PRELIMINARY DRAINAGE REPORT

WATERSIDE TOWNHOMES
(Waterside Condominiums Subdivision)

JULY 2022

Add text:
PCD Filing No.: PUDSP229

Prepared for:
LAKE WOODMOOR HOLDINGS, LLC
9540 FEDERAL DRIVE
COLORADO SPRINGS, CO 80921

Prepared by:
CLASSIC CONSULTING ENGINEERS & SURVEYORS
619 CASCADE AVENUE, SUITE 200
COLORADO SPRINGS, CO 80903
(719) 785-0790

Job no. 2588.00

PRELIMINARY DRAINAGE REPORT FOR WATERSIDE TOWNHOMES
(Waterside Condominiums Subdivision)

DRAINAGE REPORT STATEMENT

DESIGN ENGINEER'S STATEMENT:
The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the applicable 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.

_____ _____
Kyle R. Campbell, Colorado P.E. #29794 Date

OWNERS/DEVELOPER'S STATEMENT:
I, the owner/developer, have read and will comply with all of the requirements specified in this drainage report and plan.

Business Name: Lake Woodmoor Holdings, LLC

_____ _____
Date

Title: _____

Address: 9540 Federal Drive

Colorado Springs, CO 80921

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

Revise to Joshua Palmer

_____ _____
Jennifer Irvine, P.E. Date
County Engineer / ECM Administrator

Conditions:

PRELIMINARY DRAINAGE REPORT FOR WATERSIDE TOWNHOMES
(Waterside Condominiums Subdivision)

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APPENDICES

PURPOSE

This document is the Preliminary Drainage Report for Waterside Townhomes. The purpose of this report is to identify general onsite and offsite drainage patterns, conceptual storm sewer, inlet locations, and areas tributary to the site, and to safely route developed storm water runoff to adequate stormwater facilities, in accordance with all applicable area drainage plans. This report is required to accompany the proposed PUD Development Plan / Preliminary Plan that is proposed to replace the prior approved and platted "Waterside Condominiums Subdivision" community.

Delete this text

~~It is anticipated that~~ a Final Drainage Report will be provided when the Final Plat and Construction Drawings details are processed for review.

GENERAL DESCRIPTION

The overall Waterside Townhomes development is a 7.53-acre residential community within the south half of Section 11, Township 11 South, Range 67 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located on the east side of Woodmoor Drive just south of Deer Creek Road. Existing Lake Woodmoor sits directly east of the site. The development includes a total of 52 townhome residences that will be developed as a single phase.

The average soil condition of the entire site and tributary area to the proposed ponds reflects Hydrologic Group "B" (Pring Coarse Sandy Loam and Tomah-Crowfoot loamy sands) as determined by the "Soil Survey of El Paso County Area," prepared by the National Cooperative Soil Survey (see map in Appendix).

EXISTING DRAINAGE CONDITIONS

The site is located within the Dirty Woman Creek Drainage Basin. This site was previously studied in the "Drainage Report and Plan – Waterside Condominiums Subdivision", by Leigh Whitehead. This currently proposed residential community is proposed to replace the previously platted but not constructed condominium community. Also consulted for this report was the "Preliminary and Final Drainage Report – North Bay at Lake Woodmoor", by Kiowa Engineering, dated February 21, 2020.

This report detailed a similar sized development parcel located just east of this site. At this Preliminary Drainage Report level, the Kiowa Report was used as a comparable community related to detention facility discussions.

The site is predominantly covered in native grasses, with various disturbed areas (notably at the northwest corner). Existing trees are sporadically located along the south boundary and southeast boundary. The existing ground slopes in a south and south easterly direction as depicted on the Existing Conditions Drainage Map in the Appendix. An existing roadside grass swale is located along the west boundary that does not contain any flows from this site. Other than the far south area, all existing site flows drain directly into Lake Woodmoor.

what does this far south area do?

DEVELOPED DRAINAGE CONDITIONS

Based upon City/County Drainage Criteria, the drainage approach for this development now reflects current criteria for stormwater quality (on-site) and Full Spectrum Detention (Lake Woodmoor) requirements. The attached "Proposed Conditions Drainage Map" contains the preliminary, anticipated approach to drainage.

what about the remaining 2.76 acres? All of the area in the project site has to be accounted for, even if not changes or improvements are anticipated.

The majority of the site is comprised of Basin A, 4.77 acres of proposed private roadways, townhome units, parking and sidewalk areas. At this preliminary stage of analysis, it is anticipated that all developed flows will be intercepted on-site in a proposed private storm system and then directed toward the proposed Sand Filter Basin for stormwater treatment. The ultimate release of all stormwater flows will be directly into Lake Woodmoor via the proposed stormwater facility. The existing grass roadside swale will remain north of the main site entry, and be relocated south of the entry. The far easterly edge of the site will continue to sheet flow east as predominantly unconcentrated sheet flow directly into Lake Woodmoor. Other than the proposed gravel trail, no developed flows will be directly released east. All townhome unit roof drains will be required to be directed to the street side of the townhomes where they will be ultimately transferred to the proposed private stormwater quality facility.

This area should be a separate basin, as it does not reach the WQ pond and is not treated and

Street capacity calculations will need to be provided to show that no additional inlets are needed prior to the sump inlets at the south end of the project.

Existing southerly directed sheet flows will be redirected as well toward the stormwater quality facility. It is anticipated that a series of small private landscape drains will assist in directing site flows to the pond.

The subsequent Final Drainage Report will provide a much higher level of detail for this proposed storm system and facilities.

There is no public row. Streets are private and located within tracts.

All proposed storm facilities within the public Right-of-way will be private with ownership and maintenance by the homeowners' association.

Provide calculations for imperviousness. From drainage map, appears to be much larger than 42%.

LAKE WOODMOOR DETENTION

Lake Woodmoor will provide 100-year detention storage for the developed runoff from the site. The DBPS assumed a land use of residential with 2 lots per acre for the area that encompasses the Waterside Townhomes site (see Appendix). The assumed land use would have a 25 percent imperviousness resulting in a 0.5 ac-ft of only detention volume requirement. The anticipated composite percent imperviousness for the proposed site is 42 percent. This equates to a detention volume requirement of 0.7 ac-ft. The net increase in detention volume to Lake Woodmoor form what was assumed in the DBPS is 0.2 ac-ft. Given the approximately 46-acre surface area of Lake Woodmoor (over 6 times larger than the proposed 7.53-acre site), the increase in detention volume would cause an increase of 0.04 inches in the lake's water surface elevation. Lake Woodmoor therefore has sufficient capacity to accept the additional runoff volume, and no improvements are recommended for the reservoir. With the Final Plat and Final Drainage Report submittal, the Woodmoor Water and Sanitation District (WWSD) will be requested to provide a letter stating that they will allow the use of their facility (Lake Woodmoor) for this site's flood storage.

