

**FINAL DRAINAGE REPORT FOR
LOT 2 BECKETT AT WOODMEN HILLS FILING NO. 3
7368 MCLAUGHLIN ROAD
COLORADO SPRINGS, COLORADO**

**October 4, 2017
Revised July 2018**

Prepared For:

**TBONE CONSTRUCTION
1310 FORD STREET
COLORADO SPRINGS, CO 80915
(719) 570-1456**

Prepared By:

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Job No. 1729.00
PCD FILE NO. PPR-17-055

**FINAL DRAINAGE REPORT FOR
LOT 2 BECKETT AT WOODMEN HILLS FILING NO. 3
7368 MCCLAUGHLIN ROAD
COLORADO SPRINGS, COLORADO**

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REQUIRED MAPS AND DRAWINGS

GENERAL LOCATION MAP

S.C.S. SOILS MAP

FEMA FIRM MAP

HYDROLOGIC/HYDRAULIC CALCULATIONS

DRAINAGE MAP

CERTIFICATION STATEMENT:

Engineers Statement

This 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.

L Ducett, P.E. 32339

Seal

Developers Statements

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

Shops at McLaughlin 2 LLC

Business Name

By: _____
Title: _____
Address: _____

El Paso County Approval:

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

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

Date

Conditions:

**FINAL DRAINAGE LETTER FOR
LOT 2 BECKETT AT WOODMEN HILLS FILING NO. 3
7368 MCLAUGHLIN ROAD
COLORADO SPRINGS, COLORADO**

PURPOSE

The purpose of this Final Drainage Report is to identify and analyze the existing drainage patterns, determine existing runoff quantities and to analyze the current development of this site as a commercial site. This lot was previously platted with an existing drainage report entitled “Final Drainage Report for Beckett at Woodmen Hills Filing 3” by URS dated May 27, 2003. The proposed use and development is in conformance with the previously approved report.

GENERAL DESCRIPTION

This Final Drainage Letter (F.D.L.) for the site located at 7368 McLaughlin Road is an analysis of approximately 37,497 square feet. The site is currently vacant and is platted as Lot 2 Beckett at Woodmen Hills Filing No. 3. This area is part of a previous study entitled “Final Drainage Report for Becket at Woodmen Hills Filing No. 3” by URS dated May 27, 2003. The property is located in the northwest quarter of Section 7, Township 13 South, Range 64 West of the 6th Principal Meridian in the El Paso County, Colorado, near the intersection of McLaughlin and Woodmen Roads (See vicinity map, Appendix A) More specifically, the site is bounded by platted acreage properties with the same zoning on all sides.

The site lies within the Falcon Drainage Basin

The site consists of Columbine gravelly sandy loam (19) and is part of the hydrologic soil group ‘B’ therefore hydrologic group “B” was used to represent the dominant soil type. (See map in appendix)

The study area consists of undeveloped land consisting of prairie vegetation. The existing topography is sloping from the north west to the south east.

HISTORIC DRAINAGE CONDITIONS- Basin 1 from the URS Report

Currently the existing storm runoff drains overland to the southwest via sheet flow and then into the existing McLaughlin Road curb and gutter and into the existing 10' sump inlet at the south east corner of the site. From here, the flow continues in existing storm sewer to the existing regional detention pond 5 east of the site. This pond was designed with water quality and detention volume for this developed site. Total onsite existing flows from approximately 0.88 acres is 0.2 cfs in the 5 year event and 1.5 cfs in the 100 year event.

DEVELOPED DRAINAGE CONDITIONS

In the proposed condition, there will be an onsite storm gutter system that will convey flows to the existing inlet in McLaughlin Road. This inlet is sized for the developed flows. The sizing and basin areas for the onsite storm gutters are shown on the map and calculations in the appendix. The roof of the proposed building will drain into a proposed storm gutter.

Basin A, B, C and D are roof areas that will drain into the proposed storm gutter in Basin E. Flows at each point are less than 0.6 cfs in both the 5 and 100 year events.

Basins E (0.22 acres) has sheet and channel flow, and flow from the roof basins, that will discharge into a private road at Design Point 2. These combined flows will be approximately 3.6 cfs in the 100 year even and will be directed to the existing inlet at the south east corner of the site.

Basin F (0.28 acres) will flow much as it does today directly into the existing inlet. It will join with flows from Basin E and Basin G for total combined flows of 4.0 cfs in the 5 year event and 3.6 cfs in the 100 year event at Design Point 1, at the existing inlet.

These flows are consistent with the flows anticipated in the original drainage report for this area.

Please see detailed calculations in the appendix.

HYDROLOGIC CALCULATIONS

Hydrologic calculations were performed using the El Paso County Storm Drainage Design Criteria Manual Volumes 1 & 2 latest editions. The Rational Method was used to estimate storm water runoff anticipated from the 24-Hour Rainfall Depths listed in the El Paso County Drainage Criteria Manual. Figure 6-5 Intensity Frequency Duration Curve was used to obtain the intensity.

FLOODPLAIN STATEMENT

No portion of this site is within a designated F.E.M.A. floodplain, as determined by Flood Insurance Rate Map No. 08041C0575 F dated March 17, 1997 (see appendix).

EROSION CONTROL/WATER QUALITY

An erosion control plan is included with this drainage report as we are under one acre.

Below is a description of the BMP's to be used for erosion control and water quality. For more detail see the erosion control plan.

The first and most effective way to eliminate erosion is to minimize disturbance. Therefore, we have shown on the plan to reseed as soon as possible.

In an effort to protect receiving water and as part of the "four step process to minimize adverse impacts of urbanization" this site was analyzed in the following manner:

1. Runoff Reduction - The new improvements and impervious area to the site will be routed to an existing public extended detention basin (EDB). In addition to this, runoff will be trapped behind the back of walks and curbs. There is also the surface roughing that has been added to the undeveloped slopes that some of the flow will be trapped and infiltrate into the ground. These above mentioned items will reduce the volume of runoff using ponding and infiltration.
2. Stabilize Drainageways - By reducing the rate of runoff to the adjacent watershed the site is helping to stabilize the creek. The creek is currently stable as it was regraded with low flow water channel and stabilized with vegetation with previous development.
3. Provide WQCV- The EDB has been sized and designed to sufficiently capture the required

WQCV and slowly release it through the restrictor plate outlet, thereby also allowing solids and contaminants to settle out.

4. Need for Industrial and Commercial BMPs - This development will not include outdoor storage or the potential for the introduction of contaminants to the City's MS4, ~~as it is not an industrial or commercial site~~, so no industrial or commercial BMPs are proposed or necessary.

CONSTRUCTION COST OPINION

Public Non Reimbursable

NOT APPLICABLE

Remove. A retail center is a commercial site.

County's

Private Non Reimbursable

RipRap Rundown	2.3 CY	\$85/ LF	\$ 196
Storm Gutter Chase	32 LF	\$250/ LF	<u>\$ 8,000</u>

Total: \$ 8,196

DRAINAGE FEES

This site is not being platted. Drainage or bridge fees do not apply.

MAINTENANCE

The proposed erosion control and water quality measures will be repaired and maintained by the property owner or owner's representative as required.

SUMMARY

Development of this site will not adversely affect the surrounding development at this time per the previously approved drainage reports, this site will drain into the existing storm sewer system that drains into the existing pond. See the attached previous drainage report in the appendix.

PREPARED BY:
TERRA NOVA ENGINEERING, INC.

L Ducett P.E.
President
Terra Nova Engineering, Inc.

BIBLIOGRAPHY

“El Paso County Drainage Criteria Manual-Volumes 1 & 2, latest edition”

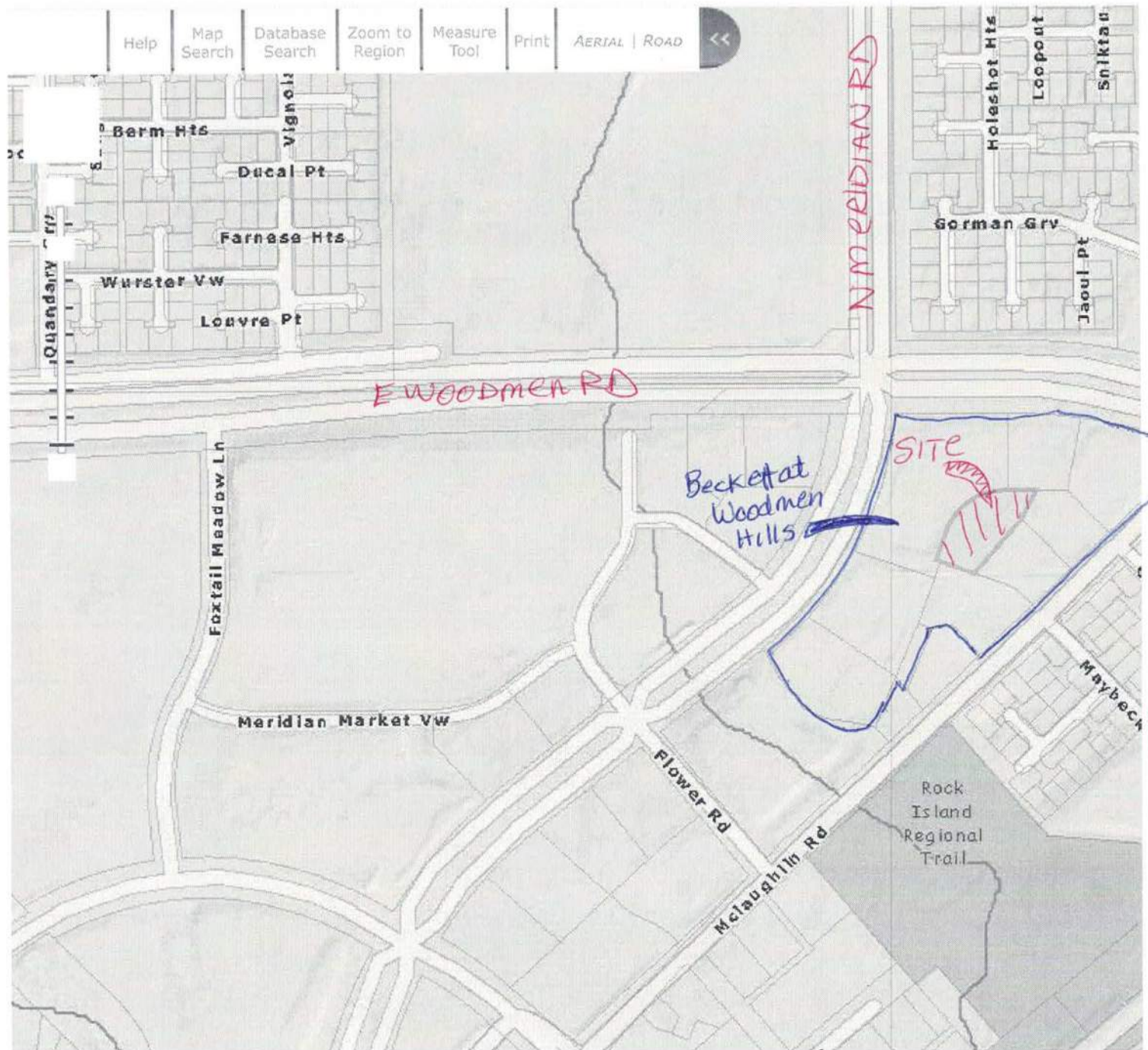
SCS Soils Map for El Paso County

Federal Emergency Management Agency (FEMA) flood maps

“Final Drainage Report for Beckett at Woodmen Hills Filing 3” by URS dated May 27, 2003

