

DRAINAGE LETTER REPORT

for

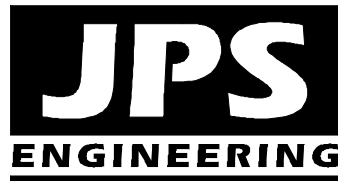
FALCON DENTAL – PARKING LOT EXPANSION LOT 2A, BENT GRASS EAST COMMERCIAL FILING NO. 2A

Prepared for:

Hammers Construction Inc.
1411 Woolsey Heights
Colorado Springs, CO 80915

December 20, 2018

Prepared by:



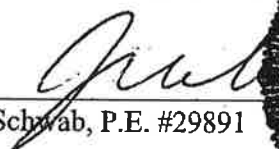
19 E. Willamette Ave.
Colorado Springs, CO 80903
(719)-477-9429
www.jpsengr.com

JPS Project No. 021601
PCD File No. PPR1850

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 the preparation of 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:



7-10-19

Date

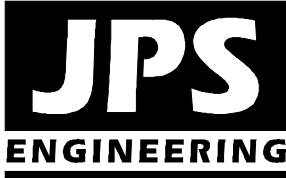
El Paso County's Statement

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:



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FALCON DENTAL PARKING LOT EXPANSION 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 East Parking Lot Expansion at the existing Falcon Dental facility. The property is located at 8011 Meridian Road in El Paso County, and 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. 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 Report, 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 East Parking Area Expansion lies within Sub-Basin N-2A. Curb and gutter will be installed along the outer perimeter of the expanded parking area to convey surface drainage southwesterly to the existing private storm inlet in the southwest corner of the parking lot.

The proposed East Parking Lot Expansion will disturb an area of approximately 0.2 acres. Developed peak flows at Design Point #N-2A are calculated as $Q_5 = 2.3$ cfs and $Q_{100} = 4.6$ 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.

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 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 East Parking Lot Expansion at the Falcon Dental facility conforms to the previously approved drainage plan for this site as detailed in the "Drainage Letter Report for Falcon Dental, Lot 2A, Bent Grass East Commercial Filing No. 2A." Site grading for the expanded parking lot will convey developed flows southwesterly to the existing storm sewer system, which flows into an 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	0.50	BUILDING / PARKING	0.9	0.12	LANDSCAPED	0.09			0.743
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	0.50	BUILDING / PARKING	0.96	0.12	LANDSCAPED	0.36			0.844
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 ⁽⁷⁾		PEAK FLOW	
			5-YEAR ⁽²⁾	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)	Tc ⁽⁶⁾ (MIN)	5-YR (IN/HR)	100-YR (IN/HR)	Q5 ⁽¹⁾ (CFS)	Q100 ⁽¹⁾ (CFS)
N-2A	N-2A	0.62	0.743	0.844	140	0.03	5.2	50	20.00	0.01	2.00	0.4	5.7	4.94	8.79	2.28	4.60
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 Tco = $(0.395^{(1)} \cdot 1.1 \cdot \text{RUNOFF COEFFICIENT})^{(2)} \cdot (\text{OVERLAND FLOW LENGTH}^{(0.5)} / (\text{SLOPE}^{(0.333)})$