With FDR will also need to include what North Bay is adding to Lake Woodmoor and show that both developments combined are able to work with Lake Woodmoor.

STORMWATER QUALITY

This site adheres to this **Four Step Process** as follows:

1. **Employ Runoff Reduction Practices:** Proposed impervious areas (roof tops, patios) will sheet flow across landscaped yards and through open space areas to slow runoff and increase time of

concentration prior to being conveyed to the proposed private streets. This will minimize directly connected impervious areas within the project site.

2. **Stabilize Drainageways:** After developed flows utilize the runoff reduction practices through the yards, these flows will travel via curb and gutter within the private streets and eventually private storm systems. These collected flows are then routed directly to the proposed stormwater quality facility on-site and ultimately released into Lake Woodmoor.

3. **Provide Water Quality Capture Volume (WQCV):** Runoff from this development will be treated through capture and slow release of the WQCV in the proposed private on-site water quality facility designed per current El Paso County drainage criteria.
4. **Consider need for Industrial and Commercial BMPs**: No industrial or commercial uses are proposed within this development. However, a site-specific storm water quality and erosion control plan and narrative will be submitted along with the grading and erosion control plan. Details such as site-specific source control construction BMP's as well as permanent BMP's were detailed in this plan and narrative to protect receiving waters. BMP's will be constructed and maintained as the development has been graded and erosion control methods employed.

Based upon the requirement to provide stormwater quality capture volume for the development area, a proposed sand filter basin is proposed in the southeast area of the site. Per the preliminary calculations in the Appendix, a 0.059 ac-ft capture volume is needed with a media surface area of 1,465 SF. The details of this stormwater facility will be provided in the subsequent Final Drainage Report.

State that it will need to treat runoff from all disturbed areas, less any excluded areas.

HYDROLOGIC CALCULATIONS

Hydrologic calculations were performed using the City of Colorado Springs/El Paso County Drainage Criteria Manual, as revised in November 1991 and 1994 with County adopted Chapter 6 and Section 3.2.1 of Chapter 13 of the City of Colorado Springs/El Paso County Drainage Criteria Manual as revised in May 2014. Individual on-site developed basin design used for inlet sizing and storm system routing was calculated using the Rational Method. Full-Spectrum detention pond modeling developed using UD-Detention spreadsheet ver. 3.07, Urban Drainage and Flood Control District.

The City of Colorado Springs/El Paso County DCM requires the Four Step Process for receiving water protection that focuses on reducing runoff volumes, treating the water quality capture volume (WQCV), stabilizing drainage ways, and implementing long-term source controls. The Four Step Process pertains to management of smaller, frequently occurring storm events, as opposed to larger storms for which drainage and flood control infrastructure are sized. Implementation of these four steps helps to achieve storm water permit requirements.

FLOODPLAIN STATEMENT

A portion of this site is located within a FEMA floodplain as determined by the Flood Insurance Rate Maps (F.I.R.M.) Map Number 08041C0276G, with effective dates of December 7, 2018 (See Appendix). All existing floodplain areas are proposed to be contained within Tract A, and no proposed lots are impacted by the existing floodplain.

EROSION CONTROL PLAN

The Drainage Criteria Manual specifies an Erosion Control Plan and associated cost estimate be submitted with the Final Drainage Report. We respectfully request that the Erosion Control Plan and cost estimate be submitted in conjunction with the Overlot Grading Plan and construction assurances posted prior to obtaining a grading permit. Early grading is not being requested with this application.

DRAINAGE & BRIDGE FEES

This site lies within the Dirty Woman Creek Drainage Basin. As this site was previously platted as Waterside Condominiums, no drainage or bridge fees will be required to be paid.

With the FDR, please pro
excerpt showing where fe
were previously paid with
prior plat. If not, fees may
be due.

SUMMARY

This proposed development remains consistent with the previously anticipated drainage patterns for the site. The proposed stormwater quality facility meets current criteria. The proposed development will not adversely impact surrounding developments.

A future Final Plat application will include Construction Drawings and a Final Drainage Report to provide further Final Design details associated with the more detailed design.

PREPARED BY:
Classic Consulting

Kyle R. Campbell, P.E.
Division Manager

db/111635/REPORTS/fdr

REFERENCES

1. City of Colorado Springs/County of El Paso Drainage Criteria Manual dated October 1991.*

2. "Drainage Report and Plan – Waterside Condominiums Subdivision", by Leigh Whitehead.

3. Drainage Criteria Manual (Volume 3) latest revision April 2008, Urban Drainage and Flood Criteria District.

4. El Paso County Engineering Criteria Manual, Resolution No. 20-222, June 23, 2020 (Supp. No.2).

*EPC Board Resolution NO. 15-042 (El Paso County adoption of Chapter 6 and Section 3.2.1 Chapter 13 of the City of Colorado Springs Drainage Criteria manual dated May 2014, hydrology and full-spectrum detention)

