



INNOVATIVE DESIGN. CLASSIC RESULTS.

**DRAINAGE ADDENDUM FOR  
MASTER DEVELOPMENT DRAINAGE PLAN FOR  
MARKETPLACE AT INTERQUEST AND FINAL  
DRAINAGE REPORT FOR MARKETPLACE AT  
INTERQUEST FILING NO. 1 AND FILING NO. 2  
(REF. FOOTHILLS FARM CAMPUS  
FILING NO. 2)  
INTERIM STORM**

Prepared for:  
**ALLISON VALLEY DEVELOPMENT COMPANY, LLC**  
1755 TELSTAR DRIVE, SUITE 211  
COLORADO SPRINGS, CO 80920  
(719) 867-2279

Job no. 2399.86

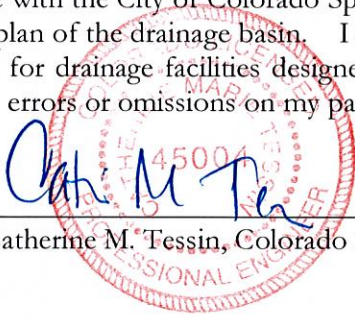


# DRAINAGE MEMO FOR MARKETPLACE AT INTERQUEST FIL. NO 1 & 2 – FOOTHILLS FARM CAMPUS FIL. 2 INTERIM STORM

## Engineer's Statement

This report and plan for the drainage design of **Foothills Farm Campus Filing No. 2** was prepared by me (or under my direct supervision) and is correct to the best of my knowledge and belief. Said report and plan has been prepared in accordance with the City of Colorado Springs Drainage Design and Technical Criteria and is in conformity with the master plan of the drainage basin. I understand that the City of Colorado Springs does not and will not assume liability for drainage facilities designed by others. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

SIGNATURE (Affix Seal):

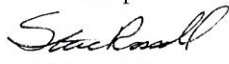
  
Catherine M. Tessin, Colorado P.E. No. 45004  
3/25/19  
Date

## Developer's Statement

**Allison Valley Development Company, LLC** hereby certifies that the drainage facilities for **Foothills Farm Campus Filing No. 2** shall be constructed according to the design presented in this report. I understand that the City of Colorado Springs does not and will not assume liability for the drainage facilities designed and/or certified by my engineer and that are submitted to the City of Colorado Springs pursuant to section 7.7.906 of the City Code; and cannot, on behalf of **Foothills Farm Campus Filing No. 2**, guarantee that final drainage design review will absolve **Allison Valley Development Company, LLC**, and/or their successors and/or assigns of future liability for improper design. I further understand that approval of the final plat does not imply approval of my engineer's drainage design.

Allison Valley Development Co., LLC a Colorado Limited Liability Company

Name of Developer

  
3/20/19  
Authorized Signature Date

Steve Rossoll

Printed Name

La Plata Communities, Inc. A Colorado Corporation, Manager  
Title

1755 Telstar Drive, Suite 211, Colorado Springs, CO 80920  
Address:

## City of Colorado Springs Statement:

Filed in accordance with Section 7.7.906 of the Code of the City of Colorado Springs, 2001, as amended.

  
04/02/2019  
For City Engineer Date  
Conditions:



## **GENERAL DESCRIPTION**

The Foothills Farm Campus PUD Concept Plan reflects a proposed mixed-use development generally located north of the existing Great Wolf Lodge and north and south of existing Federal Drive north of New Life Drive and east of the Great Wolf Lodge properties.

## **EXISTING DRAINAGE CONDITIONS**

The proposed site currently predominantly drains in a north/northwesterly direction as sheet flow. Existing public storm facilities in Federal Drive convey adjacent developed and undeveloped flows into an existing temporary detention facility located in Parcel A.

The overall site was previously studied in the "Master Development Drainage Plan for Marketplace at Interquest and Final Drainage Report for Marketplace at Interquest Filing No. 1 and Filing No. 2" dated April 2007 by Classic Consulting Engineers and Surveyors, LLC. The attached "existing conditions" map is from the approved Master Development Drainage Plan with the approved PUD Concept Plan boundary indicated.

Current conditions are generally reflected in the attached "Filing No. 1 and 2" conditions drainage map from the same approved Master Development Drainage Plan.

## **PROPOSED DRAINAGE CONDITIONS**

At this time, only an interim extension of existing storm systems is proposed, as the Development Plan or Final Plats proposed to be submitted (titled Foothills Farm Campus Filing No. 2) in the upcoming month. Site specific Final Drainage Reports will be required for any development within this PUD Concept Plan area that details full adherence to the City Drainage Criteria Manual, including the use of full spectrum detention. Unless modified in future Final Drainage Reports, all previously approved drainage routing and detention facility design will be adhered to (see attached "developed" map from approved Master Development Drainage Plan).

With the interim extensions of these pipes, the existing Pond BS-3T will continue to detain and treat the developed stormwater. The extension of these pipes is being completed at this time to facilitate the relocation of an existing 18" gas main across the subject property.

The overall drainage routing, flow calculations, and general drainage patterns described within the previously approved MIDDP match the proposed conditions on the proposed storm plans. Final drainage reports will be submitted with a Development Plan and/or Plat submittal to support site development upon extension of the storm mainlines.

Please see attached HGL calculations for the extension of the storm pipes.

