

# **DRAINAGE LETTER REPORT**

**for**

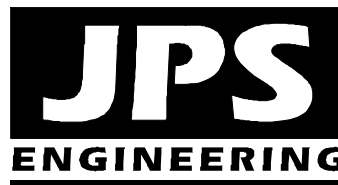
**DR. HOUSER DENTAL OFFICE ADDITION  
8011 MERIDIAN PARK DRIVE  
LOT 2A, BENT GRASS EAST COMMERCIAL FILING NO. 2A**

**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](http://www.jpsengr.com)**

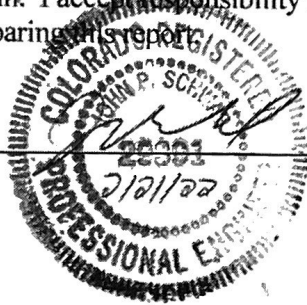
**JPS Project No. 021601  
PCD File No. PPR21-072**

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: \_\_\_\_\_

A large, stylized handwritten signature in black ink.

3-2-22

\_\_\_\_\_  
Date

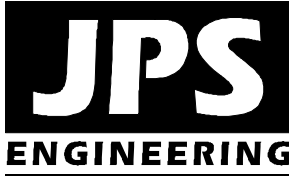
El Paso County's Statement

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:



19 E. Willamette Avenue  
Colorado Springs, CO 80903  
(719)-477-9429  
www.jpsegr.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:

#### Step 1: Employ Runoff Reduction Practices

- 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.

#### Step 2: Stabilize Drainageways

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

#### Step 3: Provide Water Quality Capture Volume (WQCV)

- 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.

#### Step 4: Consider Need for Industrial and Commercial BMPs

- 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	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	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

BASIN	DESIGN POINT	AREA (AC)	C		Overland Flow			Channel flow					TOTAL		INTENSITY <sup>(7)</sup>		PEAK FLOW	
			5-YEAR <sup>(2)</sup>	100-YEAR <sup>(2)</sup>	LENGTH (FT)	SLOPE (FT/FT)	T <sub>co</sub> <sup>(3)</sup> (MIN)	CHANNEL LENGTH (FT)	CONVEYANCE COEFFICIENT C	SLOPE (FT/FT)	VELOCITY (FT/S)	T <sub>t</sub> <sup>(5)</sup> (MIN)	T <sub>c</sub> <sup>(6)</sup> (MIN)	T <sub>c</sub> <sup>(6)</sup> (MIN)	5-YR (IN/HR)	100-YR (IN/HR)	Q <sub>5</sub> <sup>(1)</sup> (CFS)	Q <sub>100</sub> <sup>(1)</sup> (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	5.0	8.90	2.36	4.72	
O	O	0.08	0.090	0.360	145	0.04	13.5	0				0.0	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 T<sub>co</sub> = (0.395\*(1.1-RUNOFF COEFFICIENT)\*(OVERLAND FLOW LENGTH<sup>0.5</sup>)/(SLOPE<sup>0.333</sup>))

4) SCS VELOCITY = C \* (SLOPE(FT/FT)<sup>0.5</sup>)

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) T<sub>c</sub> = T<sub>co</sub> + T<sub>t</sub>