APPENDIX

VICINITY MAP

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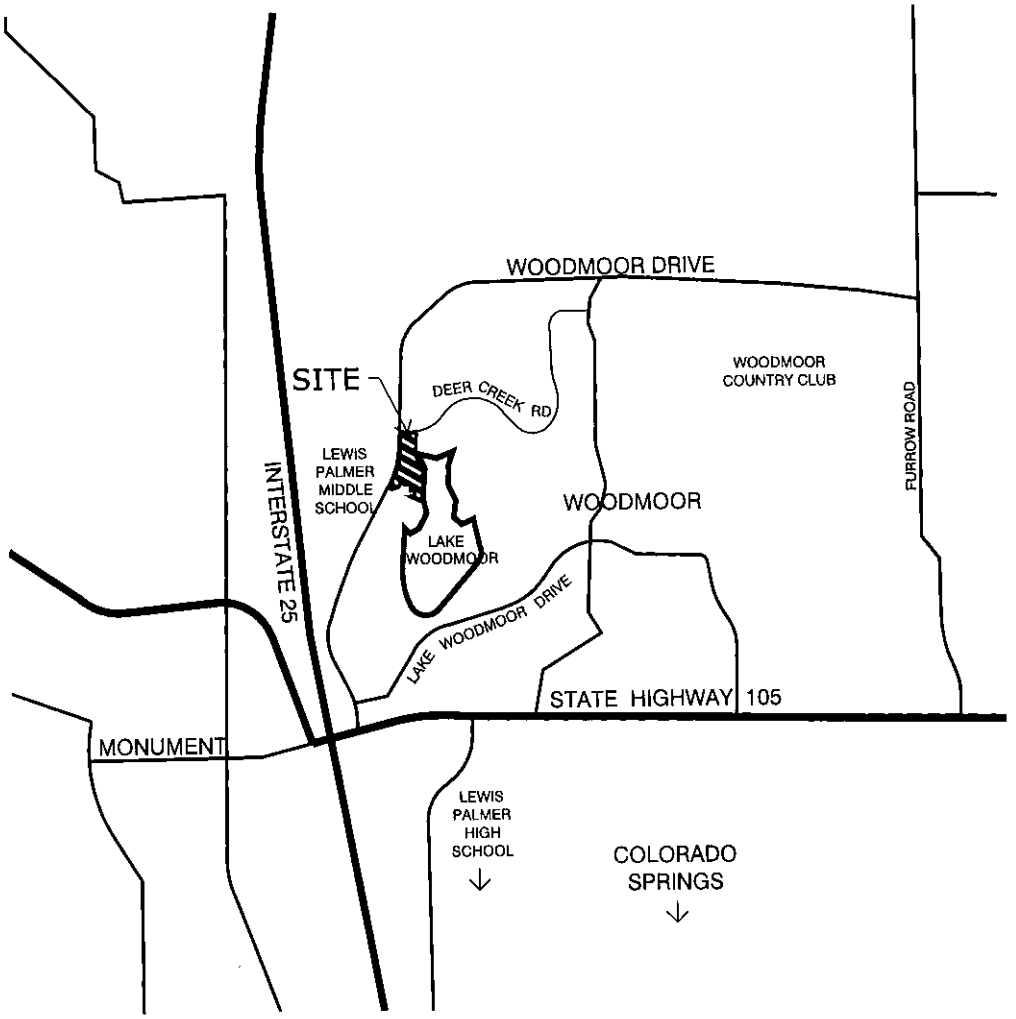
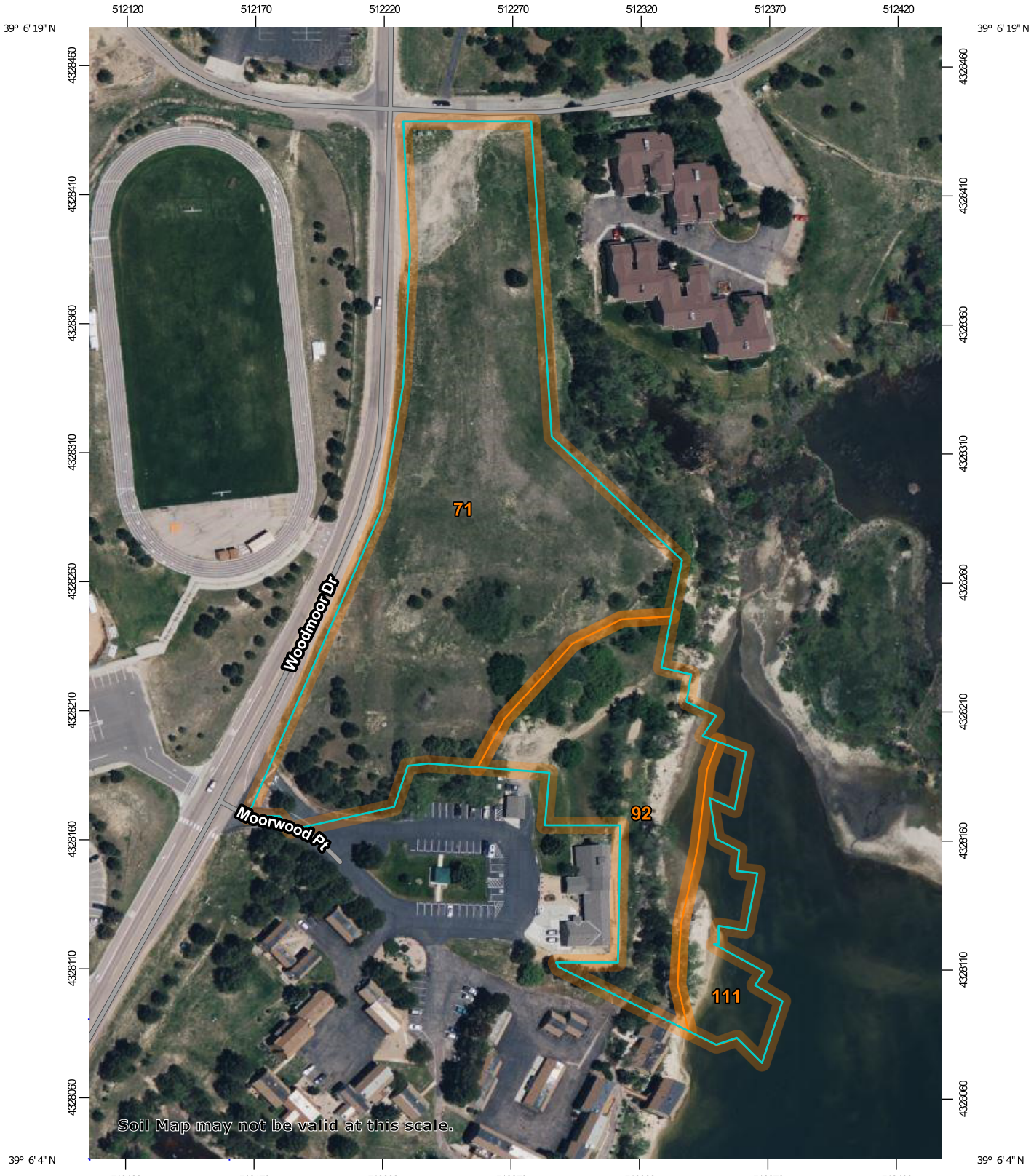


VICINITY MAP

SOILS MAP (S.C.S SURVEY)

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



Map Scale: 1:2,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

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

Date(s) aerial images were photographed: Jun 9, 2021—Jun 12, 2021

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
71	Pring coarse sandy loam, 3 to 8 percent slopes	5.0	68.1%
92	Tomah-Crowfoot loamy sands, 3 to 8 percent slopes	1.7	23.7%
111	Water	0.6	8.2%
Totals for Area of Interest		**7.3**	**100.0%**

El Paso County Area, Colorado

71—Pring coarse sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369k
Elevation: 6,800 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Pring

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam
C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R048AY222CO - Loamy Park
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Other soils

Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

El Paso County Area, Colorado

92—Tomah-Crowfoot loamy sands, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 36b9
Elevation: 7,300 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Tomah and similar soils: 50 percent
Crowfoot and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tomah

Setting

Landform: Hills, alluvial fans
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from arkose and/or residuum weathered from arkose

