DRAINAGE LETTER REPORT

for

DR. HOUSER DENTAL OFFICE ADDITION
8011 MERIDIAN PARK DRIVE
LOT 2A, BENT GRASS EAST COMMERCIAL FILING NO. 2A

Prepared for:

Bucher Design Studio, Inc.
12325 Oracle Blvd., Suite 101
Colorado Springs, CO 80921

January 17, 2022
Revised February 21, 2022

Prepared by:

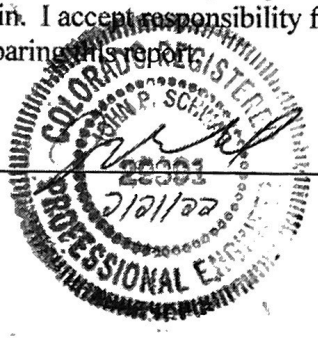
19 E. Willamette Ave.
Colorado Springs, CO 80903
(719)-477-9429
www.jpsengr.com

JPS Project No. 021601
PCD File No. PPR21-072

DRAINAGE STATEMENT

Engineer's Statement:

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



John P. Schwab, P.E. #29891

Developer's Statement:

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

By: _____ 3-2-22
Date

El Paso County's Statement

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

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

Date

Conditions:

JPS ENGINEERING
19 E. Willamette Avenue
Colorado Springs, CO 80903
(719)-477-9429
www.jpsengr.com

DR. HOUSER DENTAL OFFICE ADDITION
LOT 2A, BENT GRASS EAST COMMERCIAL FILING NO. 2A
DRAINAGE LETTER REPORT

I. INTRODUCTION

This Drainage Letter Report has been prepared in support of the Site Development Plan submittal for the proposed Dr. Houser Dental Office Addition project at 8011 Meridian Road in El Paso County. The existing 0.7-acre platted lot is described as Lot 2A, Bent Grass East Commercial Filing No. 2A.

II. EXISTING / PROPOSED DRAINAGE CONDITIONS

El Paso County previously approved the "Drainage Letter Report for Falcon Dental, Lot 2A, Bent Grass East Commercial Filing No. 2A" prepared by JPS Engineering, dated April 28, 2016, and the subsequent "Drainage Letter Report for Falcon Dental - Parking Lot Expansion, Lot 2A, Bent Grass East Commercial Filing No. 2A" prepared by JPS Engineering, dated December 20, 2018.

The existing subdivision detention pond on Tract A immediately west of this site was designed to mitigate stormwater impacts from the overall Bent Grass East Commercial Subdivision. The detention pond outlet structure conveys detained flows easterly through an existing 24-inch outlet pipe which crosses Lot 2A and discharges into the existing drainage channel along the west side of Meridian Road.

As discussed in the previously approved Drainage Letter Reports, the developed drainage plan for this site (Lot 2A) includes a private storm inlet near the southwest corner of the parking lot, with a 15-inch private storm sewer extending northwest and connecting to the existing storm inlet at the northwest corner of the site, which discharges through an existing 24-inch storm sewer flowing westerly into the existing subdivision detention pond.

As shown in the attached "Figure D1: Developed Drainage Plan," the proposed Office Addition on the west side of the existing building lies within Sub-Basin N-2A. Curb and gutter has previously been installed along the outer perimeter of the parking area to convey surface drainage southwesterly to the existing private storm inlet in the southwest corner of the parking lot.

The proposed Office Addition project will disturb an area of approximately 0.1-acre.

Developed peak flows at Design Point #N-2A are calculated as Q_5 = 2.4 cfs and Q_{100} = 4.7 cfs, and developed peak flows at Design Point #O are calculated as Q_5 =0.03 cfs and Q_{100} = 0.2 cfs (see attached Rational Method Calculation Table). The minor increase in flow at Design Point #N-2A remains well within the capacity of the existing storm sewer facilities.

The original subdivision drainage report ("Final Drainage Report for Bent Grass Commercial Filing No. 2," by Classic Consulting Engineers & Surveyors, LLC dated July, 2014) accounted for fully developed flow from Lot 2A in the sizing of the existing subdivision detention pond identified as "Pond 2." The CCES subdivision drainage report identified the originally platted Lots 1-3 (including all of Basin N) as having an impervious area of 95% for full commercial development. As noted on the enclosed Drainage Plan, the proposed site development on Lot 2A has a total impervious area of approximately 73 percent, which is well below the impervious area assumptions used in design of the existing detention facilities.