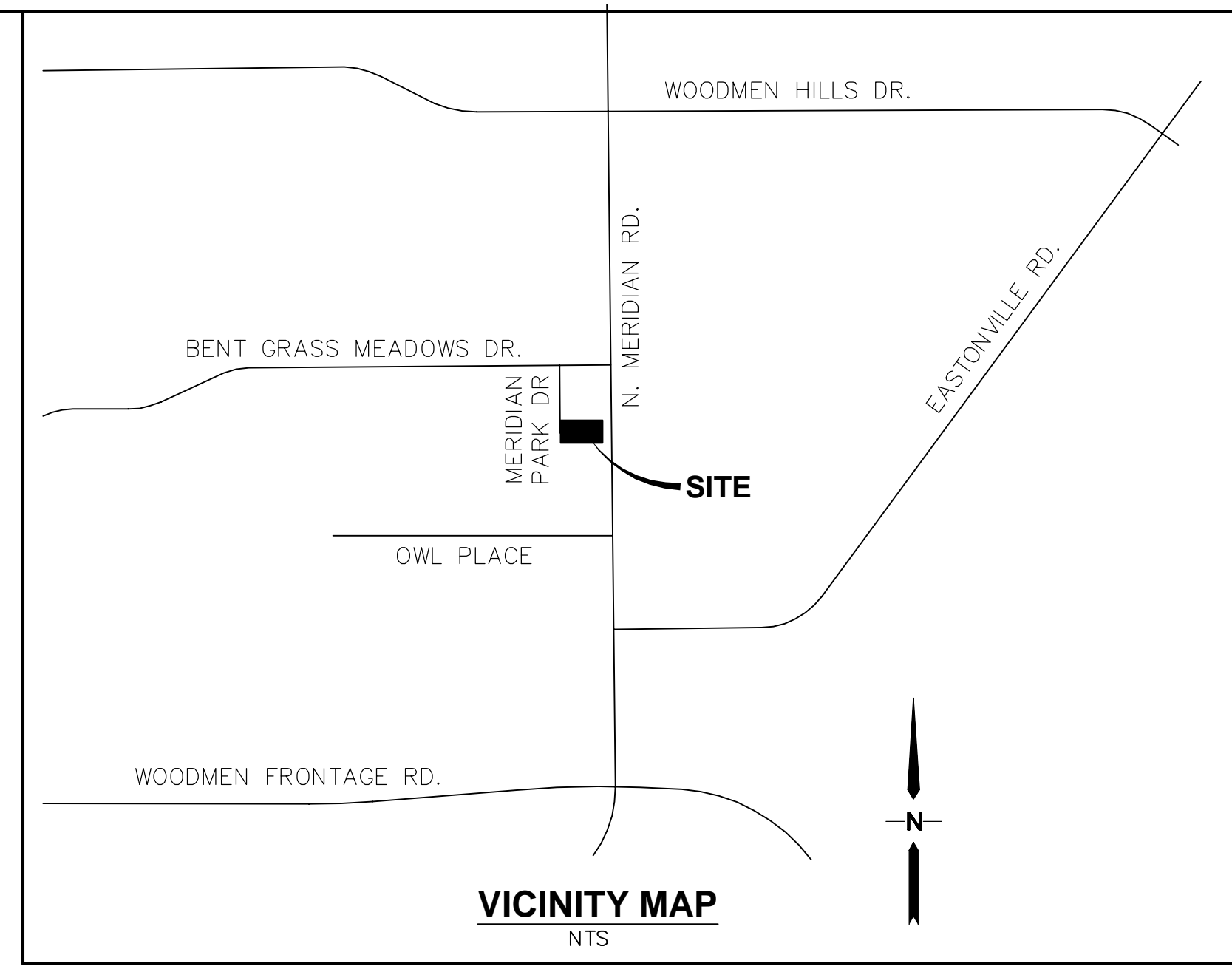
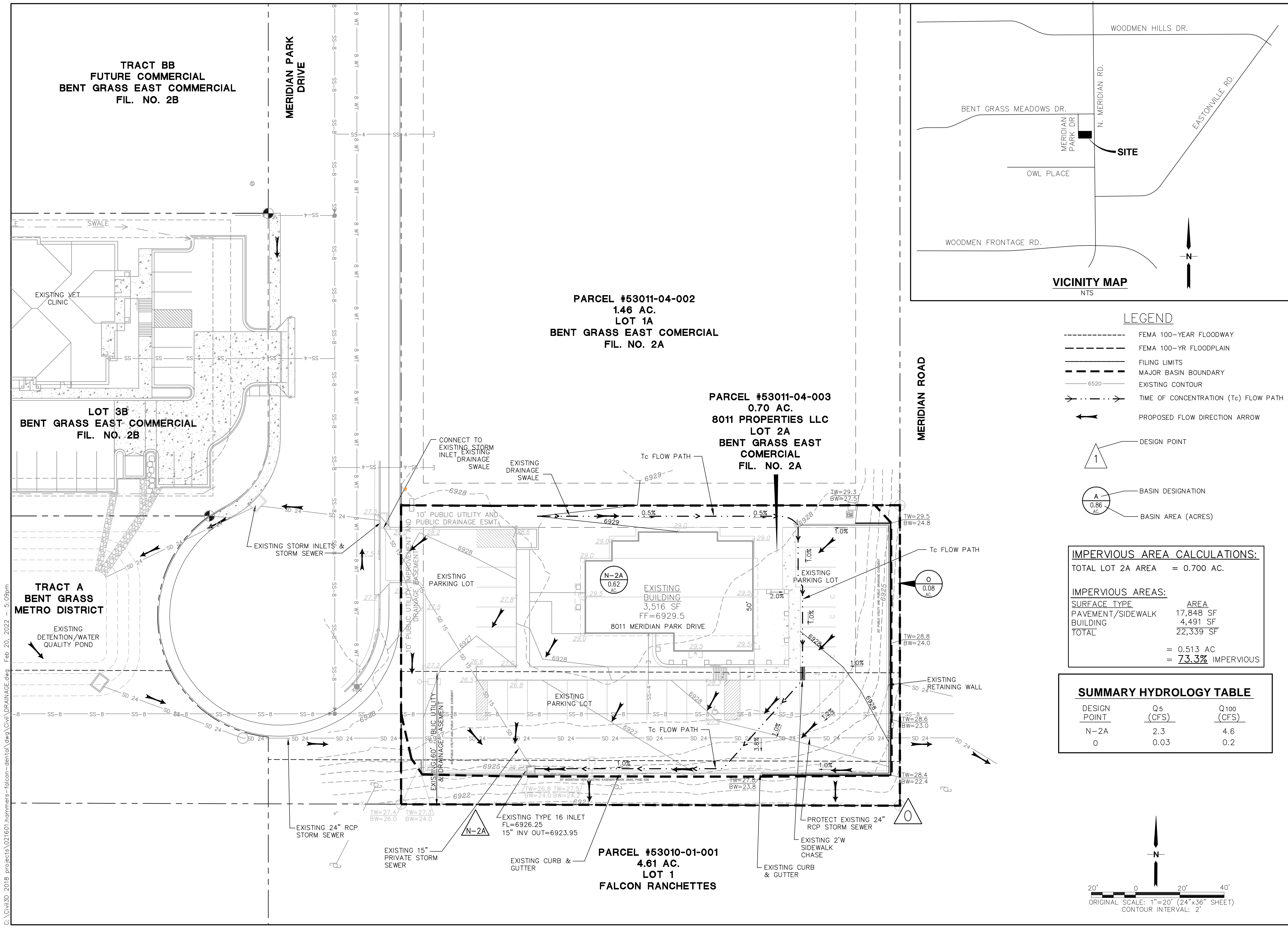
\*\*\* IF TOTAL TIME OF CONCENTRATION IS LESS THAN 5 MINUTES, THEN 5 MINUTES IS USED

