DRAINAGE LETTER REPORT

for

INTELIFAB
LOT 1, MAYBERRY, COLORADO SPRINGS FILING NO. 2

Prepared for:

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

March 30, 2020
Revised November 17, 2020

Prepared by:

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

JPS Project No. 030502
PCD File No. PPR-2012

INTELIFAB
LOT 1, MAYBERRY, COLORADO SPRINGS FILING NO. 2
DRAINAGE REPORT STATEMENTS

1. 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 for the drainage basin. I accept responsibility for liability caused by negligent acts, errors or omissions on my part in preparing this report:

10/10/21

John P. Schwab Colorado P.E. No. 29891

2. Developer's Statement:

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

By: John Mick

Printed Name:

Title: Chief Operating Officer

10/12/2021
Date

3. El Paso County 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. Date
County Engineer / ECM Administrator

Conditions:

I. INTRODUCTION

A. Property Location and Description

The Intelifab manufacturing facility is a proposed light industrial building to be constructed in the Mayberry, Colorado Springs (formerly known as "Ellicott Town Center") Master Plan area of eastern El Paso County, Colorado. The 1.5-acre property is described as Lot 1, Mayberry, Colorado Springs Filing No. 2. Intelifab manufactures framing components used in the building industry. Lot 1 will be created upon recording of the subdivision plat for Mayberry, Colorado Springs Filing No. 2, which is a replat of tracts within Mayberry, Colorado Springs Filing No. 1.

The project site is located at the northwest corner of Springs Road and Cattlemen Run. A re-zoning has been approved to establish the zoning of this property and adjoining property to the east as CS (Commercial Service).

State Highway 94 (SH94) adjoins the north boundary of this property, and the west boundary of the site adjoins an existing water storage tank parcel owned by Cherokee Metropolitan District. The south and east boundaries of the property adjoin undeveloped parts of the Mayberry, Colorado Springs (fka "Ellicott Town Center") Master Plan area.

The Intelifab project consists of a proposed 20,329 square-foot manufacturing building with associated parking and site improvements. Access will be provided by a driveway entrance onto Cattlemen Run along the south boundary of the site.

B. Scope

In support of the El Paso County Site Development Plan submittal for this project, this report is intended to meet the requirements of a site-specific "Letter Type" drainage report in accordance with El Paso County drainage criteria. This report will provide a summary of site drainage issues impacting the proposed development. The report will analyze impacts from upstream drainage patterns, site-specific developed drainage patterns, and impacts on downstream facilities. This report is based on the guidelines and criteria presented in the City of Colorado Springs and El Paso County "Drainage Criteria Manual."

C. References

City of Colorado Springs & El Paso County "Drainage Criteria Manual," revised October 12, 1994, Volumes 1 and 2.

JPS Engineering, Inc., "Final Drainage Report for Mayberry, Colorado Springs (fka "Ellicott Town Center") Filing No. 2," revised October 27, 2020 (approved by County 11/5/20).

JPS Engineering, Inc., "Final Drainage Report for Mayberry, Colorado Springs (fka "Ellicott Town Center") Filing No. 1," revised October 27, 2020 (approved by County 11/5/20).

II. EXISTING / PROPOSED DRAINAGE CONDITIONS

Drainage planning for this lot has been addressed in the "Final Drainage Report for Mayberry, Colorado Springs Filing No. 1" and the "Final Drainage Report for Mayberry, Colorado Springs Filing No. 2" by JPS Engineering. As noted in the subdivision drainage reports, on-site soils are comprised of Truckton loamy sand soils. These soils are classified as hydrologic soils group A (rapid permeability). The existing topography within this site slopes downward to the southeast with a grade of approximately 1-3 percent.

The subject property, Lot 1, has been identified as Basin C2.7 in the subdivision drainage reports, and drainage from this lot has been planned to sheet flow in a southeasterly direction to the to the curb and gutter along the west side of Springs Road. The subdivision drainage report identifies peak flows of $Q_5 = 5.2$ cfs and $Q_{100} = 10.3$ cfs for Basin C2.7 (see calculations in appendix). Developed flows in the curb and gutter along the west side of Springs Road flow south to Design Point #C2.8A at the corner of Springs Road and Village Main Street. Developed peak flows at Design Point #C2.8A are calculated as $Q_5 = 13.4$ cfs and $Q_{100} = 28.9$ cfs.

Surface runoff from the developed site will continue to follow historic drainage patterns towards the south property boundary. The proposed building pad will be graded with protective slopes to provide positive drainage away from the face of the building. A high point will be graded in the northwest corner of the site, and drainage swales will be graded along the north and west faces of the building to convey developed flows around the building. A grass-lined swale will convey drainage easterly along the north side of the building to a curb chase entering the curb and gutter along the west side of Springs Road (see hydraulic calculation in appendix).

Concrete crosspans will convey surface drainage in a southerly and southeasterly direction across the southwest parking area, flowing to the curb and gutter along the south side of the south parking area. Curb and gutter will be installed along the outer perimeter of the new parking areas to convey surface drainage to curb chases in the adjoining public streets, ultimately directing developed flows from this site to the curb and gutter along the west side of Springs Road.