Falcon Drainage Basin Planning Study

VICINITY MAP



NOT TO SCALE

0 200 400ft

S.C.S. SOILS MAP

Soil Map—El Paso County Area, Colorado
(Lot 2 Beckett at Woodmen Hills Filing No. 3)



Map Scale: 1:590 if printed on A landscape (11" x 8.5") sheet.

0 5 10 20 30 Meters

0 25 50 100 150 Feet

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




Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

6/27/2018
Page 1 of 3


MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 15, Oct 10, 2017

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

Date(s) aerial images were photographed: May 22, 2016—Mar 9, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	0.6	100.0%
Totals for Area of Interest		0.6	100.0%

El Paso County Area, Colorado

19—Columbine gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 367p

Elevation: 6,500 to 7,300 feet

Mean annual precipitation: 14 to 16 inches

Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 125 to 145 days

Farmland classification: Not prime farmland

Map Unit Composition

Columbine and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Columbine

Setting

Landform: Fan terraces, fans, flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

A - 0 to 14 inches: gravelly sandy loam

C - 14 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: A

Ecological site: Gravelly Foothill (R049BY214CO)

Hydric soil rating: No

Minor Components

Fluvaquentic haplaquolls

Percent of map unit:

Landform: Swales

Hydric soil rating: Yes

Other soils

Percent of map unit:

Hydric soil rating: No

Pleasant

Percent of map unit:

Landform: Depressions

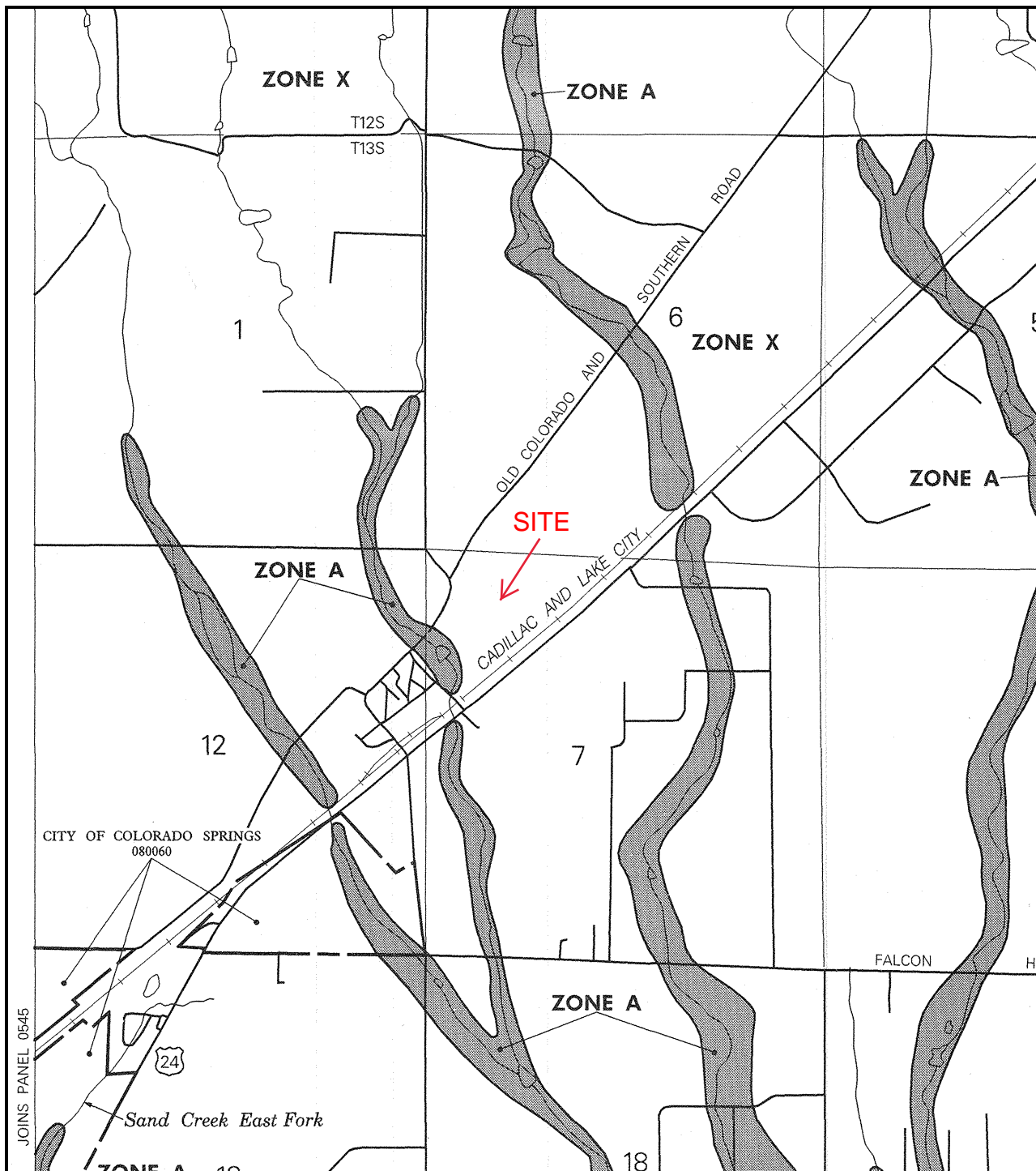
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 15, Oct 10, 2017

FEMA FIRM MAP



APPROXIMATE SCALE IN FEET
 2000 0 2000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM FLOOD INSURANCE RATE MAP

EL PASO COUNTY,
COLORADO AND
INCORPORATED AREAS

PANEL 575 OF 1300

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY

COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS, CITY OF	080060	0575	F
EL PASO COUNTY, UNINCORPORATED AREAS	080059	0575	F

MAP NUMBER
08041C0575 F

EFFECTIVE DATE:
MARCH 17, 1997



Federal Emergency Management Agency

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

HYDROLOGIC/HYDRAULIC CALCULATIONS

***SHOPS AT MCLAUGHLIN II
AREA DRAINAGE SUMMARY***

EXISTING CONDITIONS

		WEIGHTED		OVERLAND				STREET / CHANNEL FLOW				T _t	INTENSITY		TOTAL FLOWS	
BASIN	AREA TOTAL (Acres)	C ₅	C ₁₀₀	C ₅	Length	Height	T _C	Length	Slope	Velocity	T _t	TOTAL	I ₅	I ₁₀₀	Q ₅	Q ₁₀₀
		* For Calcs See Runoff Summary			(ft)	(ft)	(min)	(ft)	(%)	(fps)	(min)	(min)	(in/hr)	(in/hr)	(c.f.s.)	(c.f.s.)
EX-1	0.88	0.09	0.36	0.09	220	5.0	21.4	172	1.7%	2.5	1.1	22.5	2.9	4.8	0.2	1.5

**SHOPS AT MCLAUGHLIN II
AREA DRAINAGE SUMMARY**

DEVELOPED CONDITIONS

		WEIGHTED		OVERLAND				STREET / CHANNEL FLOW				T _i	INTENSITY		TOTAL FLOWS	
BASIN	AREA TOTAL (Acres)	C ₅	C ₁₀₀	C ₅	Length (ft)	Height (ft)	T _C (min)	Length (ft)	Slope (%)	Velocity (fps)	T _t (min)	TOTAL (min)	I ₅ (in/hr)	I ₁₀₀ (in/hr)	Q ₅ (c.f.s.)	Q ₁₀₀ (c.f.s.)
		* For Calcs See Runoff Summary														
A	0.04	0.73	1.00	0.73	0	0.0	0.0	45	2.0%	2.5	0.3	0.3	6.8	13.5	0.2	0.6
B	0.03	0.73	0.81	0.73	0	0.0	0.0	45	2.0%	2.5	0.3	0.3	6.8	13.5	0.1	0.3
C	0.03	0.78	0.87	0.78	0	0.0	0.0	45	2.0%	2.5	0.3	0.3	6.8	13.5	0.1	0.3
D	0.04	0.83	0.93	0.83	0	0.0	0.0	45	2.0%	2.5	0.3	0.3	6.8	13.5	0.2	0.4
E	0.22	0.81	0.88	0.81	30	2.0	1.6	215	0.7%	1.7	2.1	3.7	5.4	9.9	1.0	1.9
F	0.28	0.81	0.88	0.81	10	0.5	1.0	320	3.0%	3.5	1.5	2.5	5.7	10.7	1.3	2.6
G	0.24	0.81	0.88	0.81	30	1.0	2.0	180	0.5%	1.4	2.1	4.1	5.2	9.6	1.0	2.0

Calculated by: DLF

Date: 7/17/2018

Checked by: LD

SHOPS AT MCLAUGHLIN II SURFACE ROUTING SUMMARY

	A	B	C	D	E
1	<i>DEVELOPED CONDITIONS</i>				
2	<i>Design Point(s)</i>	<i>Contributing Basins</i>	<i>Area (Acres)</i>	<i>Flow</i>	
3				<i>Q₅</i>	<i>Q₁₀₀</i>
4	1	<i>A,B,C,D,E,F,G</i>	0.88	4.0	8.2
5	2	<i>A,B,C,D,E</i>	0.36	1.7	3.6
6	3	<i>G</i>	0.24	1.0	2.0
7	4	<i>A</i>	0.04	0.2	0.6
8	5	<i>B</i>	0.03	0.1	0.3
9	6	<i>C</i>	0.03	0.1	0.3
10	7	<i>D</i>	0.04	0.2	0.4
11	Calculated by: DLF				
12	Date: 7/17/2018				
13	Checked by: LD				