Typical profile

A - 0 to 10 inches: loamy sand
E - 10 to 22 inches: coarse sand
Bt - 22 to 48 inches: stratified coarse sand to sandy clay loam
C - 48 to 60 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R049XY216CO - Sandy Divide
Hydric soil rating: No

Description of Crowfoot

Setting

Landform: Alluvial fans, hills
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 12 inches: loamy sand
E - 12 to 23 inches: sand
Bt - 23 to 36 inches: sandy clay loam
C - 36 to 60 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R049XY216CO - Sandy Divide
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 19, Aug 31, 2021

El Paso County Area, Colorado

111—Water

Map Unit Composition

Water: 100 percent

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

Data Source Information

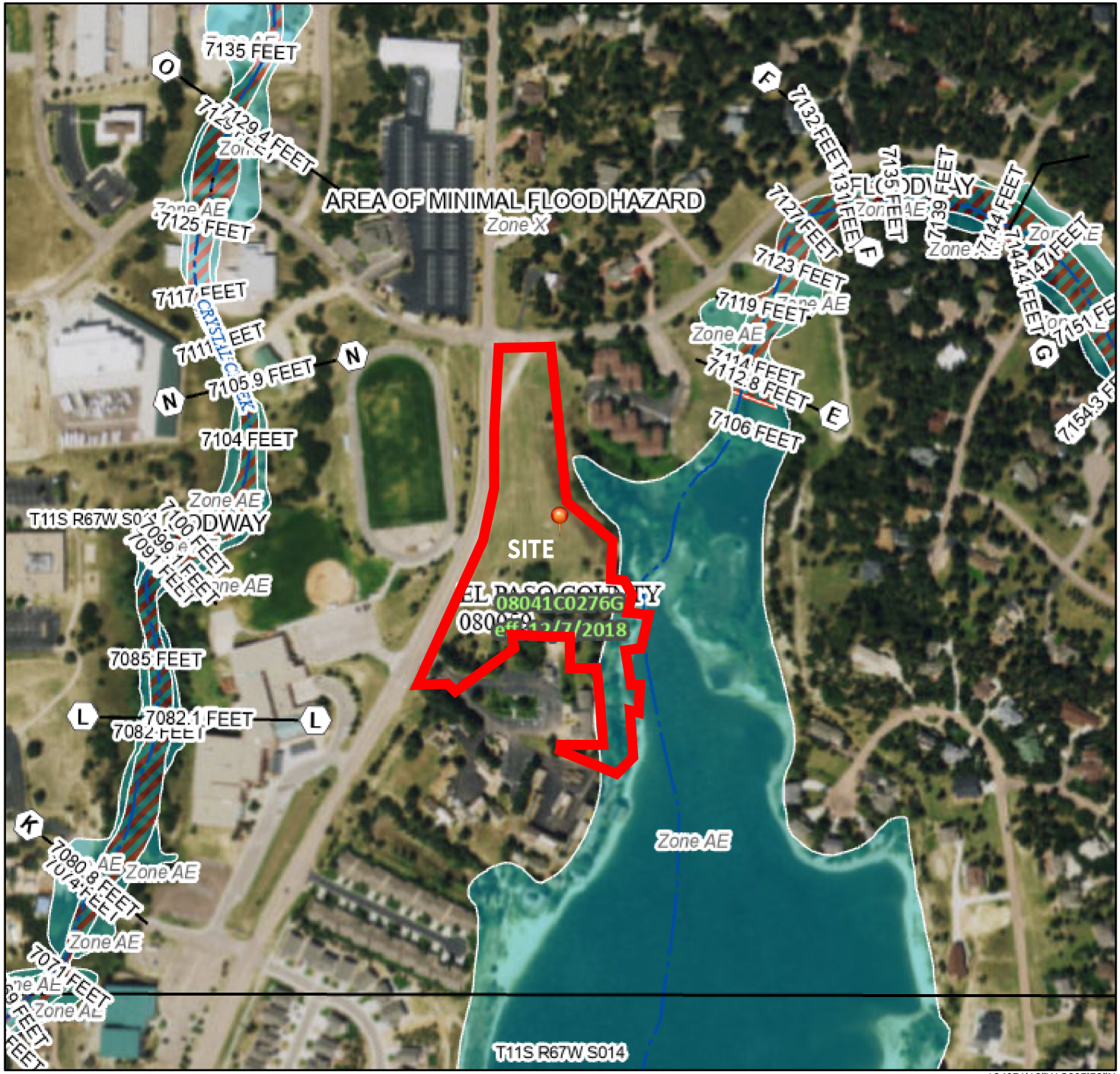
Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

F.E.M.A. MAP

National Flood Hazard Layer FIRMette

FEMA

104°51'47"W 39°6'27"N



104°51'10"W 39°5'59"N

Feet 1:6,000

0 250 500 1,000 1,500 2,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

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, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- 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
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

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

OTHER FEATURES
- 20.2 — Cross Sections with 1% Annual Chance
- 17.5 — 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

N

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 6/30/2022 at 11:25 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.

REFERENCE MATERIAL FROM PRIOR STUDIES

FIG 3

Project No. 9 I-07-17
Date: 12/91
Design: AW Mc
Drawn: EAK
Check: RNW
Revisions:

DIRTY WOMAN CREEK & CRYSTAL CREEK
DRAINAGE BASIN PLANNING STUDY
PROPOSED LAND USE MAP

Kiowa Engineering Corporation
419 W. Bijou Street
Colorado Springs, Colorado
80905-1308

HYDROLOGIC / HYDRAULIC CALCULATIONS

CLASSIC SM
CONSULTING
ENGINEERS & SURVEYORS

JOB NAME:	*Waterside Townhomes*
JOB NUMBER:	*2588.00*
DATE:	*07/01/22*
CALCULATED BY:	*KRC*

FINAL DRAINAGE REPORT ~ BASIN RUNOFF COEFFICIENT SUMMARY

		DEVELOPED AREA/IMPERVIOUS AREA				LANDSCAPE/UNDEVELOPED AREAS				WEIGHTED			WEIGHTED CA		
BASIN	TOTAL AREA (AC)	AREA (AC)	C(2)	C(5)	C(100)	AREA (AC)	C(2)	C(5)	C(100)	C(2)	C(5)	C(100)	**CA(2)**	**CA(5)**	**CA(100)**
A	4.77	2.00	0.89	0.90	0.96	2.77	0.02	0.08	0.35	0.38	0.42	0.61	**1.84**	**2.02**	**2.89**

Entirety of project area (7.53 acres) needs to be accounted for in drainage calcs, even if no development or changes are proposed.

Need to include calculations for existing conditions.

