



INNOVATIVE DESIGN. CLASSIC RESULTS.

**DRAINAGE MEMO FOR
GREENBRIAR / POWERWOOD
CONCEPT PLAN AMENDMENT**

April 2019

Prepared for:
Thompson Thrift Development Inc.
Salesforce Tower
111 MONUMENT CIRCLE, SUITE 1600
INDIANAPOLIS, IN 46204
(317) 853-5493

Job no. 2130.40



GENERAL DESCRIPTION

The Greenbriar / Powerwood Concept Plan Amendment reflects a proposed apartment development generally located north of existing Lot 1, Tutt Industrial Park Filing No. 1 (existing C and C Sand Landscape Materials), west of Templeton Gap Road, East of Tutt Boulevard and approximately 500 feet south of Woodmen Road.

EXISTING DRAINAGE CONDITIONS

The proposed apartment site currently predominantly drains in a southerly direction as sheet flow. Existing public storm facilities in existing westerly Tutt Boulevard convey adjacent developed (roadway and developed southerly parcels) and undeveloped flows into an existing public detention facility located in Tract A, Tutt Industrial Park Filing No. 1.

The overall site was previously studied in the "Master Development Drainage Plan for Powerwood / Greenbriar" dated July 2002 by Advanced Design Professionals, Incorporated. This MDDP as well as the currently approved concept plan reflected the proposed apartment site as "commercial" with an imperviousness rate reflective of a site heavily utilized with building and parking fields.

This apartment site was included as a tributary basin in the "Preliminary Final Drainage Report for Tutt Boulevard industrial Park Filing No. 1" by Classic Consulting Engineers and Surveyors, LLC, dated September 27, 2007. Per the Drainage Map from this previously approved analysis (attached to this memo), the apartment site is located with basin N-1 and S-3. Both basins have been analyzed as commercial use.

PROPOSED DRAINAGE CONDITIONS

At this time, no specific land uses layouts are known, nor are any Development Plan or Final Plats proposed to be submitted. Site specific Final Drainage Reports will be required for any development within this Concept Plan area that details full adherence to the City Drainage Criteria Manual, including the use of full spectrum detention. Unless modified in future Final Drainage Reports, all previously approved drainage routing and existing public detention facility design will be adhered to.

FLOODPLAIN STATEMENT

No portion of the Concept Plan is within a designated F.E.M.A. 100-year floodplain, indicated on Map No. 08041C 0537 G of the Federal Emergency Management Agency's Flood Insurance Rate Map of the City of Colorado Springs, El Paso County, Colorado, prepared by the National Flood Insurance Program, effective March 17, 1997 (see attachment).

DRAINAGE AND BRIDGE FEES

This site lies within Cottonwood Creek Drainage Basin. Drainage and bridge fees will be defined in future Final Drainage Reports at the time of platting.