MANNING'S EQUATION for OPEN CHANNEL FLOW

Project: Shops at MCLaughlin 2 **Location:** 2' Chase at Southwest Property Corner - Capacity
By: Dane Frank **Date:** 7/17/2018
Chk By: **Date:** version 12-2004

Mannings Formula

$$Q = (1.486/n)AR_h^{2/3}S^{1/2}$$

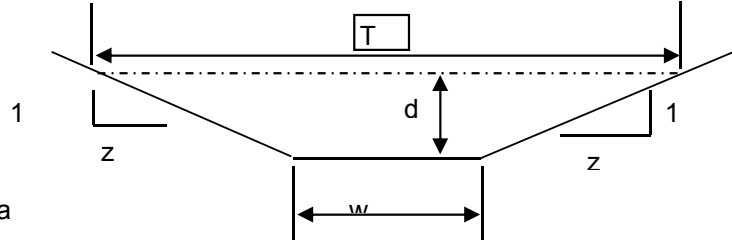
$$R = A/P$$

A = cross sectional area

P= wetted perimeter

S = slope of channel

n = Manning's roughness coefficient



$$V = (1.49/n)R_h^{2/3}S^{1/2}$$

$$Q = V \times A$$

INPUT

z (sideslope)= 0
 z (sideslope)= 0
 b (btm width, ft)= 2
 d (depth, ft)= 0.5
 S (slope, ft/ft) 0.15
 n low = 0.012
 n high = 0.012

Clear Data
 Entry Cells

Depth, ft	Area, sf	Wetted Perimeter, ft	Hydraulic Radius, ft	Low N		High N		T =	Dm =
				Velocity, fps	Flow, cfs	Velocity, fps	Flow, cfs		
0.5	1.00	3.00	0.33	23.0561321	23.0561	23.05613	23.0561	2	0.500

Sc low = 0.0045 Sc high = 0.0045

s_c = critical slope ft / ft

T = top width of the stream

d_m = a/T = mean depth of flow

.7 Sc	1.3 Sc	.7 Sc	1.3 Sc
0.0032	0.0059	0.0032	0.0059

Created by: Mike O'Shea

MANNING'S EQUATION for OPEN CHANNEL FLOW

Project: Shops at MCLaughlin 2 **Location:** 4' Chase at Northeast of Building - Capacity
By: Dane Frank **Date:** 7/17/2018
Chk By: **Date:** version 12-2004

Mannings Formula

$$Q = (1.486/n)AR_h^{2/3}S^{1/2}$$

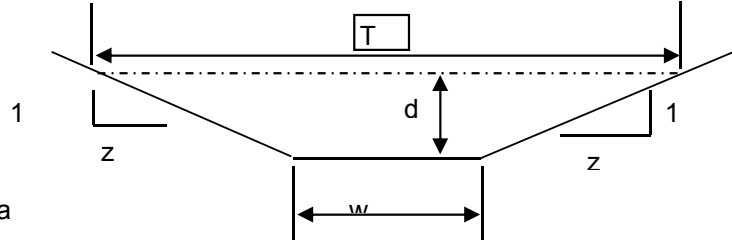
$$R = A/P$$

A = cross sectional area

P= wetted perimeter

S = slope of channel

n = Manning's roughness coefficient



$$V = (1.49/n)R_h^{2/3}S^{1/2}$$

$$Q = V \times A$$

INPUT

z (sideslope)= 0
z (sideslope)= 0
b (btm width, ft)= 4
d (depth, ft)= 0.5
S (slope, ft/ft) 0.0105
n low = 0.012
n high = 0.012

Clear Data
Entry Cells

Depth, ft	Area, sf	Wetted Perimeter, ft	Hydraulic Radius, ft	Low N		High N		T =	Dm =
				Velocity, fps	Flow, cfs	Velocity, fps	Flow, cfs		
0.5	2.00	5.00	0.40	6.88851501	13.777	6.888515	13.777	4	0.500

Sc low = 0.0036 Sc high = 0.0036

s_c = critical slope ft / ft

T = top width of the stream

d_m = a/T = mean depth of flow

.7 Sc	1.3 Sc	.7 Sc	1.3 Sc
0.0025	0.0046	0.0025	0.0046

Created by: Mike O'Shea

MANNING'S EQUATION for OPEN CHANNEL FLOW

Project: Shops at MCLaughlin 2

Location: Northwest Pan Gutter - Capacity

By: Dane Frank

Date: 7/17/2018

Chk By:

Date:

version 12-2004

Mannings Formula

$$Q = (1.486/n)AR_h^{2/3}S^{1/2}$$

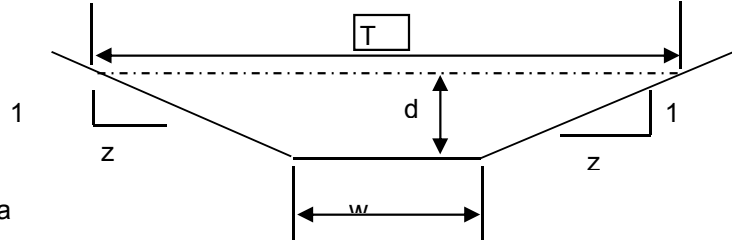
$$R = A/P$$

A = cross sectional area

P = wetted perimeter

S = slope of channel

n = Manning's roughness coefficient



$$V = (1.49/n)R_h^{2/3}S^{1/2}$$

$$Q = V \times A$$

INPUT

z (sideslope)= 100
z (sideslope)= 100
b (btm width, ft)= 0
d (depth, ft)= 0.68
S (slope, ft/ft) 0.005
n low = 0.012
n high = 0.012

Clear Data
Entry Cells

Depth, ft	Area, sf	Wetted Perimeter, ft	Hydraulic Radius, ft	Low N		High N		T =	Dm =
				Velocity, fps	Flow, cfs	Velocity, fps	Flow, cfs		
0.68	46.24	136.01	0.34	4.26525581	197.225	4.265256	197.225	136	0.340

Sc low = 0.0030 Sc high = 0.0030

s_c = critical slope ft / ft

T = top width of the stream

$d_m = a/T$ = mean depth of flow

.7 Sc	1.3 Sc	.7 Sc	1.3 Sc
0.0021	0.0039	0.0021	0.0039

Created by: Mike O'Shea

MANNING'S EQUATION for OPEN CHANNEL FLOW

Project: Shops at MCLaughlin 2

Location: Northeast Pan Gutter - Capacity

By: Dane Frank

Date: 7/17/2018

Chk By:

Date:

version 12-2004

Mannings Formula

$$Q = (1.486/n)AR_h^{2/3}S^{1/2}$$

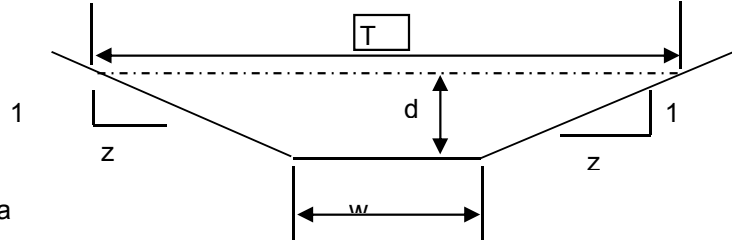
$$R = A/P$$

A = cross sectional area

P= wetted perimeter

S = slope of channel

n = Manning's roughness coefficient



$$V = (1.49/n)R_h^{2/3}S^{1/2}$$

$$Q = V \times A$$

INPUT

z (sideslope)= 45
z (sideslope)= 27
b (btm width, ft)= 0
d (depth, ft)= 0.89
S (slope, ft/ft) 0.005
n low = 0.012
n high = 0.012

Clear Data
Entry Cells

				Low N		High N			
Depth, ft	Area, sf	Wetted Perimeter, ft	Hydraulic Radius, ft	Velocity,				T =	Dm =
				Velocity, fps	Flow, cfs	fps	Flow, cfs		
0.89	28.52	64.11	0.44	5.10228938	145.495	5.102289	145.495		64.08
				Sc low =		Sc high =			
s _c = critical slope ft / ft									
T = top width of the stream				.7 Sc		1.3 Sc			
d _m = a/T = mean depth of flow				0.0019		0.0036			

s_c = critical slope ft / ft

T = top width of the stream

d_m = a/T = mean depth of flow

Created by: Mike O'Shea

MANNING'S EQUATION for OPEN CHANNEL FLOW

Project: Shops at MCLaughlin 2

Location: Southeast Gutter Channel- Capacity

By: Dane Frank

Date: 7/17/2018

Chk By:

Date:

version 12-2004

Mannings Formula

$$Q = (1.486/n)AR_h^{2/3}S^{1/2}$$

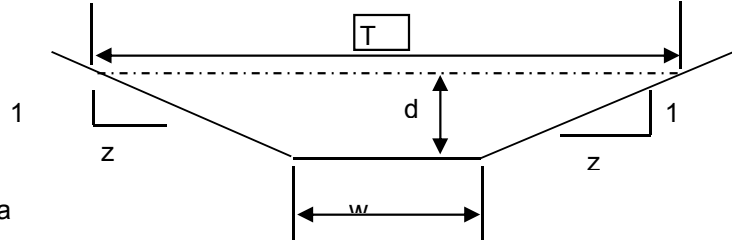
$$R = A/P$$

A = cross sectional area

P= wetted perimeter

S = slope of channel

n = Manning's roughness coefficient



$$V = (1.49/n)R_h^{2/3}S^{1/2}$$

$$Q = V \times A$$

INPUT

z (sideslope)= 0
z (sideslope)= 11
b (btm width, ft)= 0
d (depth, ft)= 0.5
S (slope, ft/ft) 0.007
n low = 0.012
n high = 0.012