JOB NAME:	***Waterside Townhomes***
JOB NUMBER:	***2588.00***
DATE:	***01/31/07***
CALC'D BY:	***KRC***

Return Period	1-Hour Depth
2	1.19
5	1.50
10	1.75
25	2.00
50	2.25
100	2.52

$$t_i = \frac{0.395(1.1 - C_5)\sqrt{L}}{S^{0.33}} \qquad V = C_v S_w^{0.5} \qquad \text{Tc=L/V}$$

$$t_c = \frac{L}{180} + 10$$

Table 6-7. Conveyance Coefficient, C_v

Type of Land Surface	C_v
Heavy meadow	2.5
Tillage/field	5
Riprap (not buried)*	6.5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

*For buried riprap, select C_v value based on type of vegetative cover.

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY

BASIN	WEIGHTED			OVERLAND				STREET / CHANNEL FLOW				Tc	INTENSITY			TOTAL FLOWS		
	CA(2)	CA(5)	CA(100)	C(5)	Length (ft)	Height (ft)	Tc (min)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	TOTAL (min)	I(2) (in/hr)	I(5) (in/hr)	I(100) (in/hr)	Q(2) (cfs)	Q(5) (cfs)	Q(100) (cfs)
A	1.84	2.02	2.89	0.08	100	2	14.7	300	3.0%	3.5	1.4	16.1	2.73	3.42	5.73	5.0	**6.9**	**16.6**

SWQ CALCULATIONS

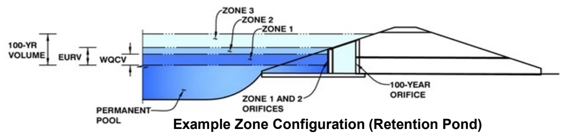
CLASSIC SM
CONSULTING
ENGINEERS & SURVEYORS

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Waterside Townhomes

Basin ID:



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	**SF**	
Watershed Area =	4.77	acres
Watershed Length =	300	ft
Watershed Slope =	0.020	ft/ft
Watershed Imperviousness =	42.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	100.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Desired WQCV Drain Time =	12.0	hours
Location for 1-hr Rainfall Depths =	User Input	
Water Quality Capture Volume (WQCV) =	0.059	acre-feet
Excess Urban Runoff Volume (EURV) =	0.211	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.167	acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	0.232	acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	0.326	acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	0.481	acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	0.587	acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	0.725	acre-feet
500-yr Runoff Volume (P1 = 3 in.) =	0.960	acre-feet
Approximate 2-yr Detention Volume =	0.156	acre-feet
Approximate 5-yr Detention Volume =	0.218	acre-feet
Approximate 10-yr Detention Volume =	0.297	acre-feet
Approximate 25-yr Detention Volume =	0.330	acre-feet
Approximate 50-yr Detention Volume =	0.346	acre-feet
Approximate 100-yr Detention Volume =	0.395	acre-feet

Note: L / W Ratio < 1

L / W Ratio = 0.4

Optional User Override 1-hr Precipitation

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

Stage-Storage Calculation

Zone 1 Volume (WQCV) =	0.059	acre-feet
Select Zone 2 Storage Volume (Optional) =		acre-feet
Select Zone 3 Storage Volume (Optional) =		acre-feet
Total Detention Basin Volume =	0.059	acre-feet
Initial Surcharge Volume (ISV) =	N/A	ft^3
Initial Surcharge Depth (ISD) =	N/A	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	N/A	ft
Slope of Trickle Channel (S_{TC}) =	N/A	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

Total detention volume is less than 100-year volume.