III. DRAINAGE PLANNING FOUR STEP PROCESS

El Paso County Drainage Criteria require drainage planning to include a Four Step Process for receiving water protection that focuses on reducing runoff volumes, treating the water quality capture volume (WQCV), stabilizing drainageways, and implementing long-term source controls.

As stated in DCM Volume 2, the Four Step Process is applicable to all new and re-development projects with construction activities that disturb 1 acre or greater or that disturb less than 1 acre but are part of a larger common plan of development. The Four Step Process has been implemented as follows in the planning of this project:

<u>Step 1: Employ Runoff Reduction Practices</u>

- Minimize Impacts: The proposed parking lot expansion is an addition to a previously developed dental office site, so this project will have minimal drainage impacts in comparison to new development of a vacant site.

<u>Step 2: Stabilize Drainageways</u>

- There are no drainageways directly adjacent to this project site.

<u>Step 3: Provide Water Quality Capture Volume (WQCV)</u>

- EDB: The developed site will continue to drain through an existing Extended Detention Basin (EDB) to the west of the property. Site drainage will be routed through the extended detention basin, which will capture and slowly discharge the WQCV over an extended release period.

<u>Step 4: Consider Need for Industrial and Commercial BMPs</u>

- No outside storage or industrial uses are proposed for this site.
- On-site drainage will be routed through the existing private Extended Detention Basin (EDB) to minimize introduction of contaminants to the County's public drainage system.

IV. SUMMARY

In summary, the proposed Office Addition project conforms to the previously approved drainage plans and reports for this site. Site grading for the building addition will continue to convey developed flows southwesterly to the existing storm sewer system, which flows into the existing stormwater detention and water quality pond serving this subdivision.

This site lies within the Falcon Drainage Basin, and applicable drainage basin fees were previously paid during the subdivision platting process, so there are no drainage basin fees or bridge fees required at this time.

FALCON DENTAL
COMPOSITE RUNOFF COEFFICIENTS

DEVELOPED CONDITIONS

5-YEAR C VALUES

BASIN	TOTAL AREA (AC)	(AC)	SUB-AREA 1 DEVELOPMENT/ COVER	C	AREA (AC)	SUB-AREA 2 DEVELOPMENT/ COVER	C	(AC)	SUB-AREA 3 DEVELOPMENT/ COVER	C	WEIGHTED C VALUE
N-2A	0.62	0.513	BUILDING / PARKING	0.9	0.11	LANDSCAPED	0.09				0.760
O	0.08	0.08	LANDSCAPED	0.09							0.090

100-YEAR C VALUES

BASIN	TOTAL AREA (AC)	(AC)	SUB-AREA 1 DEVELOPMENT/ COVER	C	AREA (AC)	SUB-AREA 2 DEVELOPMENT/ COVER	C	(AC)	SUB-AREA 3 DEVELOPMENT/ COVER	C	WEIGHTED C VALUE
N-2A	0.62	0.513	BUILDING / PARKING	0.96	0.11	LANDSCAPED	0.36				0.856
O	0.08	0.08	LANDSCAPED	0.36							0.360

FALCON DENTAL
RATIONAL METHOD

DEVELOPED FLOWS

					Overland Flow			Channel flow										
BASIN	DESIGN POINT	AREA (AC)	C 5-YEAR[2]	C 100-YEAR[2]	LENGTH (FT)	SLOPE (FT/FT)	Tco[3] (MIN)	CHANNEL LENGTH (FT)	CONVEYANCE COEFFICIENT C	SLOPE (FT/FT)	SCS[4] VELOCITY (FT/S)	Tt[5] (MIN)	TOTAL Tc[6] (MIN)	TOTAL Tc[6] (MIN)	INTENSITY[7] 5-YR (IN/HR)	INTENSITY[7] 100-YR (IN/HR)	PEAK FLOW Q5[1] (CFS)	PEAK FLOW Q100[1] (CFS)
N-2A	N-2A	0.62	0.760	0.856	140	0.03	5.0	50	20.00	0.01	2.00	0.4	5.4	5.4	5.00	8.90	2.36	4.72
O	O	0.08	0.090	0.360	145	0.04	13.5	0				0.0	13.5	13.5	3.63	6.46	0.03	0.19

