produced onsite. The water quality pond is designed to treat approx 13.720 acres, and provide 0.251 Acre-Ft of water quality storage. The water quality basin will be private and shall be maintained by the property owner through a 16' wide, 12% access road. 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 subject site was previously analyzed within the Final Drainage Report for Claremont Business Park Filing No. 2 prepared by Matrix Design Group approved April 24, 2006. Per Resolution 16-426 of the BoCC, on-site WQCV is required but on-site stormwater detention is not required per the FDR for Claremont Business Park Fil. 2. The water quality volume required for the site has been determined using the UDFCD UD-Detention workbook per the guidelines set forth in the City of Colorado Springs/El Paso County Drainage Criteria Manual - Volume II. The length to width ration in the UD-Detention “Detention

Basin Stage-Storage Table Builder" page has been adjusted to match the 100 yr calculated cfs for the Sand Filter Basin (Design Point 5, 75.6 cfs). This conservative approach increases storage volume and ensures the appropriate capacity of the pond. Refer to the water quality facility sizing calculations (UD-Detention) 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

Private Drainage Facilities NON-Reimbursable:

Item	Description	Quantity		Unit Cost			Cost
1.	24" RCP	205	LF	$48	/LF		$9,840.00
2.	36" RCP	61	LF	$82	/LF		$5,002.00
3.	42" RCP	135	LF	$120	/LF		$16.200.00
4.	WQCV Sand Filter Pond	1	EA	$15,000	/EA		$15,000.00
5.	Pond Outlet Structure	1	EA	$12,000	/EA		$12,000.00
6.	At Grade/Sump Inlet (Type R) L=15'	3	EA	$7,923	/EA		$23,769.00
						***Total $**	**$79,642.00**

***Tentative cost dependent upon use of existing 42" RCP. To Be determined with Final Drainage Report**

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 2018.

DRAINAGE & BRIDGE FEES

This site is in the Sand Creek Drainage Basin. The 2018 Drainage Bridge and Pond fees per the El Paso County for the CLAREMONT COMMERCIAL FILING NO. 2 site are as follows:

Drainage Fees:	13.720 x	75%	$	17,197.00	=	$	176,957.13
Bridge Fees:	13.720 x	75%	$	5,210.00	=	$	53,610.90
						***Total $**	**230,568.03**

***Drainage and Bridge Fees will be based on the effective rate for Sand Creek drainage basin at the time of the final plat application submittal.**

SUMMARY

Development of this site will not adversely affect the surrounding development per this final drainage report with no negative impacts of the development of the Claremont Business Park Filing No. 2. The proposed drainage facilities will adequately convey, detain and route runoff from the onsite flows to the Sand Creek Drainage channel. All drainage facilities described herein and shown on the included Drainage Map (See Appendix) 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 CLAREMONT COMMERCIAL FILING NO. 2 project will 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.

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

SOILS MAP

Hydrologic Soil Group— Summary by Map Unit — El Paso County Area, Colorado (CO625)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	A	11.7	56.7%
10	Blendon sandy loam, 0 to 3 percent slopes	B	2.1	10.0%
28	Ellicott loamy coarse sand, 0 to 5 percent slopes	A	6.9	33.3%
Totals for Area of Interest			**20.6**	**100.0%**

CLAREMONT COMMERCIAL FILING NO. 2

NOT TO SCALE

HYDROLOGIC TYPE A SOILS

HYDROLOGIC TYPE B SOILS

SITE BOUNDARY

SOILS MAP

M&S CIVIL CONSULTANTS, INC.

FIRM PANEL W/ REVISED LOMR

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
COLORADO SPRINGS, CITY OF	080060	0756	F
EL PASO COUNTY, UNINCORPORATED AREAS	080059	0756	F

REVISED TO REFLECT LOMR EFFECTIVE: September 24, 2008

MAP NUMBER
08041C0756 F

EFFECTIVE DATE:
MARCH 17, 1997

Federal Emergency Management Agency

CLAREMONT COMMERCIAL FILING NO. 2

NOT TO SCALE

LEGEND

- 1% annual chance (100-Year) Floodplain
- 1% annual chance (100-Year) Floodway
- 0.2% annual chance (500-Year) Floodplain
- SITE BOUNDARY

FIRM MAP

M&S CIVIL CONSULTANTS, INC.

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 1 3 2006 | Effective Date: NOV 1 3 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

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

REVISED TO REFLECT LOMR EFFECTIVE DEC 13 2006

FLOOD PROFILES

SAND CREEK EAST FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

EL PASO COUNTY, CO
AND INCORPORATED AREAS

212P

PALMER PARK BOULEVARD
MINEOLA STREET
CHAUTAUQUA DRIVE
WINNEBAGO ROAD
SIOUX CIRCLE
OSAGE WAY
BACONE TERRACE
SHOSHONE WAY
SEQUOYAH WAY
5
DRIVE
SHAWNEE
YAKIMA
YAKIMA
OMAHA BOULEVARD
JOINS PANEL NUMBER 0756
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 13 2006
MAP NUMBER 08041C0752 F
EFFECTIVE DATE: MARCH 17, 1997
Federal Emergency Management Agency
WHITE MOUNTAIN DRIVE
COMMANCHERO DRIVE
ZONE X
8
WESTERN DRIVE
6345
6343
6340
6338
6334
6333
6331
6328
ZONE X
ZONE AE
EL PASO COUNTY UNINCORPORATED AREAS 080059
6326
6323
6322
6319
6316
6314
East Fork
ZONE X
W
Sand Creek
6304
6307
6310
REVISED AREA
24

AREA REVISED BY LOMR DATED MARCH 24, 2004
Riverwalk Drive Bridge
AREA REVISED BY LOMR DATED OCTOBER 30, 2006
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
Sand Creek East Fork
EL PASO COUNTY
CITY OF COLORADO SPRINGS
CITY OF COLORADO SPRINGS
080060
EL PASO COUNTY
UNINCORPORATED AREAS
080059
5
4
8
9
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 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

 | **Issue Date: September 24, 2008** | **Effective Date: September 24, 2008** | **Case No.: 08-08-0630P** | 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)**	**BRIDGE CHANNELIZATION FILL**	**FLOODWAY HYDRAULIC ANALYSIS NEW TOPOGRAPHIC DATA**
	COMMUNITY NO.: 080059		
IDENTIFIER	Marksheffel Road Bridge	**APPROXIMATE LATITUDE & LONGITUDE: 38.857, -104.682** **SOURCE:** Precision Mapping Streets **DATUM:** NAD 83	

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM* NO.: 08041C0756 F DATE: March 17, 1997	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: August 23, 1999 PROFILE(S): 212P, 344P FLOODWAY DATA TABLE: 5

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 1,070 feet downstream of Marksheffel Road to 740 feet upstream

Tributary to Sand Creek East Fork (Reach No. 6) - from the confluence with Sand Creek East Fork to approximately 390 feet upstream

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
East Fork Sand Creek	Zone AE	Zone AE	YES	YES
	Floodway	Floodway	YES	YES
	BFEs*	BFEs	YES	YES
Tributary to Sand Creek East Fork (Reach No. 6)	BFEs	BFEs	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.