PREPARED BY:

Catherine M. Tessin, P.E.  
Project Manager



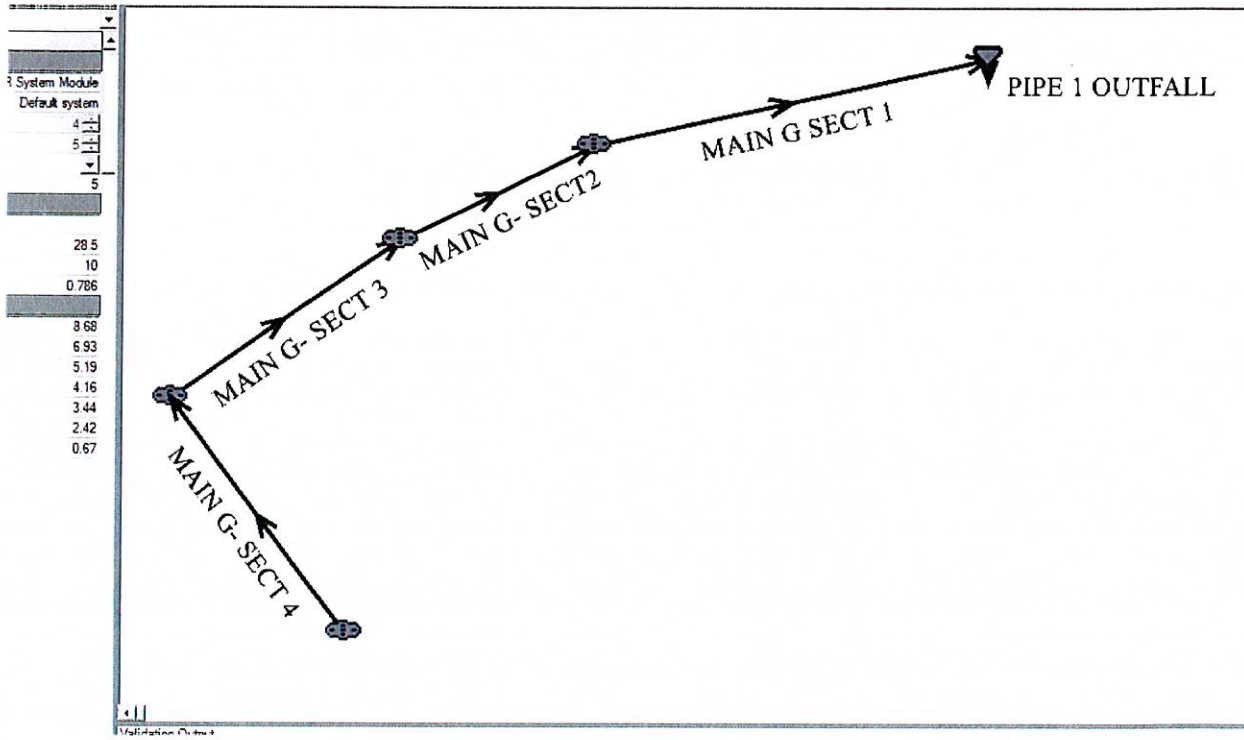


JOB NAME: INTERQUEST NORTH - FILINGS NO. 1 & 2 FDR  
 JOB NUMBER: 22206.00  
 DATE: 07/24/07  
 CALCULATED BY: MAL

\* PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM GRADE.  
 REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.

FINAL DRAINAGE REPORT ~ PIPE ROUTING SUMMARY

Pipe Run	Contributing Basins	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Pipe Size*
					I(5)	I(100)	Q(5)	Q(100)	
82	DP 57	0.54	0.54	5.0	5.10	9.07	3	5	18" @ 0.7%
83	PIPE 82 + DP 58	2.07	2.07	5.0	5.10	9.07	11	19	24"
85	PIPE 81 + PIPE 83	29.23	29.38	14.0	3.57	6.35	104	187	54" @ 0.9%
85INTERIM	PIPE 85 W/O PIPE 64	28.42	28.57	14.0	3.57	6.35	102	181	54" @ 0.9%
87	DP 60 (DEV.)	0.54	0.57	5.0	5.10	9.07	3	5	24" (INTERIM) @ 0.4%
88	DP 61	15.99	18.45	15.0	3.46	6.16	55	114	48" @ 0.6%
89	DP 62	2.61	2.76	5.8	4.90	8.70	13	24	30" @ 0.3%
90	DP 63	2.97	3.14	7.5	4.55	8.09	14	25	30" @ 0.4%
91	PIPES 89 + 90	5.58	5.89	7.5	4.55	8.09	25	48	36" @ 0.5%
92	PIPES 87 + 88 + 91	22.11	24.91	15.0	3.46	6.16	77	153	60" @ 0.6%
92INTERIM	92 w/DP 61 -INTERIM	14.73	17.53	33.8	2.26	4.02	33	70	60" @ 0.6%
95	DP 65	9.08	12.71	35.1	2.21	3.93	20	50	36" @ 0.6%
96	DP 66 (DEV.)	8.64	8.64	8.4	4.38	7.78	38	67	42" @ 0.4%
97	PIPES 95 + 96	17.72	21.35	22.0	2.87	5.10	51	109	48" @ 0.6%
97B	PIPES 104 + 97	18.49	22.05	22.0	2.87	5.10	53	113	48" @ 0.6%
98	DP 67	0.92	0.83	5.0	5.10	9.07	5	8	18" @ 0.6%
99	PIPES 97B + 98	19.41	22.88	22.0	2.87	5.10	56	117	48" @ 0.7%



# System Input Summary MAIN G 5 YEAR HGL

## Rainfall Parameters

Rainfall Return Period: 5

Rainfall Calculation Method: Table

Time	Intensity
5	8.68
10	6.93
20	5.19
30	4.16
40	3.44
60	2.42
120	0.67

## Rational Method Constraints

Minimum Urban Runoff Coeff.: 0.35

Maximum Rural Overland Len. (ft): 500

Maximum Urban Overland Len. (ft): 300

Used UDFCD Tc. Maximum: No

## Sizer Constraints

Minimum Sewer Size (in): 18.00

Maximum Depth to Rise Ratio: 0.99

Maximum Flow Velocity (fps): 18.0

Minimum Flow Velocity (fps): 2.0

## Backwater Calculations:

Tailwater Elevation (ft): 6627.90

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## Manhole Input Summary:

Element Name	Ground Elevation (ft)	Given Flow		Drainage Area (Ac.)	Sub Basin Information						
		Total Known Flow (cfs)	Local Contribution (cfs)		Runoff Coefficient	5yr Coefficient	Overland Length (ft)	Overland Slope (%)	Gutter Length (ft)	Gutter Velocity (fps)	
PIPE 1 OUTFALL	6627.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAIN G SECT 1	6650.90	104.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAIN G- SECT2	6650.91	104.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAIN G- SECT 3	6647.52	104.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAIN G- SECT 4	6647.34	104.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