SUMMARY

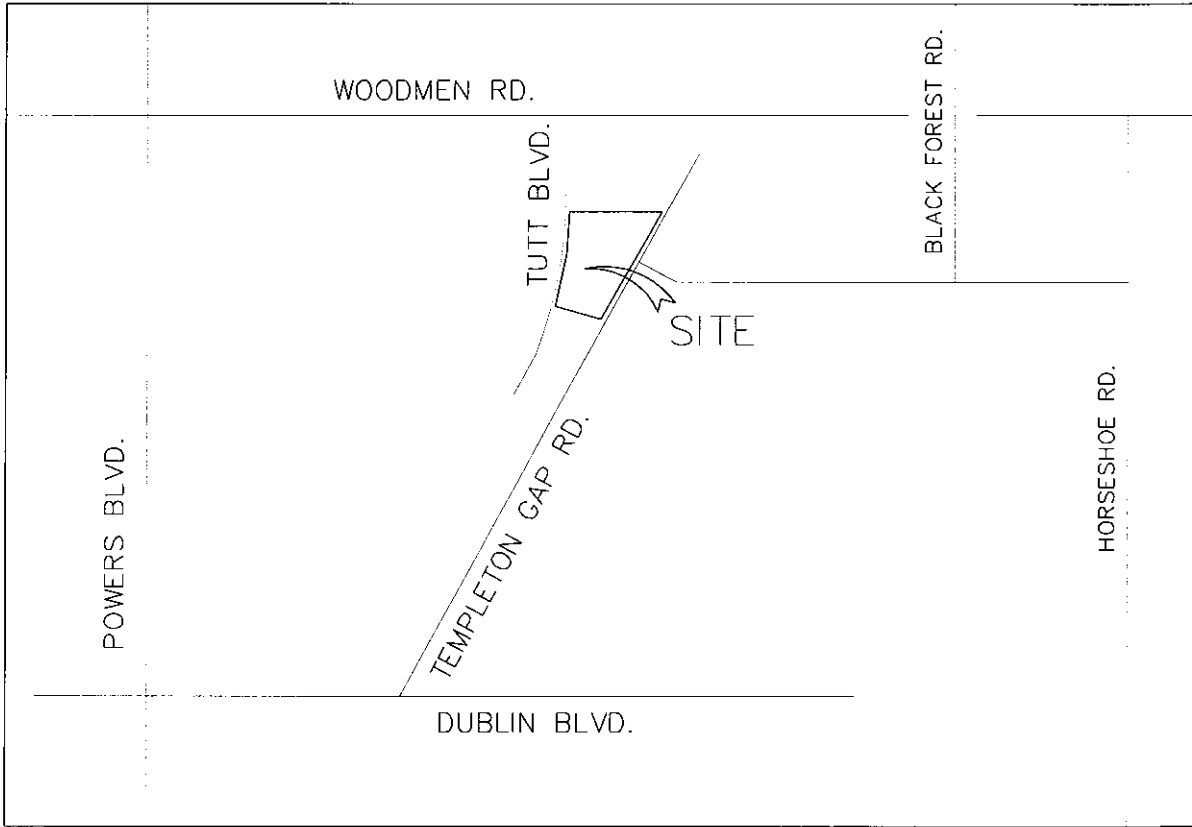
In summary, the proposed Concept Plan Amendment area was previously included in the Powerwood / Greenbriar Master Development Drainage Plan, and at this time, no changes to the approved drainage patterns are proposed. A reduction in imperviousness is anticipated with the change in land use from commercial to Multi-family residential (Apartments). Future Final Drainage Reports will detail any possible modifications to proposed drainage patterns/systems once specific land uses are known. This development is proposed to conform with all previously approved reports which reflect this site, including the existing downstream public detention facility. The need for Stormwater Quality Treatment will be addressed in future Final Drainage Reports also.

PREPARED BY:

Kyle R. Campbell, P.E.
Division Manager

db 2130400 REPORTS DRAINAGE MEMO.docx





VICINITY MAP
N.T.S.

National Flood Hazard Layer FIRMette



38°56'27.02"N

T13S R65W S006

08041 00529 G
eff. 12/7/2018

CITY OF COLORADO SPRINGS
080000

AREA OF MINIMAL FLOOD HAZARD
Zone X

T13S R65W S007

EL PASO COUNTY
080059

08041 00537 G
eff. 12/7/2018

USGS The National Map: Orthoimagery, Data refreshed October, 2017.

Feet 1:6,000



104°42'17.22"W

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Area of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile (Zone 1)
- Future Conditions 1% Annual Chance Flood Hazard (Zone X)
- Area with Reduced Flood Risk due to Levee. See Notes, Zone X
- Area with Flood Risk due to Levee (Zone D)

OTHER AREAS

- Area of Minimal Flood Hazard (Zone X)
- Effective LOMRs
- Area of Undetermined Flood Hazard (Zone)