Beth A. Norton

Beth A. Norton, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

112553 10.3.1.08080630 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 report 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.

Beth A. Norton

Beth A. Norton, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

This revision has met our criteria for removing an area from the 1-percent-annual-chance floodplain to reflect the placement of fill. However, we encourage you to require that the lowest adjacent grade and lowest floor (including basement) of any structure placed within the subject area be elevated to or above the Base (1-percent-annual-chance) Flood Elevation.

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, 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.

Beth A. Norton

Beth A. Norton, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

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 430 feet downstream of Marksheffel Road	6,375	6,374	08041C0756 F
	Approximately 290 feet upstream of Marksheffel Road	6,385	6,384	08041C0756 F
Tributary to Sand Creek East Fork (Reach No. 6)	Approximately 120 feet upstream of the confluence with Sand Creek East Fork	6,374	6,373	08041C0756 F

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 is effective as of 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*. A short notice also will be published in your local newspaper on or about the dates listed below. Please refer to FEMA's website at https://www.floodmaps.fema.gov/fhm/Scripts/bfe_main.asp for a more detailed description of the proposed BFE changes, which will be posted within a week of the date of this letter.

LOCAL NEWSPAPER Name: *El Paso County News*
Dates: 10/08/2008 10/15/2008

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.

Beth A. Norton

Beth A. Norton, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

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
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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
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AA	25,020	139	580	9.3	6,382.1	6,382.1	6,382.1	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

[1] Feet Above Confluence With Sand Creek

REVISED AREA

REVISED BY LOMR DATED OCTOBER 30, 2006

REVISED BY LOMR DATED DECEMBER 13, 2006

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

EL PASO COUNTY, CO

AND INCORPORATED AREAS

REVISED TO REFLECT LOMR EFFECTIVE: September 24, 2008

FLOODWAY DATA

SAND CREEK EAST FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

EL PASO COUNTY, CO
AND INCORPORATED AREAS

REVISED TO
REFLECT LOMR
EFFECTIVE: September 24, 2008

FLOOD PROFILES

SAND CREEK EAST FORK

212P

FLOOD PROFILES

TRIBUTARY TO SAND CREEK EAST FORK (REACH NO. 6)

REVISED TO REFLECT LOMR EFFECTIVE: September 24, 2008

FEDERAL EMERGENCY MANAGEMENT AGENCY

EL PASO COUNTY, CO
AND INCORPORATED AREAS

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
COLORADO SPRINGS, CITY OF	080060	0756	F
EL PASO COUNTY, UNINCORPORATED AREAS	080059	0756	F

REVISED TO REFLECT LOMR EFFECTIVE: September 24, 2008

MAP NUMBER
08041C0756 F

EFFECTIVE DATE:
MARCH 17, 1997

Federal Emergency Management Agency

JOINS PANEL 0752

HYDROLOGIC CALCULATIONS

CLAREMONT COMMERCIAL
PRELIMINARY DRAINAGE REPORT DRAINAGE CALCULATIONS
(Area Runoff Coefficient Summary)

			STREETS / DEVELOPED						*OVERLAND / DEVELOPED*						*OVERLAND / UNDEVELOPED*										
BASIN	**TOTAL AREA (Sq Ft)**	**TOTAL AREA *(Acres)***	**AREA *(Acres)***	C_5	C_{10}	C_{25}	C_{50}	C_{100}	**AREA *(Acres)***	C_5	C_{10}	C_{25}	C_{50}	C_{100}	**AREA *(Acres)***	C_5	C_{10}	C_{25}	C_{50}	C_{100}	C_5	C_{10}	C_{25}	C_{50}	C_{100}
A	*107329.28*	2.46	0.00	0.90	0.92	0.94	0.95	0.96	0.00	0.78	0.80	0.82	0.84	0.85	2.46	0.09	0.17	0.26	0.31	0.36	***0.09***	***0.17***	***0.26***	***0.31***	***0.36***
B	*334032.96*	7.67	1.15	0.90	0.92	0.94	0.95	0.96	6.52	0.81	0.83	0.85	0.87	0.88	0.00	0.09	0.17	0.26	0.31	0.36	***0.82***	***0.84***	***0.86***	***0.88***	***0.89***
B1	*101290.22*	2.33	0.00	0.90	0.92	0.94	0.95	0.96	2.33	0.81	0.83	0.85	0.87	0.88	0.00	0.09	0.17	0.26	0.31	0.36	***0.81***	***0.83***	***0.85***	***0.87***	***0.88***
B2	*8352.95*	0.19	0.19	0.90	0.92	0.94	0.95	0.96	0.00	0.81	0.83	0.85	0.87	0.88	0.00	0.09	0.17	0.26	0.31	0.36	***0.90***	***0.92***	***0.94***	***0.95***	***0.96***
B3	*31982.43*	0.73	0.00	0.90	0.92	0.94	0.95	0.96	0.73	0.81	0.83	0.85	0.87	0.88	0.00	0.09	0.17	0.26	0.31	0.36	***0.81***	***0.83***	***0.85***	***0.87***	***0.88***
C	*29674.18*	0.68	0.00	0.90	0.92	0.94	0.95	0.96	0.68	0.20	0.28	0.36	0.41	0.44	0.00	0.09	0.17	0.26	0.31	0.36	***0.20***	***0.28***	***0.36***	***0.41***	***0.44***
D	*41038.77*	0.94	0.00	0.90	0.92	0.94	0.95	0.96	0.94	0.12	0.20	0.30	0.34	0.39	0.00	0.09	0.17	0.26	0.31	0.36	***0.12***	***0.20***	***0.30***	***0.34***	***0.39***

CLAREMONT COMMERCIAL
PRELIMINARY DRAINAGE REPORT
(Area Drainage Summary)

