FINAL DRAINAGE REPORT

FOR

LOT 9, CLAREMONT BUSINESS PARK FILING NO. 2

EL PASO COUNTY, COLORADO

January 2018

Prepared for:

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

Prepared by:

CIVIL CONSULTANTS, INC.

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

Update to "PCD Project # PPR-18-007"

Project #44-030
DSD Project #

FINAL DRAINAGE REPORT
FOR
LOT 9 CLAREMONT BUSINESS PARK
FILING NO. 2

DRAINAGE PLAN STATEMENTS

Replace with the County Standard Signature Block

ENGINEERS STATEMENT

The attached drainage plan and report was prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria acceptable to the City of Colorado Springs. I accept responsibility for any liability caused by any negligent acts, errors of omission on my part in preparing this report.

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

DEVELOPER'S STATEMENT

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

BY:_____

TITLE:_____
DATE:_____

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

EL PASO COUNTY'S STATEMENT

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

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

Replace with El Paso County Engineering Criteria Manual

CONDITIONS

Replace title with "County Engineer/ECM Administrator"

FINAL DRAINAGE REPORT
FOR
LOT 9 CLAREMONT BUSINESS PARK
FILING NO. 2

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APPENDIX

FINAL DRAINAGE REPORT
FOR
LOT 9 CLAREMONT BUSINESS PARK
FILING NO. 2

PURPOSE

This document is intended to serve as the Final Drainage Report for LOT 9 CLAREMONT BUSINESS PARK FILING NO. 2. The purpose of this document is to identify and analyze the on and offsite drainage patterns and to ensure that post development runoff is routed through the site safely and in a manner that satisfies the requirements set forth by the El Paso County Drainage Criteria Manual. The proposed principal use for the site consists of infrastructure typically associated with commercial building structures. The majority of the site will consist of asphalt, curb, lighting, a storm water quality facility and landscaping. The proposed use is a permissible use within the Commercial Service zoning criteria.

GENERAL LOCATION AND DESCRIPTION

LOT 9 CLAREMONT BUSINESS PARK FILING NO. 2 is located in the southwest quarter of the northeast quarter of Section 8, Township 14 South, Range 65 West of the 6th P.M. in El Paso County, Colorado. The site is bound on the northeast and southwest by vacant parcels of land (Lot 8 & Lot 10 of Claremont Business Park Fil. No. 2) and to the northwest and southeast by existing commercial developments (Silver and Blue Concrete, and Whistling Pines Gun Club). Three roadways encompass the site; Selix Grove, Cole View, Meadowbrook Parkway. See the Proposed Drainage Map located in the appendix of this report. The site lies within the Sand Creek Drainage Basin. Flows from this site are tributary to Sand Creek.

The site consists of 0.981acres which is presently undeveloped. Vegetation is sparse, consisting of native grasses. The site had experienced overlot grading activities within the last ten years. Existing site terrain generally slopes from north to southwest at grade rates that vary between 1.0% and 4.7%.

The site is currently platted (Plat No. 12506) and zoned "CS" for Commercial Service. The proposed principal uses for Lot 9 will be an office/warehouse/storage facility. The majority of the lot shall consist of a warehouse building, asphalt, curb, lighting, a storm water quality facility and landscaping. A sand filter basin is to be constructed at the southwest end of the lot, which will function to provide water quality treatment.

SOILS

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

HYDROLOGIC CALCULATIONS

Hydrologic calculations were performed using the El Paso County and City of Colorado Springs Storm Drainage Design Criteria manual and where applicable the Urban Storm Drainage Criteria Manual. The

Rational Method was used to estimate stormwater runoff anticipated from design storms with 5-year and 100-year recurrence intervals.

HYDRAULIC CALCULATIONS

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

FLOODPLAIN STATEMENT

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel No. 08041C0756 F and Panel No. 08041C0752 F, effective date March 17, 1997 and revised to reflect LOMR, 06-08-B137P, dated December 13, 2006, the site lies adjacent to and is NOT impacted by a Zone "AE". An annotated FIRM/LOMR Panel is included in the Appendix.

DRAINAGE CRITERIA

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

FOUR STEP PROCESS

Step1 Employ Runoff Reduction Practices – Approx. 0.16 acres of the proposed developed 0.981acres of ground within the project is being set aside for landscaping/WQ facility. Roof drains will be directed to landscaped areas to minimize direct connection of impervious surfaces.

Step 2 Stabilize Drainageways – The site is directly adjacent to the Sand Creek Channel. The "Final Drainage Report for Claremont Business Park Filing No. 2", dated November 2006, by Matrix Design Group, Inc. (hence for referred to as "MDDP") has been designed to discharge developed flows via a 48" RCP directly to the East Fork Sand Creek. The site proposed a Sand Filter Water Quality Facility before discharging to the existing 20' Type R inlet. The outlet underdrain has been designed to drain the pond in a peak event within 12 hours, therefore is not anticipated to have negative effects on downstream drainageways. A Sand Filter Basin water quality facilities is proposed to provide WQCV.

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

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

EXISTING DRAINAGE CONDITIONS

LOT 9 CLAREMONT BUSINESS PARK FILING NO. 2 site consists of 0.981acres and is situated east of the East Fork Reach of the Sand Creek Watershed. The site is currently undeveloped and existing site terrain generally slopes from north to southwest at grade rates that vary between 1.0% and 4.7%. The northeast and southwest properties (Lot 8 and Lot 10) are currently undeveloped. Flows from the site are directed to the roadways within Basin EX3 (Selix Grove and Cole View) and collected by an existing 20' Type R inlet located at Design Point 1 (See Existing Drainage Map in the appendix).

This area was previously studied in the "Final Drainage Report for Claremont Business Park Filing No. 2", dated November 2006, by Matrix Design Group, Inc. (hence for referred to as "MDDP"). The MDDP indicates that the site is located within Basin D6 and contributes flows to Design Point 8. Drainage Maps from the MDDP are located in the appendix of this report. Flows in the developed condition will remain the same contributing to the existing 20' Type R inlet. Flows leave the inlet through a 24" RCP that joins with and existing 48" RCP and ultimately outfalls to Sand Creek.

PROPOSED DRAINAGE CHARACTERISTICS

General Concept Drainage Discussion

In the proposed condition the site will consist of a commercial building with asphalt paving and parking. Runoff tributary to the sand filter basin of the LOT 9 CLAREMONT BUSINESS PARK FILING NO. 2 site is produced within Basins A, B, SF, & OS1 contributing approximately 0.90 acres. In general flows split from a high point located near the east corner of the proposed building directing water, via grading and curb and gutter, either northwest to Design Point 1, or southwest to Design Point 2. Flows are captured by two 2'x3' ADS sump inlets located at the low points of each design point. If any of the two sump inlets become clogged, grading has been designed to allow water to escape to Selix Grove via the north and south entrance driveways. Captured flows are routed to the sand filter basin via Pipe Run 1 and Pipe Run 2. The outlet structure of the sand filter basin will be designed with an underdrain and orifice plate to maintain proper drain time and will discharge into the back of the existing 20' Type R inlet, remaining consistent with existing conditions illustrated by the MDDP. A detailed drainage discussion for each basin is described below. A worksheet detailing the calculated coefficients for each basin can be found in the appendix under Hydrologic Calculations.

Detailed Drainage Discussion

Basin A, 0.24 acres, (Q_5=1.0 cfs, Q_{100}=1.8 cfs), consists of a proposed office/warehouse/commercial building, asphalt paving, and curb and gutter. Flows produced within the Basin A and offsite Basin OS1 are routed as surface runoff to curb and gutter and drain to DP1 (Q_5=0.9 cfs, Q_{100}=2.1 cfs), where they are conveyed to the onsite Sand Filter Basin water quality pond via Pipe Run 1.

Basin B, 0.33 acres, (Q_5=1.4 cfs, Q_{100}=2.5 cfs), consists of a proposed office/warehouse/commercial building, asphalt paving, and curb and gutter. Flows produced within the Basin B are routed as surface runoff to curb and gutter and drain to DP2 (Q_5=1.4 cfs, Q_{100}=2.5 cfs), where they are conveyed to the onsite Sand Filter Basin water quality pond via Pipe Run 2.

Basin C, 0.10 acres, (Q_5=0.1 cfs, Q_{100}=0.4 cfs), consists of landscaping and two entrance driveways providing access to the proposed building. High points located at each entrance driveway, and grading within the proposed landscaping area, direct flows to Selix Grove. Flows entering the roadway are routed, via existing curb and gutter, to the existing 20' Type R sump inlet remaining consistent with existing conditions.

The drainage map identified a Phase I proposed crushed asphalt. Clarify in the sub-basin narrative. Is the pond sized for the ultimate condition?

Basin SF, 0.08 acres, (Q_5=0.1 cfs, Q_{100}=0.3 cfs), consists of the water quality sand filter basin and all its components; outlet structure, underdrain, riprap, flared end section. Flows contributing to the water quality sand filter basin are surface runoff generated within the basin boundaries and discharge from Pipe Run 2.

Basin OS1, 0.24 acres, (Q_5=0.1 cfs, Q_{100}=0.6 cfs), consists of offsite undeveloped land within Lot 8 of Claremont Business Park Filing No. 2. Flows produced within the Basin OS1 travel southwest as sheet flow and enter the site along the northeast property boundary. These flows then combine with flows from Basin A and are captured by the ADS sump inlet at Design Point 1 (Q_5=0.9 cfs, Q_{100}=2.1 cfs), where they are conveyed to the onsite Sand Filter Basin water quality pond via Pipe Run 1.

Basin EX3, 0.23 acres, (Q_5=1.1 cfs, Q_{100}=1.9 cfs), consists of existing roadways Selix Grove and Cole View. Negligible flows from Basin C (Q_5=0.1 cfs, Q_{100}=0.4 cfs) enter Basin EX3 along Selix Grove. Flows entering the roadway are routed, via existing curb and gutter, to the existing 20' Type R sump inlet remaining consistent with existing conditions.

WATER QUALITY PROVISIONS AND MAINTENANCE

The proposed Sand Filter Basin functions to provide water quality for runoff produced on the LOT 9 CLAREMONT BUSINESS PARK FILING NO. 2 site and undeveloped offsite flows contributed by Basin OS1 within Lot 8 (see Proposed Drainage Map). Upon development of Lot 8 the owner will be responsible to provide their own water quality. This water quality pond is designed to treat approx 0.90 acres (Basins A, B, SF, OS1), and provide 640 cubic-feet of water quality storage. Side slopes within the basin are graded at 4:1 or less to limit erosion and promote vegetation. The outlet structure of the sand filter basin will be designed with an underdrain and orifice plate to maintain proper drain time and will discharge into the back of the existing 20' Type R inlet, remaining consistent with existing conditions illustrated by the MDDP. The water quality basin will be private and shall be maintained by the property owner. Access shall be granted to the owner and El Paso County for access and maintenance of the private WQCV facility. A private maintenance agreement document shall accompany the submittal.

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

EROSION CONTROL

It is the policy of the El Paso County that we submit a grading and erosion control plan with the drainage report. Proposed erosion control blanket, 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.	15" PP	202	LF	$26	/LF	$5,252.00
3.	2'x3' ADS Inlet	2	EA	$1,700	/EA	$3,400.00
4.	WQCV Sand Filter Pond	1	EA	$6,000	/EA	$6,000.00
5.	Pond Outlet Structure	1	EA	$5,000	/EA	$5,000.00
6.	RIPRAP OUTFALL	40	SF	$7	/SF	$280.00
7.	SC150 Erosion Control Blanket	23	SY	$8	/SY	$184.00
					Total $	**$20,116.00**

DRAINAGE & BRIDGE FEES

The site is currently platted, with no replat being submitted. Therefore drainage and bridge fees are not due for the development of the LOT 9 CLAREMONT BUSINESS PARK FILING NO. 2 site.