7) INTENSITY BASED ON I-D-F CURVE IN EL PASO COUNTY DRAINAGE CRITERIA MANUAL, REVISED BY CITY OF COLORADO SPRINGS 1/1/03

$$I = (A * P) / (B + T_d)^C$$

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



**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 BASIN DESIGNATION
- 0.86 AC BASIN AREA (ACRES)

**IMPERVIOUS AREA CALCULATIONS:**

TOTAL LOT 2A AREA = 0.700 AC.

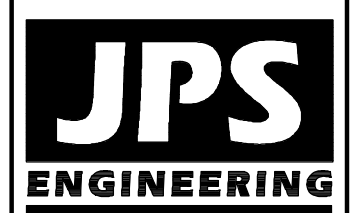
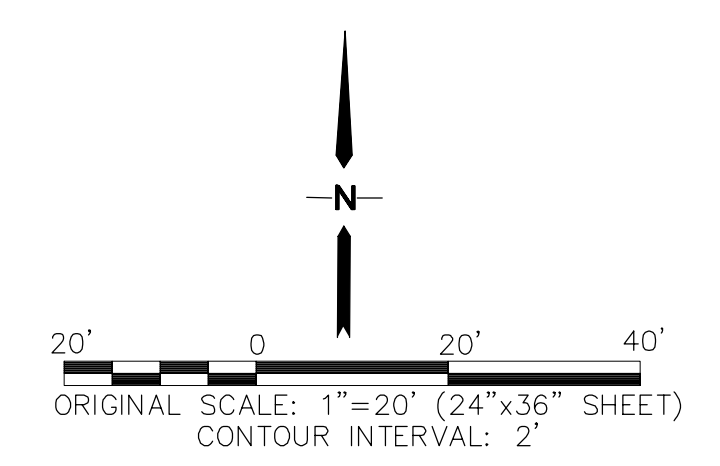
**IMPERVIOUS AREAS:**