From Area Runoff Coefficient Summary				*OVERLAND*				*STREET / CHANNEL FLOW*				*Time of Travel*		*INTENSITY **		*TOTAL FLOWS*	
BASIN	**AREA TOTAL**	**C_5**	**C_{100}**	**C_5**	**Length**	**Height**	**T_C**	**Length**	**Slope**	**Velocity**	**T_t**	**TOTAL**	**CHECK**	**I_5**	**I_{100}**	**Q_5**	**Q_{100}**
	(Acres)	*From DCM Table 5-1*			*(ft)*	*(ft)*	*(min)*	*(ft)*	*(%)*	*(fps)*	*(min)*	*(min)*	*(min)*	*(in/hr)*	*(in/hr)*	*(c.f.s.)*	*(c.f.s.)*
Proposed Area Drainage Summary								***Proposed Area Drainage Summary***									
A	2.46	0.09	0.36	0.09	35	10	3.6	85	37.0%	4.3	0.3	5.0	10.7	5.2	8.7	***1.1***	***7.7***
B	7.67	0.82	0.89	0.82	130	2.5	4.6	740	1.1%	2.1	5.9	10.5	14.8	4.1	6.8	***25.6***	***46.5***
B1	2.33	0.81	0.88	0.81	130	1.8	5.4	435	1.4%	2.3	3.1	8.4	13.1	4.4	7.4	***8.3***	***15.1***
B2	0.19	0.90	0.96	0.90	25	0.5	1.4	145	1.7%	2.6	0.9	5.0	10.9	5.2	8.7	***0.9***	***1.6***
B3	0.73	0.81	0.88	0.81	50	0.8	3.2	130	1.5%	2.4	0.9	5.0	11.0	5.2	8.7	***3.1***	***5.6***
C	0.68	0.20	0.44	0.20	40	3	5.3	100	1.5%	1.8	0.9	6.2	10.8	4.8	8.1	***0.7***	***2.4***
D	0.94	0.12	0.39	0.12	100	1.4	15.8	600	1.6%	1.3	7.9	23.7	13.9	3.6	6.1	***0.4***	***2.2***

Calculated by: CMN
Date: 1/29/2018
Checked by: VAS

MARKSHEFFEL & CONSTITUTION
PRELIMINARY DRAINAGE REPORT
(Basin Routing Summary)

From Area Runoff Coefficient Summary				OVERLAND				PIPE / CHANNEL FLOW				Time of Travel (T_t)	INTENSITY *		TOTAL FLOWS	
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.)
PROPOSED DRAINAGE BASIN ROUTING SUMMARY																
1	**B1**	1.88	2.05									8.4	4.4	7.4	***8.3***	***15.1***
2	**A**	0.22	0.89												***0.9***	***6.0***
	B	6.31	6.84												***25.6***	***46.5***
		6.54	7.73									10.5	4.1	6.8	***26.5***	***52.6***
3/3A	**B2**	0.17	0.18									5.0	5.2	8.7	***0.9***	***1.6***
4	**B3**	0.59	0.65									5.0	5.2	8.7	***3.1***	***5.6***
5	**C, DP1, DP2, DP3/3A, DP4**	9.32	10.90									10.0	4.1	6.9	***38.5***	***75.6***

Calculated by: CMN
Date: 1/29/2018
Checked by: VAS

CLAREMONT COMMERCIAL
PRELIMINARY DRAINAGE REPORT DRAINAGE CALCULATIONS
(Storm Sewer Routing Summary)

PIPE RUN Point(s)	*Contributing Pipes/Design Points*	*Equivalent CA_5*	*Equivalent CA_{100}*	*Maximum T_C*	*Intensity**		*Flow*	
					I_5	*I_{100}*	*Q_5*	*Q_{100}*
1	**DP 2**	6.54	7.73	10.5	4.1	6.8	***26.5***	***52.6***
2	**DP 1**	1.88	2.05	8.4	4.4	7.4	***8.3***	***15.1***
3	**PR 2, DP 3**	1.97	2.14	8.5	4.4	7.3	***8.6***	***15.7***
4	**PR 3, DP 3A**	2.06	2.23	8.6	4.4	7.3	***9.0***	***16.3***
5	**PR 4, DP 4**	2.65	2.88	8.8	4.3	7.3	***11.5***	***20.9***
6	**WQ POND**	9.32	10.90	10.0	4.1	6.9	***38.5***	***75.6***

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

DP - Design Point PR- Pipe Run

Calculated by: CMN
Date: 1/29/2018
Checked by: VAS

HYDRAULIC CALCULATIONS / SFB WQCV CALCULATIONS

Weighted Percent Imperviousness of WQ Pond				
Contributing Basins	***Area (Acres)***	C_5	***Impervious % (I)***	***(Acres)*(I)***
A	2.46	0.09	2	4.93
B	7.67	0.82	95	728.49
B1	2.33	0.81	95	220.90
B2	0.19	0.90	100	19.18
B3	0.73	0.81	95	69.75
C	0.68	0.20	20	13.62
D	0.94	0.12	7	6.59
Totals	***15.01***			***1063.47***
Imperviousness of WQ Pond	***70.9***			

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Lots 1-16, Claremont Commercial

Basin ID: Site

Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	SF	
Watershed Area =	15.01	acres
Watershed Length =	* 392	ft
Watershed Slope =	0.015	ft/ft
Watershed Imperviousness =	70.90%	percent
Percentage Hydrologic Soil Group A =	90.0%	percent
Percentage Hydrologic Soil Group B =	10.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Desired WQCV Drain Time =	12.0	hours
Location for 1-hr Rainfall Depths =	Denver - Capitol Building	
Water Quality Capture Volume (WQCV) =	0.279	acre-feet
Excess Urban Runoff Volume (EURV) =	1.335	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.937	acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	1.224	acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	1.491	acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	1.798	acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	2.108	acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	2.477	acre-feet
500-yr Runoff Volume (P1 = 3.14 in.) =	3.308	acre-feet
Approximate 2-yr Detention Volume =	0.887	acre-feet
Approximate 5-yr Detention Volume =	1.159	acre-feet
Approximate 10-yr Detention Volume =	1.399	acre-feet
Approximate 25-yr Detention Volume =	1.655	acre-feet
Approximate 50-yr Detention Volume =	1.807	acre-feet
Approximate 100-yr Detention Volume =	1.963	acre-feet

*** Note: L / W Ratio < 1**
L / W Ratio = 0.2

Optional User Override 1-hr Precipitation

1.19	inches
1.50	inches
1.75	inches
2.00	inches
2.25	inches
2.52	inches
	inches

Stage-Storage Calculation

Zone 1 Volume (WQCV) =	0.279	acre-feet
Select Zone 2 Storage Volume (Optional) =		acre-feet
Select Zone 3 Storage Volume (Optional) =		acre-feet
Total Detention Basin Volume =	0.279	acre-feet
Initial Surcharge Volume (ISV) =	N/A	ft^3
Initial Surcharge Depth (ISD) =	N/A	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	N/A	ft
Slope of Trickle Channel (S_{TC}) =	N/A	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

Total detention volume is less than 100-year volume.

Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
6365 **Media Surface**	--	0.00	--	--	--	6,428	0.148		
6366	--	1.00	--	--	--	8,286	0.190	7,274	0.167
6367	--	2.00	--	--	--	10,270	0.236	16,532	0.380
6368	--	3.00	--	--	--	12,368	0.284	27,954	0.642
6369	--	4.00	--	--	--	14,688	0.337	41,482	0.952

*The length to width ration in the UD-Detention "Detention Basin Stage-Storage Table Builder" page has been adjusted to match the 100 yr calculated cfs for the Sand Filter Basin (Design Point 5, 75.6 cfs). This conservative approach increases storage volume and ensures the appropriate capacity of the pond.

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Lots 1-16, Claremont Commercial

Basin ID:

Example Zone Configuration (Retention Pond)

	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.55	0.279	Filtration Media
Zone 2			
Zone 3			
		0.279	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	1.89	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	2.60	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	0.0	ft^2
Underdrain Orifice Centroid =	0.11	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =		ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =		ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =		inches
Orifice Plate: Orifice Area per Row =		inches

Calculated Parameters for Plate

WQ Orifice Area per Row =	N/A	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (optional)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =			inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =			ft^2
Vertical Orifice Centroid =			feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Not Selected	Not Selected	
Overflow Weir Front Edge Height, Ho =	1.45		ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	8.66		feet
Overflow Weir Slope =	0.00		H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	2.91		feet
Overflow Grate Open Area % =	70%		%, grate open area/total area
Debris Clogging % =	50%		%

Calculated Parameters for Overflow Weir

	Not Selected	Not Selected	
Height of Grate Upper Edge, H_t =	1.45		feet
Over Flow Weir Slope Length =	2.91		feet
Grate Open Area / 100-yr Orifice Area =			should be $\geq$ 4
Overflow Grate Open Area w/o Debris =	17.64		ft^2
Overflow Grate Open Area w/ Debris =	8.82		ft^2

Type D inlets are 68" (inside to inside). If you are anticipating a modified type D inlet indicate it on the plans or update the calculations to match standard type D dimension.

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Not Selected	Not Selected	
Depth to Invert of Outlet Pipe =			ft (distance below basin
Circular Orifice Diameter =			inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Not Selected	Not Selected	
Outlet Pipe Flow Area =			ft^2
Outlet Orifice Centroid =			feet
Restrictor Plate Height Angle =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	6367.99	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	32.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.21	feet

Calculated Parameters for Spillway

Spillway Design Flow Depth=	0.59	feet
Stage at Top of Freeboard =	6369.79	feet
Basin Area at Top of Freeboard =	0.34	acres

Routed Hydrograph Results

Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	0.53	1.07	1.19	1.50	1.75	2.00	2.25	2.52	3.14
Calculated Runoff Volume (acre-ft) =	0.279	1.335	0.937	1.224	1.491	1.798	2.108	2.477	3.308
OPTIONAL Override Runoff Volume (acre-ft) =									
Inflow Hydrograph Volume (acre-ft) =	0.279	1.336	0.938	1.224	1.492	1.800	2.110	2.479	3.311
Predevelopment Unit Peak Flow, q (cfs/acre) =	0.00	0.00	0.00	0.01	0.04	0.11	0.34	0.70	1.43
Predevelopment Peak Q (cfs) =	0.0	0.0	0.0	0.1	0.6	1.7	5.1	10.5	21.5
Peak Inflow Q (cfs) =	8.7	41.0	28.9	37.7	45.8	55.1	64.4	75.6	100.5
Peak Outflow Q (cfs) =	0.3	32.8	20.5	29.4	37.3	44.5	52.7	60.2	73.8
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	* 230.6	62.9	26.5	10.3	* 5.8	3.4
Structure Controlling Flow =	Filtration Media	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1
Max Velocity through Grate 1 (fps) =	N/A	-0.02	-0.02	0.0	0.0	0.0	0.0	0.0	0.0
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	12	11	11	11	11	10	10	9	8
Time to Drain 99% of Inflow Volume (hours) =	**12**	12	12	12	12	12	12	12	11
Maximum Ponding Depth (ft) =	1.42	2.20	2.00	2.15	2.27	2.44	2.61	2.85	3.55
Area at Maximum Ponding Depth (acres) =	0.21	0.25	0.24	0.24	0.25	0.26	0.27	0.28	0.31
Maximum Volume Stored (acre-ft) =	0.251	0.430	0.380	0.415	0.445	0.488	0.535	0.597	0.806

*Per Resolution 16-426 of the BoCC, on-site WQCV is required but on-site stormwater detention is not required per the FDR for Claremont Business Park Fil. 2.

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

Detention Basin Outlet Structure Design

Outflow Hydrograph Workbook Filename:

Storm Inflow Hydrographs **UD-Detention, Version 3.07 (February 2017)**

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

	SOURCE	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK	WORKBOOK
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
2.68 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:02:41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydrograph	0:05:22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	0:08:02	0.39	1.78	1.27	1.64	1.98	2.38	2.76	3.22	4.24
1.868	0:10:43	1.05	4.85	3.43	4.45	5.40	6.48	7.56	8.84	11.68
	0:13:24	2.71	12.45	8.82	11.44	13.87	16.64	19.42	22.70	30.00
	0:16:05	7.45	34.20	24.24	31.43	38.08	45.70	53.29	62.29	82.29
	0:18:46	8.75	41.03	28.93	37.65	45.76	55.10	64.44	75.56	100.48
	0:21:26	8.33	39.24	27.63	36.00	43.78	52.74	61.73	72.41	96.44
	0:24:07	7.58	35.72	25.16	32.77	39.86	48.01	56.18	65.91	87.77
	0:26:48	6.74	32.02	22.51	29.36	35.74	43.08	50.46	59.24	79.00
	0:29:29	5.78	27.77	19.48	25.45	31.01	37.42	43.89	51.60	68.98
	0:32:10	5.05	24.14	16.96	22.13	26.95	32.50	38.15	44.90	60.15
	0:34:50	4.57	21.89	15.37	20.07	24.44	29.48	34.58	40.66	54.38
	0:37:31	3.74	18.19	12.73	16.66	20.33	24.56	28.84	33.95	45.48
	0:40:12	3.03	14.95	10.43	13.68	16.73	20.24	23.79	28.04	37.64
	0:42:53	2.30	11.65	8.08	10.65	13.06	15.85	18.67	22.05	29.72
	0:45:34	1.69	8.80	6.05	8.03	9.89	12.05	14.25	16.88	22.87
	0:48:14	1.23	6.42	4.38	5.84	7.23	8.84	10.49	12.48	17.01
	0:50:55	0.96	4.91	3.37	4.48	5.52	6.72	7.96	9.43	12.80
	0:53:36	0.80	4.01	2.77	3.67	4.51	5.48	6.47	7.65	10.33
	0:56:17	0.68	3.40	2.35	3.10	3.81	4.63	5.46	6.45	8.70
	0:58:58	0.60	2.97	2.06	2.72	3.33	4.05	4.77	5.63	7.58
	1:01:38	0.54	2.67	1.85	2.44	2.99	3.63	4.27	5.05	6.79
	1:04:19	0.50	2.46	1.71	2.25	2.75	3.33	3.92	4.63	6.22
	1:07:00	0.37	1.81	1.25	1.65	2.03	2.46	2.90	3.42	4.62
	1:09:41	0.27	1.32	0.92	1.21	1.48	1.79	2.11	2.49	3.35
	1:12:22	0.20	0.97	0.67	0.89	1.09	1.32	1.55	1.84	2.47
	1:15:02	0.14	0.72	0.50	0.66	0.80	0.98	1.15	1.36	1.84
	1:17:43	0.10	0.52	0.36	0.47	0.58	0.71	0.84	0.99	1.34
	1:20:24	0.07	0.37	0.25	0.34	0.41	0.50	0.60	0.71	0.96
	1:23:05	0.05	0.27	0.18	0.24	0.30	0.37	0.43	0.51	0.70
	1:25:46	0.03	0.18	0.12	0.16	0.20	0.25	0.30	0.35	0.48
	1:28:26	0.02	0.11	0.07	0.10	0.13	0.16	0.19	0.22	0.31
	1:31:07	0.01	0.06	0.04	0.05	0.07	0.08	0.10	0.12	0.17
	1:33:48	0.00	0.02	0.01	0.02	0.03	0.03	0.04	0.05	0.08
	1:36:29	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.02
	1:39:10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1:41:50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1:44:31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1:47:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1:49:53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1:52:34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1:55:14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1:57:55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:00:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:03:17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:05:58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:08:38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:11:19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:14:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:16:41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:19:22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:22:02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:24:43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:27:24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:30:05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:32:46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:35:26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:38:07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:40:48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:43:29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:46:10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:48:50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:51:31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:54:12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:56:53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:59:34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:02:14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:04:55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:07:36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:10:17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:12:58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.