Clear Data
Entry Cells

Depth, ft	Area, sf	Wetted Perimeter, ft	Hydraulic Radius, ft	Low N		High N		T =	Dm =
				Velocity, fps	Flow, cfs	Velocity, fps	Flow, cfs		
0.5	1.38	6.02	0.23	3.8699657	5.3212	3.869966	5.3212	5.5	0.250
Sc low =				0.0038	Sc high =		0.0038		
				.7 Sc	1.3 Sc	.7 Sc	1.3 Sc		
				0.0026	0.0049	0.0026	0.0049		

s_c = critical slope ft / ft

T = top width of the stream

d_m = a/T = mean depth of flow

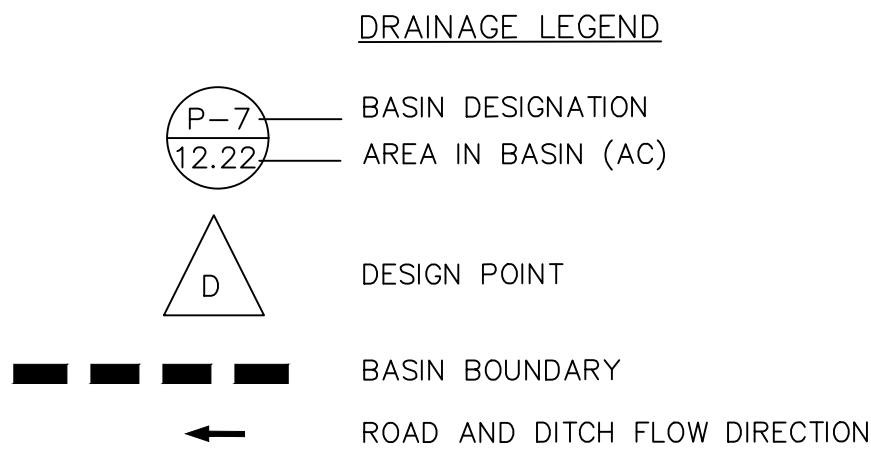
Created by: Mike O'Shea

DRAINAGE MAP

N:\jobs\1729.00\Drawings\172900 DP.dwg, DRAINAGE MAP, 8/1/2018 8:53:18 AM

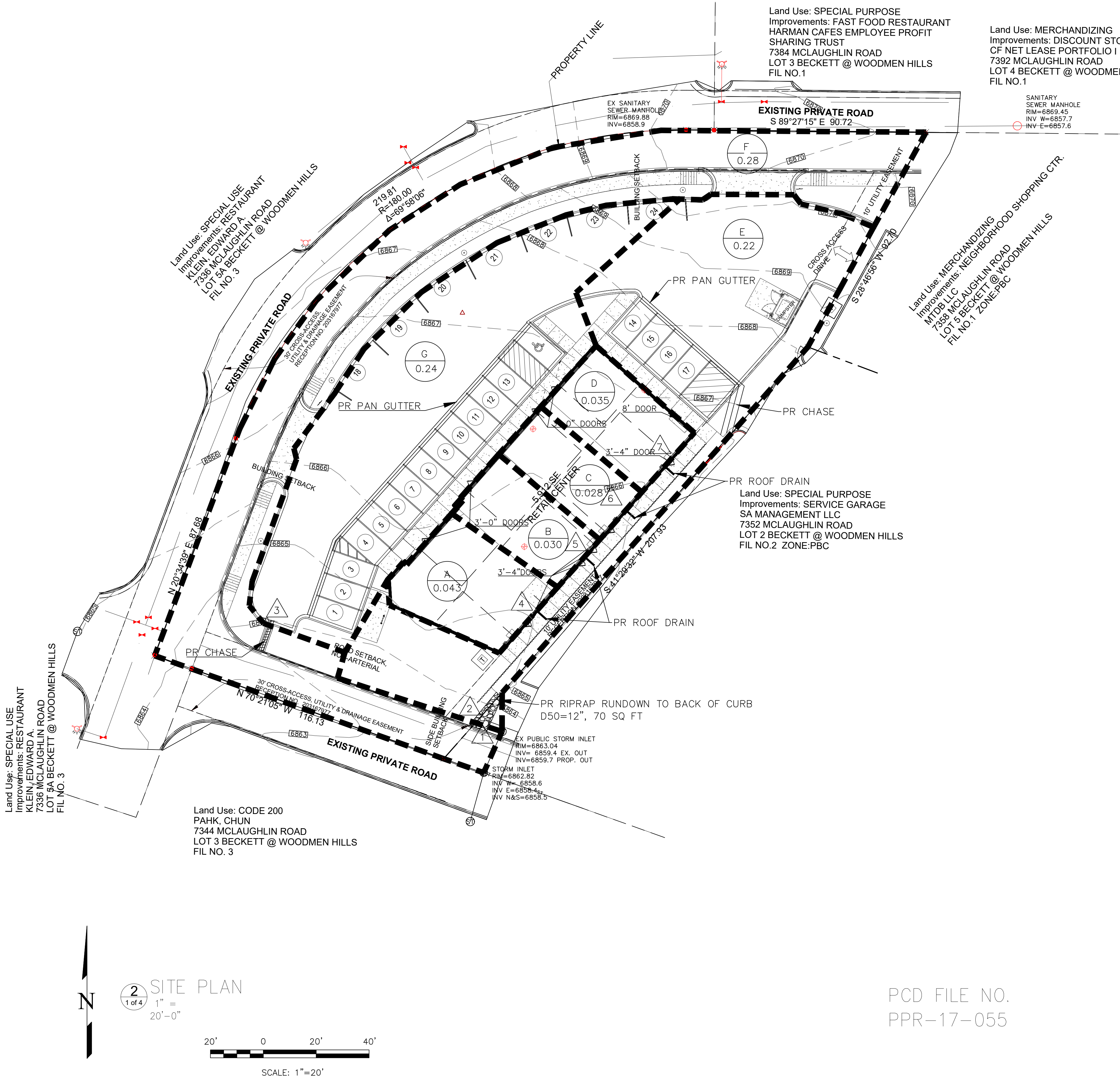
DRAINAGE SUMMARY				
DESIGN POINT	BASIN TRIBUTARY	AREA (ACRES)	FLOW	
			5 YR (cfs)	100 YR (cfs)
4	A	0.043	0.2	0.6
5	B	0.030	0.1	0.3
6	C	0.028	0.1	0.3
7	D	0.035	0.2	0.4
---	E	0.22	1.0	1.9
---	F	0.28	1.3	2.6
3	G	0.24	1.0	2.0
1	ALL	0.88	4.0	8.2
2	A,B,C,D,E	0.36	1.7	3.6

NOTES
1. THE SITE IS NOT WITHIN A FEMA 100 YEAR FLOOD PLAIN.



LEGEND

EXISTING CONTOURS - MINOR	---	6132	---
EXISTING CONTOURS - MAJOR	---	6130	---
UNDERGROUND ELECTRIC LOCATES (RED FLAGS)	ULE(R)		
UNDERGROUND GAS LOCATES (YELLOW FLAGS)	ULG(Y)		
UNDERGROUND FIB. OPT. LOCATES (ORANGE FLAGS)	ULL(R)		
UNDERGROUND WATER LOCATES (BLUE FLAGS)	ULW(B)		
UNDERGROUND CTV LOCATES (ORANGE FLAGS)	ULCTV(O)		
UNDERGROUND TEL. LOCATES (ORANGE FLAGS)	ULT(O)		
PROPOSED FINISHED SURFACE	FS		
PROPOSED FLOWLINE	FL		
SPOT ELEVATION	SE		
ASPHALT EDGE	AE		
LOW POINT	LP		
HIGH POINT	HP		
EXISTING ELEVATION	12.00*		
GRADE & DIRECTION	2.2%		
TERRAIN STRING	TS		
BOUNDARY MONUMENT	BM		
CONCRETE CURB TOP BACK	TBC		
PROPOSED CONTOUR			
EXISTING SPOT GRADE	× EX 7314.00		
PROPOSED SPOT GRADE	× 7314.00		
CONCRETE EDGE	CE		
PROPOSED FINISHED GROUND	FG		



125 N. WAHSATCH AVE., SUITE 101
COLORADO SPRINGS, CO. 80903
OFFICE: 719-635-6422
FAX: 719-635-6426
www.tnesinc.com



T-BONE
CONSTRUCTION, INC.
GENERAL CONTRACTOR

Design Development Consultants @

1310 FORD STREET
COLORADO SPRINGS, CO 80915
(719) 570-1456

(C) ALL RIGHTS RESERVED

Revisions		DATE
#	DESCRIPTION	

SHOPS AT MCLAUGHLIN II

7368 McLaughlin Road, Peyton CO 80831

D1-7074

DATE	8/01/18
CHECKED	LD
DRAWN BY	JF

PROPOSED DRAINAGE MAP

1/1

PCD FILE NO.
PPR-17-055

HISTORIC DRAINAGE REPORT

**FINAL DRAINAGE REPORT FOR
BECKETT AT WOODMEN HILLS
FILING 3**

May 27, 2003

Prepared for:

**BECKETT DEVELOPMENT, LLP
P.O. BOX 49487
COLORADO SPRINGS, CO 80949**

Prepared by:

**URS
9960 FEDERAL DRIVE, SUITE 300
COLORADO SPRINGS, CO 80921**

URS Project No. 21710935

CERTIFICATIONS

Engineer's Statement:

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the City/County for drainage reports and said report is in conformity with the master plan 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.

William D. Chaffin

William D. Chaffin, PE # 35136



Seal

Developer's Statement:

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

Beckett Development LLP

Beckett Development, LLP

By: Andrew C. Beckett

Title: Partner

Address: 1674 Pinon Glen Circle
Col Springs, Co, 80919

El Paso County's Statement

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

John A. McCarty
John McCarty, County Engineer / Director

Conditions:

7-8-03
Date

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SCS HYDROLOGIC CRITERIA	2
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- FIGURE 5: Drainage Plan
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APPENDICES

- A. Rational Method Calculations

PURPOSE

The purpose of this Final Drainage Report for Beckett at Woodmen Hills Filing 3 is to identify on-site drainage patterns and design adequate storm water facilities for routing and capturing developed storm water runoff.

This drainage report supercedes the previous drainage report submitted for Beckett at Woodmen Hills Filing No. 1. It contains the drainage information for the entire property as shown in Figure 1: Vicinity Map. This map includes areas previously platted as Beckett at Woodmen Hills Filing 1, Filing 2 and Woodmen Hills Filing 7D.