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped



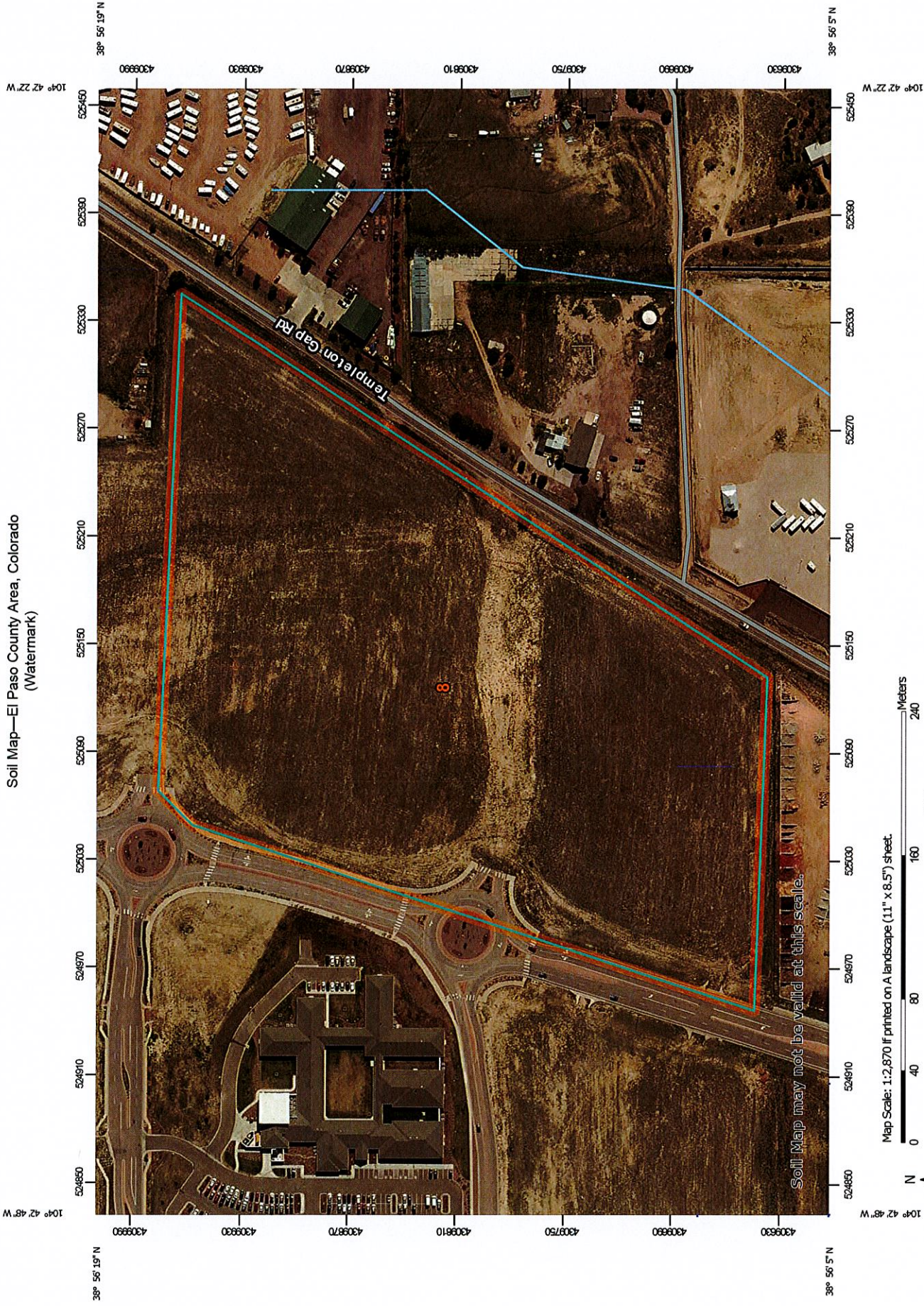
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/1/2019 at 8:34:19 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Soil Map—El Paso County Area, Colorado
(Watermark)

































Map Scale: 1:2,870 if printed on A landscape (11" x 8.5") sheet.