Depth Increment = 1 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Media Surface	--	0.00	--	--	--	1,465	0.034		
28	--	1.00	--	--	--	1,832	0.042	1,630	0.037
29	--	2.00	--	--	--	2,250	0.052	3,667	0.084
30	--	3.00	--	--	--	2,726	0.063	6,177	0.142
31	--	4.00	--	--	--	3,297	0.076	9,189	0.211
32	--	5.00	--	--	--	3,500	0.080	12,587	0.289
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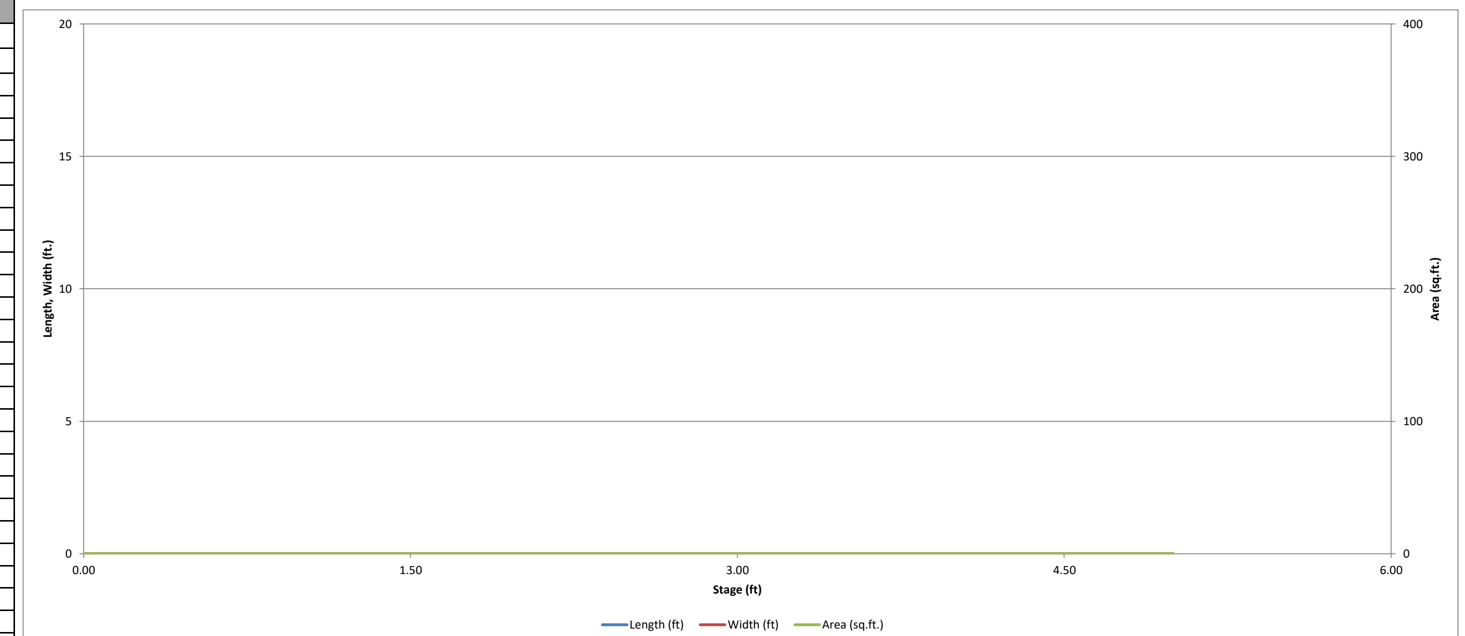
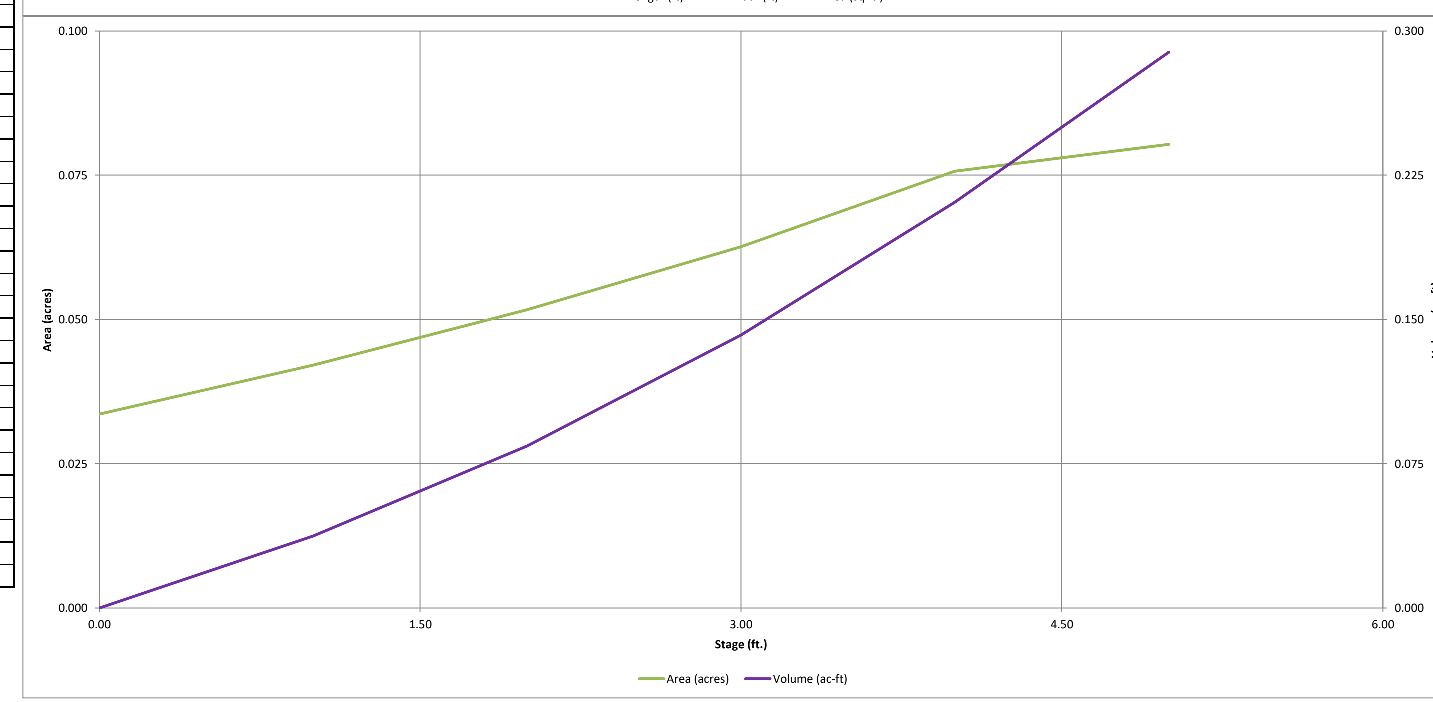
DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)





EXISTING CONDITIONS

DRAINAGE MAP

CLASSIC SM
CONSULTING
ENGINEERS & SURVEYORS

Show limits of 100-year floodplain

Design Point 1 (concentrated flow)

Design Point 2 (sheetflow across this whole property line)

Design Point 3 (sheetflow across this whole property line)

Label all easements

Include Basin summary table

Split single drainage basin into several (roughly 3 basins suggested above), with each having separate discharge points.

Basin 1

Basin 2

Basin 3

CONDO MAP FOR THE COVE AT WOODMOOR
CONDO BOOK I, PAGE 79

WOODMOOR OAKS
DEER CREEK ROAD
80' PUBLIC ROW
PLAT BOOK H-2, PAGE 59

LAKE WOODMOOR TOWNHOUSES III
PLAT BK M-2, PG 27

LAKE WOODMOOR TOWNHOUSES I
PLAT BK L-2, PG 1

LAKE WOODMOOR TOWNHOUSES II
WOODMOOR DRIVE
80' PUBLIC ROW
PLAT BOOK M-2, PAGE 26

WATERSIDE CONDOMINIUMS BOUNDARY

BOUNDARY

EXIST. EDGE OF LAKE

EXIST. SHEET FLOW TO LAKE

EXIST. SHEET FLOW TO SOUTH

EXIST. SWALE TO LAKE

EXIST. SANITARY SEWER

EXIST. WATER MAIN

EXIST. P.R.V.

EXIST. TREES (TYP.)

EXIST. E.O.A.

EXIST. ROADSIDE SWALE TO REMAIN

LEGEND

DESCRIPTION	SYMBOL
EXISTING MINOR CONTOUR	
EXISTING MAJOR CONTOUR	(7126)
PROPERTY LINE/LOT LINE	
WATERS (ORDINARY HIGH MARK)	
DIRECTION OF FLOW (EXISTING)	
LOW POINT/HIGH POINT	LP/HP

N

40 20 0 40 80

SCALE: 1" = 40'

CLASSIC CONSULTING SM

619 N. Cascade Avenue, Suite 200 (719)785-0790
Colorado Springs, Colorado 80903 (719)785-0799 (Fax)

WATERSIDE TOWNHOMES
MONUMENT, CO
FINAL DRAINAGE REPORT
EXISTING CONDITIONS DRAINAGE MAP

CLASSIC CONSULTING

DESIGNED BY	JDP	SCALE		DATE	7/1/22
DRAWN BY	JDP	(H) 1"= 40'		SHEET	1 OF 1
CHECKED BY	KRC	(V) 1"= N/A		JOB NO.	2588.00

PROPOSED CONDITIONS

DRAINAGE MAP

CLASSIC SM
CONSULTING
ENGINEERS & SURVEYORS

Split single drainage basin into several, with each having separate discharge points at each inlet. And the areas outside of the blue line (between the blue line and the red property line) should have their own basin(s) as well.