1) RATIONAL METHOD: Q (FLOW, CFS) = C (RUNOFF COEFFICIENT) * I (INTENSITY, IN/HR) * A (TRIBUTARY AREA, AC)
2) WEIGHTED AVERAGE C VALUES FOR COMBINED BASINS
3) OVERLAND FLOW Tco = (0.395*(1.1-RUNOFF COEFFICIENT)*(OVERLAND FLOW LENGTH^(0.5)/(SLOPE^(0.333))
4) SCS VELOCITY = C * (SLOPE(FT/FT)^0.5)
C = 2.5 FOR HEAVY MEADOW
C = 5 FOR TILLAGE/FIELD
C = 7 FOR SHORT PASTURE AND LAWNS
C = 10 FOR NEARLY BARE GROUND
C = 15 FOR GRASSED WATERWAY
C = 20 FOR PAVED AREAS AND SHALLOW PAVED SWALES

5) CHANNEL TRAVEL TIME = L/V (WHEN CHANNEL VELOCITY IS KNOWN)
6) Tc = Tco + Tt
*** IF TOTAL TIME OF CONCENTRATION IS LESS THAN 5 MINUTES, THEN 5 MINUTES IS USED
7) INTENSITY BASED ON I-D-F CURVE IN EL PASO COUNTY DRAINAGE CRITERIA MANUAL, REVISED BY CITY OF COLORADO SPRINGS 1/1/03
I = (A * P) / B + Td)^C
5-YEAR VALUES: A = 26.65; P1 = 1.5 IN (1-HOUR DEPTH); B = 10.0; C = 0.76
100-YEAR VALUES: A = 26.65; P = 2.67 IN (1-HOUR DEPTH); B = 10.0; C = 0.76

TRACT BB
FUTURE COMMERCIAL
BENT GRASS EAST COMMERCIAL
FIL. NO. 2B

MERIDIAN PARK DRIVE

PARCEL #53011-04-002
1.46 AC.
LOT 1A
BENT GRASS EAST COMERCIAL
FIL. NO. 2A

PARCEL #53011-04-003
0.70 AC.
8011 PROPERTIES LLC
LOT 2A
BENT GRASS EAST
COMERCIAL
FIL. NO. 2A

MERIDIAN ROAD

LOT 3B
BENT GRASS EAST COMMERCIAL
FIL. NO. 2B

EXISTING VET CLINIC

SWALE

CONNECT TO EXISTING STORM INLET

EXISTING DRAINAGE SWALE

Tc FLOW PATH

EXISTING STORM INLETS & STORM SEWER

10' PUBLIC UTILITY AND PUBLIC DRAINAGE ESMT.