The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

Stage - Storage Description	Stage [ft]	Area [ft^2]	Area [acres]	Volume [ft^3]	Volume [ac-ft]	Total Outflow [cfs]

For best results, include the stages of all grade slope changes (e.g. ISV and Floor) from the S-A-V table on Sheet 'Basin'.

Also include the inverts of all outlets (e.g. vertical orifice, overflow grate, and spillway, where applicable).

CLAREMONT COMERCIAL

EMERGENCY SPILLWAY CALCULATIONS SFB

Horizontal Broad-Crested Weir (Eqn 12-20 UDFCD)						
Variable				*Solve For*		
C	3.00			L (ft)	H (ft)	Q (cfs)
L	32.00	ft		0.0	0.0	68.7
H	0.80	ft				
Q		cfs				

Sloping Broad-Crested Weir (Eqn 12-21 UDFCD)						
Variable				*Solve For*		
C	3.00			Z (ft)	H (ft)	Q (cfs)
Z	4.00	ft		0.0	0.0	2.7
H	0.80	ft				
Q		cfs				

Total Q	74.19
100-yr Emergency Spillway Crest Elev.	6367.99
100-yr Emergency Spillway W.S Elev.	6368.79
Top Of SFB Pond Elev.	6370.00
Freeboard Provided (ft.)	1.21

Equation 12-20

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

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

ENGINEERS EDGE
Solutions By Design

Ultimate - GD&T Wall Chart
ASME Y14.5-2009 Standard
Laminated, 24" x 36" - Awesome!

Partially Full Pipe Flow Calculator and Equations

Fluid Flow Table of Contents | Hydraulic and Pneumatic Knowledge
Fluid Power Equipment

This engineering calculator determines the Flow within a partially full pipe using the Manning equation. This calculator can also be used for uniform flow in a pipe, but the Manning roughness coefficient needs to be considered to be variable, dependent upon the depth of flow.

Partially Full Pipe Flow Calculations - U.S. Units

II. Calculation of Discharge, Q, and average velocity, V
for pipes more than half full

Instructions: *Enter values in blue boxes. Calculations in yellow*

Inputs

Pipe Diameter, **D** =	42	in
Depth of flow, **y** =	36.4	in

(must have y ≥ D/2)

Full Pipe Manning roughness, $\mathbf{n_{full}}$ =	0.012	
Channel bottom slope, **S** =	0.005	ft/ft

Calculations

$\mathbf{n/n_{full}}$ =	1.0666666
Partially Full Manning roughness, **n** =	0.013

Calculations

Pipe Diameter, **D** =	3.5	ft
Pipe Radius, **r** =	1.75	ft
Circ. Segment Height, **h** =	0.467	ft
Central Angle, **q** =	1.50	radians
Cross-Sect. Area, **A** =	8.86	ft^2
Wetted Perimeter, **P** =	8.4	ft
Hydraulic Radius, **R** =	1.06	ft
Discharge, **Q** =	75.67	cfs
Ave. Velocity, **V** =	8.54	ft/sec
pipe % full [(A/A_{full})*100%] =	92.1%	

Partially Full Pipe Flow Parameters
(More Than Half Full)

r = D/2

h = 2r - y

(hydraulic radius)

R = A/P

(Manning Equation)

$Q = (1.49/n)(A)(R^{2/3})(S^{1/2})$

V = Q/A P

$$\theta = 2\arccos\left(\frac{r-h}{r}\right)$$

$$A = \pi r^2 - \frac{r^2(\theta - \sin\theta)}{2}$$

$$P = 2\pi r - r*\theta$$

Equation used for n/n_{full}: $\mathbf{n/n_{full} = 1.25 - (y/D - 0.5)*0.5}$ (for $0.5 \le y/D \le 1$)

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BOCC RESOLUTION 16-426

BOCC

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El Paso County, CO
216137149

RESOLUTION NO. 16- 426

BOARD OF COUNTY COMMISSIONERS
COUNTY OF EL PASO, STATE OF COLORADO

Resolution Denying an Appeal by Hammers Construction LLC (APP-16-002) of the Administrative Determination made by the Planning and Community Development Department Executive Director regarding the requirement for permanent/post construction Water Quality (permanent stormwater quality best management practices or BMP's).

WHEREAS, pursuant to §§30-11-101(1)(e) and 30-11-107(1)(e), C.R.S., the Board of County Commissioners of El Paso County, Colorado (hereinafter "Board) has the legislative authority to manage the concerns of El Paso County when deemed by the Board to be in the best interests of the County and its inhabitants; and

WHEREAS, after consultation with the County Attorney's Office, the Executive Director of Planning and Community Development on August 4, 2016 issued an administrative determination finding made an administrative determination that all undeveloped lots within the Claremont Business Park are subject to installation of permanent stormwater management best management practices (BMP's) associated with development, and that the terms of a 2008 approved deviation relieving the developer of the requirements have not been met.; and

WHEREAS, an appeal of the administrative determination was filed by Hammers Construction on August 10, 2016, and a hearing date was set for September 27, 2016 to hear the appeal; and

WHEREAS, the hearing was continued to a date certain of November 22, 2016; and

WHEREAS, at the Applicant's appeal hearing on November 22, 2016, testimony from the Applicant and the Applicant's representatives was heard by the Board in favor of the appeal, testimony from representatives of Planning and Community Development Department and was presented, and such testimony and associated evidence was weighed by the Board; and

WHEREAS, the Board, having reviewed the testimony and evidence, hereby finds and determines that the requested appeal of the administrative determination by the Planning and Community Development Executive Director by the Applicant did not satisfy the criteria of approval to overturn the administrative determination.