Stormwater quality mitigation and detention will be provided by routing developed flows through the subdivision detention pond south of the property. Temporary Detention Pond C2.8 will be constructed at the northwest corner of Springs Road and Village Main Street, and this pond has been sized to mitigate developed drainage impacts from Basins C2.6, C2.7, and C2.8 during the initial phase of development. In conjunction with future development of Filing No. 4 southeast of this site, the larger sub-regional Detention Pond D will be constructed further to the southeast, after which temporary Detention Pond C2.8 will be removed.

During the initial phase of development, drainage along the west side of Springs Road will be conveyed southerly in a roadside ditch, flowing into a riprap rundown entering the

northeast corner of Detention Pond C2.8. If Springs Road is improved with curb and gutter prior to construction of Detention Pond D, then a curb chase will be provided to convey drainage into Detention Pond C2.8 for the interim period.

The subdivision drainage report assumed full commercial / light industrial development of this site, and the proposed site development plan is entirely consistent with the approved subdivision drainage plan. As noted on the enclosed Drainage Plan (Sh. D1.12), the calculated impervious area of Basin C2.7 is approximately 70.6 percent, which is well below the 80 percent impervious area assumed in the subdivision drainage reports. The proposed Site Development Plan for the Intelifab building project includes landscaped areas around the perimeter of the site, as well as a 40-foot right-of-way dedication along SH94, so the total impervious area remains below the maximum impervious area anticipated in the subdivision drainage report.

Hydrologic calculations are detailed in the attached spreadsheet (Appendix A), and peak flows are identified on Figure D1.12. The contractor will need to implement standard best management practices for erosion control during construction, as depicted on the Site Grading and Erosion Control Plans.

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 Directly Connected Impervious Areas: Roof drain downspouts will be directed to flow over grass-lined drainage swales where possible. Drainage from the north side of the building will flow through a grass-lined drainage swale prior to reaching the downstream public street.

<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 drain through an off-site Extended Detention Basin (EDB) south of the property. Detention Pond C2.8. Has been designed to provide stormwater detention and water quality for this site. The extended detention basin will capture and slowly discharge the WQCV over an extended release period.

Step 4: Consider Need for Industrial and Commercial BMPs

- The property owner will implement a Stormwater Management Plan (SWMP) which includes proper housekeeping and spill containment procedures.
- Site drainage will be routed through the downstream Extended Detention Basin (EDB) to minimize discharge of contaminants to the downstream drainage system.

IV. FLOODPLAIN IMPACTS

This site is located beyond the limits of any FEMA 100-year floodplain boundaries as shown in the FEMA floodplain map for this area, FIRM Panel No. 08041C0810G, dated December 7, 2018.

V. DRAINAGE BASIN FEES

This site is located within the Ellicott Consolidated Drainage Basin. No public drainage improvements are required for development of this site. The Ellicott Consolidated Drainage Basin does not have a drainage or bridge fee requirement, and any required drainage fees would have been addressed at the subdivision stage, so there are no applicable drainage fees required with the Site Development Plan.

VI. SUMMARY

The developed drainage patterns associated with the proposed Intelifab manufacturing facility will remain consistent with historic conditions and the overall drainage plan for this commercial subdivision. Developed flows from the site will continue to follow historic drainage patterns, flowing to the subdivision detention pond southeast of this site.

The subdivision detention pond will mitigate developed drainage impacts and meet the County's stormwater quality requirements for this site. Proper maintenance of the subdivision detention pond, in conjunction with proper erosion control practices, will ensure that this developed site has no significant adverse impact on downstream or surrounding areas.

