

470 Storage

**A parcel of land being a part of the South 1/2 of Section 25,
Township 4 South, Range 66 West of the Sixth Principal Meridian,
City of Aurora, County of Arapahoe, State of Colorado**

PRELIMINARY DRAINAGE REPORT

**Project:
470 Storage
Aurora, Colorado**

**Client:
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Aurora, Colorado 80016
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October 27, 2017

APPROVED FOR ONE YEAR FROM THIS DATE	
City Engineer	Date
Water Department	Date

ENGINEER'S CERTIFICATION

This report and plan for the drainage design of 470 Storage was prepared by me (or under my direct supervision) in accordance with the provisions of City of Aurora Storm Drainage Design and Technical Criteria, and was designed to comply with the provisions thereof.

Randall J. Phelps, P.E.
Registered Professional Engineer
State of Colorado No. 35204

TABLE OF CONTENTS

INTRODUCTION.....4

 LOCATION4

 VICINITY MAP4

 PROPOSED DEVELOPMENT5

HISTORIC DRAINAGE.....5

 OVERALL SUB-BASIN DESCRIPTION5

 EXISTING DRAINAGE PATTERNS5

 OUTFALLS DOWNSTREAM FROM PROPERTY5

DESIGN CRITERIA.....6

 HYDROLOGIC CRITERIA.....6

 HYDRAULIC CRITERIA6

DRAINAGE PLAN.....6

 PROPOSED DRAINAGE CONCEPT.....6

 DETENTION SUMMARY7

 SUB-BASIN DESCRIPTIONS7

CONCLUSIONS.....8

 COMPLIANCE WITH STANDARDS8

 SUMMARY OF DRAINAGE CONCEPT8

REFERENCES.....9

- Appendix A – NRCS Soils Report
- Appendix B – Hydrologic Calculations
- Appendix C – Detention Calculations
- Appendix D – Drainage Map