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

MAP LEGEND

-  Area of Interest (AOI)
-  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
- 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 16, Sep 10, 2018

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in ACI	Percent of ACI
8	Blakeland loamy sand, 1 to 9 percent slopes	19.8	100.0%
Totals for Area of Interest		19.8	100.0%

El Paso County Area, Colorado

8—Blakeland loamy sand, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: 369v
Elevation: 4,600 to 5,800 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Blakeland and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blakeland

Setting

Landform: Hills, flats
Landform position (three-dimensional): Side slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock and/or eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 11 inches: loamy sand
AC - 11 to 27 inches: loamy sand
C - 27 to 60 inches: sand

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: 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
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: Sandy Foothill (R049BY210CO)
Hydric soil rating: No

Minor Components

Other soils

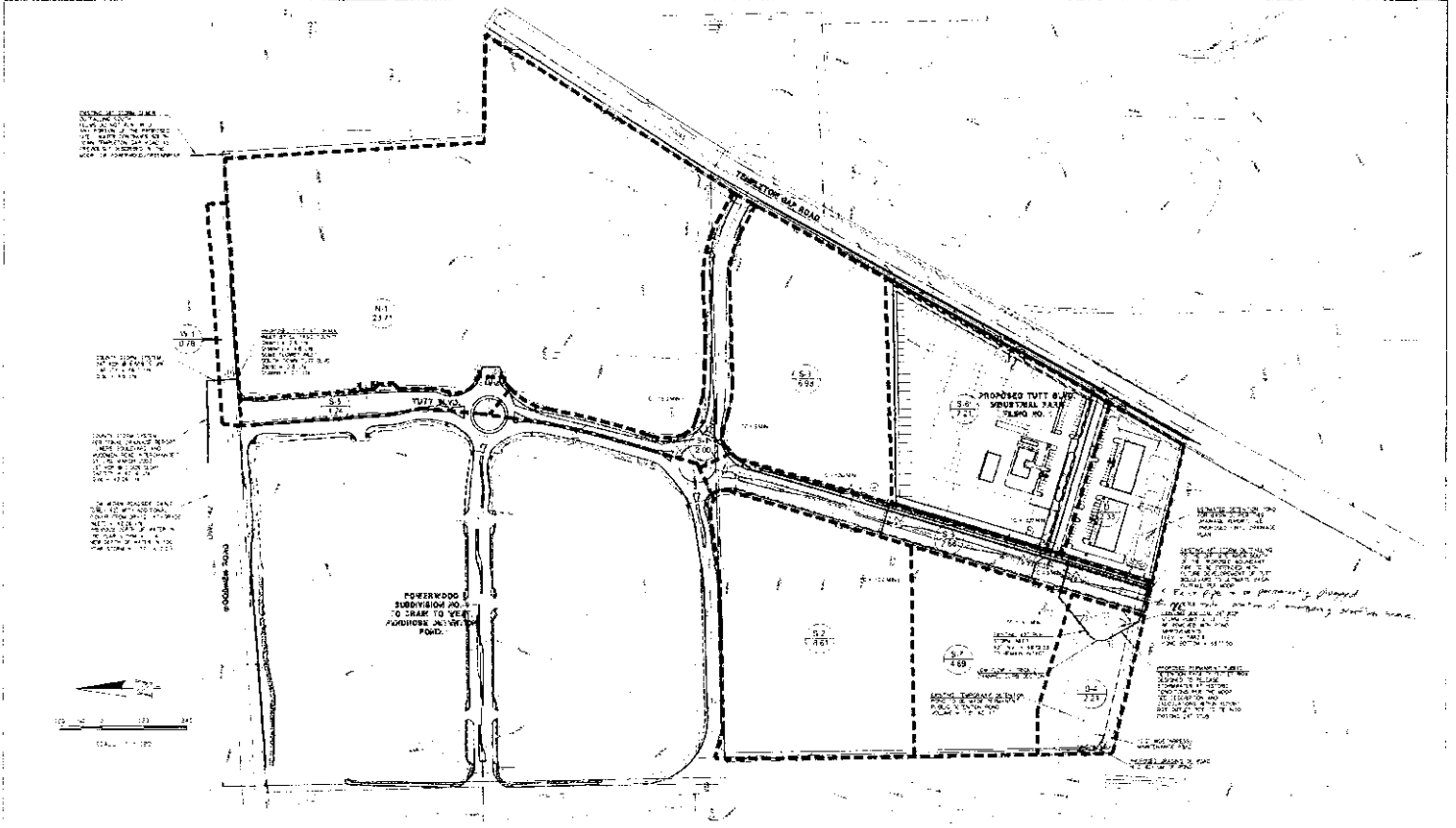
Percent of map unit:
Hydric soil rating: No

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 16, Sep 10, 2018



ALL UTILITIES SHOWN ARE BASED ON RECORD DRAWINGS AND FIELD SURVEY. THE LOCATION AND DEPTH OF UTILITIES ARE NOT GUARANTEED. THE USER SHALL VERIFY THE LOCATION AND DEPTH OF UTILITIES PRIOR TO CONSTRUCTION.