APPENDIX A

CALCULATIONS & FIGURES

MAYBERRY, COLORADO SPRINGS (ELLICOTT TOWN CENTER)
RATIONAL METHOD - HYDROLOGIC CALCULATIONS

DEVELOPED FLOWS

					Overland Flow			Channel flow										
BASIN	DESIGN POINT	AREA (AC)	C 5-YEAR	C 100-YEAR	LENGTH (FT)	SLOPE (FT/FT)	Tco [1] (MIN)	CHANNEL LENGTH (FT)	CONVEYANCE COEFFICIENT C	SLOPE (FT/FT)	SCS [2] VELOCITY (FT/S)	Tt [3] (MIN)	TOTAL Tc [4] (MIN)	TOTAL Tc [4] (MIN)	INTENSITY [5] 5-YR (IN/HR)	INTENSITY [5] 100-YR (IN/HR)	PEAK FLOW Q5 [6] (CFS)	PEAK FLOW Q100 [6] (CFS)
FILING NO. 1																		
A1A	A1A	2.80	0.355	0.555	40	0.020	6.8	2035	15.00	0.011	1.57	21.6	28.4	28.4	2.56	4.30	2.55	6.68
C1.2	C1.2	7.97	0.490	0.620			0.0	1000	20.00	0.009	1.90	8.8	8.8	8.8	4.32	7.26	16.88	35.87
C1.7A	C1.7A	0.58	0.375	0.545			0.0	680	20.00	0.013	2.28	5.0	5.0	5.0	5.17	8.68	1.12	2.74
C1.7B	C1.7B	4.34	0.490	0.620	100	0.020	8.9	400	20.00	0.01	2.00	3.3	12.2	12.2	3.83	6.43	8.15	17.31
C1.7A,C1.7B	C1.7B1	4.92	0.476	0.611									12.2	12.2	3.83	6.43	8.97	19.33
C1.2,C1.7	C1.2D	12.89	0.485	0.617									12.2	12.2	3.83	6.43	23.95	51.15
C1.3		3.02	0.375	0.545			0.0	280	20.00	0.01	2.00	2.3	2.3	5.0	5.17	8.68	5.85	14.29
C1.2,C1.3,C1.7	C1.3A	15.91	0.464	0.603									14.5	14.5	3.57	5.99	26.34	57.47
C1.4		3.23	0.375	0.545			0.0	300	20.00	0.01	2.00	2.5	2.5	5.0	5.17	8.68	6.26	15.28
C1.2-C1.4,C1.7	C1.4A	19.14	0.449	0.593									17.0	17.0	3.33	5.59	28.62	63.45
C1.5		3.18	0.375	0.545			0.0	300	20.00	0.01	2.00	2.5	2.5	5.0	5.17	8.68	6.16	15.04
C1.2-C1.5,C1.7	C1.5A	22.32	0.438	0.586									19.5	19.5	3.12	5.25	30.55	68.61
C1.1	C1.1	9.38	0.226	0.447	100	0.017	13.4	1800	20.00	0.01	2.00	15.0	28.4	28.4	2.56	4.30	5.43	18.04
C1.6		1.98	0.375	0.545			0.0	280	20.00	0.01	2.00	2.3	2.3	5.0	5.17	8.68	3.84	9.37
C1.1,C1.6	C1.6B	11.36	0.252	0.464									30.7	30.7	2.44	4.10	7.00	21.62
C1.1-C1.7	C1.7A	33.68	0.376	0.545									30.7	30.7	2.44	4.10	30.96	75.30
C1.8		3.89	0.375	0.545			0.0	600	20.00	0.016	2.53	4.0	4.0	5.0	5.17	8.68	7.54	18.40
C1.9		3.60	0.375	0.545			0.0	580	20.00	0.012	2.19	4.4	4.4	5.0	5.17	8.68	6.98	17.03
C1.8,C1.9	C1.9A	7.49	0.375	0.545									8.4	8.4	4.40	7.38	12.35	30.14
C1.1-C1.9	**C1.9B**	**41.17**	**0.376**	**0.545**									**30.7**	**30.7**	**2.44**	**4.10**	**37.84**	**92.05**
C1.10	C1.10	1.82	0.375	0.545	50	0.020	7.5	1500	20.00	0.01	2.00	12.5	20.0	20.0	3.09	5.19	2.11	5.15
C1.1-C1.10	**C1.10A**	**42.99**	**0.375**	**0.545**									**30.7**	**30.7**	**2.44**	**4.10**	**39.41**	**96.12**
FILING NO. 2																		
C2.1		5.59	0.242	0.457	100	0.016	13.4	650	20.00	0.01	2.00	5.4	18.8	18.8	3.18	5.34	4.30	13.63
C2.2		4.03	0.375	0.545			0.0	460	20.00	0.01	2.00	3.8	3.8	5.0	5.17	8.68	7.81	19.06
C2.3		2.76	0.375	0.545			0.0	260	20.00	0.01	2.00	2.2	2.2	5.0	5.17	8.68	5.35	13.06
C2.1-C2.3	C2.3A	12.38	0.315	0.505									21.0	21.0	3.02	5.06	11.76	31.64
C2.4		4.98	0.375	0.545			0.0	560	20.00	0.012	2.19	4.3	4.3	5.0	5.17	8.68	9.65	23.56
C2.5		4.12	0.375	0.545			0.0	330	20.00	0.01	2.00	2.8	2.8	5.0	5.17	8.68	7.99	19.49
C2.1-C2.5	C2.5A	21.48	0.341	0.522									23.8	23.8	2.83	4.75	20.73	53.27