Show limits of floodplain

Need to provide access to pond

Show & label outlet structure & emergency overflow

Need to have a separate basin for rear lots which drain directly into lake and do not reach WQ pond

Add "WQ" to clarify that it will just be for WQ and not detention.

It appears that the "back yard" flow from this area is directed towards the WQ facility and will continue sheet flowing to the south.

Each inlet should have a corresponding design point. See ECM Section 3.2.8.G

What is this line? Label or remove

Include basin summary table

LAKE WOODMOOR

WATERSIDE CONDOMINIUMS BOUNDARY

CONDO MAP FOR THE COVE AT WOODMOOR CONDO BOOK I, PAGE 79

WOODMOOR OAKS DEER CREEK ROAD 80' PUBLIC ROW PLAT BOOK H-2, PAGE 59

LAKE WOODMOOR TOWNHOUSES I PLAT BK L-2, PG 1

LAKE WOODMOOR TOWNHOUSES III PLAT BK M-2, PG 27

LAKE WOODMOOR TOWNHOUSES II WOODMOOR DRIVE 80' PUBLIC ROW PLAT BOOK M-2, PAGE 28

BARNET VIEW

HILLINGDON HEIGHTS

BOUNDARY

EXIST. EDGE OF LAKE

100 YEAR OVERFLOW ROUTING INTO LAKE WOODMOOR

PROP. SAND FILTER BASIN 0.059 AC-FT

PROP. PRIVATE STORM

PROP. PRIVATE SUMP INLETS (TYP.)

PROP. PRIVATE MH'S (TYP.)

EXIST. TREES (TYP.)

A 4.77

HP

LP

EXIST. E.O.A.

EXIST. ROADSIDE SWALE TO REMAIN

RELOCATE EXISTING GRASS SWALE W/ SIDEWALK CONSTRUCTION

NOTE:
WALKOUT ROOF DRAINS TO BE DIRECTED TO STREET SIDE OF TOWNHOME.

LEGEND

DESCRIPTION	SYMBOL
EXISTING MINOR CONTOUR	
EXISTING MAJOR CONTOUR	(7126)
PROPOSED MINOR CONTOUR	
PROPOSED MAJOR CONTOUR	7132
PROPERTY LINE/LOT LINE	
WATERS (ORDINARY HIGH MARK)	
BASIN BOUNDARY	
DESIGN POINT	1
BASIN IDENTIFIER / AREA IN ACRES	EX-A / 1.30
DIRECTION OF FLOW (EXISTING)	
DIRECTION OF FLOW (PROPOSED)	
LOW POINT/HIGH POINT	LP/HP

N

40 20 0 40 80

SCALE: 1" = 40'

CLASSIC CONSULTING SM
619 N. Cascade Avenue, Suite 200 (719)785-0790
Colorado Springs, Colorado 80903 (719)785-0799 (Fax)

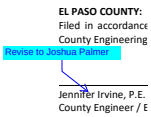
WATERSIDE TOWNHOMES
MONUMENT, CO
FINAL DRAINAGE REPORT
PROPOSED CONDITIONS DRAINAGE MAP

CLASSIC CONSULTING

DESIGNED BY	JDP	SCALE		DATE	7/1/22
DRAWN BY	JDP	(H) 1"= 40'		SHEET	1 OF 1
CHECKED BY	KRC	(V) 1"= N/A		JOB NO.	2588.00

MDDP_v1_Comments.pdf Markup Summary

Callout (13)



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Date: 8/15/2022 9:45:12 AM
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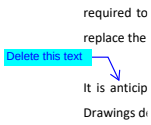
Revise to Joshua Palmer



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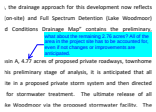

Subject: Callout
Page Label: 5
Author: CDurham
Date: 8/16/2022 1:30:08 PM
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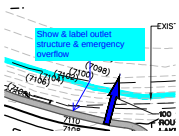
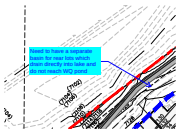
Layer:
Space:

what about the remaining 2.76 acres? All of the area in the project site has to be accounted for, even if not changes or improvements are anticipated.



Subject: Callout
Page Label: 35
Author: CDurham
Date: 8/16/2022 2:43:52 PM
Status:
Color:
Layer:
Space:

Show & label outlet structure & emergency overflow



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Author: CDurham
Date: 8/16/2022 4:10:34 PM
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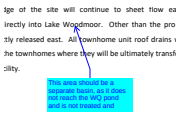
Need to have a separate basin for rear lots which drain directly into lake and do not reach WQ pond

---



Subject: Callout
Page Label: 5
Author: CDurham
Date: 8/16/2022 4:48:54 PM
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Color:
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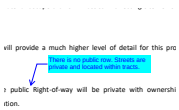
Space:

This area should be a separate basin, as it does not reach the WQ pond and is not treated and



Subject: Callout
Page Label: 6
Author: CDurham
Date: 8/16/2022 4:51:50 PM
Status:
Color:
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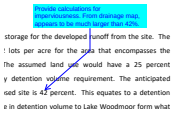
There is no public row. Streets are private and located within tracts.



Subject: Callout
Page Label: 6
Author: CDurham
Date: 8/16/2022 5:08:27 PM
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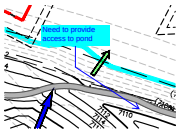
Color:
Layer:
Space:

Provide calculations for imperviousness. From drainage map, appears to be much larger than 42%.

Subject: Callout
Page Label: 33
Author: CDurham
Date: 8/16/2022 5:41:16 PM
Status:
Color:
Layer:
Space:

Label all easements



Subject: Callout
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Author: CDurham
Date: 8/16/2022 5:51:38 PM
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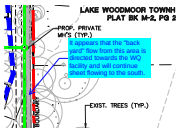
Space:

Need to provide access to pond



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Author: CDurham
Date: 8/16/2022 6:02:30 PM
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It appears that the "back yard" flow from this area is directed towards the WQ facility and will continue sheet flowing to the south.