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

SUMMARY

Development of the LOT 9 CLAREMONT BUSINESS PARK FILING NO. 2 site shall not adversely affect adjacent or downstream properties per this final drainage report. The proposed drainage facilities will adequately convey, detain and route runoff from tributary onsite and existing offsite flows to the Sand Creek Drainage channel. All drainage facilities described herein and shown on the included drainage map are subject to change due to formal design considerations during the construction document preparation stage. Care will be taken to accommodate overland emergency flow routes on site and temporary drainage conditions.

REFERENCES

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

2.) "Urban Storm Drainage Criteria Manual"

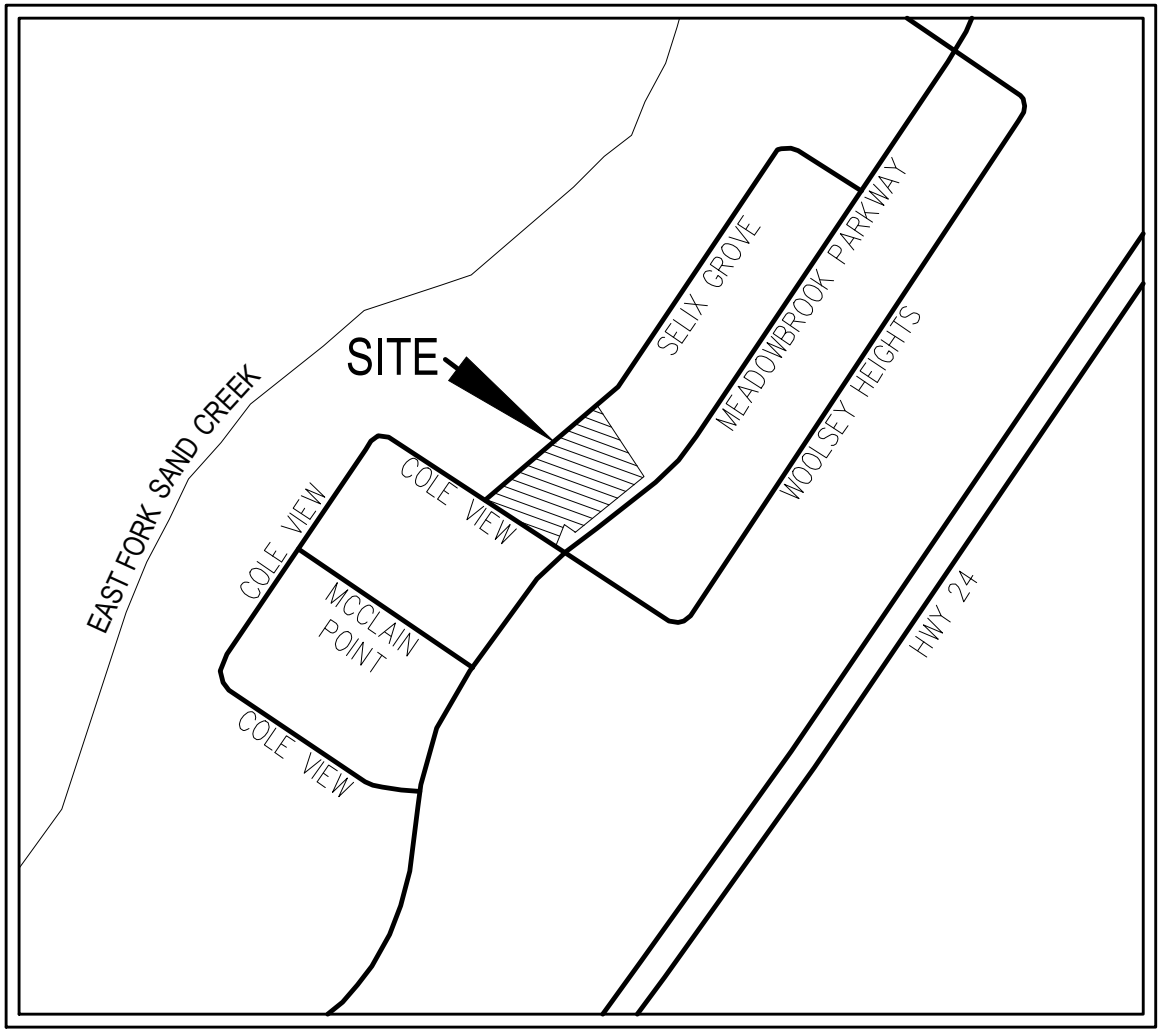
3.) SCS Soils Map for El Paso County.

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

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

APPENDIX

VICINITY MAP



VICINITY MAP

N.T.S.

SOILS MAP


104° 41' 22" W
104° 41' 16" W
38° 50' 57" N
38° 50' 54" N
526950
526960
526970
526980
526990
527000
527010
527020
527030
527040
527050
527060
527070
527080
4300090
4300080
4300070
4300060
4300050
4300040
4300030
4300020
4300010
SITE ONLY
Soil Map may not be valid at this scale.
Map Scale: 1:636 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 5 10 20 30
Feet
0 30 60 120 180
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84


104° 41' 22" W
104° 41' 14" W
526950
526960
526970
526980
526990
527000
527010
527020
527030
527040
527050
527060
527070
527080
527090
527100
527110
38° 50' 58" N
38° 50' 54" N
4300110
4300100
4300090
4300080
4300070
4300060
4300050
4300040
4300030
4300020
4300010
SITE INLCUDING
OFFSITE AREA NORTH
28
Soil Map may not be valid at this scale.
Map Scale: 1:782 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0
10
20
40
60
Feet
0
35
70
140
210
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 15, Oct 10, 2017

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

Date(s) aerial images were photographed: Jun 3, 2014—Jun 17, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
28	Ellicott loamy coarse sand, 0 to 5 percent slopes	A	0.8	100.0%
Totals for Area of Interest			**0.8**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

FIRM PANEL W/ REVISED LOMR

Federal Emergency Management Agency

Washington, D.C. 20472

NOV 13 2006

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

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

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

Dear Ms. Clark:

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

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

Sincerely,

Kevin C Long

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

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

List of Enclosures:

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

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

[redacted]
Central Marksheffel Business District

[redacted]
Matrix Design Group

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

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

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

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

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

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

FLOODING SOURCE(S) & REVISED REACH(ES)