THE USER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.

THE USER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY EASEMENTS AND RIGHTS-OF-WAY FROM THE ADJACENT PROPERTY OWNERS.

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LEGEND

EXISTING ASPHALT DRIVE	---	NEW ASPHALT DRIVE	---
EXISTING CONCRETE DRIVE	---	NEW CONCRETE DRIVE	---
EXISTING SIDEWALK	---	NEW SIDEWALK	---
EXISTING DRIVE	---	NEW DRIVE	---
EXISTING SIDEWALK	---	NEW SIDEWALK	---
EXISTING DRIVE	---	NEW DRIVE	---

VERBODEN TOEGANG

18 HUNTERS BOUTPOST NO. 303
 2400 HUNTERS BOUTPOSTS
1-800-922-1987
 10000 HUNTERS BOUTPOSTS
 10000 HUNTERS BOUTPOSTS
 10000 HUNTERS BOUTPOSTS
 10000 HUNTERS BOUTPOSTS

NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6	NO. 7	NO. 8	NO. 9	NO. 10	NO. 11	NO. 12	NO. 13	NO. 14	NO. 15	NO. 16	NO. 17	NO. 18	NO. 19	NO. 20	NO. 21	NO. 22	NO. 23	NO. 24	NO. 25	NO. 26	NO. 27	NO. 28	NO. 29	NO. 30	NO. 31	NO. 32	NO. 33	NO. 34	NO. 35	NO. 36	NO. 37	NO. 38	NO. 39	NO. 40	NO. 41	NO. 42	NO. 43	NO. 44	NO. 45	NO. 46	NO. 47	NO. 48	NO. 49	NO. 50	NO. 51	NO. 52	NO. 53	NO. 54	NO. 55	NO. 56	NO. 57	NO. 58	NO. 59	NO. 60	NO. 61	NO. 62	NO. 63	NO. 64	NO. 65	NO. 66	NO. 67	NO. 68	NO. 69	NO. 70	NO. 71	NO. 72	NO. 73	NO. 74	NO. 75	NO. 76	NO. 77	NO. 78	NO. 79	NO. 80	NO. 81	NO. 82	NO. 83	NO. 84	NO. 85	NO. 86	NO. 87	NO. 88	NO. 89	NO. 90	NO. 91	NO. 92	NO. 93	NO. 94	NO. 95	NO. 96	NO. 97	NO. 98	NO. 99	NO. 100
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CLASSIC CONSULTING ENGINEERS & SURVEYORS
 10000 HUNTERS BOUTPOSTS
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TUTT BAY INDUSTRIAL PARK	PLANS NO. 1
DATE: 10/10/10	SCALE: AS SHOWN
DESIGNED BY: [Name]	CHECKED BY: [Name]
DATE: 10/10/10	SCALE: AS SHOWN

JOB NAME: Tutt Blvd. Industrial Park Filing No. 1 Detention Pond Analysis
 JOB NUMBER: 2130.50
 DATE: 08/21/07
 CALCULATED BY: MAL