GENERAL LOCATION AND DESCRIPTION

Beckett at Woodmen Hills, Filing 3, is located approximately 1/2 mile north-northeast of Falcon, Colorado in El Paso County as shown on Figure 1, and further illustrated in Figure 2.

Filing 3, which is platted to be 9.21 acres, is located partly in Section 7, Township 13 South, Range 64 West, and partly in Section 12, Township 13 South, Range 65 West. Planned development for Filing 3 is commercial.

The terrain is generally flat with gentle northwest to southeast slopes ranging from 1% to 3%. The vegetation is typical eastern Colorado prairie grasses with little or no shrubs. Trees are present only near the existing drainage ways. The intermittent streams drain into the Black Squirrel Creek Basin which ultimately outfalls into the Arkansas River.

The site and surrounding area have soil characteristics of hydrologic soil Group A (Columbine and Blakeland) as classified by the Soil Conservation Service (See Figure 4). There are no irrigation facilities, utilities or other encumbrances that affect the drainage analysis of this site.

A FEMA regulated flood plain has been identified running adjacent with Filing 3 as shown in Figure 3.

The drainage design for Beckett at Woodmen Hills Filing 3 is consistent with the Final Drainage Report for Beckett at Woodmen Hills Filing 1 dated March 8, 2001.

DRAINAGE BASINS AND SUB-BASINS

The Falcon Basin Drainage Basin Planning Study was completed and adopted by El Paso County in December 2000. In addition, a Drainage Plan and Report was submitted to El Paso County for Phase III and Filing 7 Woodmen Hills in February 1999. This report is supplemental to the 1999 report. Drainage Reports have also been accepted and approved for Woodmen Hills Filings 1 through 11 and Drainage Letters have been approved for the Lot 3, Beckett at Woodmen Hills Filing 1 and Lot 2, Beckett at Woodmen Hills Filing No. 2.

Developed condition basins for the Falcon Basin have been detailed in the previously mentioned Phase III Preliminary and Filing 7 Final Drainage and Erosion Control Report. These basin boundaries and designations are consistent with the earlier MDDP and Preliminary and Final Drainage Reports submitted for Woodmen Hills Subdivision Filing numbers 1 through 11 and remain consistent for this property. Beckett at Woodmen Hills Filing No. 3 is contained within basins 35A and 35B (the right-of-way for McLaughlin Road) as detailed in these previous reports.

DRAINAGE DESIGN CRITERIA

SCS Hydrologic Criteria

The SCS method was used in calculating drainage for Filing 7 (including this property). Please see Phase III Preliminary and Filing 7 Final Drainage and Erosion Control Report for HEC-1 computer model results.

Rational Method Hydrologic Criteria

The Rational Method was used to estimate stormwater runoff facilities for the 5-year and 100-year design storm. The Rational Method coefficients "C" were selected from Table 5-1 in the Drainage Criteria Manual. The time of concentration is calculated per Drainage Criteria Manual requirements. The intensities for each basin are calculated from Figure 5-1 of the Drainage Criteria Manual based upon the basin time of concentration. Because there is no current development plan for the property, maximum values for C and intensity were used. Proposed developed subbasins used in the Rational Method analysis are detailed in Figure 5.

Detention Storage Criteria

Detention Pond No. 5 was designed in Woodmen Hills Filing 7 to handle runoff from the Woodmen Hills development, including portions of this property. Please see Phase III Preliminary and Filing 7 Final Drainage and Erosion Control Report for calculations and discussion on design.

DRAINAGE FACILITY DESIGN

General Concept

This Final Drainage Report for Beckett at Woodmen Hills Filing 3 consists of seven drainage sub-basins as shown on Figure 5. Runoff from the area will drain to McLaughlin Road and to the existing FEMA floodplain along the southern boundary of the site. The direct flow to the FEMA floodplain will be compensated for by over detention of developed flows in Pond No. 5 as designed in the Phase III Preliminary and Filing 7 Final Drainage and Erosion Control Report.

Existing Drainage Characteristics

Currently, runoff from this property flows south and east and is intercepted by existing roads or flows over the curb and gutter into McLaughlin Road. Existing inlets intercept flows in McLaughlin Road per the Phase III Preliminary and Filing 7 Final Drainage and Erosion Control Report. Please see Phase III Preliminary and Filing 7 Final Drainage and Erosion Control Report for details.

Proposed Design Drainage Characteristics

The sub-basins shown on Figure 5 were developed based on the proposed lot layout for this site. The northwestern area (Basin 1) will be graded to drain to two 10-foot sump inlets located at Design Point 1. The inlets will discharge into an existing storm system and eventually discharge into Detention Pond 5. Design flows are estimated to be 15 cfs and 28 cfs for 5-year and 100-year storm.

Basin 2 contains 4.3 acres and is located in the northeastern part of the site. Runoff drains south to the existing access road from McLaughlin Road. Runoff travels along the curb and gutter to Design Point 2 located at the intersection with McLaughlin Road. Anticipated design flows are 13 cfs and 24 cfs for the 5-year and 100-year storm. Flows are routed south to Design Point 3 to the existing 15-foot on-grade inlet along the western flowline of McLaughlin Road.

Basin 3 contains 1.6 acres west of McLaughlin Road. Runoff drains south to a proposed access road from McLaughlin Road. Runoff is directed east, via curb and gutter, to Design Point 3. Anticipated flows from Basin 3 are 6 cfs and 12 cfs for the 5-year and 100-year storm.

Flows from Basin 2 and 3 are combined at Design Point 3 and intercepted by the existing 15-foot on-grade inlet. Routed flows to Design Point 3 are 17 cfs and 31 cfs. The 15-foot on-grade inlet at Design Point 3 will intercept approximately 10 cfs and 13 cfs and bypass 7 cfs and 18 cfs for the 5-year and 100-year storm. Bypassed flows continue south to Design Point 4.

Basin 4 contains 2.3 acres west of McLaughlin Road. Runoff drains south to a proposed access road from McLaughlin Road. Runoff is directed east and south, via curb and gutter, to an existing inlet in McLaughlin Road at Design Point 4. The inlet discharges directly into the FEMA floodplain. Anticipated design flows for Basin 4 are 6 cfs and 13 cfs for 5-year and 100-year storm. Routed flows from Basin 4 and Design Point 3 are 10 cfs and 25 cfs for the 5-year and 10-year storm at Design Point 4. The existing inlet along the western side of McLaughlin Road is a 5-foot type R inlet. The inlet will not handle the 5-year or 100-year storm. Both storms will overtop the curb and flow into the existing FEMA floodplain. Riprap protection can be added behind the inlet for stabilization.

Basin 5 is along the southern boundary of the site, adjacent to McLaughlin Road. This small basin drains south directly into the FEMA floodplain. Anticipated flows for Basin 5 are 2 cfs and 3 cfs for the 5-year and 100-year storm.

Basin 6 is centrally located and adjacent to the future Meridian Road. Runoff flows south to Design Point 5. Estimated runoff of 8 cfs and 14 cfs will be generated for the 5-year and 100-year storm.

Basin 7 is located along the southern boundary of the site, adjacent to the future Meridian Road. Anticipated flows for Basin 7 are 7 cfs and 13 cfs. Runoff from basins 6 and 7 are routed to Design Point 6 and discharge directly into the FEMA floodplain. Routed flows are estimated to be 14 cfs and 26 cfs for the 5-year and 100-year storm. The discharge structure at Design Point 6 will be designed as part of the individual development plan for these lots. The owner of the lot will be responsible for the installation of the required drainage structure. The structure at Design Point 6 will be equivalent to a 15-foot sump inlet.

EROSION CONTROL

General Concept

All ditches will be designed to meet El Paso County criteria for slope and velocity. During construction, best management practices for erosion control will be employed based on El Paso County Criteria and the erosion control plans shown in Figure 6.

Detention Ponds

The detention ponds will act as the primary erosion control facilities for this property and other tributary areas. The ponds will serve dual purposes in facilitating the settling of sediment in runoff during and after construction, and in maintaining runoff to existing levels.

Silt Fencing

Silt fencing will be placed along the southern and eastern property boundaries. This will prevent suspended sediment from leaving the site during construction. Silt fencing is to remain in place until vegetation is reestablished after completion of construction.

Erosion Bales

Erosion bales will be placed within the Woodmen Road ditch as check dams. Erosion bales will remain in place until vegetation is reestablished in drainage swales. Erosion bales will also be placed around all inlets to minimize sediment transport.

Miscellaneous

Best erosion control practices will be utilized as deemed necessary by the Contractor or Engineer and are not limited to the measures described above or as shown in Figure 6.

COST ESTIMATE

The following table is a summary of estimated costs for proposed drainage improvements and erosion control measures for Beckett at Woodmen Hills Filing 3. The cost estimate submitted herein is based on time-honored practices within the construction industry. As such, the engineer does not control the cost of labor, material, equipment or a contractor's method of determining prices and competitive bidding practices or market conditions. The estimate contained represents our best judgement as design professionals using current information available at the time of preparation. The engineer cannot guarantee that proposals, bids, and/or construction costs will not vary from this cost estimate.

Item	Quantity	Unit	Unit Cost	Extension
Erosion Control Measures				
Erosion Control Hay Bales	8	EA	\$ 15.00	120
Silt Fencing	1,000	LF	\$ 2.00	2,000
Subtotal, Erosion Control Measures				\$ 2,120
Subtotal, All Drainage & Erosion Control				\$ 2,120
Engineering (10%)				\$ 212
Contingency (10%)				\$ 212
TOTAL, DRAINAGE & EROSION CONTROL				\$ 2,544

Drainage Fees

Drainage fees for Beckett at Woodmen Hills Filing 3 have been paid in the previous submittals for Beckett at Woodmen Hills Filing 1 and Filing 2.

FIGURES

BECKETT AT WOODMEN HILLS



VICINITY MAP

N.T.S.