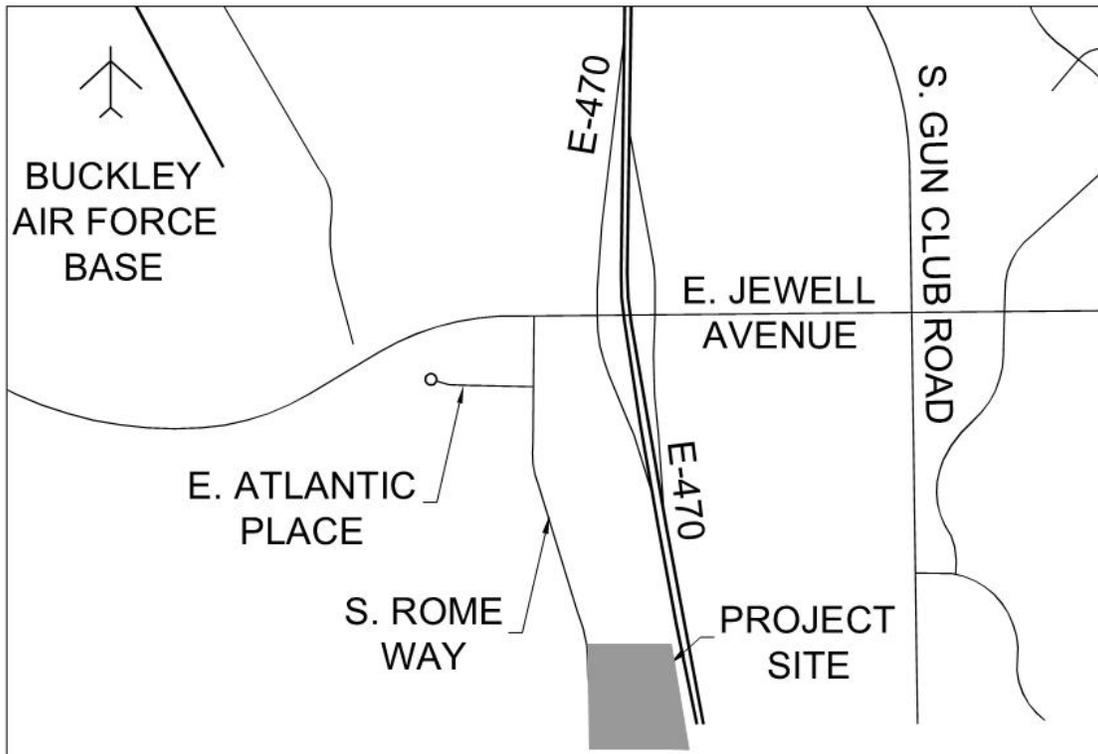
INTRODUCTION

Location

The site is located south of the intersection of Jewell Street and E-470, situated in the South 1/2 of Section 25, Township 4 South, Range 66 West of the 6th Principal Meridian, City of Aurora, County of Arapahoe, State of Colorado. The proposed site is bounded by an undeveloped lot to the north and south, Rome Way and the Plains Conservation to the west and E-470 to the east. The 38.0 +/- acre project site is currently undeveloped and consists of primarily sparse native grass, weeds, and brush cover.

Vicinity Map

A vicinity map is provided below for reference:



 VICINITY MAP

Proposed Development

The proposed development (the project) is to consist of +/- 14.4-acres of RV Storage, with +/- 12.9-acres of future RV Storage expansion to the south and +/- 7.0-acres of future self-storage to the north. A 26-foot wide fire lane is proposed around the inside perimeter of the project site connecting to South Rome Way.

An NRCS soil study for the project area was obtained in order to determine the soil characteristics of the site. The results of this study show that the soils are silty loam in nature and 100 percent of the site is Soil Type C. The NRCS study is provided in Appendix A.

The development of this project results in an overall imperviousness of 76% percent for the site.

No variances are being requested at this time.

HISTORIC DRAINAGE

Overall Sub-Basin Description

The Site is not part of any Master Drainage Report.

The site is located within FEMA Food Insurance Rate Map (FIRM) Number 08001C0950H, dated March 5, 2007. This project site is located in Zone X which is outside the 500-year floodplain. This map is not available to print on the FEMA website.

Existing Drainage Patterns

The project site is currently undeveloped and generally sheet flows from the southwest to the northeast with slopes between 2% and 4%.

Offsite Basins

The Site and area around the Site generally drain from west to east. A landscape berm is located along the west that will allow offsite flow to be captured by an 8' existing box culvert located south of the existing self-storage facility. These flows are captured by a drainage channel that continues northeast. The existing box culvert and drainage channel will not be affected by this development.

Outfalls Downstream from Property

Site drainage currently sheet flows to the east and northeast of the property and into an existing inlet structure that connects to an outlet structure on the east side of the E-470. Flows are prevented from discharging across the E-470 by an existing berm located along the east property boundary.

DESIGN CRITERIA

The “City of Aurora Storm Drainage Design and Technical Criteria,” revised October 2010 (The “Criteria”) and the “Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual” Volumes 1, 2, and 3 (The “Manual”), with latest revisions, were used when preparing the storm calculations.

Hydrologic Criteria

The 2-year and 100-year design storm events will be used in determining rainfall and runoff for the proposed site. Chapter 5 of the Criteria Manual was used to determine rainfall data for the storm events. Table 1 of the City of Aurora Storm Drainage Design and Technical Criteria was utilized to obtain the runoff coefficients and percent impervious for commercial development. The Manual, adopted by the City of Aurora, was used to calculate runoff using the Rational Method for sub-basins less than 160 acres in size. Figures RA-1 through RA-6, of the Manual, were used to determine the P1 values for the intensity values used. One hour rainfall depths used for the calculations at the site are 0.97 inches and 2.63 inches for the 2-year and 100-year events, respectively. All water quality and detention will be sized using the full-spectrum detention method as described in Chapter 12 of the UDFCD Criteria Manual, Volume 2.

Hydraulic Criteria

The project will construct a private internal storm sewer network, including inlets, to capture runoff. All inlets will be sized using UD Inlet to intercept the 100-year event, and all pipes will be sized to convey the 100-year event using StormCAD for design. These calculations will be performed with the Final Drainage report.

DRAINAGE PLAN

Proposed Drainage Concept

Stormwater generated by the project will sheet flow to the proposed drainage pans and will be captured and conveyed to a proposed detention pond by an underground storm sewer system. The proposed detention pond will release flows to an existing 54” RCP located northeast of the site at historic flow rates. The property owner will be responsible for maintenance of the on-site detention system.