FINAL DRAINAGE REPORT ~ BASIN RUNOFF COEFFICIENT SUMMARY

BASIN	TOTAL AREA (AC)	IMPERVIOUS AREA / STREETS			LANDSCAPE/UNDEVELOPED AREAS			WEIGHTED		WEIGHTED CA		
		AREA (AC)	C(5)	C(100)	AREA (AC)	C(5)	C(100)	C(5)	C(100)	CA(5)	CA(100)	
EX-1	39.96	0.00	0.90	0.95	39.96	0.25	0.35	0.25	0.35	9.99	13.99	
N-1	23.71	23.71	0.75	0.90	0.00	0.25	0.35	0.75	0.90	17.78	18.97	COMMERCIAL (Neighborhood Areas)
S-1	2.00	2.00	0.90	0.95	0.00	0.25	0.35	0.90	0.95	1.80	1.90	ROADS
S-2	8.61	8.61	0.80	0.90	0.00	0.25	0.35	0.80	0.90	6.89	7.75	INDUSTRIAL (HEAVY)
S-3	6.98	6.98	0.80	0.90	0.00	0.25	0.35	0.80	0.90	5.58	6.28	INDUSTRIAL (HEAVY)
S-4	2.21	0.00	0.90	0.95	2.21	0.25	0.35	0.25	0.35	0.55	0.77	POND
S-5	1.24	1.24	0.90	0.95	0.00	0.25	0.35	0.90	0.95	1.12	1.18	ROADS
S-6	7.21	7.21	0.80	0.90	0.00	0.25	0.35	0.80	0.90	5.77	6.13	INDUSTRIAL (GRAVEL)
S-7	4.99	4.99	0.80	0.90	0.00	0.25	0.35	0.80	0.90	3.75	4.22	INDUSTRIAL (HEAVY)
S-8	2.98	2.98	0.90	0.95	0.00	0.25	0.35	0.90	0.95	2.59	2.74	ROADS
D	2.33	0.00	0.90	0.95	2.33	0.25	0.35	0.25	0.35	0.58	0.82	ENTIRE AREA 59.53
												NORTH 23.71
W-1	0.79	0.78	0.90	0.95	0.00	0.25	0.35	0.90	0.95	0.70	0.74	SOUTH 35.82

JOB NAME: Tutt Blvd. Industrial Park Filing No. 1 Detention Pond Analysis
 JOB NUMBER: 2130.50
 DATE: 08/21/07
 CALC'D BY: MAL

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY

BASIN	WEIGHTED		OVERLAND				STREET / CHANNEL FLOW				Tc (min)	INTENSITY		TOTAL FLOWS	
	CA(5)	CA(100)	C(5)	Length (ft)	Height (ft)	Tc (min)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)		TOTAL (min)	I(5) (in/hr)	I(100) (in/hr)	Q(5) (cfs)
EX-1	9.99	13.99	0.25	1400	72	34.6	300	5.0%	7.9	0.6	35.3	2.20	3.92	22	55
N-1	17.78	28.97	0.25	0	0	#DIV/0!	0	0.0%	0.0	#DIV/0!	15.0	3.48	6.18	62	117
S-1	1.80	1.90	0.25	0	0	#DIV/0!	0	1.5%	4.3	0.0	5.0	5.10	9.07	3	17
S-2	6.89	7.76	0.25	0	0	#DIV/0!	0	1.5%	4.3	0.0	13.0	4.10	7.26	28	57
S-3	5.58	8.26	0.25	0	0	#DIV/0!	0	1.5%	4.3	0.0	10.0	4.10	7.26	23	46
S-4	0.55	0.77	0.25	70	19	4.5	300	1.5%	4.3	1.2	5.6	4.94	8.79	3	7
S-5	1.12	1.16	0.25	0	0	#DIV/0!	0	1.5%	4.3	0.0	5.0	5.10	9.07	6	11
S-6	6.77	6.13	0.25	0	0	#DIV/0!	0	1.5%	4.3	0.0	15.0	3.48	6.18	20	38
S-7	3.75	4.22	0.25	0	0	#DIV/0!	0	1.5%	4.3	0.0	5.0	5.10	9.07	19	39
S-8	2.59	2.74	0.25	0	0	#DIV/0!	0	1.5%	4.3	0.0	3.0	5.10	9.07	13	25
D	0.59	3.82	0.25	240	12	14.5	0	1.5%	4.3	0.0	14.5	3.52	5.25	2	5
W-1	0.70	0.74	0.25	0	0	#DIV/0!	0	0.0%	0.0	#DIV/0!	5.0	5.10	9.07	4	7