					Overland Flow			Channel flow										
BASIN	DESIGN POINT	AREA (AC)	C 5-YEAR	C 100-YEAR	LENGTH (FT)	SLOPE (FT/FT)	Tco [1] (MIN)	CHANNEL LENGTH (FT)	CONVEYANCE COEFFICIENT C	SLOPE (FT/FT)	SCS [2] VELOCITY (FT/S)	Tt [3] (MIN)	TOTAL Tc [4] (MIN)	TOTAL Tc [4] (MIN)	INTENSITY [5] 5-YR (IN/HR)	INTENSITY [5] 100-YR (IN/HR)	PEAK FLOW Q5 [6] (CFS)	PEAK FLOW Q100 [6] (CFS)
C3		20.25	0.080	0.350			0.0	1050	15.00	0.011	1.57	11.1	11.1	11.1	3.97	6.66	6.43	47.23
Tc C2.5A TO DP-D2B								2450	15.00	0.01	1.50	27.2						
C2.1-C2.5,C3	C4.1	41.73	0.214	0.439									30.7	30.7	2.44	4.10	21.83	75.15
C2.6		2.76	0.422	0.579	100	0.020	9.9	550	20.00	0.016	2.53	3.6	13.5	13.5	3.68	6.18	4.29	9.88
C2.7		2.14	0.590	0.700	100	0.020	7.4	400	20.00	0.013	2.28	2.9	10.3	10.3	4.08	6.85	5.15	10.26
C2.8		3.00	0.472	0.615			0.0	250	20.00	0.012	2.19	1.9	1.9	5.0	5.17	8.68	7.32	16.01
C2.6-C2.8	C2.8A	7.90	0.486	0.625									15.4	15.4	3.48	5.85	13.37	28.87
D1.2		2.99	0.472	0.615			0.0	300	20.00	0.01	2.00	2.5	2.5	5.0	5.17	8.68	7.29	15.96
C2.6-C2.8,D1.2	D1.2A	10.89	0.482	0.622									17.9	17.9	3.26	5.47	17.10	37.04
D1.1	D1.1	3.60	0.590	0.700			0.0	750	20.00	0.011	2.10	6.0	6.0	6.0	4.91	8.24	10.42	20.76
D1.3		2.87	0.472	0.615			0.0	280	20.00	0.01	2.00	2.3	2.3	5.0	5.17	8.68	7.00	15.32
C2.6-C2.8,D1.1-D1.3	D1.3A	17.36	0.503	0.637									20.2	20.2	3.07	5.16	26.84	57.05
D1.4	D1.4	4.19	0.375	0.545			0.0	550	20.00	0.012	2.19	4.2	4.2	5.0	5.17	8.68	8.12	19.82
D1.5		5.09	0.375	0.545			0.0	280	20.00	0.01	2.00	2.3	2.3	5.0	5.17	8.68	9.87	24.08
D1.6		3.33	0.375	0.545			0.0	1060	20.00	0.01	2.00	8.8	8.8	8.8	4.32	7.25	5.39	13.15
C2.6-C2.8,D1.1-D1.6	D1.6A	29.97	0.449	0.598									24.4	24.4	2.79	4.69	37.56	83.97
PHASE 2																		
D2		44.58	0.341	0.523	100	0.020	11.0	1750	20.00	0.011	2.10	13.9	24.9	24.9	2.76	4.63	41.94	107.95
C2.6-C2.8,D1.1-D1.6,D2	D2A	74.55	0.385	0.553									4.3	5.0	5.17	8.68	148.35	357.81
C2,C3,D	**D2B**	**116.28**	**0.323**	**0.512**									**23.8**	**23.8**	**2.83**	**4.75**	**106.32**	**282.86**
C4	**C4**	**72.81**	**0.331**	**0.516**	**100**	**0.020**	**11.2**	**3000**	**20.00**	**0.011**	**2.10**	**23.8**	**35.0**	**35.0**	**2.25**	**3.77**	**54.21**	**141.81**
E	**E**	**2.37**	**0.114**	**0.372**			**0.0**	**1450**	**15.00**	**0.0083**	**1.37**	**17.7**	**17.7**	**17.7**	**3.27**	**5.50**	**0.88**	**4.85**

1) OVERLAND FLOW Tco = (0.395*(1.1-RUNOFF COEFFICIENT)*(OVERLAND FLOW LENGTH^(0.5)/(SLOPE^(0.333))
2) 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
3) MANNING'S CHANNEL TRAVEL TIME = L/V (WHEN CHANNEL VELOCITY IS KNOWN)
4) Tc = Tco + Tt
*** IF TOTAL TIME OF CONCENTRATION IS LESS THAN 5 MINUTES, THEN 5 MINUTES IS USED
5) INTENSITY BASED ON I-D-F EQUATIONS IN CITY OF COLORADO SPRINGS DRAINAGE CRITERIA MANUAL
   $I_5 = -1.5 * \ln(Tc) + 7.583$
   $I_{100} = -2.52 * \ln(Tc) + 12.735$
6) Q = CiA