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

= 0.513 AC  
= **73.3%** IMPERVIOUS

**SUMMARY HYDROLOGY TABLE**

DESIGN POINT	Q <sub>5</sub> (CFS)	Q <sub>100</sub> (CFS)
N-2A	2.3	4.6
0	0.03	0.2



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

**EXISTING CONDITIONS  
DRAINAGE PLAN**

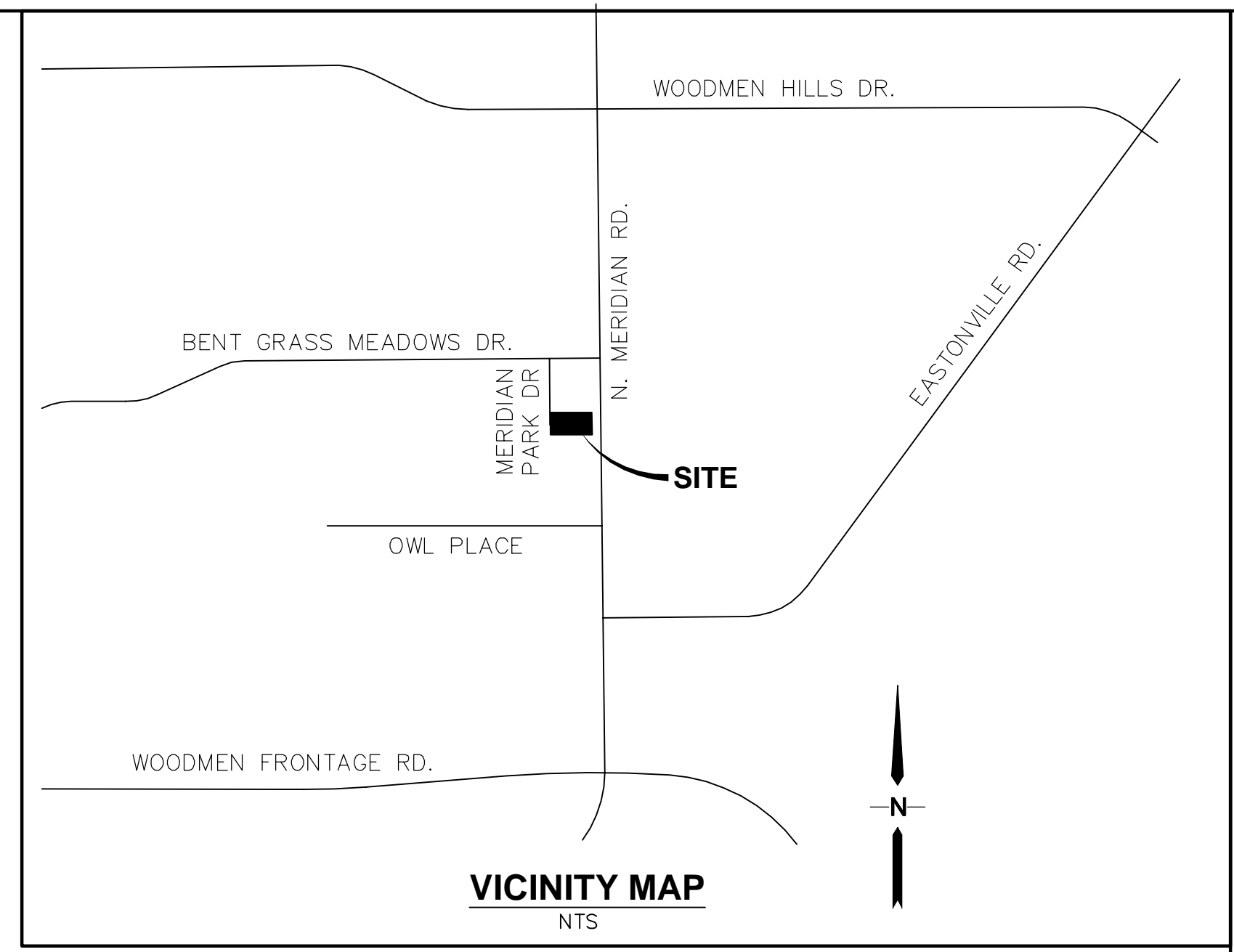
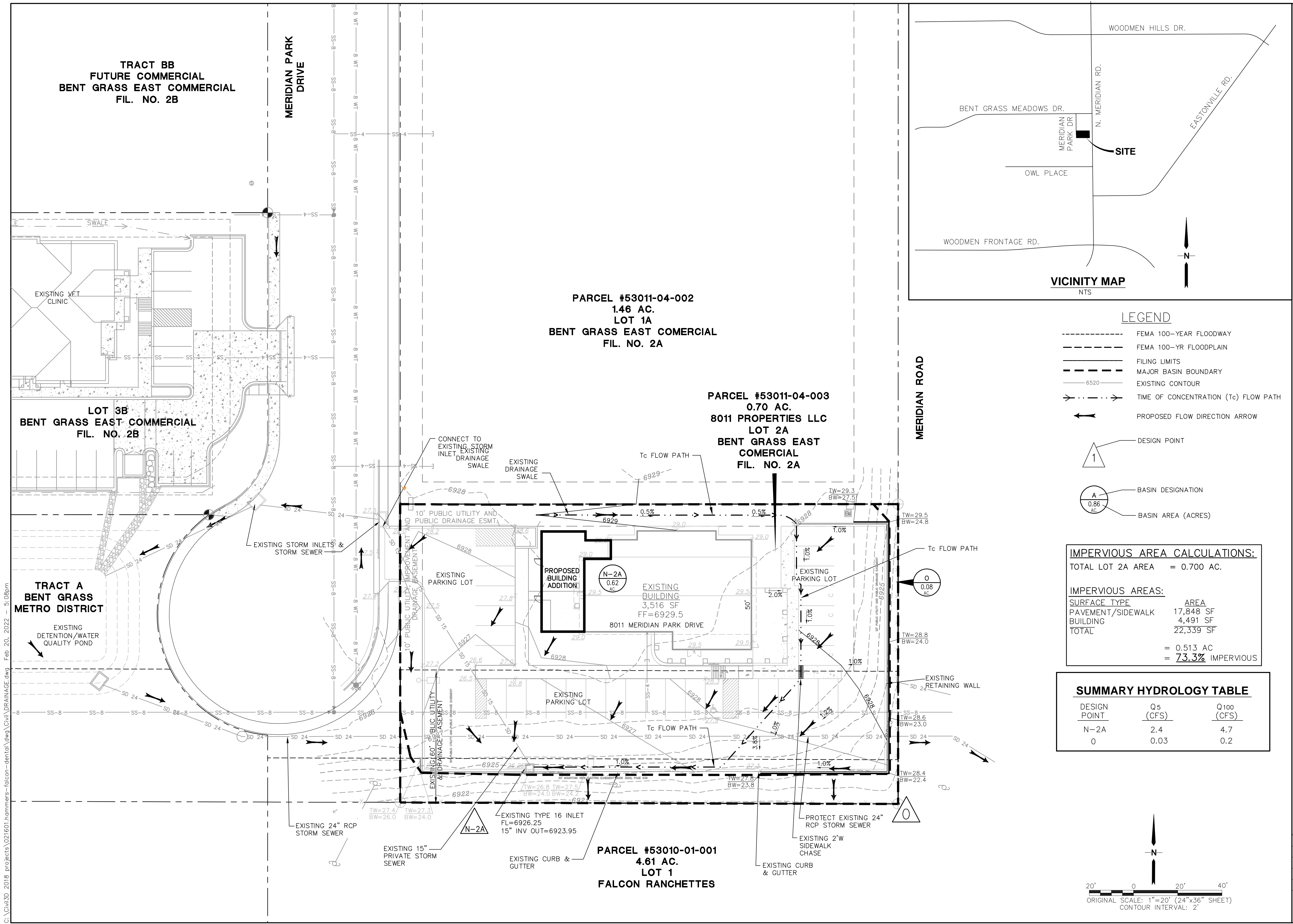
**FALCON DENTAL - OFFICE ADDITION  
LOT 2A, BENT GRASS EAST COMMERCIAL FILING NO. 2A**