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

SUMMARY OF REVISIONS

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

* BFEs - Base Flood Elevations

DETERMINATION

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

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

Kevin C. Long

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

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

FEDERAL EMERGENCY MANAGEMENT AGENCY

EL PASO COUNTY, CO
AND INCORPORATED AREAS

212P

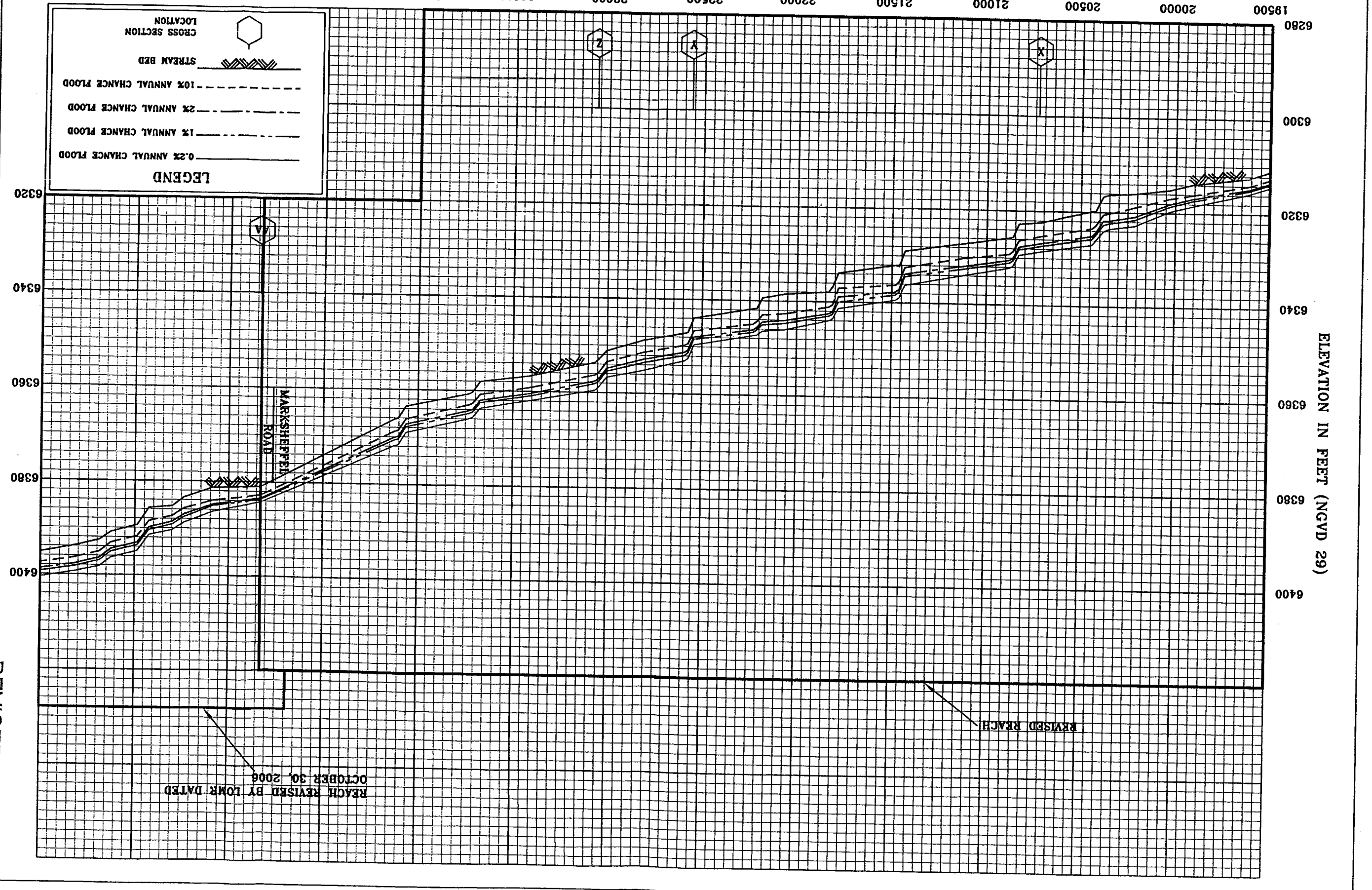
REVISED TO
REFLECT LOMR
EFFECTIVE DEC 13 2006

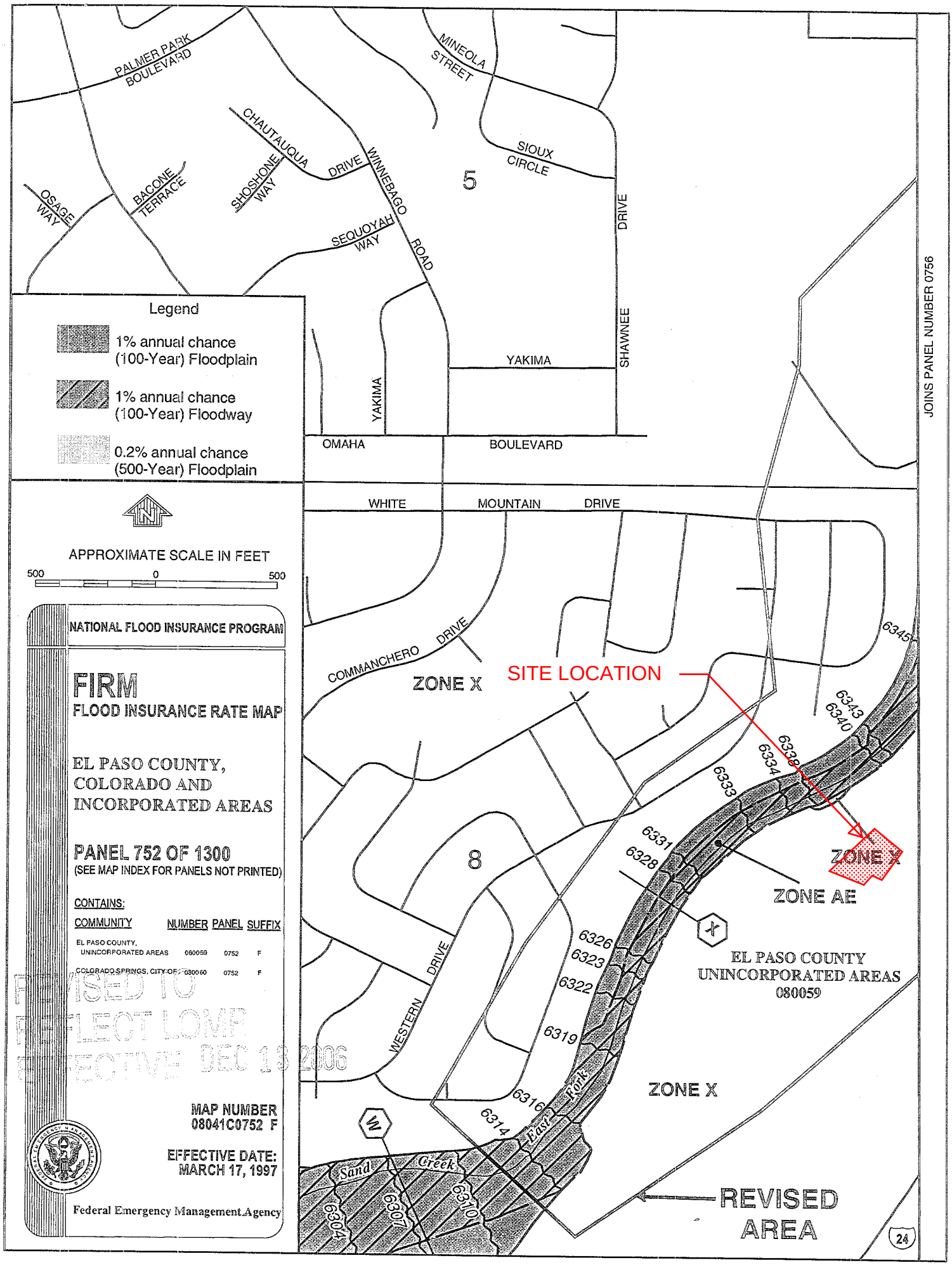
FLOOD PROFILES

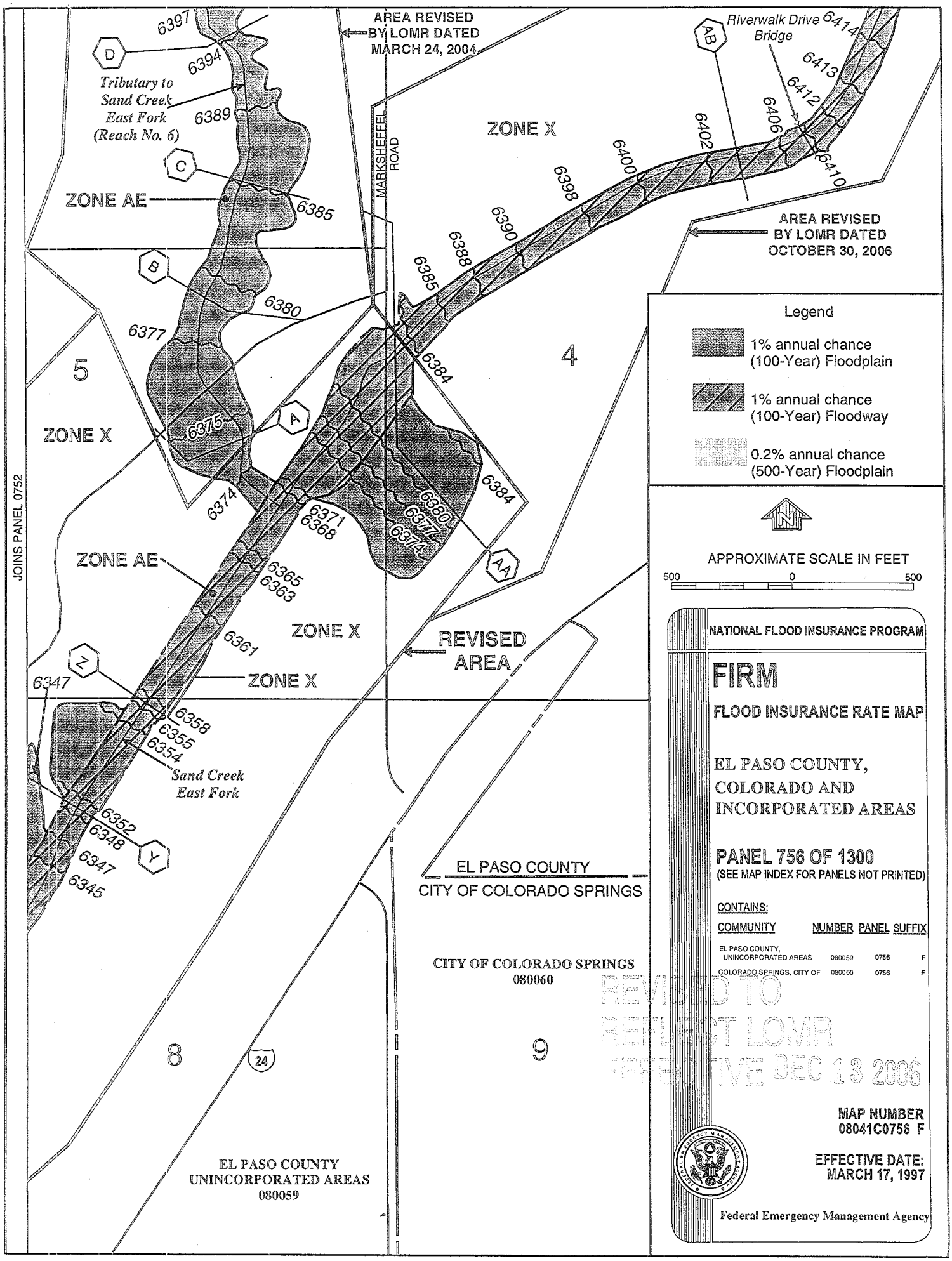
SAND CREEK EAST FORK

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH SAND CREEK

ELEVATION IN FEET (NGVD 29)




PALMER PARK BOULEVARD
MINEOLA STREET
CHAUTAUQUA DRIVE
WINNEBAGO ROAD
SIOUX CIRCLE
SHAWNEE DRIVE
OSAGE WAY
BACONE TERRACE
SHOSHONE WAY
SEQUOYAH WAY
5
YAKIMA
OMAHA BOULEVARD
WHITE MOUNTAIN DRIVE
COMMANCHERO DRIVE
ZONE X
SITE LOCATION
8
WESTERN DRIVE
ZONE AE
EL PASO COUNTY
UNINCORPORATED AREAS
080059
ZONE X
REVISED AREA
Sand Creek
East Fork
6304
6307
6310
6314
6316
6319
6322
6323
6326
6328
6331
6333
6334
6339
6340
6343
6345
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
24


AREA REVISED BY LOMR DATED MARCH 24, 2004
AREA REVISED BY LOMR DATED OCTOBER 30, 2006
Riverwalk Drive Bridge
Tributary to Sand Creek East Fork (Reach No. 6)
Sand Creek East Fork
MARKSHEFFEL ROAD
ZONE X
ZONE AE
ZONE X
ZONE AE
ZONE X
ZONE X
REVISED AREA
JOINS PANEL 0752
5
4
8
9
24
6397
6394
6389
6385
6380
6377
6375
6374
6371
6368
6365
6363
6361
6347
6358
6355
6354
6352
6348
6347
6345
6414
6413
6412
6406
6402
6400
6398
6390
6388
6385
6384
6384
6380
6377
6374
A
AA
AB
B
C
D
Y
Z
EL PASO COUNTY
CITY OF COLORADO SPRINGS
CITY OF COLORADO SPRINGS
080060
EL PASO COUNTY
UNINCORPORATED AREAS
080059
Legend
1% annual chance (100-Year) Floodplain
1% annual chance (100-Year) Floodway
0.2% annual chance (500-Year) Floodplain
APPROXIMATE SCALE IN FEET
500
0
500
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY, COLORADO AND INCORPORATED AREAS
PANEL 756 OF 1300
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
EL PASO COUNTY, UNINCORPORATED AREAS 080059 0756 F
COLORADO SPRINGS, CITY OF 080060 0756 F
REVISED TO REFLECT LOMR EFFECTIVE DEC 13 2006
MAP NUMBER
08041C0756 F
EFFECTIVE DATE:
MARCH 17, 1997
Federal Emergency Management Agency

HYDROLOGIC CALCULATIONS

LOT 9 CLAREMONT BUSINESS PARK
EXISTING DRAINAGE CALCULATIONS
(Area Runoff Coefficient Summary)

			STREETS / DEVELOPED			*OVERLAND / DEVELOPED*			*OVERLAND / UNDEVELOPED*			*WEIGHTED*	
BASIN	**TOTAL AREA** *(SF)*	**TOTAL AREA** *(Acres)*	**AREA** *(Acres)*	**C_5**	**C_{100}**	**AREA** *(Acres)*	**C_5**	**C_{100}**	**AREA** *(Acres)*	**C_5**	**C_{100}**	**C_5**	**C_{100}**
OS1	***10563***	0.24	0.00			0.00			0.24	0.09	0.36	***0.09***	***0.36***
EX1	***18813***	0.43	0.00			0.00			0.43	0.09	0.36	***0.09***	***0.36***
EX2	***13951***	0.32	0.00			0.00			0.32	0.09	0.36	***0.09***	***0.36***
EX3	***9949***	0.23	0.23	0.90	0.96	0.00			0.00			***0.90***	***0.96***

LOT 9 CLAREMONT BUSINESS PARK
PRELIMINARY/FINAL DRAINAGE REPORT
(Area Drainage Summary)

From Area Runoff Coefficient Summary				*OVERLAND*				*STREET / CHANNEL FLOW*				*Time of Travel (T_t)*		*INTENSITY **		*TOTAL FLOWS*	
BASIN	**AREA TOTAL** *(Acres)*	**C_5** *From DCM Table 5-1*	**C_{100}** *From DCM Table 5-1*	**C_5**	**Length** *(ft)*	**Height** *(ft)*	**T_C** *(min)*	**Length** *(ft)*	**Slope** *(%)*	**Velocity** *(fps)*	**T_t** *(min)*	**TOTAL** *(min)*	**CHECK** *(min)*	**I_5** *(in/hr)*	**I_{100}** *(in/hr)*	**Q_5** *(c.f.s.)*	**Q_{100}** *(c.f.s.)*
OS1	0.24	0.09	0.36	0.09	60	0.8	13.1	30	1.1%	1.0	0.5	13.6	10.5	4.1	6.8	***0.1***	***0.6***
EX1	0.43	0.09	0.36	0.09	60	0.5	15.0	140	1.3%	1.1	2.0	17.0	11.1	4.0	6.7	***0.2***	***1.0***
EX2	0.32	0.09	0.36	0.09	60	0.5	15.0	170	1.1%	1.0	2.7	17.7	11.3	3.9	6.6	***0.1***	***0.8***
EX3	0.23	0.90	0.96	0.90	20	0.5	1.2	155	0.6%	1.5	1.7	2.9	11.0	5.2	8.7	***1.1***	***1.9***

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

Calculated by: CMN
Date: 1/23/2018
Checked by: VAS

LOT 9 CLAREMONT BUSINESS PARK
PRELIMINARY/FINAL 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.)*	COMMENTS
1	**OS1, EX1, EX2, EX3**	0.30	0.58	0.24	60	0.75	11.2	260	3.1%	1.8	2.5	13.6	3.7	6.2	***1.1***	***3.6***	EXISTING 20' SUMP INLET

Calculated by: CMN
Date: 1/23/2018
Checked by: VAS

Update to identify the specific surface characteristics.