MAYBERRY, COLORADO SPRINGS (ELLICOTT TOWN CENTER)
IMPERVIOUS AREA CALCULATIONS

DEVELOPED CONDITIONS

BASIN	TOTAL AREA (AC)	(AC)	SUB-AREA 1 DEVELOPMENT/ COVER	IMP. AREA (%)	AREA (AC)	SUB-AREA 2 DEVELOPMENT/ COVER	IMP. AREA (%)	(AC)	SUB-AREA 3 DEVELOPMENT COVER	IMP. AREA (%)	WEIGHTED IMP. AREA (%)
A1A	2.80	0.9	ROADWAY	100	1.9	GRASS	0				33.571
C1.2	7.97	8.0	COMMERCIAL	70							70.000
C1.7A	0.58	0.6	SF LOTS (1/6-AC)	52.5							52.500
C1.7B	4.34	4.3	COMMERCIAL	70							70.000
C1.7A,C1.7B	4.92										67.937
C1.2,C1.7	12.89										69.213
C1.3	3.02	3.0	SF LOTS (1/6-AC)	52.5							52.500
C1.2,C1.3,C1.7	15.91										66.040
C1.4	3.23	3.2	SF LOTS (1/6-AC)	52.5							52.500
C1.2-C1.4,C1.7	19.14										63.755
C1.5	3.18	3.2	SF LOTS (1/6-AC)	52.5							52.500
C1.2-C1.5,C1.7	22.32										62.152
C1.1	9.38	3.0	RESIDENTIAL	52.5	1.2	COMMERCIAL	70	5.2	OPEN SPACE	0	25.672
C1.6	1.98	2.0	SF LOTS (1/6-AC)	52.5							52.500
C1.1,C1.6	11.36										30.348
C1.1-C1.7	33.68										51.424
C1.8	3.89	3.9	SF LOTS (1/6-AC)	52.5							52.500
C1.9	3.60	3.6	SF LOTS (1/6-AC)	52.5							52.500
C1.8-C1.9	7.49										52.500
C1.1-C1.9	41.17										51.620
C1.10	1.82	1.8	SF LOTS (1/6-AC)	52.5							52.500
C1.1-C1.10	**42.99**										**51.657**
C2.1	5.59	1.8	SF LOTS (1/6-AC)	52.5	0.9	COMMERCIAL	70	2.9	OPEN SPACE	0	28.426
C2.2	4.03	4.0	SF LOTS (1/6-AC)	52.5							52.500
C2.3	2.76	2.8	SF LOTS (1/6-AC)	52.5							52.500
C2.1-C2.3	12.38										41.630
C2.4	4.98	5.0	SF LOTS (1/6-AC)	52.5							52.500
C2.5	4.12	4.1	SF LOTS (1/6-AC)	52.5							52.500
C2.1-C2.5	21.48										46.235
C3	20.25	20.3	PARK / OS	0							0.000
C2.1-C2.5,C3	41.73										23.799
C2.6	2.76	2.2	SF LOTS (1/6-AC)	52.5	0.6	COMM / LT INDUSTRIAL	80				58.478
C2.7	2.14	2.1	COMM / LT INDUSTRIAL	80							80.000
C2.8	3.00	2.0	SF LOTS (1/6-AC)	52.5	1.0	COMM / LT INDUSTRIAL	80				61.667
C2.6-C2.8	7.90										65.519

INTERIM PHASE 1 DETENTION POND C2.8:											
C2.6	2.76	2.8	VACANT	0							0.000
C2.7	2.14	2.1	COMM / LT INDUSTRIAL	80							80.000
C2.8	3.00	3.0	VACANT	0							0.000
C2.6-C2.8	7.90										21.671
D1.2	2.99	1.6	SF LOTS (1/6-AC)	52.5	1.4	COMM / LT INDUSTRIAL	80				64.916
C2.6-C2.8,D1.2	10.89										65.354
D1.1	3.60	3.6	COMM / LT INDUSTRIAL	80							80.000
D1.3	2.87	1.6	SF LOTS (1/6-AC)	52.5	1.3	COMM / LT INDUSTRIAL	80				64.861
C2.6-C2.8,D1.1-D1.3	17.36										68.309
D1.4	4.19	4.2	SF LOTS (1/6-AC)	52.5							52.500
D1.5	5.09	5.1	SF LOTS (1/6-AC)	52.5							52.500
D1.6	3.33	3.3	SF LOTS (1/6-AC)	52.5							52.500
C2.6-C2.8,D1.1-D1.6	29.97										61.657
D2	44.58	39.5	SF LOTS (1/6-AC)	52.5	5.1	LANDSCAPE/OS	0				46.494
C2.6-C2.8,D1.1-D1.6,D2	74.55										52.590
C2,C3,D	**116.28**										**42.257**
C1-C3,D	**159.27**										**44.795**
C4	**72.81**	61.9	MDR-RESIDENTIAL	52.5	10.9	LANDSCAPE/OS	0				**44.625**
E	2.4	0.3	MDR-RESIDENTIAL	52.5	2.1	OPEN SPACE	0				5.981

INTELIFAB - LOT 1, MAYBERRY, COLORADO SPRINGS FILING NO. 2
CHANNEL CALCULATIONS
DEVELOPED FLOWS

PROPOSED CHANNELS

CHANNEL	DESIGN POINT	PROPOSED SLOPE (%)	BOTTOM WIDTH (B, FT)	SIDE SLOPE (Z)	CHANNEL DEPTH (FT)	FRICTION FACTOR (n)		Q100 FLOW (CFS)	Q100 DEPTH (FT)	Q100 VELOCITY (FT/S)	Q100 MAX. SHEAR STRESS (PSF)	CHANNEL LINING
C2.7A	C2.7A	0.50	0	3:1	2.0	0.030		4.7	0.9	2.0	0.3	GRASS