Approximately 7.93 acres of runoff from the adjacent land to the north will also be captured and detained by the detention pond.

Detention Summary

All onsite flows will be conveyed directly to the proposed detention pond northeast of the site. Detention and water quality will be provided for all onsite detained flows via a forebay and trickle channel system per the Manual. Flows north of the site will sheet flow to the proposed pond. The proposed detention pond, as shown on the included drainage map, has been calculated to provide approximately 5.21 acre-feet of storage as required per the Manual. Calculations for the detention pond are provided in the appendix. The release rate for the proposed detention system is based on 1.0 cfs/acre resulting in approximately 33 cfs.

Sub-basin Descriptions

A Drainage Map has been provided and illustrates the sub-basins proposed with this project. Individual sub-basin details such as runoff, coefficient calculations, and imperviousness percentages are provided in Appendix B. The 2-year and 100-year peak flows for each sub-basin are also provided in Appendix B.

Sub-basins A-1 through A-5

Sub-basins A-1 through A-5 have areas ranging from 2.20 – 2.66 acres and consist of asphalt paving and landscaping. Runoff will sheet flow across landscaping and drive areas to concrete pans in the parking area where it will be conveyed to inlets. The runoff coefficients for these sub-basins range from 0.74 – 0.82 and 0.80 – 0.87 for the 2-year and 100-year storm, respectively.

Sub-basin A-6

Sub-basin A-6 is located north of the asphalt paving and consists primarily of landscaping and a small amount of asphalt paving connecting the site to South Rome Way and a portion of the fire access road. Runoff will flow from south to north and flow to undeveloped basin F-2 to the north. The runoff coefficients for sub-basin A6 are 0.22 and 0.26 for the 2-year and 100-year storm, respectively.

Sub-basin B-1

Sub-basin B-1 is located northeast of the site and includes the proposed detention pond. Flows from this basin will flow into the detention pond. This sub-basin is 2.73 acres of landscaped area and has runoff coefficients of 0.13 and 0.17 for the 2-year and 100-year, respectively.

Sub-basin F-1

Sub-basin F-1 is located south of the site and consists of 12.86 acres of existing, undeveloped land with slopes that range from 2-4% draining from west to east. Runoff from this sub-basin drains west and flows north to the existing 54" flared end section. The runoff coefficients are 0.13 and 0.17 for the 2-year and 100-year, respectively.

Sub-basin F-2

Sub-basin F-1 is located north of the site and consists of 7.93 acres of existing, undeveloped land with slopes that range from 2-5% draining from southwest to northeast. Runoff from this sub-basin drains to the proposed detention pond. This basin also has runoff from Sub-basin A-6 that also drains to the detention pond. The runoff coefficients are 0.13 and 0.17 for the 2-year and 100-year, respectively.

Sub-basin OS-1

Sub-basin OS-1 contains 1.78 acres and consists of the landscape berm east of the site. This off-site area sheet flows north to the existing 54" flared end section northeast of the site. Runoff coefficients for this sub-basin are 0.13 and 0.17 for the 2-year and 100-year storm, respectively.

Sub-basin OS-2

Sub-basin OS-2 contains 1.43 acres and consists of undeveloped land northeast of the site. This off-site area sheet flows east to the existing 54" flared end section. Runoff coefficients for this sub-basin are 0.13 and 0.17 for the 2-year and 100-year storm, respectively.

CONCLUSIONS

Compliance with Standards

The project complies with the City of Aurora criteria for storm drainage design. City of Aurora Storm Drainage Design and Technical Criteria and the Urban Drainage Flood Control District Urban Storm Drainage Criteria Manual Volumes 1, 2, and 3 have been utilized in the design of the storm sewer system as well as Best Management Practices. The ultimate storm sewer system for this site will provide for the 100-year storm event and will not surcharge the storm sewer in the minor event.

Summary of Drainage Concept

The project flows are tributary to Gun Club Creek and ultimately the South Platte River. Runoff generated within the site is collected using storm inlets. The flows will then be detained and treated by the forebay, trickle channel, and micropool per UDFCD requirements. The proposed detention pond releases flows at historic rates to an existing 54" RCP located northeast of the detention pond. The proposed pond is sized to accommodate the additional flows for developed conditions for the entire +/- 38-acre property.