4) SCS VELOCITY = $C \cdot (\text{SLOPE}(\text{FT/FT})^{0.5})$

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

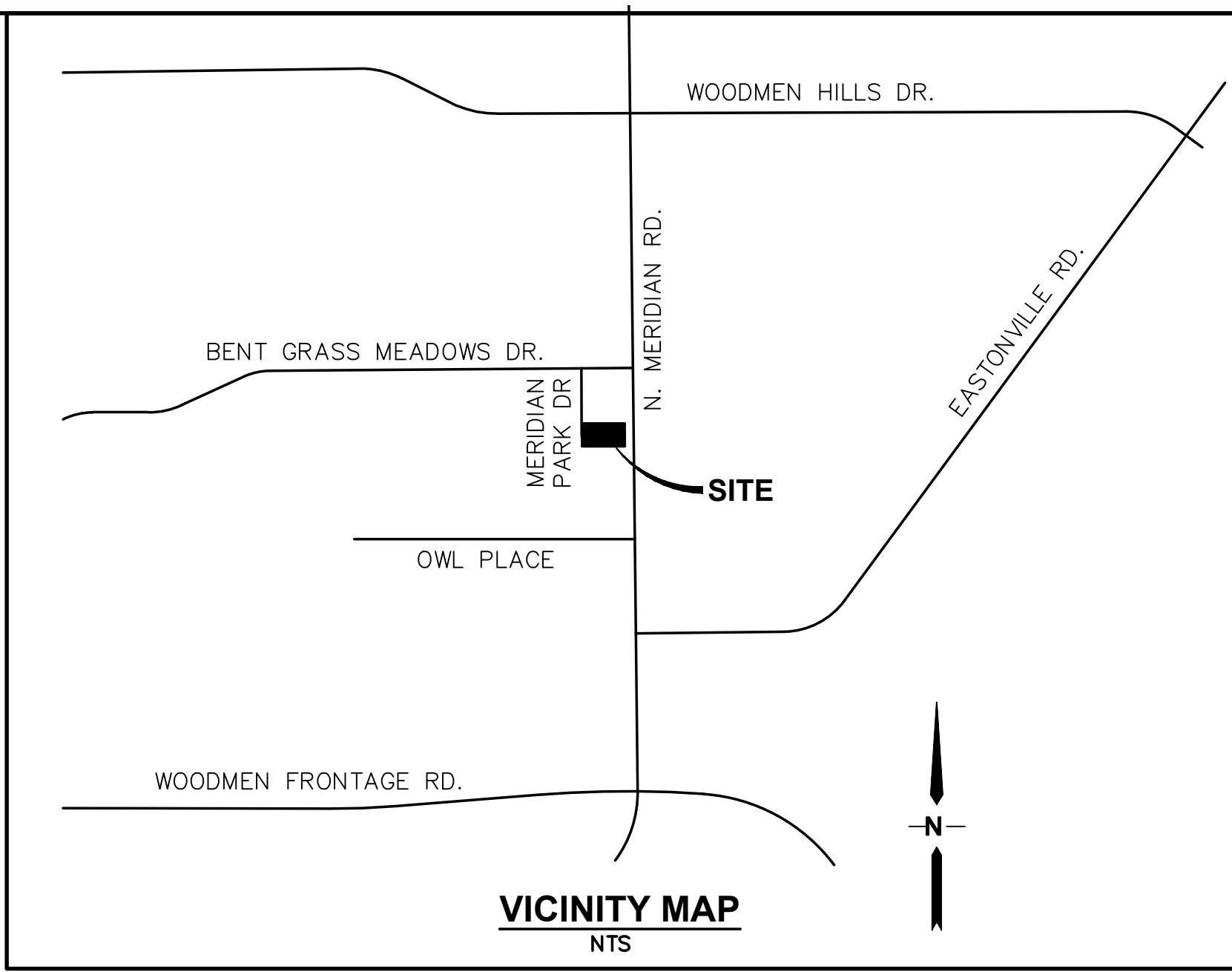
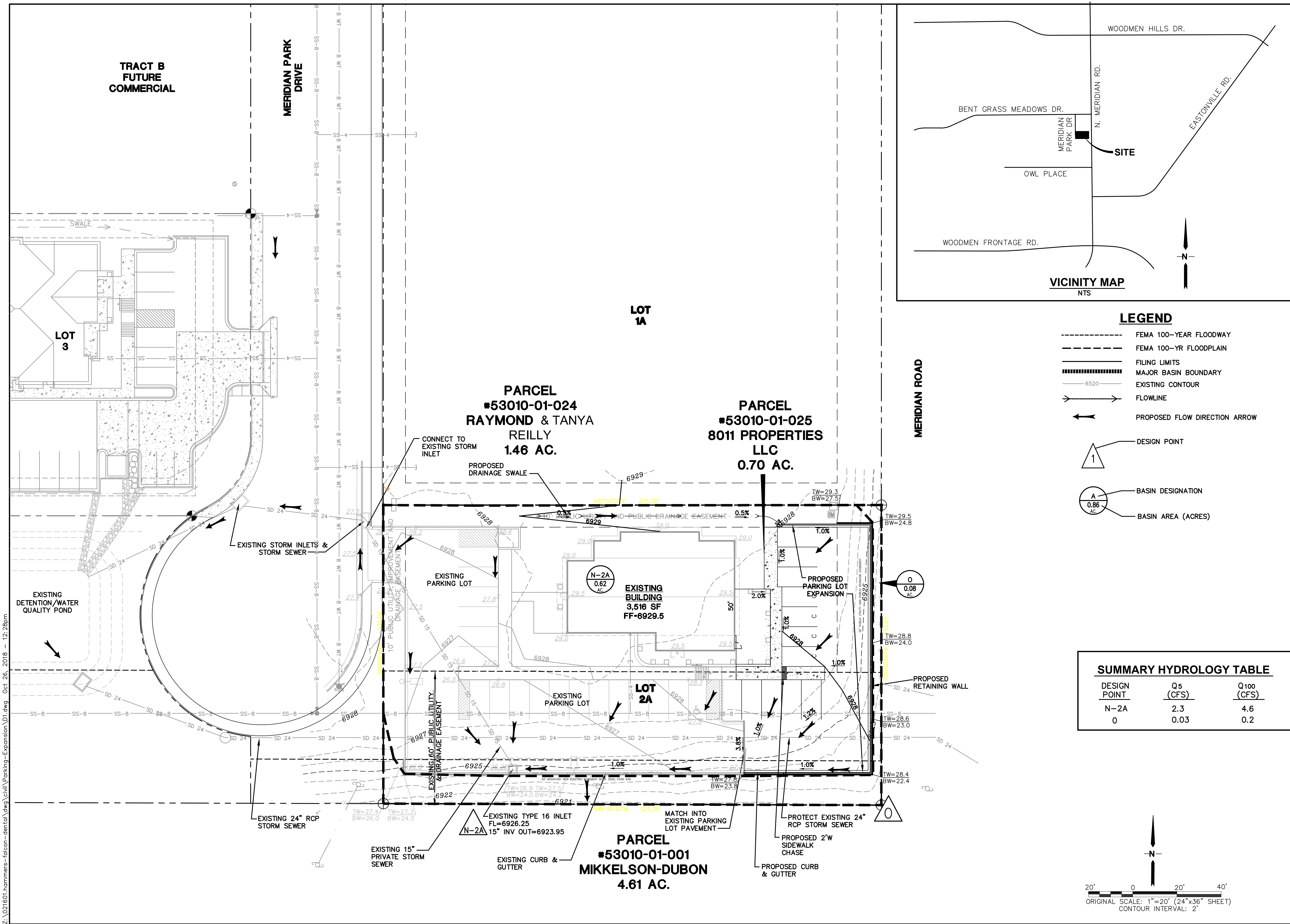
*** IF TOTAL TIME OF CONCENTRATION IS LESS THAN 5 MINUTES, THEN 5 MINUTES IS USED