* DP-C2.7A FLOW CALCULATED AS 45% OF DP-C2.7: Q100 = (40% * 10.3 CFS) = 4.7 CFS

1) Channel flow calculations based on Manning's Equation
2) Channel depth includes 1' minimum freeboard
3) n = 0.03 for grass-lined non-irrigated channels (minimum)
4) Vmax = 5.0 fps for 100-year flows w/ grass-lined channels
5) Vmax = 8.0 fps for 100-year flows w/ Erosion Control Blankets (Tensar Eronet P300 or equal)

Hydraulic Analysis Report

Project Data

Project Title: Project - Intelifab

Designer: JPS

Project Date: Tuesday, November 17, 2020

Project Units: U.S. Customary Units

Notes:

Channel Analysis: Channel Analysis-C2.7A

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 3.0000 ft/ft

Side Slope 2 (Z2): 3.0000 ft/ft

Longitudinal Slope: 0.0050 ft/ft

Manning's n: 0.0300

Flow: 4.7000 cfs

Result Parameters

Depth: 0.8911 ft

Area of Flow: 2.3824 ft^2

Wetted Perimeter: 5.6361 ft

Hydraulic Radius: 0.4227 ft

Average Velocity: 1.9728 ft/s

Top Width: 5.3469 ft

Froude Number: 0.5208

Critical Depth: 0.6865 ft

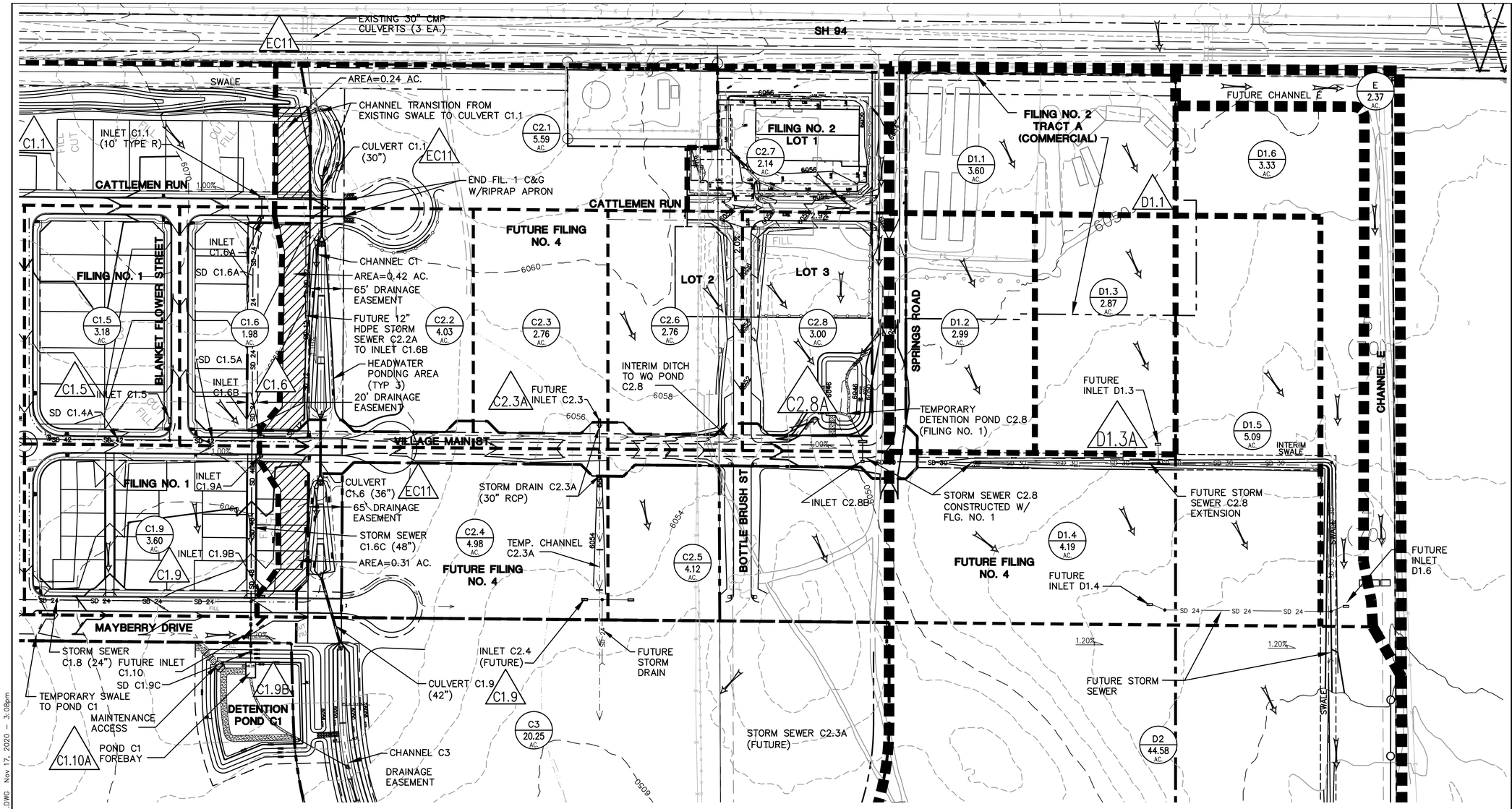
Critical Velocity: 3.3245 ft/s

Critical Slope: 0.0201 ft/ft

Critical Top Width: 4.12 ft

Calculated Max Shear Stress: 0.2780 lb/ft^2

Calculated Avg Shear Stress: 0.1319 lb/ft^2



LEGEND:

- PROPERTY LINES
- DRAINAGE BASIN BOUNDARY
- SUB-BASIN BOUNDARY
- PROPOSED FLOW DIRECTION ARROW
- EXISTING CONTOURS (6490)
- PROPOSED CONTOURS (6490)
- PROPOSED STREET PROFILE GRADE (1.5%)
- AREA EXCLUDED FROM WATER QUALITY FACILITIES
- DESIGN POINT (C1.9)
- DEVELOPED BASIN DESIGNATION (OA1)
- BASIN AREA (ACRES) (66.8 AC.)

BASIN C2.7 IMPERVIOUS CALCULATION

BASIN C2.7 AREA = 2.14 AC.

IMPERVIOUS AREAS:

SURFACE TYPE	AREA
PARKING PAVEMENT	43,839 SF
BUILDING	20,328 SF
SIDEWALK	1,581 SF
TOTAL	65,748 SF
	= 1.51 AC
	= 70.6% IMPERVIOUS

SUMMARY HYDROLOGY TABLE

DESIGN POINT	Q_5 (CFS)	Q_{100} (CFS)
C2.3A	11.8	31.6
C2.8A	13.4	28.9
D1.1	10.4	20.8
D1.3A	26.8	57.1

MAYBERRY, COLORADO SPRINGS - FILING NO. 1-2

EAST SITE / FILING NO. 2 DEVELOPED DRAINAGE PLAN

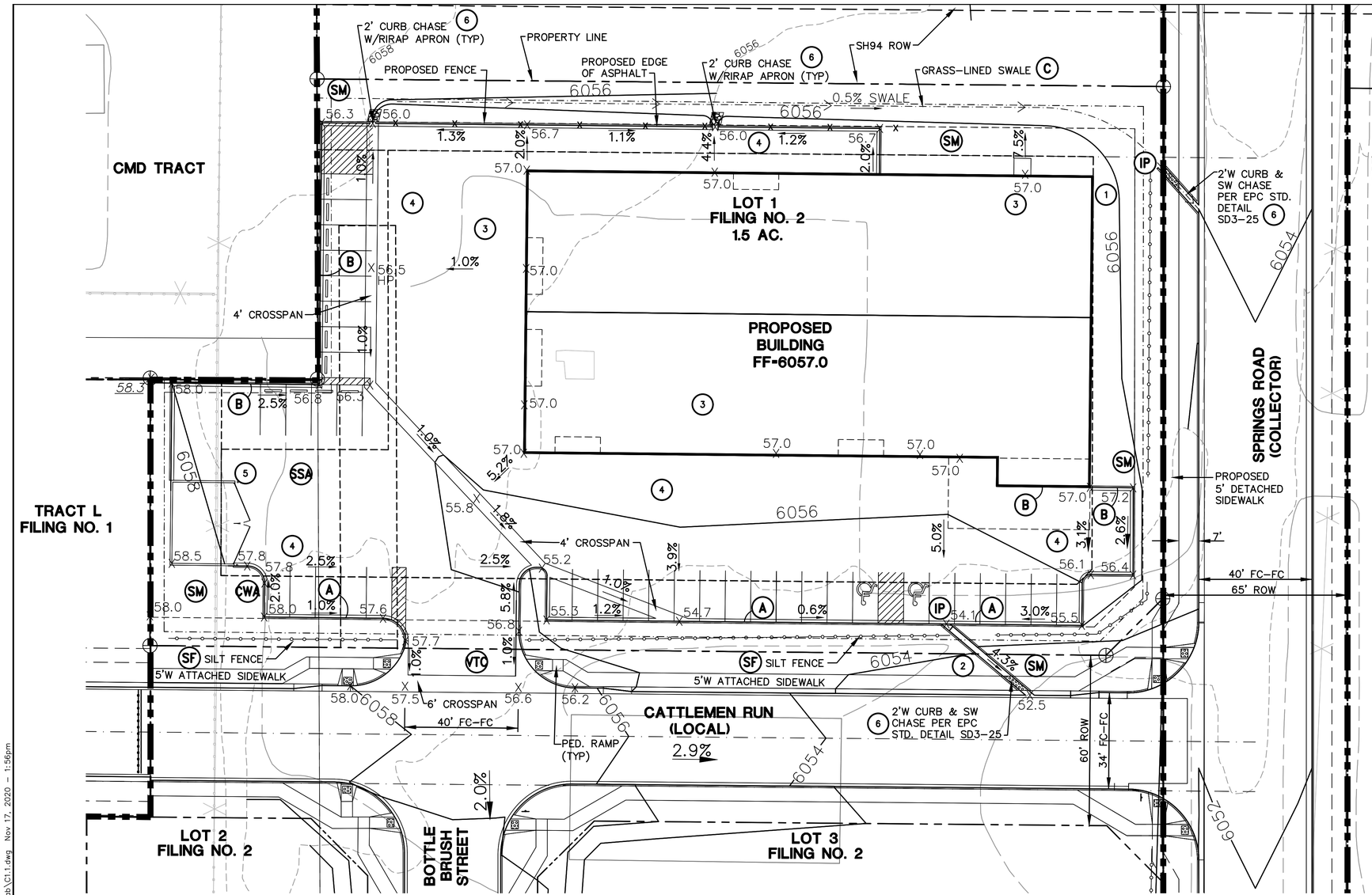
JPS ENGINEERING
19 E. Willamette Ave.
Colorado Springs, CO 80903
PH: 719-477-9429
FAX: 719-471-0766
www.jpsengr.com