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

**EX1**

C:\civild\2018\_projects\021601\_hammers-falcon-dental\Civil\DRAINAGE.dwg Feb 20, 2022 - 5:09pm





- 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
  - 0.86 AC BASIN DESIGNATION
  - 0.86 AC BASIN AREA (ACRES)

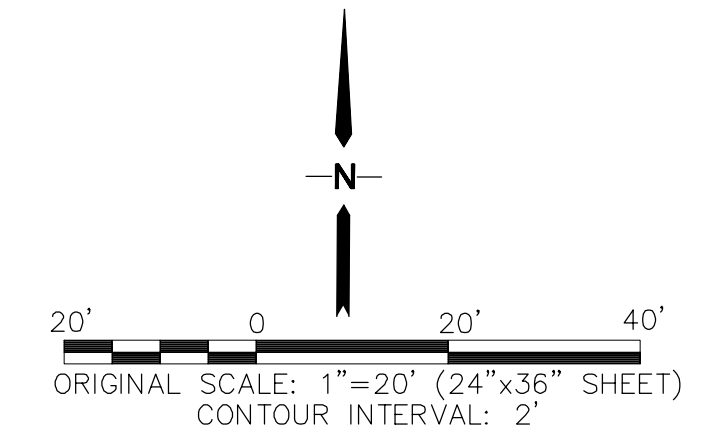
**IMPERVIOUS AREA CALCULATIONS:**  
TOTAL LOT 2A AREA = 0.700 AC.

**IMPERVIOUS AREAS:**

SURFACE TYPE	AREA
PAVEMENT/SIDEWALK	17,848 SF
BUILDING	4,491 SF
<b>TOTAL</b>	<b>22,339 SF</b>
	= 0.513 AC
	= <b>73.3% IMPERVIOUS</b>

**SUMMARY HYDROLOGY TABLE**

DESIGN POINT	Q <sub>5</sub> (CFS)	Q <sub>100</sub> (CFS)
N-2A	2.4	4.7
0	0.03	0.2



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

**DEVELOPED  
DRAINAGE PLAN**



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

**D1**

C:\civild\2018\_projects\021601\_hammers-falcon-dental\Civil\DRAINAGE.dwg Feb 20, 2022 - 5:08pm