REFERENCES

Storm Drainage Design and Technical Criteria, City of Aurora; October 2010.

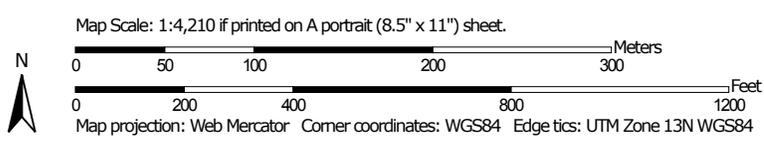
Urban Storm Drainage Criteria Manual, Volumes 1-3, Urban Drainage and Flood Control District, June 2001 with latest revisions.

APPENDIX A –NRCS SOILS REPORT

Soil Map—Arapahoe County, Colorado
(470 Storage)



Soil Map may not be valid at this scale.



Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
FoC	Fondis-Colby silt loams, 3 to 5 percent slopes	43.8	100.0%
Totals for Area of Interest		43.8	100.0%

APPENDIX B – HYDROLOGY CALCULATIONS



RAINFALL INTENSITY

$$I = \frac{28.5 P_1}{(10 + T_C)^{0.786}}$$

Where:

I = rainfall intensity (inches per hour)

P₁ = one-hour rainfall depth (inches) from figures RA1-RA-6
in USDCM, Volume 1

T_C = time of concentration (minutes)

$$P_1 = \begin{array}{cccc} \underline{2\text{-yr}} & \underline{5\text{-yr}} & \underline{10\text{-yr}} & \underline{100\text{-yr}} \\ 0.97 & 1.39 & 1.63 & 2.63 \end{array}$$

Time Intensity Frequency Tabulation

TIME	2 YR	5 YR	10 YR	100 YR
5	3.29	4.71	5.53	8.92
10	2.62	3.76	4.41	7.12
15	2.20	3.16	3.70	5.97
20	1.91	2.73	3.21	5.17
25	1.69	2.42	2.84	4.58
30	1.52	2.18	2.56	4.13
40	1.28	1.83	2.15	3.46
50	1.11	1.59	1.86	3.00
60	0.98	1.40	1.65	2.66
120	0.60	0.86	1.01	1.63

BASIN IMPERVIOUSNESS AND RUNOFF COEFFICIENT

	Imp.	C2	C5	C10	C100
Landscape	2%	0.13	0.14	0.15	0.17
Light Industrial	80%	0.71	0.72	0.76	0.82
Roof	90%	0.80	0.85	0.90	0.90
Concrete	96%	0.87	0.87	0.88	0.89
Street - Paved	100%	0.87	0.88	0.90	0.93

ON-SITE BASINS

Basin ID	Roof (SF)	Landscape (SF)	Concrete (SF)	Street - Paved (SF)	Total Basin Area (SF)	Total Basin Area (Acres)	Basin Imperviousness	C2	C5	C100
A-1	0	16739	0	79181	95920	2.20	0.83	0.74	0.75	0.80
A-2	0	8195	0	102372	110567	2.54	0.93	0.82	0.83	0.87
A-3	0	8369	0	105009	113379	2.60	0.93	0.82	0.83	0.87
A-4	0	8387	0	107381	115768	2.66	0.93	0.82	0.83	0.87
A-5	0	10444	0	85584	96028	2.20	0.89	0.79	0.80	0.85
A-6	0	17436	0	2431	19866	0.46	0.14	0.22	0.23	0.26
B-1	0	118909	0	0	118909	2.73	0.02	0.13	0.14	0.17
F-1	0	59975	0	500000	559975	12.86	0.90	0.79	0.80	0.85
F-2	0	35449	0	310000	345449	7.93	0.90	0.79	0.80	0.85
Total	0	283903	0	1291958	1575861	36.18	0.82	0.74	0.75	0.79

OFF-SITE BASINS

OS-1	0	77701	0	0	77701	1.78	0.02	0.13	0.14	0.17
OS-2	0	62258	0	0	62258	1.43	0.02	0.13	0.14	0.17
Total	0	139959	0	1837	139959	3.21	0.03	0.14	0.15	0.18