BECKETT AT WOODMEN HILLS
VICINITY MAP

URS

PROJ NO. 6742451

FIGURE 1

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SITE MAP

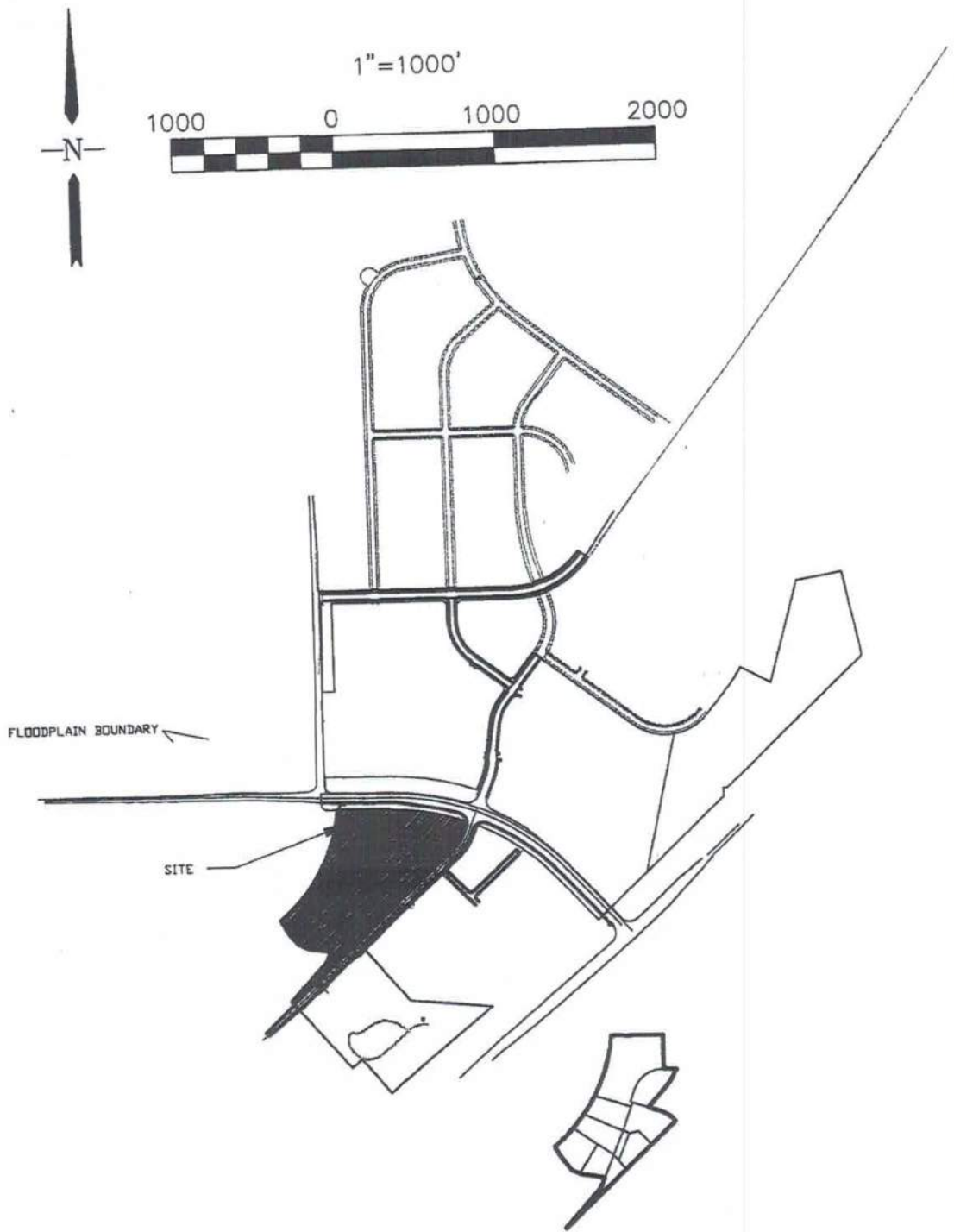
NO SCALE

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FIGURE 2

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BECKETT AT WOODMEN HILLS

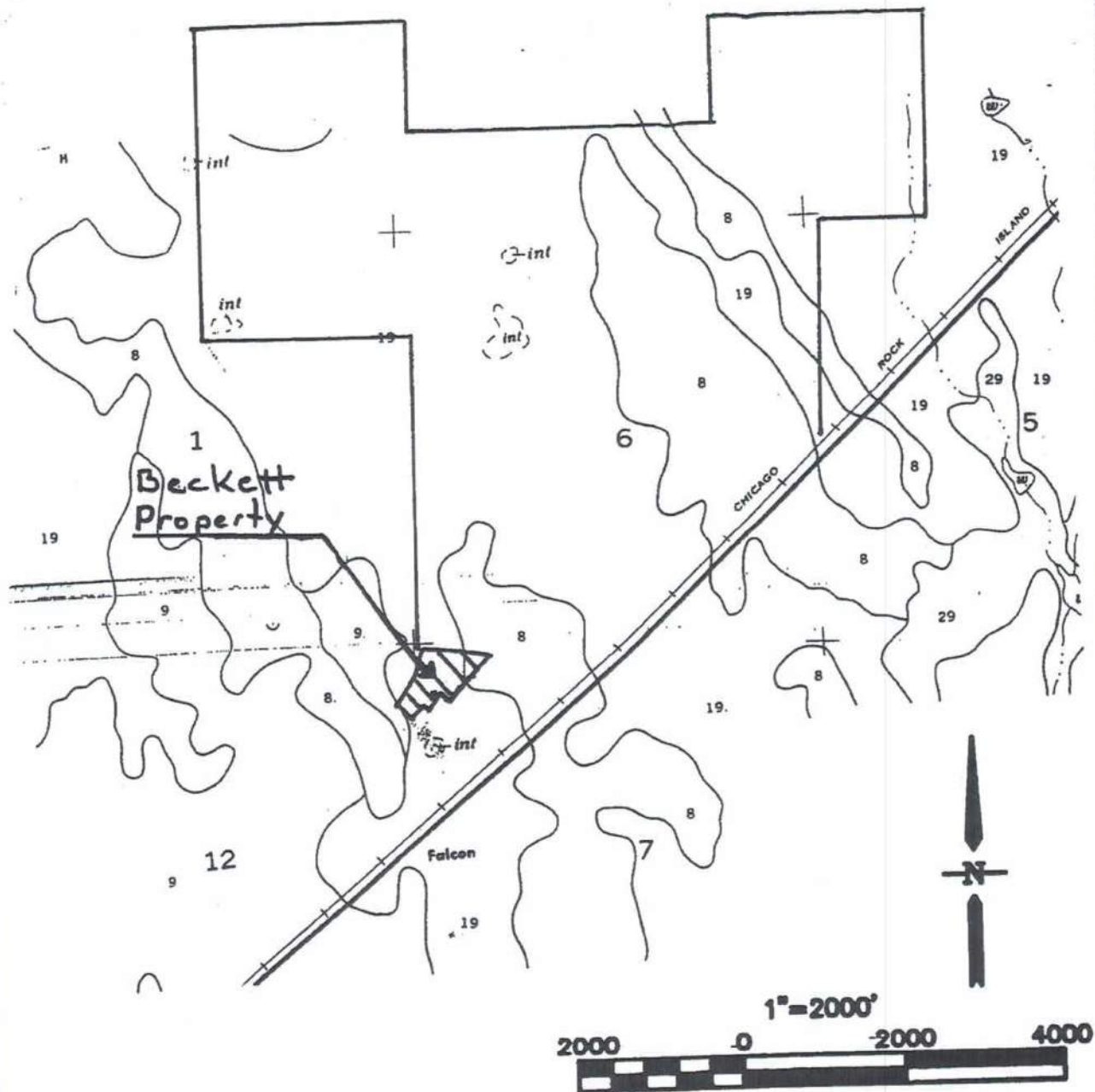
FEMA FLOOD INSURANCE RATE MAP

URS

PROJ NO. 6700042451

FIGURE 3

\\urws167\6742451\CAD\FIGURES\FG01SOIL04.dwg 08/16/2000 09:51:55 AM MDT



BECKETT AT WOODMEN HILLS

SOILS MAP

URS

PROJ NO. 6742451

FIGURE 4

APPENDIX A:
Rational Method Calculations

BECKETT @ WOODMEN HILLS FILING 3 ON-GRADE INLET CALCULATIONS

Based on table 7-2 Drainage Criteria Manual

Based on table 7-2 Drainage Criteria Manual																							
DP	Inlet size L(f)	CROSS SLOPE	STREET SLOPE	Q(5)	Q(100)	Qi (5)	T	Q ₅							Q ₁₀₀							Bypass	
								F _w	L1	L2	L3	Qi (100)	T	F _w	L1	L2	L3	F _w	L1	L2	L3	Q ₅	Q ₁₀₀
3		2.0%	2.0%	17	31	19	18	1.9244	27	16	58	13	23	2.0077	36	21	75	7	18				

BECKETT @ WOODMEN HILLS FILING 3 SUMP INLET CALCULATIONS

Based on formula: $Q_i = 1.7(L_i + 1.8W)(d_{max} + W^{12})^{1.48}$

DP	Inlet size L(f) initial	CROSS SLOPE	Q(5)	Q(100)	Q ₅					Q ₁₀₀					Clogging Factor	Length Final
					Qi (5)	d _{max}	W	a	Qi (100)	d _{max}	W	a	Qi (100)	Length Initial		
1	16	2.0%	15	28	15	0.5	2	0.17	28	1.0	2	0.2	28	90/100	1.25	90/100
6	12	2.0%	14	26	14	0.5	2	0.17	26	1.0	2	0.2	26	115/100	1.25	115/100
4	5	2.0%	10	25	8	0.5	2	0.17	19	1.0	2	0.2	19	N/A	NA	N/A

D	Q	SX	SO
0.48406	22	0.02	0.005
0.41014	20	0.02	0.01
0.38011	20	0.02	0.015
0.36015	20	0.02	0.02
0.3454	20	0.02	0.025
0.33379	20	0.02	0.03

BECKETT @ WOODMEN HILLS FILING 3
(RATIONAL METHOD Q=CIA)