## Manhole Output Summary:

Element Name	Local Contribution					Total Design Flow				Comment
	Overland Time (min)	Gutter Time (min)	Basin Tc (min)	Intensity (in/hr)	Local Contrib (cfs)	Coeff. Area	Intensity (in/hr)	Manhole Tc (min)	Peak Flow (cfs)	
PIPE 1 OUTFALL	0.00	0.00	0.00	0.00	0.00	179.99	0.58	0.33	104.00	
MAIN G SECT 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	104.00	Surface Water Present (Downstream)
MAIN G- SECT2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	104.00	
MAIN G- SECT 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	104.00	
MAIN G- SECT 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	104.00	



## Sewer Input Summary:

Element Name	Sewer Length (ft)	Elevation			Loss Coefficients			Given Dimensions		
		Downstream Invert (ft)	Slope (%)	Upstream Invert (ft)	Mannings n	Bend Loss	Lateral Loss	Cross Section	Rise (ft or in)	Span (ft or in)
MAIN G SECT 1	130.59	6627.93	0.8	6628.98	0.013	0.03	0.00	CIRCULAR	54.00 in	54.00 in
MAIN G- SECT2	40.00	6628.98	0.8	6629.30	0.013	0.05	0.00	CIRCULAR	60.00 in	60.00 in
MAIN G- SECT 3	66.43	6629.30	0.8	6629.83	0.013	0.07	0.00	CIRCULAR	60.00 in	60.00 in
MAIN G- SECT 4	30.68	6630.13	0.8	6630.38	0.013	1.32	0.00	CIRCULAR	60.00 in	60.00 in

## Sewer Flow Summary:

Element Name	Full Flow Capacity		Critical Flow		Normal Flow				Flow (cfs)	Surcharged Length (ft)	Comment
	Flow (cfs)	Velocity (fps)	Depth (in)	Velocity (fps)	Depth (in)	Velocity (fps)	Froude Number	Flow Condition			
MAIN G SECT 1	176.79	11.12	35.97	9.24	29.78	11.56	1.44	Supercritical	104.00	0.00	
MAIN G- SECT2	233.51	11.89	34.86	8.79	28.05	11.55	1.51	Supercritical	104.00	0.00	
MAIN G- SECT 3	233.32	11.88	34.86	8.79	28.06	11.54	1.51	Supercritical	104.00	0.00	
MAIN G- SECT 4	235.73	12.01	34.86	8.79	27.90	11.63	1.53	Supercritical	104.00	0.00	

- A Froude number of 0 indicates that pressurized flow occurs (adverse slope or undersized pipe).
- If the sewer is not pressurized, full flow represents the maximum gravity flow in the sewer.
- If the sewer is pressurized, full flow represents the pressurized flow conditions.

## Sewer Sizing Summary:

Element Name	Peak Flow (cfs)	Cross Section	Existing		Calculated		Used		Area (ft^2)	Comment
			Rise	Span	Rise	Span	Rise	Span		
MAIN G SECT 1	104.00	CIRCULAR	54.00 in	54.00 in	48.00 in	48.00 in	54.00 in	54.00 in	15.90	
MAIN G- SECT2	104.00	CIRCULAR	60.00 in	60.00 in	48.00 in	48.00 in	60.00 in	60.00 in	19.63	
MAIN G- SECT 3	104.00	CIRCULAR	60.00 in	60.00 in	48.00 in	48.00 in	60.00 in	60.00 in	19.63	
MAIN G- SECT 4	104.00	CIRCULAR	60.00 in	60.00 in	48.00 in	48.00 in	60.00 in	60.00 in	19.63	

- Calculated diameter was determined by sewer hydraulic capacity rounded up to the nearest commercially available size.
- Sewer sizes should not decrease downstream.
- All hydraulics were calculated using the 'Used' parameters.

## Grade Line Summary:

Tailwater Elevation (ft): 6627.90

Element Name	Invert Elev.		Downstream Manhole Losses		HGL		EGL		
	Downstream (ft)	Upstream (ft)	Bend Loss (ft)	Lateral Loss (ft)	Downstream (ft)	Upstream (ft)	Downstream (ft)	Friction Loss (ft)	Upstream (ft)
MAIN G SECT 1	6627.93	6628.98	0.00	0.00	6630.41	6631.98	6632.49	0.82	6633.30
MAIN G- SECT2	6628.98	6629.30	0.02	0.00	6632.00	6632.21	6633.39	0.02	6633.40
MAIN G- SECT 3	6629.30	6629.83	0.03	0.00	6632.24	6632.74	6633.71	0.23	6633.93
MAIN G- SECT 4	6630.13	6630.38	0.58	0.00	6633.31	6633.64	6634.56	0.00	6634.56

- Bend and Lateral losses only apply when there is an outgoing sewer. The system outfall, sewer #0, is not considered a sewer.
- Bend loss =  $Bend\ K * V_{fi}^2 / (2 * g)$
- Lateral loss =  $V_{fo}^2 / (2 * g) - Junction\ Loss\ K * V_{fi}^2 / (2 * g)$ .
- Friction loss is always Upstream EGL - Downstream EGL.

# System Input Summary MAIN G 100 YEAR HGL

## Rainfall Parameters

Rainfall Return Period: 100

Rainfall Calculation Method: Table

Time	Intensity
5	8.68
10	6.93
20	5.19
30	4.16
40	3.44
60	2.42
120	0.67

## Rational Method Constraints

Minimum Urban Runoff Coeff.: 0.35

Maximum Rural Overland Len. (ft): 500

Maximum Urban Overland Len. (ft): 300

Used UDFCD Tc. Maximum: No

## Sizer Constraints

Minimum Sewer Size (in): 18.00

Maximum Depth to Rise Ratio: 0.99

Maximum Flow Velocity (fps): 18.0

Minimum Flow Velocity (fps): 2.0

## Backwater Calculations:

Tailwater Elevation (ft): 6627.90

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## Sewer Input Summary:

Element Name	Sewer Length (ft)	Elevation			Loss Coefficients			Given Dimensions		
		Downstream Invert (ft)	Slope (%)	Upstream Invert (ft)	Mannings n	Bend Loss	Lateral Loss	Cross Section	Rise (ft or in)	Span (ft or in)
MAIN G SECT 1	130.59	6627.93	0.8	6628.98	0.013	0.03	0.00	CIRCULAR	54.00 in	54.00 in
MAIN G- SECT2	40.00	6628.98	0.8	6629.30	0.013	0.05	0.00	CIRCULAR	60.00 in	60.00 in
MAIN G- SECT 3	66.43	6629.30	0.8	6629.83	0.013	0.07	0.00	CIRCULAR	60.00 in	60.00 in
MAIN G- SECT 4	30.68	6630.13	0.8	6630.38	0.013	1.32	0.00	CIRCULAR	60.00 in	60.00 in

## Sewer Flow Summary:

Element Name	Full Flow Capacity		Critical Flow		Normal Flow			Flow Condition	Flow (cfs)	Surcharged Length (ft)	Comment
	Flow (cfs)	Velocity (fps)	Depth (in)	Velocity (fps)	Depth (in)	Velocity (fps)	Froude Number				
MAIN G SECT 1	176.79	11.12	54.00	11.76	54.00	11.76	0.00	Pressurized	187.00	130.59	
MAIN G- SECT2	233.51	11.89	46.95	11.34	40.63	13.22	1.34	Pressurized	187.00	40.00	
MAIN G- SECT 3	233.32	11.88	46.95	11.34	40.65	13.21	1.34	Pressurized	187.00	66.43	
MAIN G- SECT 4	235.73	12.01	46.95	11.34	40.35	13.32	1.36	Pressurized	187.00	30.68	

- A Froude number of 0 indicates that pressured flow occurs (adverse slope or undersized pipe).
- If the sewer is not pressurized, full flow represents the maximum gravity flow in the sewer.
- If the sewer is pressurized, full flow represents the pressurized flow conditions.

## Sewer Sizing Summary:

Element Name	Peak Flow (cfs)	Cross Section	Existing		Calculated		Used		Area (ft <sup>2</sup> )	Comment
			Rise	Span	Rise	Span	Rise	Span		
MAIN G SECT 1	187.00	CIRCULAR	54.00 in	54.00 in	60.00 in	60.00 in	54.00 in	54.00 in	15.90	Existing height is smaller than the suggested height. Existing width is smaller than the suggested width. Exceeds max. Depth/Rise
MAIN G- SECT2	187.00	CIRCULAR	60.00 in	60.00 in	60.00 in	60.00 in	60.00 in	60.00 in	19.63	
MAIN G- SECT 3	187.00	CIRCULAR	60.00 in	60.00 in	60.00 in	60.00 in	60.00 in	60.00 in	19.63	
MAIN G- SECT 4	187.00	CIRCULAR	60.00 in	60.00 in	60.00 in	60.00 in	60.00 in	60.00 in	19.63	

- Calculated diameter was determined by sewer hydraulic capacity rounded up to the nearest commercially available size.
- Sewer sizes should not decrease downstream.
- All hydraulics were calculated using the 'Used' parameters.



## Grade Line Summary:

Tailwater Elevation (ft): 6627.90

Element Name	Invert Elev.		Downstream Manhole Losses		HGL		EGL		
	Downstream (ft)	Upstream (ft)	Bend Loss (ft)	Lateral Loss (ft)	Downstream (ft)	Upstream (ft)	Downstream (ft)	Friction Loss (ft)	Upstream (ft)
MAIN G SECT 1	6627.93	6628.98	0.00	0.00	6632.43	6633.60	6634.58	1.17	6635.75
MAIN G- SECT2	6628.98	6629.30	0.07	0.00	6634.41	6634.62	6635.82	0.21	6636.03
MAIN G- SECT 3	6629.30	6629.83	0.10	0.00	6634.72	6635.06	6636.13	0.34	6636.47
MAIN G- SECT 4	6630.13	6630.38	1.86	0.00	6636.92	6637.07	6638.33	0.16	6638.48

- Bend and Lateral losses only apply when there is an outgoing sewer. The system outfall, sewer #0, is not considered a sewer.
- Bend loss = Bend K \* V<sub>fi</sub> ^ 2/(2\*g)
- Lateral loss = V<sub>fo</sub> ^ 2/(2\*g)- Junction Loss K \* V<sub>fi</sub> ^ 2/(2\*g).
- Friction loss is always Upstream EGL - Downstream EGL.

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# System Input Summary – MAIN D 5 YEAR HGL

## Rainfall Parameters

**Rainfall Return Period:** 100

**Rainfall Calculation Method:** Table

Time	Intensity
5	8.68
10	6.93
20	5.19
30	4.16
40	3.44
60	2.42
120	0.67

## Rational Method Constraints

**Minimum Urban Runoff Coeff.:** 0.35

**Maximum Rural Overland Len. (ft):** 500

**Maximum Urban Overland Len. (ft):** 300

**Used UDFCD Tc. Maximum:** No

## Sizer Constraints

**Minimum Sewer Size (in):** 18.00

**Maximum Depth to Rise Ratio:** 0.99

**Maximum Flow Velocity (fps):** 18.0

**Minimum Flow Velocity (fps):** 2.0

## Backwater Calculations:

**Tailwater Elevation (ft):** 6638.49

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## Manhole Input Summary:

Element Name	Ground Elevation (ft)	Given Flow		Drainage Area (Ac.)	Runoff Coefficient	Sub Basin Information				
		Total Known Flow (cfs)	Local Contribution (cfs)			5yr Coefficient	Overland Length (ft)	Overland Slope (%)	Gutter Length (ft)	Gutter Velocity (fps)
PIPE 1 OUTFALL	6627.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAIN D	6660.54	77.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

## Manhole Output Summary:

Element Name	Local Contribution				Local Contrib (cfs)	Total Design Flow				Peak Flow (cfs)	Comment
	Overland Time (min)	Gutter Time (min)	Basin Tc (min)	Intensity (in/hr)		Coeff. Area	Intensity (in/hr)	Manhole Tc (min)			
PIPE 1 OUTFALL	0.00	0.00	0.00	0.00	0.00	118.54	0.65	0.37	77.00	Surface Water Present (Upstream)	
MAIN D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	77.00	Surface Water Present (Downstream)	