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"=100'
VERT. SCALE:	N/A
SURVEYED:	RAMPART
CREATED:	3/28/19
PROJECT NO:	090001
DRAWN:	BJJ
DESIGNED:	JPS
CHECKED:	JPS
LAST MODIFIED:	11/17/20
MODIFIED BY:	BJJ

SHEET: D1.12



GRADING & EROSION CONTROL (GEC) PLAN SHEET INDEX

NOTE: STORMWATER DETENTION AND WATER QUALITY FOR THIS SITE (INCLUDING TEMPORARY SEDIMENT BASIN) IS PROVIDED IN OFF-SITE DETENTION POND C2.8

KEYED NOTES:

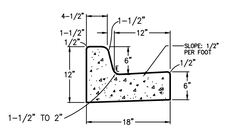
1. TOPSOIL & STRIPPINGS STOCKPILE AREA (SP)
2. CONTRACTOR MAY WASTE EXCESS CUT MATERIAL OR BORROW SUITABLE FILL MATERIAL FROM THIS AREA. MAINTAIN POSITIVE DRAINAGE & MATCH INTO EXISTING GRADES WITH 3:1 MAX. SLOPE.
3. PREPARE AND COMPACT BUILDING FOUNDATION & SLAB PER PROJECT GEOTECHNICAL REPORT
4. PARKING LOT PAVING PER GEOTECHNICAL REPORT (4" ASPHALT OVER 6" AGGREGATE BASE UNLESS NOTED OTHERWISE)
5. STORAGE AREA FOR BUILDING MATERIALS, EQUIPMENT, CONSTRUCTION WASTE, & STOCKPILES (CONTRACTOR MAY ADJUST AS NEEDED)
6. 2' CURB CHASE W/4'x4'x2'D RIPRAP APRON (d_{50}=12")

LEGEND:

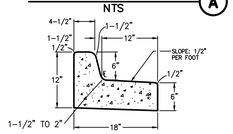
- BOUNDARY LINES
- 6490 EXISTING CONTOURS
- 6490 PROPOSED CONTOURS
- 99.00 PROPOSED SPOT ELEVATION (FLOWLINE)
- PROPOSED STREET PROFILE GRADE
- CUT / FILL CUT-FILL DEMARCATION LINES
- FLOW DIRECTION ARROWS

EROSION CONTROL LEGEND:

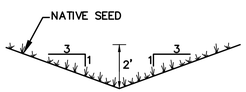
- (IP) INLET PROTECTION (GRAVEL FILTER)
- (SF) SILT FENCE
- (VTC) VEHICLE TRACKING CONTROL PAD (PER EPC STD. DETAIL)
- (SM) SEED AND MULCH
- (STB) STRAW BALE BARRIER
- (TSB) TEMPORARY SEDIMENT BASIN
- (RR) RIPRAP
- (CWA) CONCRETE WASHOUT AREA
- (SSA) STABILIZED STAGING AREA



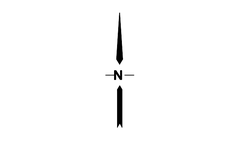
TYPE 3 CARRY CURB (A)
NTS



TYPE 3 SPILL CURB (B)
NTS



TYPICAL GRASS SWALE SECTION (C)
NTS



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

EPC PROJ. NO. PPR-2012

INTELIFAB
LOT 1, MAYBERRY, COLORADO SPRINGS, FIL. NO. 2

SITE GRADING & EROSION CONTROL PLAN

No.	REVISION	BY	DATE
	DP SUBMITTAL	JPS	3/30/20
	COUNTY COMMENTS	JPS	11/17/20

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

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.

HORZ. SCALE:	1"=20'
VERT. SCALE:	N/A
SURVEYED:	RAMPART
CREATED:	11/14/20
PROJECT NO:	090001
DRAWN:	BJJ
DESIGNED:	JPS
CHECKED:	JPS
LAST MODIFIED:	11/17/20
MODIFIED BY:	BJJ

SHEET: C1.1

C:\Users\Owner\Dropbox\jpsprojects\090001.Ellicott1TC\dwg\Civil\Intelifab C1.1.dwg Nov 17, 2020 - 1:56pm