BASIN	TOTAL FLOWS			AREA TOTAL (Ac)	WEIGHTED		OVERLAND			CHANNEL			Tc		INTENSITY		COMMENTS	
	Q(5) (c.f.s.)	Q(100) (c.f.s.)	CA(equiv.) 5 YR 100 YR		C(5)	C(100)	C(5)	Length (ft)	Slope (ft)	Tc (min)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	TOTAL (min)	I(5) (in/hr)		I(100) (in/hr)
1	15	28	3.53	3.92	0.90	0.95	0.25	35	3.0%	6.5	620	2.0%	4.5	2.3	8.8	4.3	7.4	
2	13	24	3.90	4.33	0.90	0.95	0.25	130	3.0%	12.6	780	2.0%	4.5	2.9	15.5	3.3	5.8	
3	6	12	1.41	1.57	0.90	0.95	0.25	30	2.0%	6.9	330	2.0%	5.5	1.0	7.9	4.4	7.8	
4	6	13	1.38	2.34	0.59	0.71	0.25	25	3.0%	5.5	660	1.9%	6.5	1.7	7.2	4.6	8.0	
5	1	3	0.13	0.37	0.35	0.45	0.25	25	3.0%	5.5	360	2.0%	7.5	0.8	6.3	4.8	8.4	
6	8	14	1.60	1.69	0.90	0.95	0.25	25	3.0%	5.5	280	3.1%	8.5	0.5	6.1	4.9	8.5	
7	7	13	1.46	1.54	0.90	0.95	0.25	25	3.0%	5.5	220	3.0%	5.5	0.7	6.2	4.8	8.5	

BECKETT @ WOODMEN HILLS FILING 3 SURFACE ROUTING

DESIGN POINT	CONTRIBUTING BASINS	CA (equivalent)		Tc (min.)	INTENSITY		TOTAL FLOWS	
		CA(5)	CA(100)		I(5) (in/hr)	I(100) (in/hr)	Q(5) (cfs)	Q(100) (cfs)
2	2	3.90	4.11	15.5	3.3	5.8	13	24
		TRAVEL TIME						
		3.90	4.11	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
3	2 3	3.90	4.11		320	4.5	1.2	16.7
		1.41	1.49	TRAVEL TIME				
		5.31	5.61	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
4	4 2,3	1.38	1.66	16.7	3.2	5.6	17	31
		5.31	5.61		660	4.5	2.4	19.1
		6.69	7.27	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
5	6	1.60	1.69	19.1	3.0	5.2	20	38
		1.60	1.69	TRAVEL TIME				
		1.60	1.69	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)
6	6 7	1.60	1.69	6.1	4.9	8.5	8	14
		1.46	1.54	TRAVEL TIME				
		3.06	3.23	Type/flow	Length (ft)	Velocity (fps)	d. Time (min)	T. Time (min)

Flows intercepted at DP-3 are 10 cfs and 13 cfs
 this flow is removed from the 20 cfs and 38 cfs
 routed flows , $\begin{array}{r} 20 \text{ cfs} \\ - 10 \text{ cfs} \\ \hline = 10 \text{ cfs} \end{array}$ 5 year $\begin{array}{r} 38 \text{ cfs} \\ - 13 \text{ cfs} \\ \hline = 25 \text{ cfs} \end{array}$ 100 yr
 at DP-4

BECKETT @ WOODMEN HILLS FILING 3 ON-GRADE INLET CALCULATIONS

Based on table 7-2 Drainage Criteria Manual

Based on table 1-2 Drainage Criteria Provision

DP	Inlet size L(f)	CROSS SLOPE	STREET SLOPE	Q ₅										Q ₁₀₀						Bypass	
				Q(5)	Q(100)	Q(5)	T	F _w	L1	L2	L3	Q(100)	T	F _w	L1	L2	L3	Q ₅	Q ₁₀₀		
3	15	2.0%	2.0%	17	31	10	18	1.9244	27	16	58	13	23	2.0077	36	21	75	7	18		

BECKETT @ WOODMEN HILLS FILING 3 SUMP INLET CALCULATIONS

Based on formula: $Q_s = 1.7(L_i + 1.8W)(d_{max} + W^{1/2})^{1.48}$

DP	Inlet size L(f)	CROSS SLOPE	Q ₅						Q ₁₀₀						Clogging Factor	Length Final
			Q(5)	Q(100)	Q(5)	d _{max}	W	a	Q(100)	d _{max}	W	a	Q(100)	Q(100)		
1	16	2.0%	15	28	15	0.5	2	0.17	28	1.0	2	0.2	28	1.25	1.25	20.00
6	12	2.0%	14	26	14	0.5	2	0.17	26	1.0	2	0.2	26	1.25	1.25	15.00
4	5	2.0%	10	25	8	0.5	2	0.17	19	1.0	2	0.2	19	NA	NA	N/A

D	Q	SX	SO
0.48406	22	0.02	0.005
0.41014	20	0.02	0.01
0.38011	20	0.02	0.015
0.36015	20	0.02	0.02
0.3454	20	0.02	0.025
0.33379	20	0.02	0.03

STREET CAPACITY

FOR 1/2 STREET SECTION

	Formula	Longitudinal Slope	Cross Slope	n	Curb Type	Depth of flow	Q _{max}	Q	Comments
Residential	Q=170.2 S ^{1/2}	0.5%	0.02	0.016	V/R	0.5	34	12.0	County ramp curb is 6"
		1.0%					34	17.0	
		1.5%					34	20.8	
		2.0%					34	24.1	
		2.5%					34	26.9	
		3.0%					34	29.5	
		3.5%					34	31.8	
Collector/Arterial	Q=171.7 S ^{1/2}	4.0%					34	34.0	
		0.5%	0.02	0.016	V	0.5	34	12.0	
		1.0%					34	17.0	
		1.5%					34	20.8	
		2.0%					34	24.1	
		2.5%					34	26.9	
		3.0%					34	29.5	
		3.5%					34	31.8	
		4.0%					34	34.0	

GENERAL NOTES:

- ALL FINANCIAL CONSTRUCTION SHALL MEET THE SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS PAVO CONSTRUCTION CRITERIA MANUAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE NOTIFICATION AND FIELD LOCATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, BEFORE BEGINNING CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO ACTUAL CONSTRUCTION. THE SOLE REPORT FOR THIS SITE, PREPARED BY CIL DATED NOVEMBER 11, 2000 SHALL BE CONSIDERED A PART OF THESE PLANS AND SHALL BE ADHERED TO.
- THE CONTRACTOR SHALL HAVE AT LEAST ONE (1) COPIES OF THESE APPROVED PLANS AND SHALL REPORT PREPARED FOR THIS SITE BY CIL, DATED NOVEMBER 11, 2000 AND AT LEAST ONE (1) COPY OF THE APPROPRIATE DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS AT THE JOB SITE AT ALL TIMES.
- REVISIONS: MAKE THE FOLLOWING CHANGES TO THE PLANS AND SUBMIT TO THE CITY OF COLORADO SPRINGS PAVO CONSTRUCTION CRITERIA MANUAL FOR REVIEW AND APPROVAL:
1. PAVO CONSTRUCTION CRITERIA MANUAL, 2000 EDITION, SECTION 100.00, 100.01, 100.02, 100.03, 100.04, 100.05, 100.06, 100.07, 100.08, 100.09, 100.10, 100.11, 100.12, 100.13, 100.14, 100.15, 100.16, 100.17, 100.18, 100.19, 100.20, 100.21, 100.22, 100.23, 100.24, 100.25, 100.26, 100.27, 100.28, 100.29, 100.30, 100.31, 100.32, 100.33, 100.34, 100.35, 100.36, 100.37, 100.38, 100.39, 100.40, 100.41, 100.42, 100.43, 100.44, 100.45, 100.46, 100.47, 100.48, 100.49, 100.50, 100.51, 100.52, 100.53, 100.54, 100.55, 100.56, 100.57, 100.58, 100.59, 100.60, 100.61, 100.62, 100.63, 100.64, 100.65, 100.66, 100.67, 100.68, 100.69, 100.70, 100.71, 100.72, 100.73, 100.74, 100.75, 100.76, 100.77, 100.78, 100.79, 100.80, 100.81, 100.82, 100.83, 100.84, 100.85, 100.86, 100.87, 100.88, 100.89, 100.90, 100.91, 100.92, 100.93, 100.94, 100.95, 100.96, 100.97, 100.98, 100.99, 100.100, 100.101, 100.102, 100.103, 100.104, 100.105, 100.106, 100.107, 100.108, 100.109, 100.110, 100.111, 100.112, 100.113, 100.114, 100.115, 100.116, 100.117, 100.118, 100.119, 100.120, 100.121, 100.122, 100.123, 100.124, 100.125, 100.126, 100.127, 100.128, 100.129, 100.130, 100.131, 100.132, 100.133, 100.134, 100.135, 100.136, 100.137, 100.138, 100.139, 100.140, 100.141, 100.142, 100.143, 100.144, 100.145, 100.146, 100.147, 100.148, 100.149, 100.150, 100.151, 100.152, 100.153, 100.154, 100.155, 100.156, 100.157, 100.158, 100.159, 100.160, 100.161, 100.162, 100.163, 100.164, 100.165, 100.166, 100.167, 100.168, 100.169, 100.170, 100.171, 100.172, 100.173, 100.174, 100.175, 100.176, 100.177, 100.178, 100.179, 100.180, 100.181, 100.182, 100.183, 100.184, 100.185, 100.186, 100.187, 100.188, 100.189, 100.190, 100.191, 100.192, 100.193, 100.194, 100.195, 100.196, 100.197, 100.198, 100.199, 100.200, 100.201, 100.202, 100.203, 100.204, 100.205, 100.206, 100.207, 100.208, 100.209, 100.210, 100.211, 100.212, 100.213, 100.214, 100.215, 100.216, 100.217, 100.218, 100.219, 100.220, 100.221, 100.222, 100.223, 100.224, 100.225, 100.226, 100.227, 100.228, 100.229, 100.230, 100.231, 100.232, 100.233, 100.234, 100.235, 100.236, 100.237, 100.238, 100.239, 100.240, 100.241, 100.242, 100.243, 100.244, 100.245, 100.246, 100.247, 100.248, 100.249, 100.250, 100.251, 100.252, 100.253, 100.254, 100.255, 100.256, 100.257, 100.258, 100.259, 100.260, 100.261, 100.262, 100.263, 100.264, 100.265, 100.266, 100.267, 100.268, 100.269, 100.270, 100.271, 100.272, 100.273, 100.274, 100.275, 100.276, 100.277, 100.278, 100.279, 100.280, 100.281, 100.282, 100.283, 100.284, 100.285, 100.286, 100.287, 100.288, 100.289, 100.290, 100.291, 100.292, 100.293, 100.294, 100.295, 100.296, 100.297, 100.298, 100.299, 100.300, 100.301, 100.302, 100.303, 100.304, 100.305, 100.306, 100.307, 100.308, 100.309, 100.310, 100.311, 100.312, 100.313, 100.314, 100.315, 100.316, 100.317, 100.318, 100.319, 100.320, 100.321, 100.322, 100.323, 100.324, 100.325, 100.326, 100.327, 100.328, 100.329, 100.330, 100.331, 100.332, 100.333, 100.334, 100.335, 100.336, 100.337, 100.338, 100.339, 100.340, 100.341, 100.342, 100.343, 100.344, 100.345, 100.346, 100.347, 100.348, 100.349, 100.350, 100.351, 100.352, 100.353, 100.354, 100.355, 100.356, 100.357, 100.358, 100.359, 100.360, 100.361, 100.362, 100.363, 100.364, 100.365, 100.366, 100.367, 100.368, 100.369, 100.370, 100.371, 100.372, 100.373, 100.374, 100.375, 100.376, 100.377, 100.378, 100.379, 100.380, 100.381, 100.382, 100.383, 100.384, 100.385, 100.386, 100.387, 100.388, 100.389, 100.390, 100.391, 100.392, 100.393, 100.394, 100.395, 100.396, 100.397, 100.398, 100.399, 100.400, 100.401, 100.402, 100.403, 100.404, 100.405, 100.406, 100.407, 100.408, 100.409, 100.410, 100.411, 100.412, 100.413, 100.414, 100.415, 100.416, 100.417, 100.418, 100.419, 100.420, 100.421, 100.422, 100.423, 100.424, 100.425, 100.426, 100.427, 100.428, 100.429, 100.430, 100.431, 100.432, 100.43