LOT 9 CLAREMONT BUSINESS PARK
PROPOSED DRAINAGE CALCULATIONS
(Area Runoff Coefficient Summary)

			STREETS / DEVELOPED			*OVERLAND / DEVELOPED*			*OVERLAND / UNDEVELOPED*			*WEIGHTED*	
BASIN	**TOTAL AREA** *(SF)*	**TOTAL AREA** *(Acres)*	**AREA** *(Acres)*	**C_5**	**C_{100}**	**AREA** *(Acres)*	**C_5**	**C_{100}**	**AREA** *(Acres)*	**C_5**	**C_{100}**	**C_5**	**C_{100}**
A	***10505***	0.24	0.00			0.24	0.81	0.88				***0.81***	***0.88***
B	***14443***	0.33	0.00			0.33	0.81	0.88				***0.81***	***0.88***
C	***4234***	0.10	0.02	0.90	0.96	0.08	0.12	0.39				***0.28***	***0.51***
SF	***3582***	0.08	0.00			0.08	0.12	0.39				***0.12***	***0.39***
OS1	***10563***	0.24	0.00			0.00			0.24	0.09	0.36	***0.09***	***0.36***
EX3	***9949***	0.23	0.23	0.90	0.96	0.00			0.00			***0.90***	***0.96***

LOT 9 CLAREMONT BUSINESS PARK
PRELIMINARY/FINAL DRAINAGE REPORT
(Area Drainage Summary)

From Area Runoff Coefficient Summary				*OVERLAND*				*STREET / CHANNEL FLOW*				*Time of Travel (T_t)*		*INTENSITY **		*TOTAL FLOWS*	
BASIN	**AREA TOTAL**	**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.)*
A	0.24	0.81	0.88	0.81	45	0.6	3.2	85	0.5%	1.4	1.0	4.2	10.7	5.2	8.7	***1.0***	***1.8***
B	0.33	0.81	0.88	0.81	45	0.8	2.9	120	0.5%	1.4	1.4	4.3	10.9	5.2	8.7	***1.4***	***2.5***
C	0.10	0.28	0.51	0.28	25	1.0	4.7	0	0.0%	0.0	0.0	4.7	10.1	5.2	8.7	***0.1***	***0.4***
SF	0.08	0.12	0.39	0.12	10	2.0	2.1	45	0.1%	0.3	2.4	4.5	10.3	5.2	8.7	***0.1***	***0.3***
OS1	0.24	0.09	0.36	0.09	60	0.8	13.1	30	1.1%	1.0	0.5	13.6	10.5	4.1	6.8	***0.1***	***0.6***
EX3	0.23	0.90	0.96	0.90	20	0.5	1.2	155	0.6%	1.5	1.7	2.9	11.0	5.2	8.7	***1.1***	***1.9***

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

Calculated by: CMN
Date: 1/23/2018
Checked by: VAS

LOT 9 CLAREMONT BUSINESS PARK
PRELIMINARY/FINAL 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.)*	COMMENTS
1	**OS1, A**	0.22	0.30	0.45	45	0.6	7.2	85	0.5%	0.7	2.0	9.2	4.3	7.2	*0.9*	*2.1*	2'X3' ADS SUMP INLET
2	**B**	0.27	0.29					**Tc FROM BASIN B**				5.0	5.2	8.7	*1.4*	*2.5*	2'X3' ADS SUMP INLET
3	**SF, DP1, DP2**	0.50	0.62					**Tc CONSIDERED FROM ALL CONTRIBUTING BASINS**				6.0	4.9	8.2	*2.4*	*5.1*	SAND FILTER WQ POND AND CDOT TYPE C OUTLET STRUCTURE
4	**C, EX3**	0.23	0.27					**Tc = MINIMUM TRAVEL TIME**				5.0	5.2	8.7	*1.2*	*2.3*	EXISTING 20' SUMP INLET

Calculated by: CMN
Date: 1/23/2018
Checked by: VAS

LOT 9 CLAREMONT BUSINESS PARK
PRELIMINARY/FINAL DRAINAGE REPORT
(Storm Sewer Routing Summary)

PIPE	*Contributing Pipes/Design Points*	*Equivalent CA_5*	*Equivalent CA_{100}*	*Maximum T_C*	*Intensity**		*Flow*	
					I_5	*I_{100}*	*Q_5*	*Q_{100}*
1	**DP1**	0.22	0.30	9.2	4.3	7.2	***0.9***	***2.1***
2	**DP2, PR1**	0.49	0.59	8.0	4.5	7.5	***2.2***	***4.4***

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

DP - Design Point
EX - Existing Design Point
FB- Flow By from Design Point
INT- Intercepted Flow from Design Point

Calculated by: CMN
Date: 1/23/2018
Checked by: VAS

HYDRAULIC CALCULATIONS / SFB WQCV CALCULATIONS

Design Procedure Form: Sand Filter (SF)

UD-BMP (Version 3.06, November 2016)

Designer:	**Chase M. Neises**
Company:	**M&S Civil Consultants**
Date:	**January 23, 2018**
Project:	**Lot 9, Claremont Business Park**
Location:	**Selix Grove and Cole View, El Paso County**

1. Basin Storage Volume

A) Effective Imperviousness of Tributary Area, I_a (100% if all paved and roofed areas upstream of sand filter): I_a = 61.8 %

B) Tributary Area's Imperviousness Ratio ($i = I_a/100$): i = 0.618

C) Water Quality Capture Volume (WQCV) Based on 12-hour Drain Time: WQCV = 0.19 watershed inches
$WQCV = 0.8 * (0.91 * i^3 - 1.19 * i^2 + 0.78 * i)$

D) Contributing Watershed Area (including sand filter area): Area = 39,093 sq ft

E) Water Quality Capture Volume (WQCV) Design Volume: V_{WQCV} = 632 cu ft
$V_{WQCV} = WQCV / 12 * Area$

F) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm: d_6 = ____ in

G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume: $V_{WQCV\ OTHER}$ = ____ cu ft

H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired): $V_{WQCV\ USER}$ = ____ cu ft

2. Basin Geometry

A) WQCV Depth: D_{WQCV} = 2.0 ft

B) Sand Filter Side Slopes (Horizontal distance per unit vertical, 4:1 or flatter preferred). Use "0" if sand filter has vertical walls.: Z = 4.00 ft / ft

C) Minimum Filter Area (Flat Surface Area): A_{Min} = 302 sq ft

D) Actual Filter Area: A_{Actual} = 339 sq ft

E) Volume Provided: V_T = 640 cu ft

3. Filter Material

Choose One
- (●) 18" CDOT Class B or C Filter Material
- ( ) Other (Explain):

4. Underdrain System

A) Are underdrains provided?

Choose One
- (●) YES
- ( ) NO

B) Underdrain system orifice diameter for 12 hour drain time

i) Distance From Lowest Elevation of the Storage Volume to the Center of the Orifice: y = 1.5 ft

ii) Volume to Drain in 12 Hours: Vol_{12} = 632 cu ft

iii) Orifice Diameter, 3/8" Minimum: D_O = 9 / 16 in

Design Procedure Form: Sand Filter (SF)

Designer: Chase M. Neises
Company: M&S Civil Consultants
Date: January 23, 2018
Project: Lot 9, Claremont Business Park
Location: Selix Grove and Cole View, El Paso County

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

Notes:

Weighted Percent Imperviousness of WQ SFB				
Contributing Basins	*Area (Acres)*	C_5	*Impervious % (I)*	*(Acres)*(I)*
A	0.24	0.81	95	22.91
B	0.33	0.81	95	31.50
SF	0.08	0.12	7	0.58
OS1	0.24	0.09	2	0.48
Totals	***0.90***			***55.47***
Imperviousness of WQ Pond 1	***61.8***			

Based on the Galloway FDR for Lot 8, Basin OS1 is significantly smaller.

CLAREMONT BUSINESS PARK
DRAINAGE REPORT DRAINAGE CALCULATIONS
(Pond Volume/Storage Calculation)

SAND FILTER BASIN

Elevation	SF	CF	Storage AF	Storage Sum
6342.10	351.00			0
6343.00	814.00	524.25	0.01	0.01
6344.00	1,549.00	1,181.50	0.03	0.04

Total = 1,706 CF

Total = 0.0 Ac-ft

At top of WQCV Elevation = 6343.10 , the Volume is 640 CF

100 Year Spillway Elevation = 6344.27

Calculated by: CMN

Date: 1/19/2018

Checked by:

Lot 9, Claremont Business Park

Outlet Box Sizing Worksheet and orifice/weir head required

increment 0.067 ft

Proposed SFB - Outlet Box

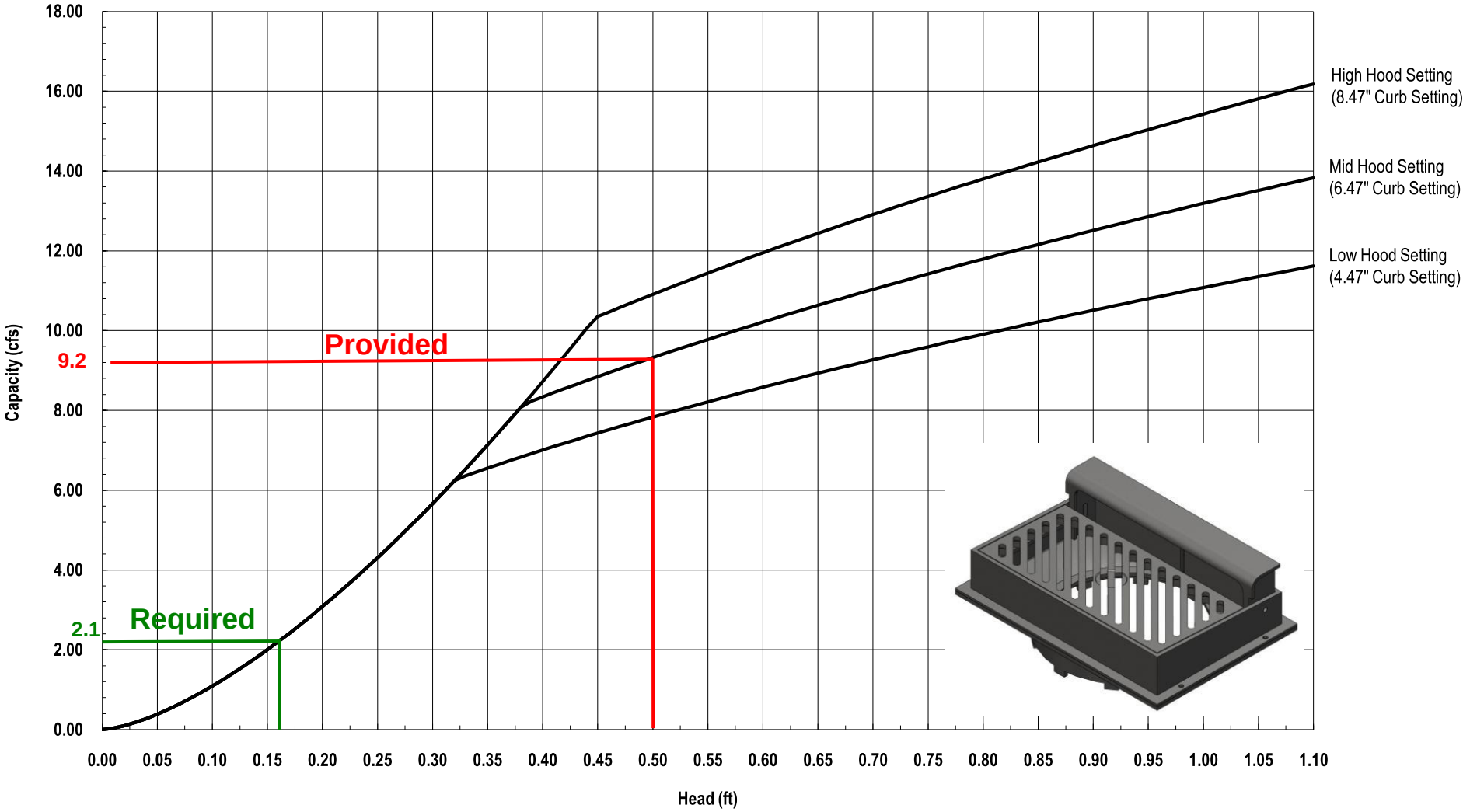
Box Size

Width	**2.91** ft	area	8.4681 sq ft	open area	4.23 sq ft
Length	**2.91** ft	Est. blockage	50%		
Perimeter	11.64 ft	Est .blockage	3.2 ft	non obstr. Perm	8.4 ft

TOB EL	H					**Orifice**	**Weir**
6343.10	0					0	0
6343.17	0.07					5.3	0.5
6343.23	0.13					7.5	1.3
6343.30	0.20					9.1	2.4
6343.37	0.27					10.6	3.6
6343.44	0.34					11.8	5.1
6343.50	0.40					12.9	6.7
6343.57	0.47					14.0	8.4
6343.64	0.54					14.9	10.3
6343.70	0.60					15.8	12.3
6343.77	0.67					16.7	14.3
6343.84	0.74					17.5	16.6

Inlet DP1

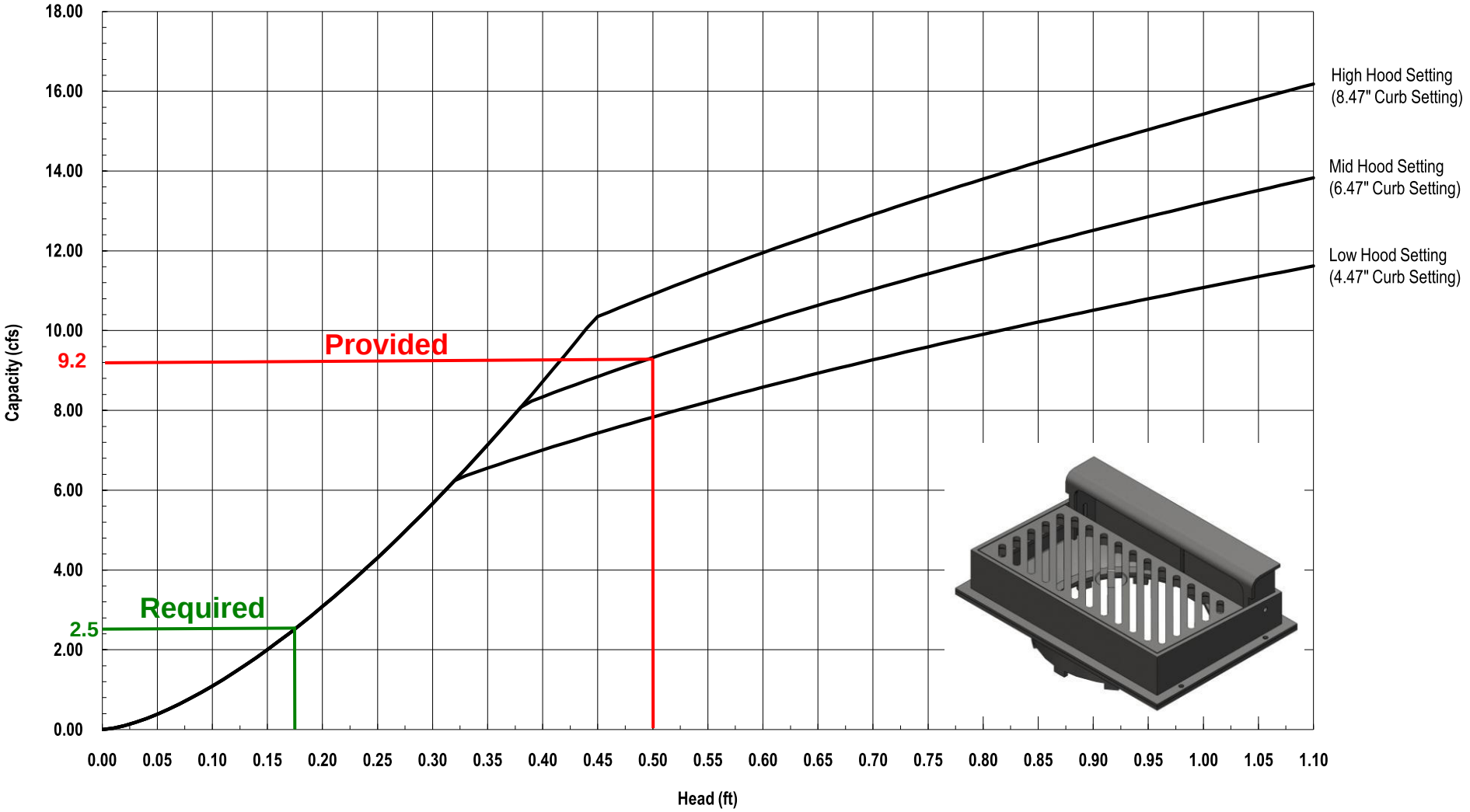
Nyloplast 2' x 3' Curb Inlet Diagonal Grate Inlet Capacity Chart



Nyloplast®
3130 Verona Avenue • Buford, GA 30518
(866) 888-8479 / (770) 932-2443 • Fax: (770) 932-2490

Inlet DP2

Nyloplast 2' x 3' Curb Inlet Diagonal Grate Inlet Capacity Chart

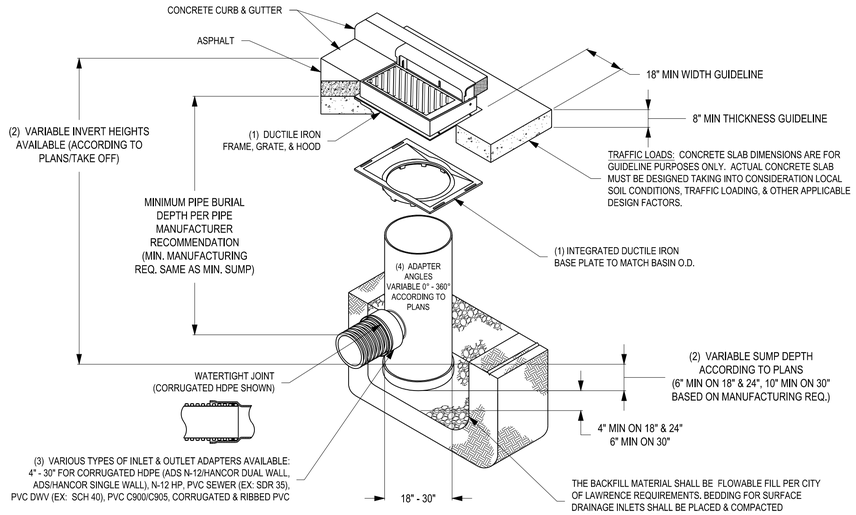


Nyloplast®

3130 Verona Avenue • Buford, GA 30518

(866) 888-8479 / (770) 932-2443 • Fax: (770) 932-2490

NYLOPLAST 2 FT X 3FT CURB INLET STRUCTURE: 30 _ _ AGR _ _ X

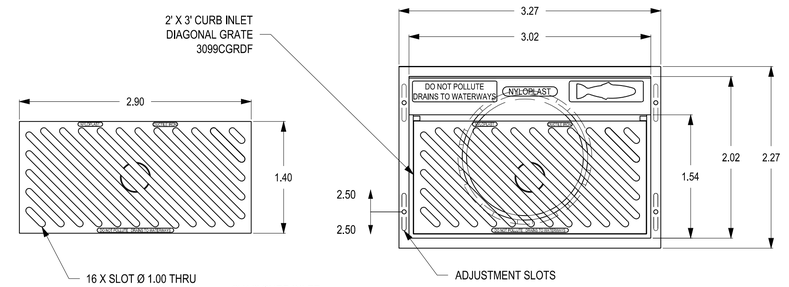


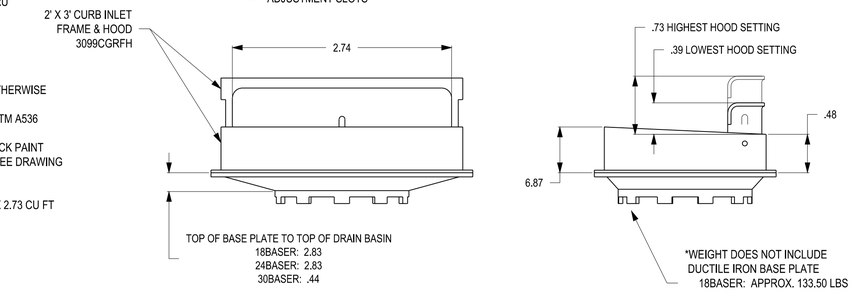
1 - 18" - 30" FRAMES, GRATES, HOODS, & BASE PLATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS.
3 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER (4" - 24").
4 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.
5 - ALL CURB INLET GRATE OPTIONS (DIAGONAL & HIGH FLOW) SHALL MEET H-20 LOAD RATING