## Sewer Input Summary:

Element Name	Sewer Length (ft)	Elevation			Loss Coefficients			Given Dimensions		
		Downstream Invert (ft)	Slope (%)	Upstream Invert (ft)	Mannings n	Bend Loss	Lateral Loss	Cross Section	Rise (ft or in)	Span (ft or in)
MAIN D	88.04	6638.61	1.6	6640.03	0.013	0.03	0.00	CIRCULAR	60.00 in	60.00 in

## Sewer Flow Summary:

Element Name	Full Flow Capacity		Critical Flow		Normal Flow			Flow Condition	Flow (cfs)	Surcharged Length (ft)	Comment
	Flow (cfs)	Velocity (fps)	Depth (in)	Velocity (fps)	Depth (in)	Velocity (fps)	Froude Number				
MAIN D	331.64	16.89	29.79	7.92	19.67	13.75	2.22	Supercritical	77.00	0.00	

- A Froude number of 0 indicates that pressured flow occurs (adverse slope or undersized pipe).
- If the sewer is not pressurized, full flow represents the maximum gravity flow in the sewer.
- If the sewer is pressurized, full flow represents the pressurized flow conditions.

## Sewer Sizing Summary:

Element Name	Peak Flow (cfs)	Cross Section	Existing		Calculated		Used			Comment
			Rise	Span	Rise	Span	Rise	Span	Area (ft <sup>2</sup> )	
MAIN D	77.00	CIRCULAR	60.00 in	60.00 in	36.00 in	36.00 in	60.00 in	60.00 in	19.63	

- Calculated diameter was determined by sewer hydraulic capacity rounded up to the nearest commercially available size.
- Sewer sizes should not decrease downstream.
- All hydraulics were calculated using the 'Used' parameters.

# Grade Line Summary:

Tailwater Elevation (ft): 6638.49

Element Name	Invert Elev.		Downstream Manhole Losses		HGL		EGL		
	Downstream (ft)	Upstream (ft)	Bend Loss (ft)	Lateral Loss (ft)	Downstream (ft)	Upstream (ft)	Downstream (ft)	Friction Loss (ft)	Upstream (ft)
MAIN D	6638.61	6640.03	0.00	0.00	6640.25	6642.51	6643.19	0.30	6643.48

- Bend and Lateral losses only apply when there is an outgoing sewer. The system outfall, sewer #0, is not considered a sewer.
- Bend loss = Bend K \* V<sub>fi</sub> ^ 2/(2\*g)
- Lateral loss = V<sub>fo</sub> ^ 2/(2\*g)- Junction Loss K \* V<sub>fi</sub> ^ 2/(2\*g).
- Friction loss is always Upstream EGL - Downstream EGL.



# System Input Summary – MAIN D 100 YEAR HGL

## Rainfall Parameters

**Rainfall Return Period:** 100

**Rainfall Calculation Method:** Table

<b>Time</b>	<b>Intensity</b>
5	8.68
10	6.93
20	5.19
30	4.16
40	3.44
60	2.42
120	0.67

## Rational Method Constraints

**Minimum Urban Runoff Coeff.:** 0.35

**Maximum Rural Overland Len. (ft):** 500

**Maximum Urban Overland Len. (ft):** 300

**Used UDFCD Tc. Maximum:** No

## Sizer Constraints

**Minimum Sewer Size (in):** 18.00

**Maximum Depth to Rise Ratio:** 0.99

**Maximum Flow Velocity (fps):** 18.0

**Minimum Flow Velocity (fps):** 2.0

## Backwater Calculations:

**Tailwater Elevation (ft):** 6638.49

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## Manhole Input Summary:

Element Name	Ground Elevation (ft)	Given Flow		Drainage Area (Ac.)	Runoff Coefficient	Sub Basin Information				
		Total Known Flow (cfs)	Local Contribution (cfs)			5yr Coefficient	Overland Length (ft)	Overland Slope (%)	Gutter Length (ft)	Gutter Velocity (fps)
PIPE 1 OUTFALL	6627.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAIN D	6660.54	153.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

## Manhole Output Summary:

Element Name	Local Contribution					Total Design Flow				Comment
	Overland Time (min)	Gutter Time (min)	Basin Tc (min)	Intensity (in/hr)	Local Contrib (cfs)	Coeff. Area	Intensity (in/hr)	Manhole Tc (min)	Peak Flow (cfs)	
PIPE 1 OUTFALL	0.00	0.00	0.00	0.00	0.00	468.03	0.33	0.19	153.00	Surface Water Present (Upstream)
MAIN D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	153.00	Surface Water Present (Downstream)

## Sewer Input Summary:

Element Name	Sewer Length (ft)	Elevation			Loss Coefficients			Given Dimensions		
		Downstream Invert (ft)	Slope (%)	Upstream Invert (ft)	Mannings n	Bend Loss	Lateral Loss	Cross Section	Rise (ft or in)	Span (ft or in)
MAIN D	88.04	6638.61	1.6	6640.03	0.013	0.03	0.00	CIRCULAR	60.00 in	60.00 in

## Sewer Flow Summary:

Element Name	Full Flow Capacity		Critical Flow		Normal Flow			Flow Condition	Flow (cfs)	Surcharged Length (ft)	Comment
	Flow (cfs)	Velocity (fps)	Depth (in)	Velocity (fps)	Depth (in)	Velocity (fps)	Froude Number				
MAIN D	331.64	16.89	42.55	10.28	28.62	16.55	2.14	Supercritical	153.00	0.00	

- A Froude number of 0 indicates that pressurized flow occurs (adverse slope or undersized pipe).
- If the sewer is not pressurized, full flow represents the maximum gravity flow in the sewer.
- If the sewer is pressurized, full flow represents the pressurized flow conditions.

## Sewer Sizing Summary:

Element Name	Peak Flow (cfs)	Cross Section	Existing		Calculated		Used			Comment
			Rise	Span	Rise	Span	Rise	Span	Area (ft <sup>2</sup> )	
MAIN D	153.00	CIRCULAR	60.00 in	60.00 in	48.00 in	48.00 in	60.00 in	60.00 in	19.63	

- Calculated diameter was determined by sewer hydraulic capacity rounded up to the nearest commercially available size.
- Sewer sizes should not decrease downstream.
- All hydraulics were calculated using the 'Used' parameters.