EXISTING PARKING LOT

N-2A
0.62 AC

EXISTING BUILDING
3,516 SF
FF=6929.5
8011 MERIDIAN PARK DRIVE

O
0.08 AC

TRACT A
BENT GRASS
METRO DISTRICT

EXISTING DETENTION/WATER QUALITY POND

EXISTING 60' PUBLIC UTILITY & DRAINAGE EASEMENT

EXISTING RETAINING WALL

EXISTING 24" RCP STORM SEWER

EXISTING 15" PRIVATE STORM SEWER

EXISTING TYPE 16 INLET
FL=6926.25
15" INV OUT=6923.95

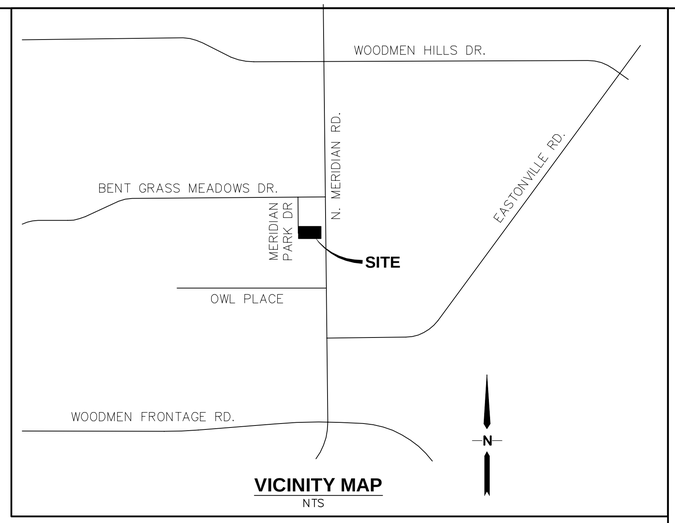
EXISTING CURB & GUTTER

PARCEL #53010-01-001
4.61 AC.
LOT 1
FALCON RANCHETTES

PROTECT EXISTING 24" RCP STORM SEWER

EXISTING 2'W SIDEWALK CHASE

EXISTING CURB & GUTTER



VICINITY MAP
NTS

LEGEND

- FEMA 100-YEAR FLOODWAY
- FEMA 100-YR FLOODPLAIN
- FILING LIMITS
- MAJOR BASIN BOUNDARY
- 6520 EXISTING CONTOUR
- TIME OF CONCENTRATION (Tc) FLOW PATH
- PROPOSED FLOW DIRECTION ARROW
- 1 DESIGN POINT
- A / 0.86 AC. BASIN DESIGNATION / BASIN AREA (ACRES)

IMPERVIOUS AREA CALCULATIONS:

TOTAL LOT 2A AREA = 0.700 AC.

IMPERVIOUS AREAS:

SURFACE TYPE	AREA
PAVEMENT/SIDEWALK	17,848 SF
BUILDING	4,491 SF
TOTAL	22,339 SF

= 0.513 AC
= 73.3% IMPERVIOUS

SUMMARY HYDROLOGY TABLE

DESIGN POINT	Q_5 (CFS)	Q_{100} (CFS)
N-2A	2.3	4.6
O	0.03	0.2

N
20' 0 20' 40'
ORIGINAL SCALE: 1"=20' (24"x36" SHEET)
CONTOUR INTERVAL: 2'

FALCON DENTAL - OFFICE ADDITION
LOT 2A, BENT GRASS EAST COMMERCIAL FILING NO. 2A

EXISTING CONDITIONS
DRAINAGE PLAN

JPS ENGINEERING
19 E. Willamette Ave.
Colorado Springs, CO
80903
PH: 719-477-9429
FAX: 719-471-0766
www.jpsengr.com

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

No.	REVISION	BY	DATE

HORZ. SCALE:	1"=20'	DRAWN:	BJJ
VERT. SCALE:	N/A	DESIGNED:	JPS
SURVEYED:	RAMPART	CHECKED:	JPS
CREATED:	3/02/16	LAST MODIFIED:	2/20/22
PROJECT NO:	021601	MODIFIED BY:	MSP

SHEET: EX1

C:\Civil3D 2018 projects\021601.hammers-falcon-dental\dwg\Civil\DRAINAGE.dwg Feb 20, 2022 - 5:09pm

TRACT BB
FUTURE COMMERCIAL
BENT GRASS EAST COMMERCIAL
FIL. NO. 2B

MERIDIAN PARK DRIVE

LOT 3B
BENT GRASS EAST COMMERCIAL
FIL. NO. 2B

EXISTING VET CLINIC

SWALE

PARCEL #53011-04-002
1.46 AC.
LOT 1A
BENT GRASS EAST COMERCIAL
FIL. NO. 2A

PARCEL #53011-04-003
0.70 AC.
8011 PROPERTIES LLC
LOT 2A
BENT GRASS EAST
COMERCIAL
FIL. NO. 2A

MERIDIAN ROAD

CONNECT TO EXISTING STORM INLET

EXISTING DRAINAGE SWALE

Tc FLOW PATH

10' PUBLIC UTILITY AND PUBLIC DRAINAGE ESMT.

EXISTING STORM INLETS & STORM SEWER

EXISTING PARKING LOT

PROPOSED BUILDING ADDITION

N-2A
0.62
AC.