1 Nyloplast 2 ft x 3 ft Curb Inlet Standard Detail
Not to Scale

3099CGRDF & 3099CGRFH

APPROX. GRATE DRAIN AREA = 232.87 SQ IN
*APPROX. WEIGHT WITH FRAME & HOOD = 344.00 LBS

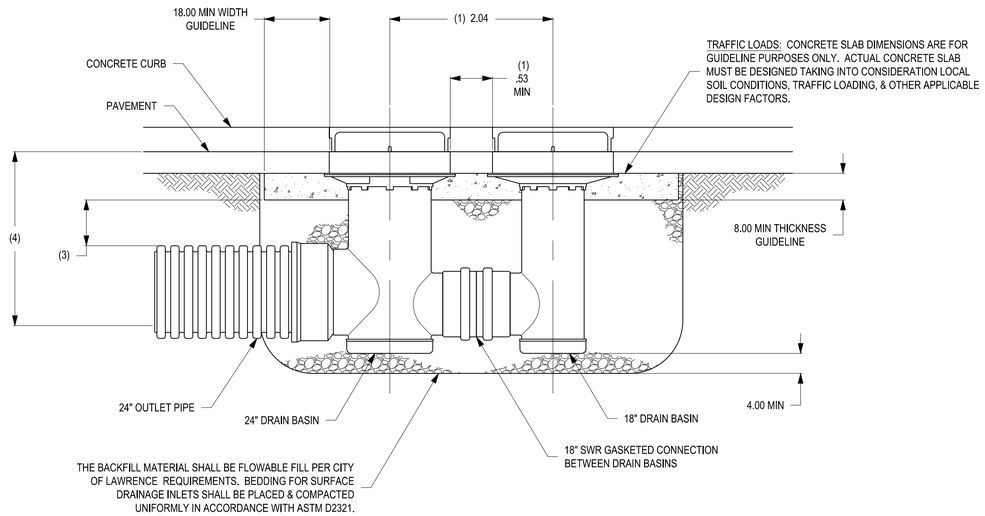




ALL DIMENSIONS IN INCHES UNLESS NOTED OTHERWISE
GRATE MEETS H-20 LOAD RATING
QUALITY: MATERIALS SHALL CONFORM TO ASTM A536 GRADE 70-50-05
PAINT: CASTINGS ARE FURNISHED WITH A BLACK PAINT
LOCKING DEVICE AVAILABLE UPON REQUEST SEE DRAWING NO. 7002-110-057
SLOPE OF GRATE SURFACE IS 5.2%
CURB INLET FRAME INSIDE VOLUME IS APPROX 2.73 CU FT
APPROX. DRAIN AREA OF GRATE & HOOD
LOWEST SETTING = 369.54 SQ IN
LOWEST + 1" SETTING = 402.41 SQ IN
LOWEST + 2" SETTING = 435.29 SQ IN
LOWEST + 3" SETTING = 468.16 SQ IN
HIGHEST SETTING = 501.044 SQ IN

2 2 ft x 3 ft Curb Inlet Diagonal Grate ASsembly
Not to Scale

NYLOPLAST 2 X 3 CURB INLET DOUBLE STRUCTURES



1 - DIMENSIONS ARE FOR REFERENCE ONLY ACTUAL DIMENSIONS MAY VARY
2 - DIMENSIONS ARE IN INCHES
3 - MINIMUM PIPE BURIAL DEPTH PER PIPE MANUFACTURER RECOMMENDATION
4 - VARIABLE INVERT HEIGHTS AVAILABLE (ACCORDING TO PLANS/TAKE OFF)

3 Nyloplast Dual 2 ft x 3 ft Curb Inlet Detail
Not to Scale

ADS HP STORM 12”- 60” PIPE SPECIFICATION

Scope

This specification describes 12- through 60-inch (300 to 1500 mm) ADS HP Storm pipe for use in gravity-flow storm drainage applications.

Pipe Requirements

ADS HP Storm pipe shall have a smooth interior and annular exterior corrugations.

- 12- through 60-inch (300 to 1500 mm) pipe shall meet ASTM F2881 or AASHTO M330
- Manning’s “n” value for use in design shall be 0.012

Joint Performance

Pipe shall be joined using a bell & spigot joint meeting the requirements of ASTM F2881 or AASHTO M330. The joint shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477. Gasket shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly. 12- through 60-inch (300 to 1500 mm) diameters shall have an exterior bell wrap installed by the manufacturer.

Fittings

Fittings shall conform to ASTM F2881 or AASHTO M330. Bell and spigot connections shall utilize a welded or integral bell and valley or inline gaskets meeting the watertight joint performance requirements of ASTM D3212.

Field Pipe and Joint Performance

To assure watertightness, field performance verification may be accomplished by testing in accordance with ASTM F1417 or ASTM F2487. Appropriate safety precautions must be used when field-testing any pipe material. Contact the manufacturer for recommended leakage rates.

Material Properties

Polypropylene compound for pipe and fitting production shall be impact modified copolymer meeting the material requirements of ASTM F2881, Section 5 and AASHTO M330, Section 6.1.

Installation

Installation shall be in accordance with ASTM D2321 and ADS recommended installation guidelines, with the exception that minimum cover in traffic areas for 12- through 48-inch (300 to 1200 mm) diameters shall be one foot (0.3 m) and for 60-inch (1500 mm) diameter the minimum cover shall be 2 ft. (0.6 m) in single run applications. Backfill for minimum cover situations shall consist of Class 1 (compacted), Class 2 (minimum 90% SPD), or Class 3 (minimum 95%) material. Maximum fill heights depend on embedment material and compaction level; please refer to Technical Note 2.04. Contact your local ADS representative or visit our website at www.ads-pipe.com for a copy of the latest installation guidelines.

Pipe Dimensions

Nominal Pipe I.D. in (mm)	12 (300)	15 (375)	18 (450)	24 (600)	30 (750)	36 (900)	42 (1050)	48 (1200)	60 (1500)
Average Pipe I.D. in (mm)	12.2 (310)	15.1 (384)	18.2 (462)	24.1 (612)	30.2 (767)	36.0 (914)	42.0 (1067)	47.9 (1217)	59.9 (1521)
Average Pipe O.D. in (mm)	14.5 (368)	17.7 (450)	21.4 (544)	28.0 (711)	35.5 (902)	41.5 (1054)	47.4 (1204)	54.1 (1374)	67.1 (1704)
Minimum Pipe Stiffness * @ 5% Deflection #/in./in. (kN/m^2)	75 (517)	60 (414)	56 (386)	50 (345)	46 (317)	40 (276)	35 (241)	35 (241)	30 (207)

*Minimum pipe stiffness values listed; contact a representative for average values.

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

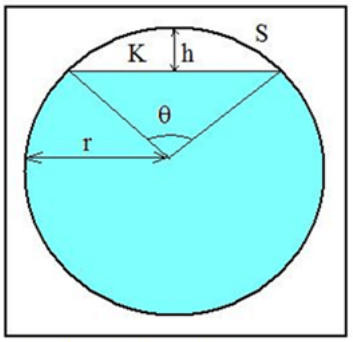
Pipe Diameter, **D** =	15	in
Depth of flow, **y** =	12	in
(must have y ≥ D/2)		
Full Pipe Manning roughness, n_{full} =	0.012	
Channel bottom slope, **S** =	0.005	ft/ft

Calculations

n/n_{full} =	1.1	
Partially Full Manning roughness, **n** =	0.013	

Calculations

Pipe Diameter, **D** =	1.25	ft
Pipe Radius, **r** =	0.625	ft
Circ. Segment Height, **h** =	0.250	ft
Central Angle, **q** =	1.85	radians
Cross-Sect. Area, **A** =	1.05	ft^2
Wetted Perimeter, **P** =	2.8	ft
Hydraulic Radius, **R** =	0.38	ft
Discharge, **Q** =	4.41	cfs
Ave. Velocity, **V** =	4.19	ft/sec
pipe % full [$(A/A_{full})*100\%$] =	85.8%	



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

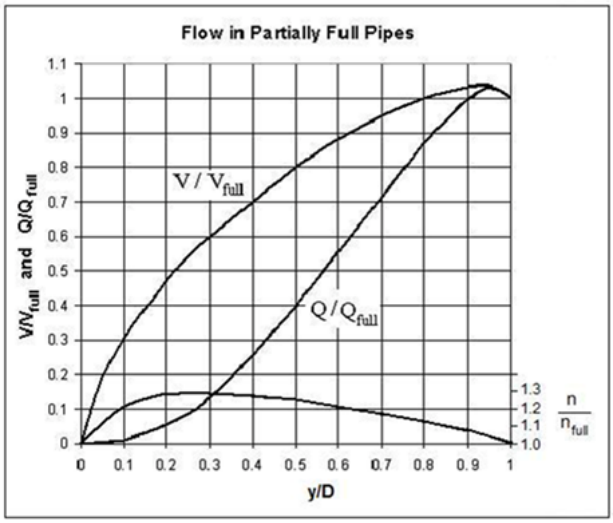
P

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

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

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

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



GRADING AND EROSION CONTROL PLAN

LOT 9 OF CLAREMONT BUSINESS PARK FIL NO. 2

EL PASO COUNTY, STATE OF COLORADO

GRADING & EROSION CONTROL PLAN

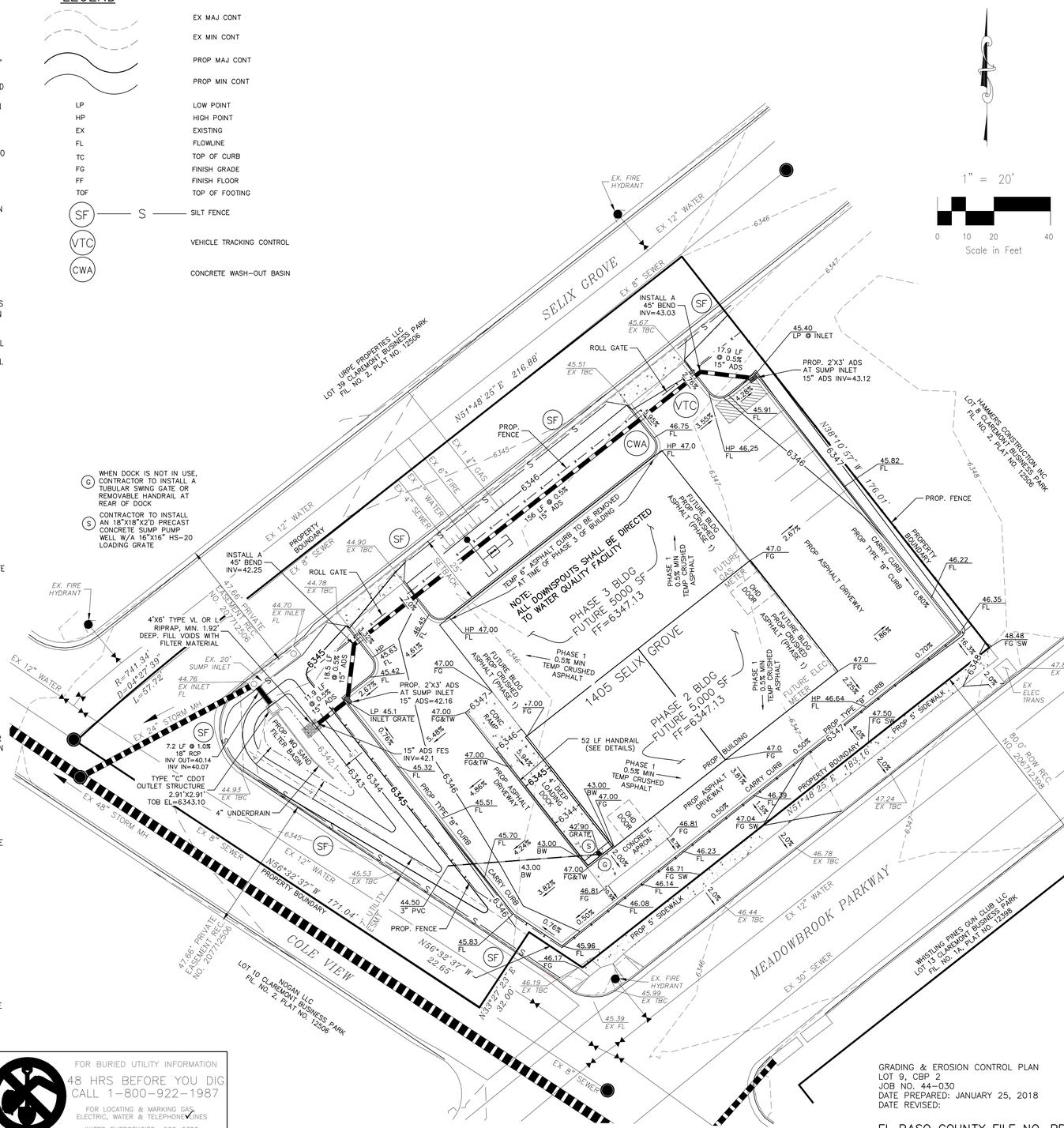
GRADING AND EROSION CONTROL NOTES:

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 TERRACON # 23055071 MAY 30, 2006. 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

LEGEND

	EX MAJ CONT
	EX MIN CONT
	PROP MAJ CONT
	PROP MIN CONT
LP	LOW POINT
HP	HIGH POINT
EX	EXISTING
FL	FLOWLINE
TC	TOP OF CURB
FG	FINISH GRADE
FF	FINISH FLOOR
TOF	TOP OF FOOTING
SF — S	SILT FENCE
VTC	VEHICLE TRACKING CONTROL
CWA	CONCRETE WASH-OUT BASIN



1" = 20'

0 10 20 40

Scale in Feet

DESIGN ENGINEER'S STATEMENT

THIS GRADING AND EROSION CONTROL PLAN WAS PREPARED UNDER MY DIRECTION AND SUPERVISION AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. SAID PLAN HAS BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR GRADING AND EROSION CONTROL PLANS. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARING THIS PLAN.