## Grade Line Summary:

Tailwater Elevation (ft): 6638.49

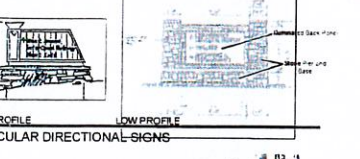
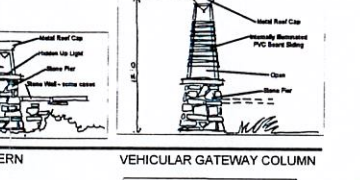
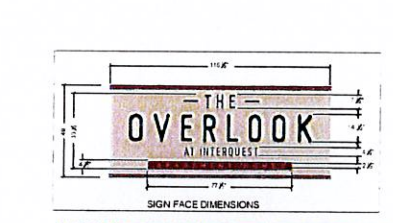
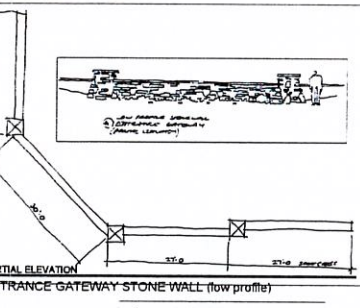
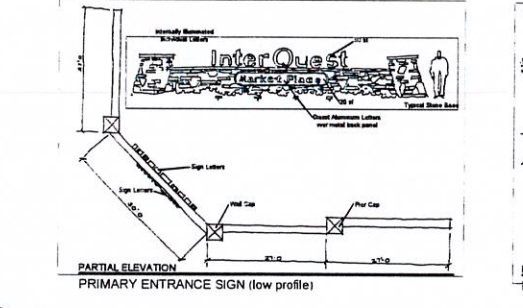
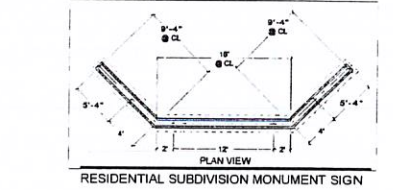
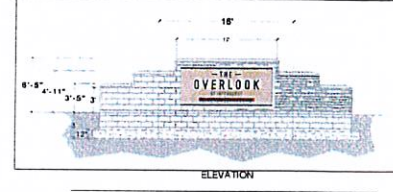
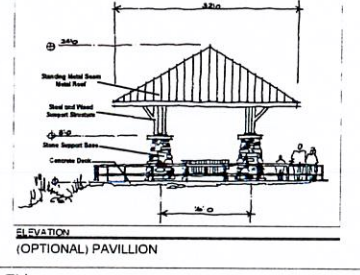
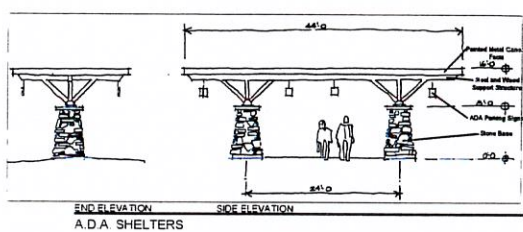
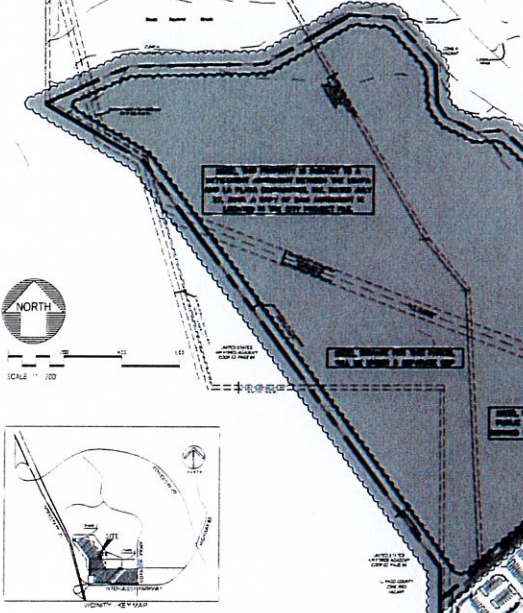
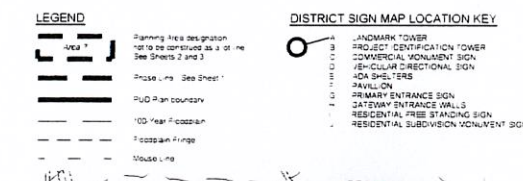
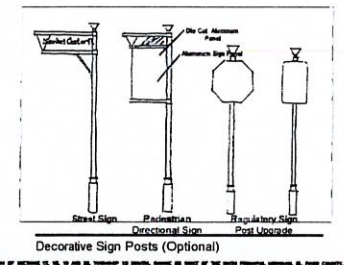
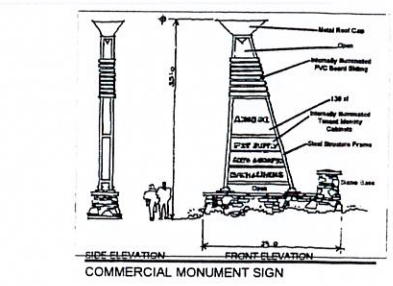
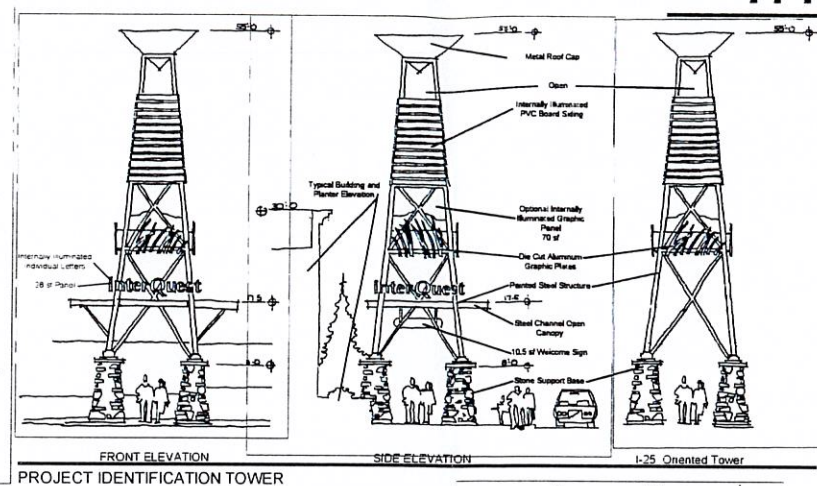
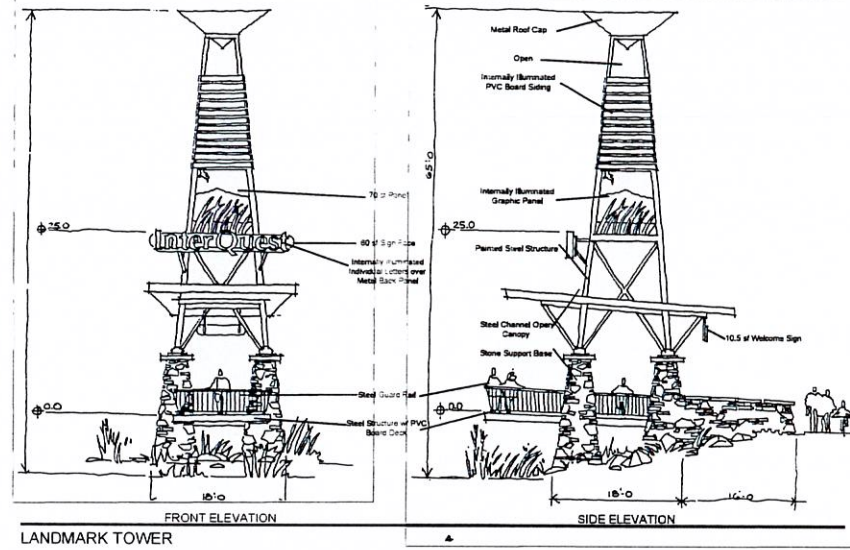
Element Name	Invert Elev.		Downstream Manhole Losses		HGL		EGL		
	Downstream (ft)	Upstream (ft)	Bend Loss (ft)	Lateral Loss (ft)	Downstream (ft)	Upstream (ft)	Downstream (ft)	Friction Loss (ft)	Upstream (ft)
MAIN D	6638.61	6640.03	0.00	0.00	6641.00	6643.83	6645.25	0.00	6645.25