Total Onsite and Offsite	0	423862	0	1293795	1715821	39.39	0.76	0.69	0.70	0.74
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TIME OF CONCENTRATION

Watercourse Coefficient																	
					Forest & Meadow 2.50			Short Grass Pasture & Lawns 7.00			Grassed Waterway 15.00						
					Fallow or Cultivation 5.00			Nearly Bare Ground 10.00			Paved Area & Shallow Gutter 20.00						
SUB-BASIN DATA					INITIAL / OVERLAND T(i)			TRAVEL TIME T(t)					T(c) CHECK (URBANIZED BASINS)			FINAL T(c)	
DESIGN POINT	DRAIN BASIN	AREA sq. ft.	AREA ac.	C(5)	Length ft.	Slope ft/ft	T(i) min	Length ft.	Slope ft/ft	Coeff.	Velocity fps	T(t) min.	COMP. T(c)	TOTAL LENGTH	L/180+10	min.	
A-1	A-1	95,920	2.20	0.75	130	0.04	4.7	445	0.030	20	3.5	2.1	6.8	575	13.2	6.8	
A-2	A-2	110,567	2.54	0.83	150	0.03	4.2	445	0.030	20	3.5	2.1	6.3	595	13.3	6.3	
A-3	A-3	113,379	2.60	0.83	145	0.04	3.8	470	0.030	20	3.5	2.3	6.1	615	13.4	6.1	
A-4	A-4	115,768	2.66	0.83	140	0.05	3.5	485	0.030	20	3.5	2.3	5.8	625	13.5	5.8	
A-5	A-5	96,028	2.20	0.80	140	0.03	4.4	500	0.030	20	3.5	2.4	6.8	640	13.6	6.8	
A-6	A-6	19,866	0.46	0.23	70	0.04	8.2	0	0.000	20	0.0	0.0	8.2	70	10.4	8.2	
B-1	B-1	118,909	2.73	0.14	170	0.07	12.3	403	0.005	7	0.5	13.6	25.9	573	13.2	13.2	
F-1	F-1	559,975	12.86	0.80	300	0.03	6.6	433	0.030	7	1.2	6.0	12.6	733	14.1	12.6	
F-2	F-2	345,449	7.93	0.80	300	0.03	6.5	336	0.030	7	1.2	4.6	11.1	636	13.5	11.1	
OS-1	OS-1	77,701	1.78	0.14	75	0.07	8.0	55	0.030	7	1.2	0.8	8.8	130	10.7	8.8	
OS-2	OS-2	62,258	1.43	0.14	250	0.05	16.3	127	0.040	7	1.4	1.5	17.8	377	12.1	12.1	

RUNOFF CALCULATIONS

Design Storm 100 Year												
BASIN INFORMATON				DIRECT RUNOFF				TOTAL RUNOFF				REMARKS
DESIGN POINT	DRAIN BASIN	AREA ac.	RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs	T(c) min	SUM C x A	I in/hr	Q cfs	
A-1	A-1	2.20	0.80	6.8	1.76	8.26	14.5					
A-2	A-2	2.54	0.87	6.3	2.22	8.44	18.7	6.8	3.97	8.26	32.8	A1+A2
A-3	A-3	2.60	0.87	6.1	2.27	8.54	19.4	6.8	6.25	8.26	51.6	A1+A2+A3
A-4	A-4	2.66	0.87	5.8	2.33	8.62	20.0	6.8	8.57	8.26	70.8	A1+A2+A3+A4
A-5	A-5	2.20	0.85	6.8	1.87	8.27	15.4	6.8	10.44	8.26	86.2	A1+A2+A3+A4+A5
A-6	A-6	0.46	0.26	8.2	0.12	7.77	0.9					
B-1	B-1	2.73	0.17	13.2	0.46	6.38	3.0					
F-1	F-1	12.86	0.85	12.6	10.91	6.53	71.2					
F-2	F-2	7.93	0.85	11.1	6.76	6.86	46.3					
OS-1	OS-1	1.78	0.17	8.8	0.30	7.56	2.3					
OS-2	OS-2	1.43	0.17	12.1	0.24	6.63	1.6					
OUTFALL											222.2	ALL BASINS