- A. PRE-CONSTRUCTION MEETING BETWEEN THE CONTRACTOR, ENGINEER AND THE PAGO COUNTY DEPARTMENT OF TRANSPORTATION WILL BE HELD PRIOR TO ANY CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBSERVE THE MEETING TIME AND PLACE WITH ALL PERSONS TO ATTEND.
- BENCHMARK: 2-1/2" METAL DIAL, L.S. 17864, AT THE NW CORNER OF SECTION 7 (INTERSECTION OF WOODMEN ROAD AND MEDISON ROAD).
- C. ALL APPROPRIATE PERMITS [SUCH AS FILL, ETC.] MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
- D. CONSTRUCTION SCHEDULING WILL BE PROVIDED BY THE ENGINEER
- E. GRAVITY OPERATIONS TO BEGIN IN FEBRUARY 2003, TO BE COMPLETED FEBRUARY 2004.
- F. ALL FILL & CUT SLOPES SHALL NOT EXCEED 3:1 TV.
- G. PROPOSED CONTIGUOUS AND SPOT ELEVATIONS SHOWN WITHIN THE RIGHT-OF-WAY ARE TO FINISHED GRADE.
- H. USER IS NOT RESPONSIBLE FOR THE ACCURACY OF THE EXISTING CONDITIONS.
- I. ALL OUTRIGGERED SLOPES SHALL BE REVEGETATED WITHIN AN APPROVED EQUAL TWO WEEKS AFTER FINAL GRADING IS COMPLETED.
- J. EXISTING CONTRACTOR, FARMER, SHALL BE USED ON SHOULDER SLOPES WHICH ARE EQUAL TO OR GREATER THAN SIX (6) VERTICAL SLOPE.
- K. EROSION CONTROL WILL CONSIST OF BARE NOT LIMITED TO STRAW BALES PLACED AT THE POSITION SHOWN ON THIS PLAN, AND TOP SOIL MIXED WITH GRADES SEED WHICH WILL BE WATERED UNTIL VEGETATION HAS ESTABLISHED.
- L. THE EROSION CONTROL MEASURES ARE DEFINED AS FOLLOWS:
- M. EROSION CONTROL MEASURES SHALL BE IMPLEMENTED IN A MANNER THAT WILL PROTECT ADJACENT PROPERTIES AND PUBLIC FACILITIES FROM THE ADVERSE EFFECTS OF EROSION AND SEDIMENTATION AS A RESULT OF CONSTRUCTION AND EARLYWORK ACTIVITIES WITHIN THE PROJECT SITE.
- N. EROSION CONTROL BLANKET TO BE EXCELSSOR HI-VELOCITY CURLEX BLANKET OR EQUIVALENT, FOR ALL SLOPES EQUAL TO OR GREATER THAN 2:1.
- O. ADDITIONAL STRUCTURES MAY BE REQUIRED AT THE TIME OF CONSTRUCTION.
- P. ADDITIONAL MEASURES MAY BE REQUIRED.

- [illegible]

STEPS FOR CONSTRUCTION

- THE ANTICIPATED START FOR THIS PROJECT IS FEBRUARY 2003 WITH AN ANTICIPATED COMPLETION DATE OF FEBRUARY 2004. BELOW IS A BRIEF OUTLINE OF THE CONSTRUCTION SEQUENCE FOR THIS PROJECT.
- CONSTRUCTION OF DESIGN CONTROL STRUCTURES
 - ROAD GRADING
 - UTILITIES INSTALLATION

STAIN BAITS AND STEAM BAITS CATCHES WILL BE INSTALLED IMMEDIATELY AFTER ANY EXCAVATION FOR THE MAJOR STRUCTURE. STEAM BAITS AND CATCHES WILL BE PLACED AT ALL ENTRANCES AND EXITS OF DRAINAGE WAYS. THE TYPICAL MAINTENANCE POND WILL ALSO BE USED AS AN INFILTRATION POND FOR SURFACING AND TYPICAL CONSTRUCTION. STEAM BAITS WILL BE INSTALLED AROUND THE DUTTY AND TYPICAL STRUCTURE. THE TYPICAL STRUCTURE WILL ALSO BE PROTECTED WITH NEW TOP UP ON THE CONSTRUCTION SITE.

NON-STRUCTURE PRACTICES TO CONTROL EROSION AND SEDIMENTATION WILL INCLUDE REVEGETATION OF GRASSING OTHER IN ESTABLISHED AREAS ACCORDING TO THE TYPICAL MAINTENANCE POND. TYPICAL MAINTENANCE OF THE TYPICAL MAINTENANCE POND AND MAINTENANCE ALONG WITH THE TYPICAL MAINTENANCE POND.

THE MOST PROBABLE SOURCE OF NON-STORMWATER POLLUTION IS RETAILING AND DAILY MAINTENANCE OPERATIONS. IF WHEELS, TIRE TRACKS, AND TIRE CHAINS ARE USED TO SERVICE EQUIPMENT, ADJACENT MATERIALS AND CONTAINERS FOR THE STORAGE OF USED ADJACENT MATERIAL WILL BE CLOSE BY. IF A FUEL TANK IS LEFT ON SITE, BURNS WILL BE MADE AROUND THE TANK TO CAPTURE ANY FUEL. ADJACENT MATERIALS AND SUPPLIES WILL BE ON HAND.

[illegible][illegible][illegible]

GRASS	VARIETY	AMOUNT IN TONS LBS. PER ACRE
SODGROSS GRAMA	EL BEND	2.0
WESTERN WHEATGRASS	ELBTON	2.0
SLENDER WHEA GRASS	NATIVE	2.0
LITTLE BLKSTERN	PASTURA	0.6
WANG GRASS	NATIVE	2.0
STATION GRASS	NEBRASKA	1.0
WHEATING JOSE GRASS		



DEVELOPERS STATEMENT:

1. THE DEVELOPER HAVE REVIEWED AND WILL COMPLY WITH ALL OF THE REQUIREMENTS SPECIFIED IN THIS GRADING AND EROSION CONTROL PLAN.

Dudley C. Buckett
BUCKETT DEVELOPMENT

SHEET INDEX

1. COVER SHEET
-
2. GRADING AND EROSION CONTROL

[illegible]

ENGINEER

DESIGNED BY: DC DATE: 2-26-03

DRAWN BY: DC DATE: 2-28-

CHECKED BY: DATE

48 HOURS BEFORE YOU DIG,
CALL UTILITY LOCATORS

1-800-922-1987
(SEE INDEX FOR LIST OF UTILITY CONTACTS)

STUDY

1000

COLLEGE ASIAN

PROJECT J

SHEET TITLE

FROM _____

SCALE: 1" = 50'

NOTE: CONTOURS SHOWN ARE
GRADED ONLY. FINAL GRADING
DEVELOPED FOR EACH INDIVIDUAL

WOODMEN ROAD

FUTURE MERIDIAN ROAD

LEGEND

BASIN
AREAS
5yr

BASIN BOUNDARY

RETAINING WALL

DESIGN POINT

1
3.92
15.28

6
1.78
14

7
1.82
13

8
2.34
13

3
1.57
12

2
4.22
13

5
0.37
11

15' INLET
Q=10 CFS
Q=15 CFS
Q=20 CFS
Q=25 CFS
Q=30 CFS
Q=35 CFS
Q=40 CFS
Q=45 CFS
Q=50 CFS
Q=55 CFS
Q=60 CFS
Q=65 CFS
Q=70 CFS
Q=75 CFS
Q=80 CFS
Q=85 CFS
Q=90 CFS
Q=95 CFS
Q=100 CFS

APPROXIMATE INLET LOCATION
DUE TO PEAK FLOODPLAIN
Q=10 CFS
Q=25 CFS

EXISTING
STORM
SEWER
TO ROAD #1

PROPERTY BOUNDARY

PLAT BOUNDARY

RETAINING WALL

DESIGN POINT

WOODMEN ROAD

6870

6865

6860

6855

6850

6845

6840

6835

6830

6825

6820

6815

6810

6805

6800

6795

6790

6785

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6775

6770

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Markup Summary

County's (1)

minants to the City's MS4, as it is not a
r commercial BMPs are proposed c

County's

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County's

Remove. A retail center is a commercial site. (1)

or the potential for the introduction of contaminants to t
ul or commercial site, so no industrial or commerc
ary:

TION COST OPINION
rimbursable
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Remove. A retail
center is a
commercial site.

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Remove. A retail center is a commercial site.

(2)

include outdoor
S4, as it is not an
ire proposed or

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and contaminants to settle out.
4. Need for Industrial and Commercial
storage or the potential for the introd
~~industrial or commercial site~~, so n
necessary.

CONSTRUCTION COST OPINION

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