- Bend and Lateral losses only apply when there is an outgoing sewer. The system outfall, sewer #0, is not considered a sewer.
- Bend loss = Bend K \* V<sub>fi</sub> ^ 2 / (2 \* g)
- Lateral loss = V<sub>fo</sub> ^ 2 / (2 \* g) - Junction Loss K \* V<sub>fi</sub> ^ 2 / (2 \* g).
- Friction loss is always Upstream EGL - Downstream EGL.



# InterQuest Marketplace

COLORADO SPRINGS, COLORADO



Item No.	Item Description	Quantity	Notes
1	Landmark Tower	1	See Sheet 1 for details
2	Project Identification Tower	1	See Sheet 1 for details
3	Commercial Monument Sign	1	See Sheet 1 for details
4	Residential Subdivision Monument Sign	1	See Sheet 1 for details
5	Residential Free Standing Sign	1	See Sheet 1 for details
6	Primary Entrance Sign (Low Profile)	1	See Sheet 1 for details
7	Entrance Gateway Stone Wall (Low Profile)	1	See Sheet 1 for details
8	Pier Lantern	1	See Sheet 1 for details
9	Vehicular Gateway Column	1	See Sheet 1 for details
10	Low Profile Vehicular Directional Signs	1	See Sheet 1 for details

**SHADE AND UNDERPROTECT IDENTIFICATION TOWER PROVISIONS**

Shade and underprotect identification tower architectural features will be allowed to be constructed within the PUD District as long as they do not obstruct the view of the tower. The tower will have a maximum height of 150 feet. The tower will be constructed within the PUD District as long as they do not obstruct the view of the tower. The tower will have a maximum height of 150 feet. The tower will be constructed within the PUD District as long as they do not obstruct the view of the tower. The tower will have a maximum height of 150 feet.

**Monument Signs**

Monument signs are used throughout the district to direct users to general areas within the district. The signs are constructed of metal and are used throughout the district to direct users to general areas within the district. The signs are constructed of metal and are used throughout the district to direct users to general areas within the district. The signs are constructed of metal and are used throughout the district to direct users to general areas within the district.

**Primary Entrance Signs and Gateway Entrance Signs**

Primary entrance signs and gateway entrance signs are used throughout the district to direct users to general areas within the district. The signs are constructed of metal and are used throughout the district to direct users to general areas within the district. The signs are constructed of metal and are used throughout the district to direct users to general areas within the district.

**Decorative Sign Posts**

Decorative sign posts are used throughout the district to direct users to general areas within the district. The signs are constructed of metal and are used throughout the district to direct users to general areas within the district. The signs are constructed of metal and are used throughout the district to direct users to general areas within the district.

**EXISTING ZONE**

PERMITTED AND CONDITIONAL LAND USES

INCREASE

MASTER PLAN

DRAINAGE BASIN

MAXIMUM BASE BUILDING HEIGHT

Building Height Restrictions

NOTICE

1. The City of Colorado Springs reserves the right to modify or remove any traffic sign, traffic signal, or street marking traffic signs located on public right-of-way or private property. The City of Colorado Springs reserves the right to modify or remove any traffic sign, traffic signal, or street marking traffic signs located on public right-of-way or private property. The City of Colorado Springs reserves the right to modify or remove any traffic sign, traffic signal, or street marking traffic signs located on public right-of-way or private property.