VIRGIL A. SANCHEZ, COLORADO P.E. #37160 DATE
FOR AND ON BEHALF OF M & S CIVIL CONSULTANTS, INC.

OWNER/DEVELOPER'S STATEMENT:

I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH ALL OF THE REQUIREMENTS SPECIFIED IN THESE DETAILED PLANS AND SPECIFICATIONS.

NAME: DATE

DBA: HAMMERS CONSTRUCTION

ADDRESS: 1411 WOOLSEY HEIGHTS COLORADO SPRINGS, 80915

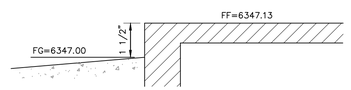
EL PASO COUNTY:

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.

FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, DRAINAGE CRITERIA, AND ENGINEERING CRITERIA MANUAL AS AMENDED.

IN ACCORDANCE WITH ECM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VALID FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTOR'S DISCRETION.

JENNIFER IRVINE, P.E. DATE
COUNTY ENGINEER / ECM ADMINISTRATOR



BUILDING FINISH FLOOR DETAIL

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WATER EMERGENCIES 520-0300

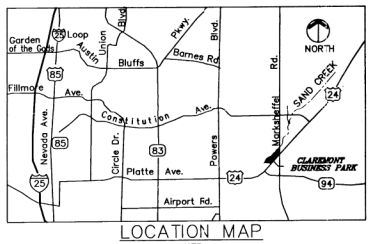
GRADING & EROSION CONTROL PLAN
LOT 9, CBP 2
JOB NO. 44-030
DATE PREPARED: JANUARY 25, 2018
DATE REVISED:

EL PASO COUNTY FILE NO. PPR 18-000

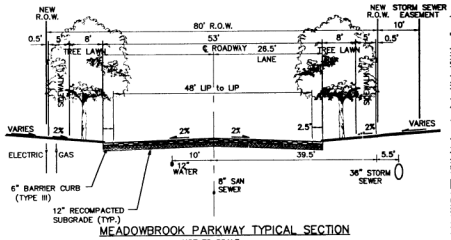
20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485
CIVIL CONSULTANTS, INC.

REFERENCE MAPS

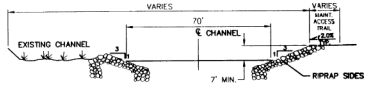
DRAINAGE PLAN
CLAREMONT BUSINESS PARK FILING NO. 2



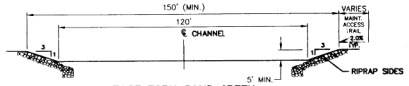
LOCATION MAP
NTS



MEADOWBROOK PARKWAY TYPICAL SECTION
NOT TO SCALE

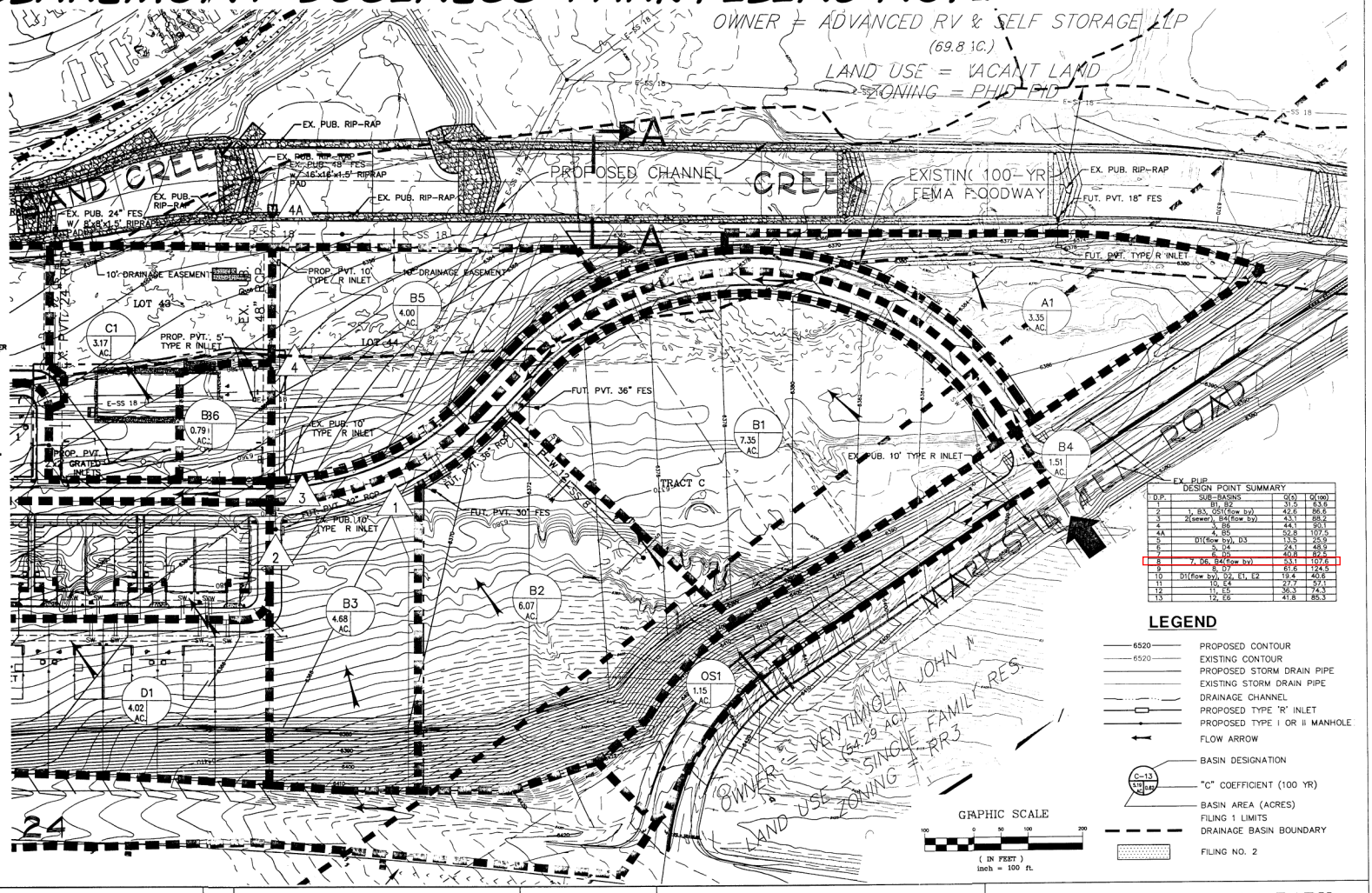


EAST FORK SAND CREEK
SECTION B-B
N.T.S.
FOR INFORMATION ONLY



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	53.6
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	13.5	25.9
6	5, D4	24.1	48.9
7	6, D5	40.8	82.0
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=13 A=1.0 Q=13 — "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 MDP 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 719-575-038

CLAREMONT BUSINESS PARK

FINAL DRAINAGE PLAN

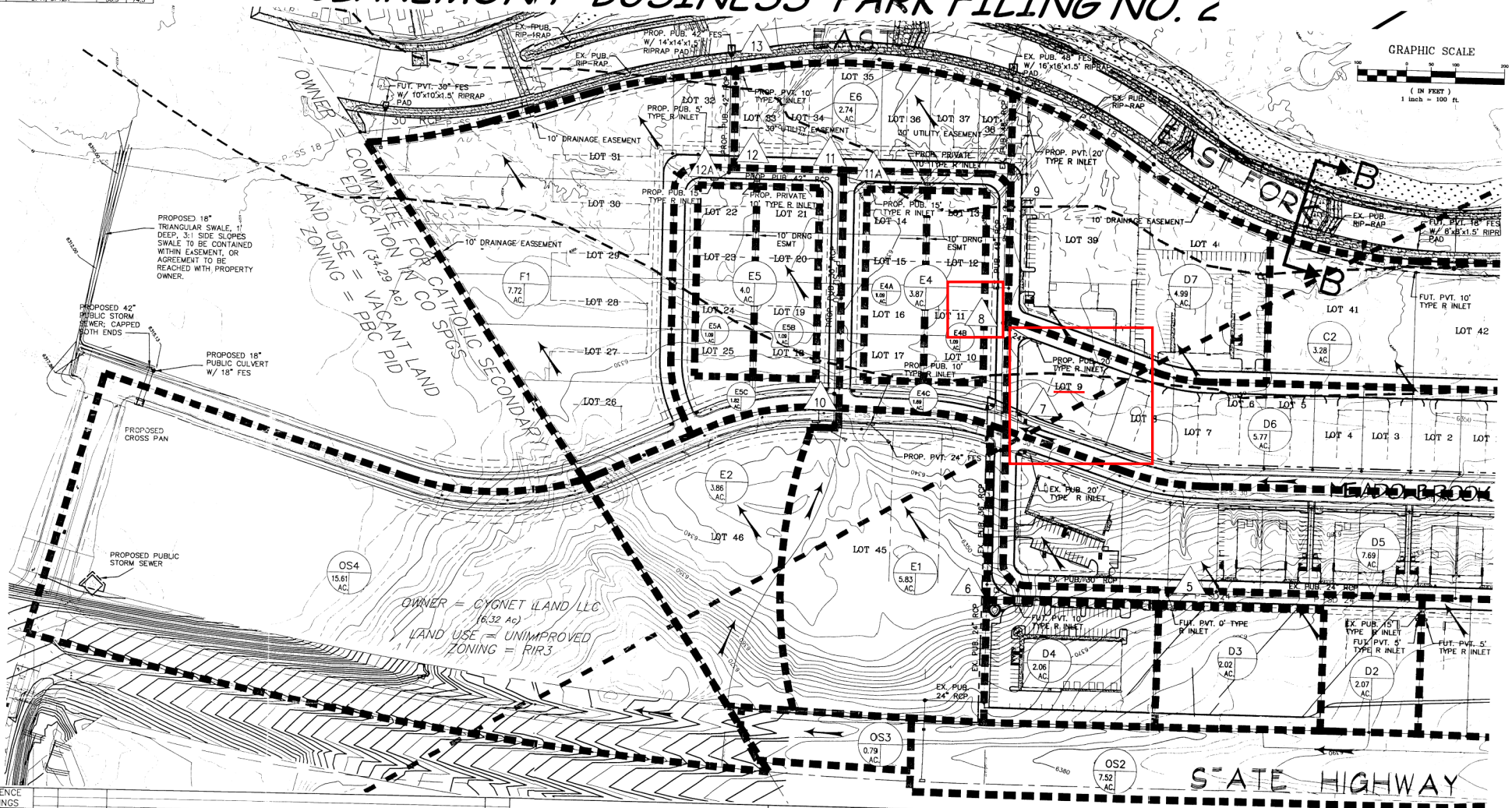
MASTER DEVELOPMENT DRAINAGE PLAN
FINAL DRAINAGE PLAN
FILING NO. 2

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

DR01

DRAINAGE PLAN
CLAREMONT BUSINESS PARK FILING NO. 2

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

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

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PLOT DATE: Mar 02, 2007 8:44am