EXISTING BUILDING
3,516 SF
FF=6929.5
8011 MERIDIAN PARK DRIVE

O
0.08
AC.

EXISTING PARKING LOT

EXISTING RETAINING WALL

TRACT A
BENT GRASS
METRO DISTRICT

EXISTING DETENTION/WATER QUALITY POND

EXISTING 60' PUBLIC UTILITY & DRAINAGE EASEMENT

EXISTING 24" RCP STORM SEWER

EXISTING 15" PRIVATE STORM SEWER

EXISTING TYPE 16 INLET
FL=6926.25
15" INV OUT=6923.95

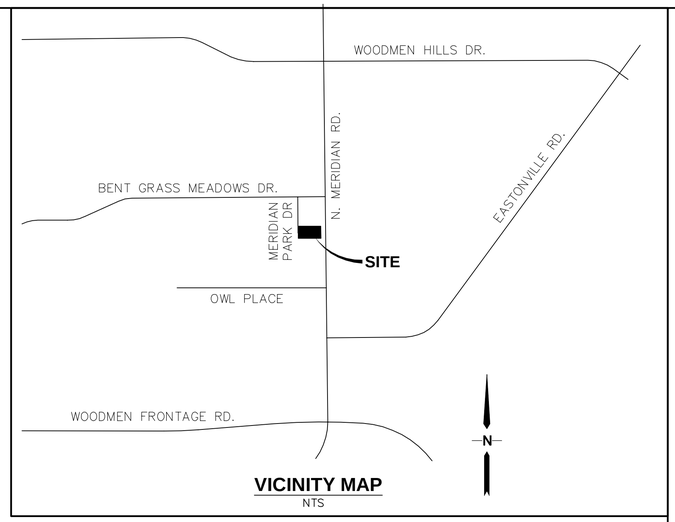
EXISTING CURB & GUTTER

PROTECT EXISTING 24" RCP STORM SEWER

EXISTING 2'W SIDEWALK CHASE

EXISTING CURB & GUTTER

PARCEL #53010-01-001
4.61 AC.
LOT 1
FALCON RANCHETTES



VICINITY MAP
NTS

LEGEND

- FEMA 100-YEAR FLOODWAY
- FEMA 100-YR FLOODPLAIN
- FILING LIMITS
- MAJOR BASIN BOUNDARY
- 6520 EXISTING CONTOUR
- TIME OF CONCENTRATION (Tc) FLOW PATH
- PROPOSED FLOW DIRECTION ARROW
- 1 DESIGN POINT
- A / 0.86 AC. BASIN DESIGNATION / BASIN AREA (ACRES)

IMPERVIOUS AREA CALCULATIONS:

TOTAL LOT 2A AREA = 0.700 AC.

IMPERVIOUS AREAS:

SURFACE TYPE	AREA
PAVEMENT/SIDEWALK	17,848 SF
BUILDING	4,491 SF
TOTAL	22,339 SF

= 0.513 AC
= 73.3% IMPERVIOUS

SUMMARY HYDROLOGY TABLE

DESIGN POINT	Q5 (CFS)	Q100 (CFS)
N-2A	2.4	4.7
O	0.03	0.2

N
20' 0 20' 40'
ORIGINAL SCALE: 1"=20' (24"x36" SHEET)
CONTOUR INTERVAL: 2'

FALCON DENTAL - OFFICE ADDITION
LOT 2A, BENT GRASS EAST COMMERCIAL FILING NO. 2A

DEVELOPED DRAINAGE PLAN

JPS ENGINEERING
19 E. Willamette Ave.
Colorado Springs, CO
80903
PH: 719-477-9429
FAX: 719-471-0766
www.jpsengr.com

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

No.	REVISION	BY	DATE

HORZ. SCALE:	1"=20'	DRAWN:	BJJ
VERT. SCALE:	N/A	DESIGNED:	JPS
SURVEYED:	RAMPART	CHECKED:	JPS
CREATED:	3/02/16	LAST MODIFIED:	2/20/22
PROJECT NO:	021601	MODIFIED BY:	MSP

SHEET: D1

C:\Civil3D 2018 projects\021601-hammers-falcon-dental\dwg\Civil\DRAINAGE.dwg Feb 20, 2022 - 5:08pm