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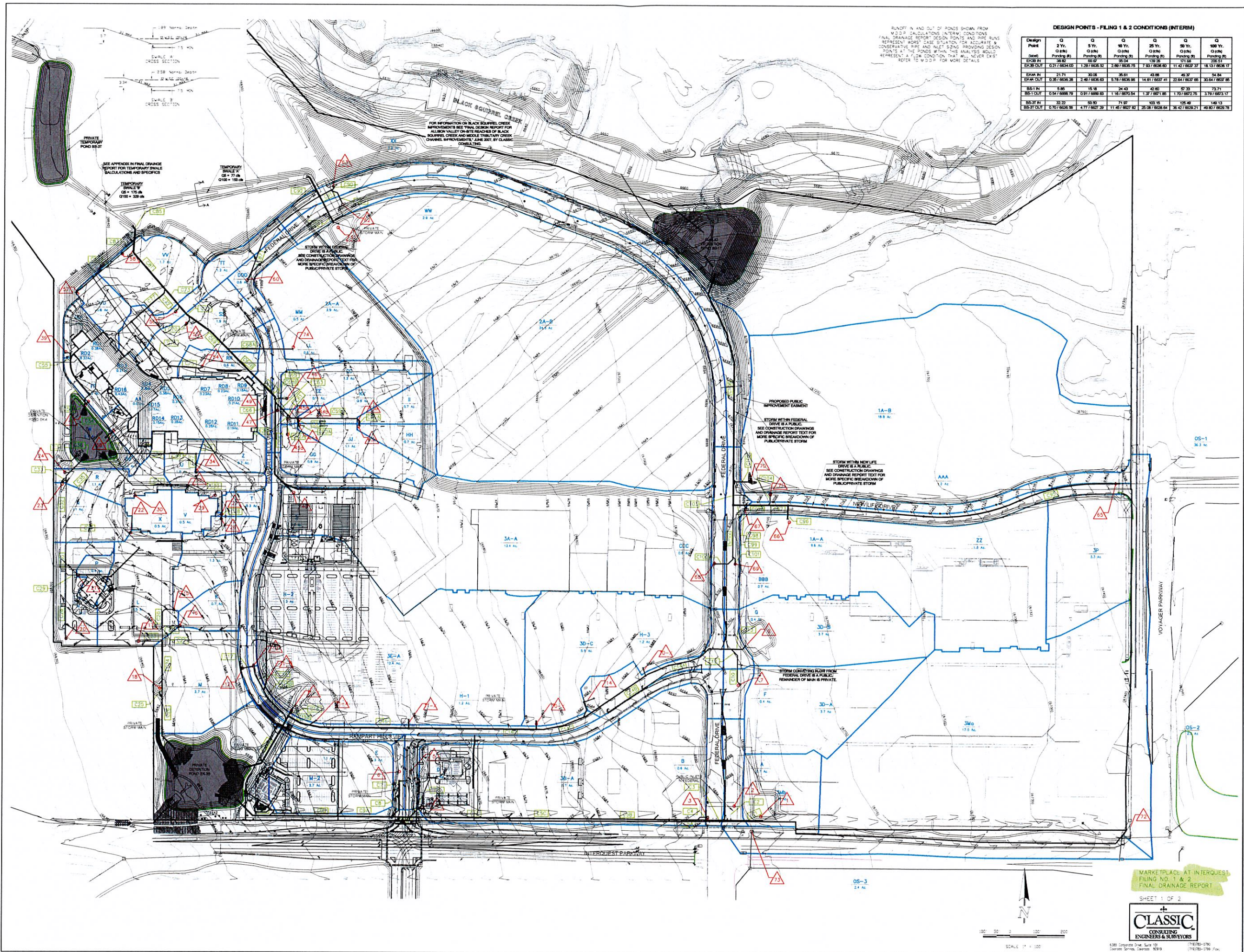
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InterQuest  
Marketplace  
PUD Plan  
Colorado Springs, Colorado

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Amendment to



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RUNOFF IN AND OUT OF PONDS SHOWN FROM W.D.P. CALCULATIONS. INTERIM CONDITIONS FINAL DRAINAGE REPORT DESIGN POINTS AND PIPE SIZES REPRESENT WORST CASE SITUATION FOR ACCURATE & CONSERVATIVE PIPE AND SIZES. PROVIDING DESIGN POINTS AT THE PONDS WITHIN THIS ANALYSIS WOULD REPRESENT A LOW CONDITION THAT WILL NEVER EXIST. REFER TO W.D.P. FOR MORE DETAILS.

DESIGN POINTS - FILING 1 & 2 CONDITIONS (INTERIM)

Design Point	Q	Q	Q	Q	Q	Q	Q
(cfs)	2 Yr.	5 Yr.	10 Yr.	25 Yr.	50 Yr.	100 Yr.	
(in/hr)	0.50	0.50	0.50	0.50	0.50	0.50	
EX-38 IN	0.217605400	1.29760532	2.99760575	7.53760680	11.47760737	18.13760817	
EX-38 OUT	21.71	30.05	36.81	43.86	49.37	54.84	
EX-38 IN	0.35760626	2.49760663	5.78760695	14.81760741	22.84760785	30.84760825	
EX-38 OUT	5.85	15.18	24.43	42.40	59.33	75.71	
EX-37 IN	0.14760679	0.87760683	1.87760684	3.37760685	4.87760687	6.37760689	
EX-37 OUT	39.25	58.50	71.87	83.15	92.49	100.13	
EX-37 IN	0.10760656	0.77760670	1.47760672	2.60760674	3.62760675	4.60760676	

SEE APPENDIX IN FINAL DRAINAGE REPORT FOR TEMPORARY SWALE CALCULATIONS AND SPECIFICS

TEMPORARY SWALE V  
OS = 77.0h  
OTIS = 158.0h

STORM WITHIN FEDERAL DRIVE IS A PUBLIC. SEE CONSTRUCTION DRAWINGS AND DRAINAGE REPORT TEXT FOR MORE SPECIFIC BREAKDOWN OF PUBLIC/PRIVATE STORM.

PROPOSED PUBLIC IMPROVEMENT ELEMENT

STORM WITHIN NEW LIFE DRIVE IS A PUBLIC. SEE CONSTRUCTION DRAWINGS AND DRAINAGE REPORT TEXT FOR MORE SPECIFIC BREAKDOWN OF PUBLIC/PRIVATE STORM.

STORM COMING FROM FEDERAL DRIVE IS A PUBLIC. REMAINDER OF MAN IS PRIVATE.

MARKETPLACE AT INTERQUEST FILING NO. 1 & 2 FINAL DRAINAGE REPORT

SHEET 1 OF 2



630 Corporate Drive, Suite 100  
Carrollton, Georgia 30089  
770-382-0760  
770-382-0769 Fax