NOW, THEREFORE, BE IT RESOLVED that the Board of County Commissioners of El Paso County, Colorado, hereby denies the appeal of the administrative determination by Hammers Construction and determines that permanent stormwater management best management practices (BMP's) are required with new development within the Claremont Business Park: and

BE IT FURTHER RESOLVED that Sallie Clark, duly elected, qualified member and Chair of the Board of County Commissioners, or Darryl Glenn, duly elected, qualified member and Vice Chair of the Board of County Commissioners, be and is hereby authorized on behalf of the Board to execute any and all documents necessary to carry out the intent of the Board as described herein.

DONE THIS 22nd day of November, 2016, at Colorado Springs Colorado.

BOARD OF COUNTY COMMISSIONERS
EL PASO COUNTY, COLORADO

By: _____
Chair of the Board

ATTEST: _____
County Clerk & Recorder

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

Engineer's Statement:

The *revisions* (changes made to the base Final Drainage Report since July, 2006) to the attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. The revisions encompassed adding additional right of way to the study area at the County's request, the handling of offsite drainage due to the additional right of way, a breakdown of private drainage within lot numbers 10 through 25 of Filing No. 2 due to cross-lot drainage (contrary to note # 25 on the recorded plat), profiling additional inlets along the channel edge, and rip-rap sizing for outlet structures along the channel. The Final Drainage Report dated July, 2006 was prepared under the direct supervision of Richard G. Gallegos, Jr. in July, 2006 and stamped (see next sheet).

The Final Drainage Report was prepared according to the criteria established by the County for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing the *revisions* to this report.

Brady A. Shyrock
Registered Professional Engineer
State of Colorado
No. 38164

SEAL

Engineer's Statement:

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

SEAL

Richard G. Gallegos, Jr.
Registered Professional Engineer
State of Colorado
No. 36247

Developer's Statement:

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

Claremont Development, Inc.
Business Name

By: _____

Title: _____
Address: 3460 Capital Drive
Colorado Springs, CO 80915

El Paso County:

Filed in accordance with Section 51.1 of the El Paso Land Development Code, as amended.

For Mr. John McCarty, County Engineer/Director — Date 4/23/07

Conditions:

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)

DESIGN POINT SUMMARY			
D.P.	SUB-BASINS	Q(5)	Q(100)
1	B1, B2	31.5	63.6
2	1, B3, OS1(flow by)	42.6	86.6
3	2(sewer), B4(flow by)	43.1	88.2
4	3, B6	44.1	90.1
4A	4, B5	52.8	107.5
5	D1(flow by), D3	12.5	25.5
6	5, D4	24.1	48.9
7	6, D5	40.8	82.5
8	7, D6, B4(flow by)	53.1	107.6
9	8, D7	61.6	124.5
10	D1(flow by), D2, E1, E2	19.4	40.6
11	10, E4	27.7	57.1
12	11, E5	36.3	74.3
13	12, E6	41.8	85.3

LEGEND

- 6520 — PROPOSED CONTOUR
- 6520 — 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-09-01-05-bas

NO.	DATE	DESCRIPTION	BY
		REVISIONS	

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

C:\Documents and Settings\rich_gallegos\My Documents\05.151.036(FILING 2)\Matrix Resources\302-FDR\DR01-02.dwg
PLOT DATE: Mar 02, 2007 9:29am

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 30
Colorado Springs, CO 80920
Phone 719-575-030
Fax 719-575-028

CLAREMONT BUSINESS PARK
FINAL DRAINAGE PLAN
MASTER DEVELOPMENT DRAINAGE PLAN
FINAL DRAINAGE PLAN
FILING NO. 2

DESIGNED BY: RGG	SCALE	DATE ISSUED: SEPTEMBER 2006	DR01
DRAWN BY: GES	HORIZ: 1"= 100'		
CHECKED BY: JPL	VERT: N/A	SHEET NO. 1 OF 2 SHEETS	

DRAINAGE PLAN
CLAREMONT BUSINESS PARK FILING NO. 2

1

DESIGN POINT SUMMARY			
D.P.	SUB-BASINS	Q(5)	Q(100)
11A	E4A, E4B, E4C	11.5	23.0
11	DP10, DP11A	27.7	57.1
12A	E5A, E5B, E5C	11.7	23.5
12	DP11, DP12A	36.3	74.3

REFERENCE DRAWINGS
X-BASE-04.052.001
x-util
X-TOPO
X-ROAD
X-BASE
X-TOPO-09-01-05-bas

NO.	DATE	DESCRIPTION	BY

REVISIONS

C:\Documents and Settings\rich_gallegos\My Documents\05.151.006(FILIN:22 Resources\302-FDR\
DR02-revised-02-19-07.dwg
PLOT DATE: Mar 02, 2007 8:44am

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

REVISED FINAL DRAINAGE PLAN

MASTER DEVELOPMENT DRAINAGE PLAN
REVISED FINAL DRAINAGE PLAN
FILING NO. 2

DESIGNED BY: RGG	SCALE	DATE ISSUED: FEBRUARY 2007	
DRAWN BY: BAS	HORIZ: 1" = 100'		
CHECKED BY: JPL	VERT: N/A	SHEET NO. 1 OF 1 SHEETS	DR02

STORM DRAINAGE DESIGNATION PLAN
CLAREMONT BUSINESS PARK FILING NO. 2

REFERENCE DRAWINGS	NO.	DATE	DESCRIPTION	BY
x-title x-util X-BASE			REVISIONS	

NAME: C:\Documents and Settings\rich_gallegos\My Documents\05.151.006 (Claremont) Water Resources\302-FDR\SD-EXHIBIT.dwg
PCP: Matrix.ctb
PLOT DATE: Mar 07, 2007 8:19am

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

SUBDIVIDER:
HAMMERS CONSTRUCTION, INC.
3460 CAPITIAL DRIVE
COLORADO SPRINGS, CO 80915

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 FILING NO. 2

STORM DRAINAGE DESIGNATION PLAN
FILING NO. 2

DESIGNED BY: BAS	SCALE	DATE ISSUED: JANUARY, 2007	EXH01
DRAWN BY: BAS	HORIZ. 1 = 200'	SHEET NO. 1 OF 1 SHEETS	
CHECKED BY: RGG	VERT. N/A		