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

$$I = (A \cdot P) / B + Td)^C$$

5-YEAR VALUES: A = 26.65; P1 = 1.5 IN (1-HOUR DEPTH); B = 10.0; C = 0.76

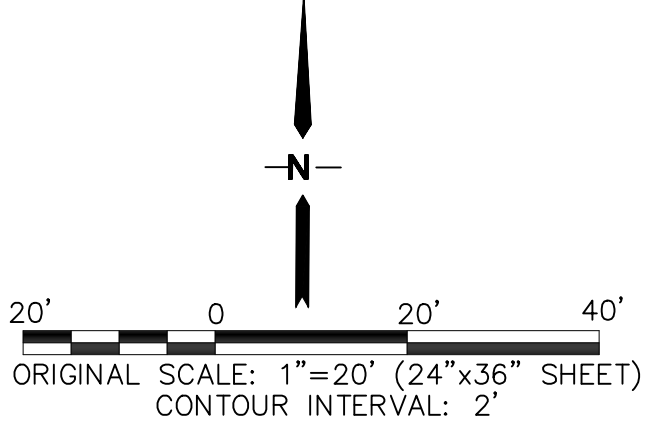
100-YEAR VALUES: A = 26.65; P = 2.67 IN (1-HOUR DEPTH); B = 10.0; C = 0.76



LEGEND

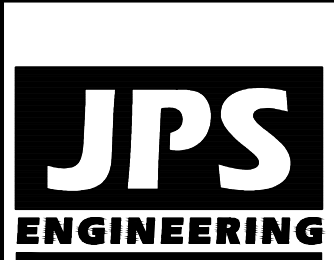
- FEMA 100-YEAR FLOODWAY
- FEMA 100-YR FLOODPLAIN
- FILING LIMITS
- ===== MAJOR BASIN BOUNDARY
- 6520 EXISTING CONTOUR
- ==> FLOWLINE
- ← PROPOSED FLOW DIRECTION ARROW
- △ 1 DESIGN POINT
- A BASIN DESIGNATION
- 0.86 BASIN AREA (ACRES)

SUMMARY HYDROLOGY TABLE		
DESIGN POINT	Q5 (CFS)	Q100 (CFS)
N-2A	2.3	4.6
0	0.03	0.2



FALCON DENTAL - PARKING LOT EXPANSION
8011 MERIDIAN PARK DRIVE, PEYTON, CO 80831

HORZ. SCALE: 1"=20'	DRAWN: BJJ
VERT. SCALE: N/A	DESIGNED: JPS
SURVEYED: RAMPART	CHECKED: JPS
CREATED: 3/02/16	LAST MODIFIED: 10/26/18
PROJECT NO: 021601	MODIFIED BY: BJJ
SHEET:	D1



19 E. Willamette Ave.
Colorado Springs, CO 80903
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CALL UTILITY NOTIFICATION
CENTER OF COLORADO
1-800-922-1987
CALL 3 BUSINESS DAYS IN ADVANCE
BEFORE YOU DIG, GRADE, OR EXCAVATE
FOR THE MARKING OF UNDERGROUND
MEMBER UTILITIES.

DATE	BY	REVISION

DEVELOPED
DRAINAGE PLAN

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