Subject: Callout
Page Label: 35
Author: CDurham
Date: 8/16/2022 6:04:27 PM
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Color:
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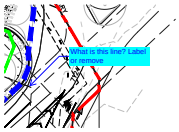
Each inlet should have a corresponding design point. See ECM Section 3.2.8.G



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Date: 8/16/2022 6:04:49 PM
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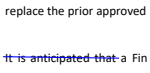
What is this line? Label or remove

Line (1)



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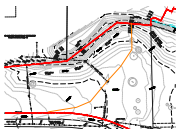
Page Label: 4
Author: CDurham
Date: 8/16/2022 1:24:11 PM
Status:
Color:
Layer:
Space:

PolyLine (2)

Subject: PolyLine
Page Label: 33
Author: Glenn Reese - EPC Stormwater
Date: 8/9/2022 3:39:43 PM
Status:
Color:
Layer:
Space:



Subject: PolyLine
Page Label: 33
Author: Glenn Reese - EPC Stormwater
Date: 8/9/2022 3:39:43 PM
Status:
Color:
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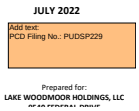
Space:

SW - Textbox (1)



Subject: SW - Textbox
Page Label: 1
Author: Glenn Reese - EPC Stormwater
Date: 8/9/2022 3:38:09 PM
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Color:
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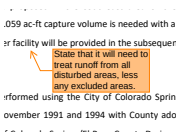
Space:

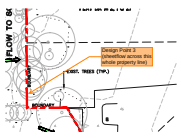
Add text:
PCD Filing No.: PUDSP229

SW - Textbox with Arrow (2)



Subject: SW - Textbox with Arrow
Page Label: 7
Author: Glenn Reese - EPC Stormwater
Date: 8/9/2022 3:39:27 PM
Status:
Color:
Layer:
Space:

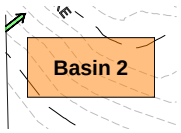
State that it will need to treat runoff from all disturbed areas, less any excluded areas.



Subject: SW - Textbox with Arrow
Page Label: 33
Author: Glenn Reese - EPC Stormwater
Date: 8/9/2022 3:39:43 PM
Status:
Color:
Layer:
Space:

Design Point 3
(sheetflow across this whole property line)

SW - Textbox (1)



Subject: SW - Textbox
Page Label: 33
Author: Glenn Reese - EPC Stormwater
Date: 8/9/2022 3:39:43 PM
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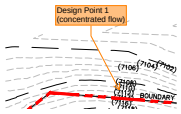
Color:
Layer:
Space:

Basin 2

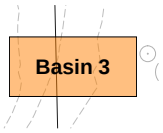
SW - Textbox with Arrow (1)



Subject: SW - Textbox with Arrow
Page Label: 33
Author: Glenn Reese - EPC Stormwater
Date: 8/9/2022 3:39:43 PM
Status:
Color:
Layer:
Space:

Design Point 1
(concentrated flow)

SW - Textbox (1)



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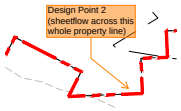
Page Label: 33
Author: Glenn Reese - EPC Stormwater
Date: 8/9/2022 3:39:43 PM
Status:
Color:
Layer:
Space:

Basin 3

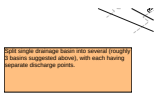
SW - Textbox with Arrow (1)



Subject: SW - Textbox with Arrow
Page Label: 33
Author: Glenn Reese - EPC Stormwater
Date: 8/9/2022 3:39:43 PM
Status:
Color:
Layer:
Space:

Design Point 2
(sheetflow across this whole property line)

SW - Textbox (3)



Subject: SW - Textbox
Page Label: 33
Author: Glenn Reese - EPC Stormwater
Date: 8/9/2022 3:39:43 PM
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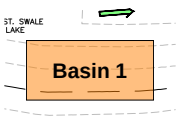
Space:

Split single drainage basin into several (roughly 3 basins suggested above), with each having separate discharge points.



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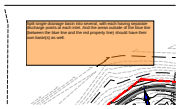
Space:

Basin 1



Subject: SW - Textbox
Page Label: 35
Author: Glenn Reese - EPC Stormwater
Date: 8/9/2022 3:39:55 PM
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Color:
Layer:
Space:

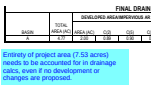
Split single drainage basin into several, with each having separate discharge points at each inlet. And the areas outside of the blue line (between the blue line and the red property line) should have their own basin(s) as well.

SW - Textbox with Arrow (1)

Subject: SW - Textbox with Arrow
Page Label: 35
Author: Glenn Reese - EPC Stormwater
Date: 8/9/2022 3:39:55 PM
Status:
Color:
Layer:
Space:

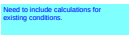
Add "WQ" to clarify that it will just be for WQ and not detention.

Text Box (10)



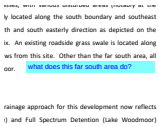
Subject: Text Box
Page Label: 28
Author: CDurham
Date: 8/15/2022 9:50:57 AM
Status:
Color:
Layer:
Space:

Entirety of project area (7.53 acres) needs to be accounted for in drainage calcs, even if no development or changes are proposed.



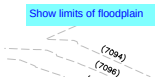
Subject: Text Box
Page Label: 28
Author: CDurham
Date: 8/16/2022 1:21:35 PM
Status:
Color:
Layer:
Space:

Need to include calculations for existing conditions.



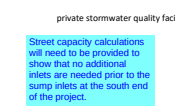
Subject: Text Box
Page Label: 5
Author: CDurham
Date: 8/16/2022 1:28:52 PM
Status:
Color:
Layer:
Space:

what does this far south area do?



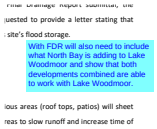
Subject: Text Box
Page Label: 35
Author: CDurham
Date: 8/16/2022 2:43:25 PM
Status:
Color:
Layer:
Space:

Show limits of floodplain



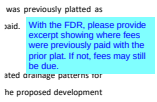
Subject: Text Box
Page Label: 5
Author: CDurham
Date: 8/16/2022 4:50:40 PM
Status:
Color:
Layer:
Space:

Street capacity calculations will need to be provided to show that no additional inlets are needed prior to the sump inlets at the south end of the project.



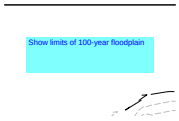
Subject: Text Box
Page Label: 6
Author: CDurham
Date: 8/16/2022 5:14:15 PM
Status:
Color:
Layer:
Space:

With FDR will also need to include what North Bay is adding to Lake Woodmoor and show that both developments combined are able to work with Lake Woodmoor.



Subject: Text Box
Page Label: 8
Author: CDurham
Date: 8/16/2022 5:39:22 PM
Status:
Color:
Layer:
Space:

With the FDR, please provide excerpt showing where fees were previously paid with the prior plat. If not, fees may still be due.



Subject: Text Box
Page Label: 33
Author: CDurham
Date: 8/16/2022 5:41:41 PM
Status:
Color:
Layer:
Space:

Show limits of 100-year floodplain

Subject: Text Box
Page Label: 33
Author: CDurham
Date: 8/16/2022 5:49:46 PM
Status:
Color:
Layer:
Space:

Include Basin summary table

Include basin summary table

Subject: Text Box
Page Label: 35
Author: CDurham
Date: 8/16/2022 5:50:47 PM
Status:
Color:
Layer:
Space:

Include basin summary table