DRAINAGE MAP

CLAREMONT COMMERCIAL SUBDIVISION FILING NO. 2

COUNTY OF EL PASO, STATE OF COLORADO

PRELIMINARY DRAINAGE PLAN

JANUARY 2018

1" = 60'

0 30 60 120

Scale in Feet

LEGEND

BASIN DESIGNATION — Z; 25 (ACRES); .25 (C5); .35 (C100)

- PIPE RUN REFERENCE LABEL
- SURFACE DESIGN POINT
- BASIN BOUNDARY
- (6920) EXISTING CONTOUR
- 6920 PROP CONTOUR
- UGE UNDERGROUND ELECTRICAL
- GAS EXISTING GAS LINE
- STORM SEWER PIPE
- EXISTING STORM SEWER PIPE
- CROSSPAN
- INLET
- EXISTING FLOW DIRECTION ARROW
- EMERGENCY OVERFLOW DIRECTION
- FLOW DIRECTION
- FLARED END SECTION
- H.P. HIGH POINT
- L.P. LOW POINT

BASIN SUMMARY			
BASIN	AREA (ACRES)	Q_5	Q_{100}
A	2.46	1.1	7.7
B	7.67	25.6	46.5
B1	2.33	8.3	15.1
B2	0.19	0.9	1.6
B3	0.73	3.1	5.6
C	0.68	0.7	2.4
D	0.94	0.4	2.2

DESIGN POINT SUMMARY				
DESIGN POINT	Q_5	Q_{100}	BASIN	STRUCTURE
1	8.3	15.1	B1	AREA INLET
2	26.5	52.6	A,B	SUMP INLET
3/3A	0.9	1.6	B2	TWO AT-GRADE INLETS
4	3.1	5.6	B3	AREA INLET
5	38.5	75.6	C,DP1, DP2, DP3/3A, DP4	OUTLET STRUCTURE

WQCV SUMMARY	
EPC/URBAN DRAINAGE SAND FILTER BASIN-SEE STD. DET.	
WQCV PROVIDED	0.251 Acre-Ft
AREA PROVIDED	6,428 SF

WQCV WSE = 6366.42

100 YR SPILLWAY ELEV = 6367.99

100 YR WSE = 6367.85

STORM SEWER SUMMARY				
PIPE RUN	Q_5	Q_{100}	PIPE SIZE	CONTRIBUTING PIPES
1	26.5	52.6	42" RCP	DP2
2	8.3	15.1	24" RCP	DP1
3	8.6	15.7	24" RCP	PR2, DP3
4	9.0	16.3	24" RCP	PR3, DP3A
5	11.5	20.9	36" RCP	PR4, DP4
6	38.5	75.6	42" RCP	WQ POND

SECTION A-A

SAND FILTER POND/SPILLWAY DETAIL

EL PASO COUNTY FILE NO. PPR 17-004

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M&S CIVIL CONSULTANTS, INC.

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

CLAREMONT COMMERCIAL SUB FILING NO. 2

PRELIMINARY DRAINAGE PLAN

PROJECT NO. 42-008 | FILE: \dwg\Eng Exhibits\PDRM.dwg

DESIGNED BY: VAS | DRAWN BY: BB | CHECKED BY: VAS

SCALE: HORIZ: 1"=60' VERT: N/A | DATE: 1/29/2018

SHEET 1 OF 1 | PDP01

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GRADING AND EROSION CONTROL PLAN

CLAREMONT COMMERCIAL FILING NO. 2

COUNTY OF EL PASO, STATE OF COLORADO

PRELIMINARY GRADING AND EROSION CONTROL PLAN

JANUARY 2018

GRADING AND EROSION CONTROL NOTES:

1. CONSTRUCTION MAY NOT COMMENCE UNTIL A CONSTRUCTION PERMIT IS OBTAINED FROM DEVELOPMENT SERVICES AND A PRECONSTRUCTION CONFERENCE IS HELD WITH DEVELOPMENT SERVICES INSPECTIONS.
2. STORMWATER DISCHARGES FROM CONSTRUCTION SITES SHALL NOT CAUSE OR THREATEN TO CAUSE POLLUTION, CONTAMINATION, OR DEGRADATION OF STATE WATERS. ALL WORK AND EARTH DISTURBANCE SHALL BE DONE IN A MANNER THAT MINIMIZES POLLUTION OF ANY ON-SITE OR OFF SITE WATERS, INCLUDING WETLANDS.
3. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS TO REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING.
4. A SEPARATE STORMWATER MANAGEMENT PLAN (SMWP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. DURING CONSTRUCTION THE SWMP IS THE RESPONSIBILITY OF THE DESIGNATED STORMWATER MANAGER, SHALL BE LOCATED ON SITE AT ALL TIMES AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS AND CHANGES IN THE FIELD.
5. ONCE THE ESQCP HAS BEEN ISSUED, THE CONTRACTOR MAY INSTALL THE INITIAL STAGE EROSION AND SEDIMENT CONTROL BMPS AS INDICATED ON THE GEC. A PRECONSTRUCTION MEETING BETWEEN THE CONTRACTOR, ENGINEER, AND EL PASO COUNTY WILL BE HELD PRIOR TO ANY CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE APPLICANT TO COORDINATE THE MEETING TIME AND PLACE WITH COUNTY DSD INSPECTIONS STAFF.
6. SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 21 CALENDAR DAYS AFTER FINAL GRADING, OR FINAL EARTH DISTURBANCE, HAS BEEN COMPLETED. DISTURBED AREAS AND STOCKPILES WHICH ARE NOT AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 30 DAYS SHALL ALSO BE MULCHED WITHIN 21 DAYS AFTER INTERIM GRADING. AN AREA THAT IS GOING TO REMAIN IN AN INTERIM STATE FOR MORE THAN 60 DAYS SHALL ALSO BE SEEDED. ALL TEMPORARY SOIL EROSION CONTROL MEASURES AND BMPS SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND ESTABLISHED.
7. TEMPORARY SOIL EROSION CONTROL FACILITIES SHALL BE REMOVED AND EARTH DISTURBANCE AREAS GRADED AND STABILIZED WITH PERMANENT SOIL EROSION CONTROL MEASURES PURSUANT TO STANDARDS AND SPECIFICATION PRESCRIBED IN THE DCM VOLUME II AND THE ENGINEERING CRITERIA MANUAL (ECM) APPENDIX I.
8. ALL PERSONS ENGAGED IN EARTH DISTURBANCE SHALL IMPLEMENT AND MAINTAIN ACCEPTABLE SOIL EROSION AND SEDIMENT CONTROL MEASURES INCLUDING BMPS IN CONFORMANCE WITH THE EROSION CONTROL TECHNICAL STANDARDS OF THE DRAINAGE CRITERIA MANUAL (DCM) VOLUME II AND IN ACCORDANCE WITH THE STORMWATER MANAGEMENT PLAN (SWMP).
9. ALL TEMPORARY EROSION CONTROL FACILITIES INCLUDING BMPS AND ALL PERMANENT FACILITIES INTENDED TO CONTROL EROSION OF ANY EARTH DISTURBANCE OPERATIONS, SHALL BE INSTALLED AS DEFINED IN THE APPROVED PLANS, THE SWMP AND THE DCM VOLUME II AND MAINTAINED THROUGHOUT THE DURATION OF THE EARTH DISTURBANCE OPERATION.
10. ANY EARTH DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER SO AS TO EFFECTIVELY REDUCE ACCELERATED SOIL EROSION AND RESULTING SEDIMENTATION. ALL DISTURBANCES SHALL BE DESIGNED, CONSTRUCTED, AND COMPLETED SO THAT THE EXPOSED AREA OF ANY DISTURBED LAND SHALL BE LIMITED TO THE SHORTEST PRACTICAL PERIOD OF TIME.
11. ANY TEMPORARY OR PERMANENT FACILITY DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF STORMWATER AROUND, THROUGH, OR FROM THE EARTH DISTURBANCE AREA SHALL BE DESIGNED TO LIMIT THE DISCHARGE TO A NON-EROSIVE VELOCITY.
12. CONCRETE WASH WATER SHALL BE CONTAINED AND DISPOSED OF IN ACCORDANCE WITH THE SWMP. NO WASH WATER SHALL BE DISCHARGED TO OR ALLOWED TO RUNOFF TO STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
13. EROSION CONTROL BLANKETING IS TO BE USED ON SLOPES STEEPER THAN 3:1.
14. BUILDING, CONSTRUCTION, EXCAVATION, OR OTHER WASTE MATERIALS SHALL NOT BE TEMPORARILY PLACED OR STORED IN THE STREET, ALLEY, OR OTHER PUBLIC WAY, UNLESS IN ACCORDANCE WITH AN APPROVED TRAFFIC CONTROL PLAN. BMP'S MAY BE REQUIRED BY EL PASO COUNTY ENGINEERING IF DEEMED NECESSARY, BASED ON SPECIFIC CONDITIONS AND CIRCUMSTANCES.
15. VEHICLE TRACKING OF SOILS AND CONSTRUCTION DEBRIS OFF-SITE SHALL BE MINIMIZED. MATERIALS TRACKED OFFSITE SHALL BE CLEANED UP AND PROPERLY DISPOSED OF IMMEDIATELY.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL WASTES FROM THE CONSTRUCTION SITE FOR DISPOSAL IN ACCORDANCE WITH LOCAL AND STATE REGULATORY REQUIREMENTS. NO CONSTRUCTION DEBRIS, TREE SLASH, BUILDING MATERIAL WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURIED, DUMPED, OR DISCHARGED AT THE SITE.
17. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, AND SAND THAT MAY ACCUMULATE IN THE STORM SEWER OR OTHER DRAINAGE CONVEYANCE SYSTEM AND STORMWATER APPURTENANCES AS A RESULT OF SITE DEVELOPMENT.
18. THE QUANTITY OF MATERIALS STORED ON THE PROJECT SITE SHALL BE LIMITED, AS MUCH AS PRACTICAL, TO THAT QUANTITY REQUIRED TO PERFORM THE WORK IN AN ORDERLY SEQUENCE. ALL MATERIALS STORED ON-SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER, IN THEIR ORIGINAL CONTAINERS, WITH ORIGINAL MANUFACTURER'S LABELS.
19. NO CHEMICALS ARE TO BE USED BY THE CONTRACTOR, WHICH HAVE THE POTENTIAL TO BE RELEASED IN STORMWATER UNLESS PERMISSION FOR THE USE OF A SPECIFIC CHEMICAL IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING THE USE OF SUCH CHEMICALS, SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.
20. BULK STORAGE STRUCTURES FOR PETROLEUM PRODUCTS AND OTHER CHEMICALS SHALL HAVE ADEQUATE PROTECTION SO AS TO CONTAIN ALL SPILLS AND PREVENT ANY SPILLED MATERIAL FROM ENTERING STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
21. NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE FLOW LINE OF THE CURB AND GUTTER OR IN THE DITCHLINE.
22. INDIVIDUALS SHALL COMPLY WITH THE "COLORADO WATER QUALITY CONTROL ACT" (TITLE 25, ARTICLE 8, CRS), AND THE "CLEAN WATER ACT" (33 USC 1344), IN ADDITION TO THE REQUIREMENTS INCLUDED IN THE DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, OR COUNTY AGENCIES, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
23. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
24. PRIOR TO ACTUAL CONSTRUCTION THE PERMITEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
25. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
26. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY ENTECH ENGINEERING, INC. # 76021 JUNE 1, 2011. AND SHALL BE CONSIDERED A PART OF THESE PLANS.
27. AT LEAST TEN DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB 1 ACRE OR MORE, THE OWNER OR OPERATOR OF CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STORMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
WATER QUALITY CONTROL DIVISION
WQCD - PERMITS
4300 CHERRY CREEK DRIVE SOUTH
DENVER, CO 80246-1530
ATTN: PERMITS UNIT

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

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

LEGEND

— — (6920) — —	EXISTING CONTOUR
—— 6920 ——	PROP CONTOUR
	STORM SEWER PIPE
	CROSSPAN
	INLET
	EXISTING FLOW DIRECTION ARROW
	EMERGENCY OVERFLOW DIRECTION
	FLOW DIRECTION
	FLARED END SECTION
	DIVERSION SWALE
— — — — UGE —	UNDERGROUND ELECTRICAL
H.P. ×	HIGH POINT
L.P. ×	LOW POINT
SF —— S ——	SILT FENCE
VTC	VEHICLE TRACKING CONTROL
CWA	CONCRETE WASH-OUT BASIN
IP	INLET PROTECTION
SBB	STRAW BALE DITCH CHECK

TEMPORARY DIVERSION SWALE (DS)
N.T.S.

URBAN LOCAL CROSS SECTION
SCALE: NTS

EL PASO COUNTY FILE NO. PPR 17-004

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

CLAREMONT COMMERCIAL FILING NO. 2
PRELIMINARY GRADING AND EROSION CONTROL PLAN

PROJECT NO. 42-008	FILE: \dwg\Eng Exhibits\PGR&EC.dwg		
DESIGNED BY: CMN	SCALE	DATE: 1-29-2018	
DRAWN BY: CMN	HORIZ: 1"=60'	SHEET 1 OF 1	GR&EC01
CHECKED BY: VAS	VERT: N/A		

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