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	
DRAWN BY:	BAS	HORIZ:	1"= 100'
CHECKED BY:	JPL	VERT:	N/A

DATE ISSUED: FEBRUARY 2007
SHEET NO. 1 OF 1 SHEETS

DR02

PROPOSED AND EXISTING DRAINAGE MAP

LOT 9 CLAREMONT BUSINESS PARK

COUNTY OF EL PASO, STATE OF COLORADO

EXISTING DRAINAGE MAP

JANUARY 2018

LEGEND

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

6 — SURFACE DESIGN POINT

BASIN BOUNDARY

(6920) — EXISTING CONTOUR

CROSSPAN

INLET

EXISTING FLOW DIRECTION ARROW

H.P. — HIGH POINT

L.P. — LOW POINT

BASIN SUMMARY			
BASIN	AREA (ACRES)	Q_5	Q_{100}
OS1	0.24	0.1	0.6
EX1	0.43	0.2	1.0
EX2	0.32	0.1	0.8
EX3	0.23	1.1	1.9

DESIGN POINT SUMMARY				
DESIGN POINT	Q_5	Q_{100}	BASIN	STRUCTURE
1	1.1	3.6	OS1, EX1, EX2, EX3	EXISTING 20' SUMP INLET

1" = 20'

0 10' 20' 40'

Scale in Feet

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COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

LOT 9 CBP

EXISTING DRAINAGE MAP

PROJECT NO. 44-030	SCALE: HORIZONTAL: 1"=20' VERTICAL: N/A	DATE: 1/22/2018	
DESIGNED BY: CMN		SHEET 1 OF 1	EDM
DRAWN BY: CMN			
CHECKED BY: VAS			

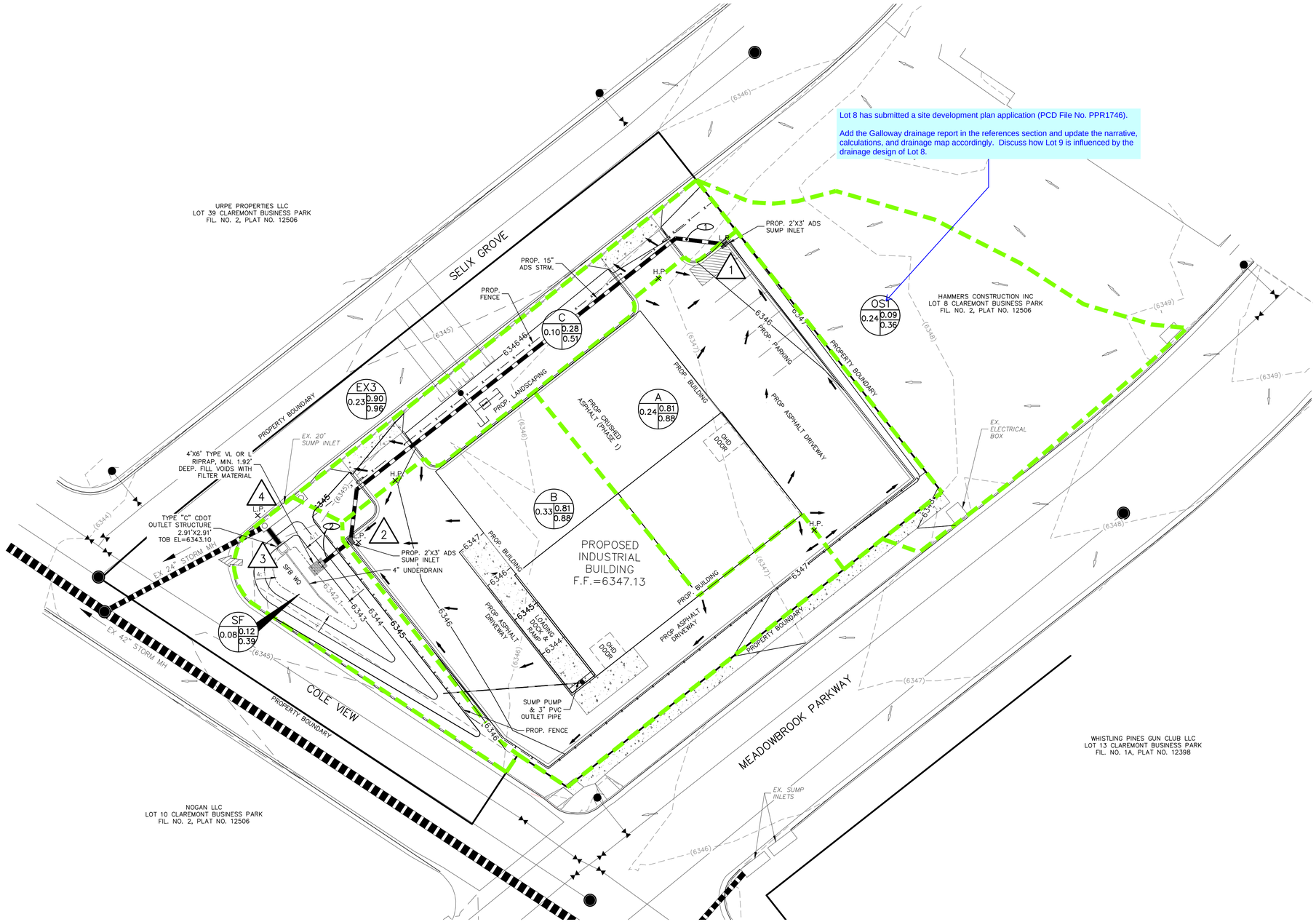
File: O:\44030A-CBP Lot 9\CBP LOT 9\Dwg\Eng Exhibits\Existing Drainge Map.dwg Plotstamp: 1/23/2018 4:41 PM

LOT 9 CLAREMONT BUSINESS PARK

COUNTY OF EL PASO, STATE OF COLORADO

PROPOSED DRAINAGE MAP

JANUARY 2018



LEGEND

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

- PIPE RUN REFERENCE LABEL
- SURFACE DESIGN POINT
- BASIN BOUNDARY
- (6920) EXISTING CONTOUR
- 6920 PROP CONTOUR
- PROP FENCE
- STORM SEWER PIPE
- FLARED END SECTION
- CROSSPAN
- INLET/OUTLET STRUCTURE
- EXISTING FLOW DIRECTION ARROW
- EMERGENCY OVERFLOW DIRECTION
- FLOW DIRECTION
- H.P. HIGH POINT
- L.P. LOW POINT
- RIPRAP

BASIN SUMMARY			
BASIN	AREA (ACRES)	Q_5	Q_{100}
A	0.24	1.0	1.8
B	0.33	1.4	2.5
C	0.10	0.1	0.4
SF	0.08	0.1	0.3
OS1	0.24	0.1	0.6
EX3	0.23	1.1	1.9

DESIGN POINT SUMMARY				
DESIGN POINT	Q_5	Q_{100}	BASIN	STRUCTURE
1	0.9	2.1	OS1, A	2'X3' ADS SUMP INLET
2	1.4	2.5	B	2'X3' ADS SUMP INLET
3	2.4	5.1	SF, DP1, DP2	SAND FILTER WQ POND AND OUTLET STRUCTURE
4	1.2	2.3	C, EX3	EXISTING 20' SUMP INLET

STORM SEWER SUMMARY				
PIPE RUN	Q_5	Q_{100}	PIPE SIZE	CONTRIBUTING PIPES/DP
1	0.9	2.1	15"	DP1
2	2.2	4.4	15"	DP2, PR1

WQCV SUMMARY	
EPC/URBAN DRAINAGE SAND FILTER BASIN–SEE STD. DET.	
WQCV REQUIRED	632 CF
WQCV PROVIDED	640 CF
AREA REQUIRED	302 SF
AREA PROVIDED	339 SF
TOP OF OUTLET BOX EL	6343.10
100 YEAR WSE	6343.44
EMERGENCY SPILLWAY EL	6344.27

1" = 20'

0 10' 20' 40'

Scale in Feet

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

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COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

LOT 9 CBP

PROPOSED DRAINAGE MAP

PROJECT NO. 44-030	SCALE: HORIZONTAL: 1"=20' VERTICAL: N/A	DATE: 1/25/2018	
DESIGNED BY: CMN		SHEET 1 OF 1	PDM
DRAWN BY: CMN			
CHECKED BY: VAS			

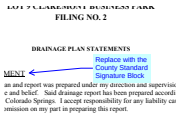
File: Q:\44030A-CBP Lot 9\CBP LOT 9\dwg\Eng Exhibits\Proposed Drainge Map.dwg Plotstamp: 1/25/2018 1:11 PM

Markup Summary

#0000FF (10)

Subject: Callout
Page Label: 1
Lock: Locked
Status:
Checkmark: Unchecked
Author: dsdlaforce
Date: 3/5/2018 2:56:04 PM
Color:
Layer:
Space:

Update to "PCD Project # PPR-18-007"



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Author: dsdlaforce
Date: 3/5/2018 2:56:03 PM
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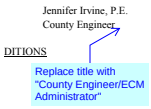
Space:

Replace with the County Standard Signature Block



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Status:
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Author: dsdlaforce
Date: 3/5/2018 2:56:08 PM
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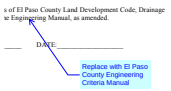
Replace title with
"County Engineer/ECM Administrator"



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Date: 3/5/2018 2:56:06 PM
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Replace with El Paso County Engineering Criteria Manual

Subject: Callout
Page Label: 5
Lock: Locked
Status:
Checkmark: Unchecked
Author: dsdlaforce
Date: 3/5/2018 2:56:09 PM
Color:
Layer:
Space:

The drainage map identified a Phase I proposed crushed asphalt. Clarify in the sub-basin narrative. Is the pond sized for the ultimate condition?

Subject: Callout
Page Label: 6
Lock: Locked
Status:
Checkmark: Unchecked
Author: dsdlaforce
Date: 3/5/2018 2:56:10 PM
Color:
Layer:
Space:

Add a statement explaining why on-site flood control detention is not provided.

Subject: Callout
Page Label: 1
Lock: Locked
Status:
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Author: dsdlaforce
Date: 3/5/2018 2:56:12 PM
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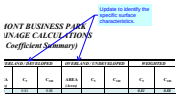
Layer:
Space:

Add the Sand Creek DBPS and the Galloway FDR for Lot 8



Subject: Callout
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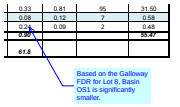
Date: 3/5/2018 2:56:13 PM
Color:
Layer:
Space:

Update to identify the specific surface characteristics.



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Status:
Checkmark: Unchecked
Author: dsdlaforce
Date: 3/5/2018 2:56:16 PM
Color:
Layer:
Space:

Based on the Galloway FDR for Lot 8, Basin OS1 is significantly smaller.

Subject: Callout
Page Label: [1] DRAINAGE
Lock: Locked
Status:
Checkmark: Unchecked
Author: dsdlaforce
Date: 3/5/2018 2:56:16 PM
Color:
Layer:
Space:

Lot 8 has submitted a site development plan application (PCD File No. PPR1746).

Add the Galloway drainage report in the references section and update the narrative, calculations, and drainage map accordingly. Discuss how Lot 9 is influenced by the drainage design of Lot 8.