RUNOFF CALCULATIONS

Design Storm 2 Year												
BASIN INFORMATON				DIRECT RUNOFF				TOTAL RUNOFF				REMARKS
DESIGN POINT	DRAIN BASIN	AREA ac.	RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs	T(c) min	SUM C x A	I in/hr	Q cfs	
A-1	A-1	2.20	0.74	6.8	1.63	3.04	5.0					
A-2	A-2	2.54	0.82	6.3	2.07	3.11	6.4	6.8	3.70	3.04	11.3	A1+A2
A-3	A-3	2.60	0.82	6.1	2.12	3.15	6.7	6.8	5.82	3.04	17.7	A1+A2+A3
A-4	A-4	2.66	0.82	5.8	2.17	3.18	6.9	6.8	7.99	3.04	24.3	A1+A2+A3+A4
A-5	A-5	2.20	0.79	6.8	1.74	3.05	5.3	6.8	9.73	3.04	29.6	A1+A2+A3+A4+A5
A-6	A-6	0.46	0.22	8.2	0.10	2.86	0.3					
B-1	B-1	2.73	0.13	13.2	0.35	2.35	0.8					
F-1	F-1	12.86	0.79	12.6	10.17	2.41	24.5					
F-2	F-2	7.93	0.79	11.1	6.30	2.53	15.9					
OS-1	OS-1	1.78	0.13	8.8	0.23	2.79	0.6					
OS-2	OS-2	1.43	0.13	12.1	0.19	2.45	0.5					
OUTFALL											77.2	ALL BASINS

**470 Storage
Aurora, CO**

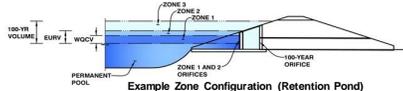
			Direct Flows		Cumulative Flows	
DESIGN POINT	DRAIN BASIN	AREA Ac	Q ₂ CFS	Q ₁₀₀ CFS	Q ₂ CFS	Q ₁₀₀ CFS
A-1	A-1	2.20	5.0	14.5	4.97	14.5
A-2	A-2	2.54	6.4	18.7	11.27	32.8
A-3	A-3	2.60	6.7	19.4	17.73	51.6
A-4	A-4	2.66	6.9	20.0	24.34	70.8
A-5	A-5	2.20	5.3	15.4	29.64	86.2
A-6	A-6	0.46	0.3	0.9	0.29	0.9
B-1	B-1	2.73	0.8	3.0	0.84	3.0
F-1	F-1	12.86	24.5	71.2	24.49	71.2
F-2	F-2	7.93	15.9	46.3	15.93	46.3
OS-1	OS-1	1.78	0.6	2.3	0.6	2.3
OS-2	OS-2	1.43	0.5	1.6	0.5	1.6

APPENDIX C – DETENTION CALCULATIONS

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: 470 Storage
Basin ID: Detention Pond



Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	38.50	acres
Watershed Length =	1,770	ft
Watershed Slope =	0.030	ft/ft
Watershed Imperviousness =	90.00%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	0.0%	percent
Percentage Hydrologic Soil Group C/D =	100.0%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	Aurora Reservoir	
Water Quality Capture Volume (WQCV) =	1,288	acre-feet
Excess Urban Runoff Volume (EURV) =	3,436	acre-feet
2-yr Runoff Volume (P1 = 0.84 in.) =	2,362	acre-feet
5-yr Runoff Volume (P1 = 1.13 in.) =	3,341	acre-feet
10-yr Runoff Volume (P1 = 1.39 in.) =	4,158	acre-feet
25-yr Runoff Volume (P1 = 1.77 in.) =	5,479	acre-feet
50-yr Runoff Volume (P1 = 2.08 in.) =	6,502	acre-feet
100-yr Runoff Volume (P1 = 2.42 in.) =	7,733	acre-feet
500-yr Runoff Volume (P1 = 3.3 in.) =	10,787	acre-feet
Approximate 2-yr Detention Volume =	2,218	acre-feet
Approximate 5-yr Detention Volume =	3,145	acre-feet
Approximate 10-yr Detention Volume =	3,844	acre-feet
Approximate 25-yr Detention Volume =	4,530	acre-feet
Approximate 50-yr Detention Volume =	4,831	acre-feet
Approximate 100-yr Detention Volume =	5,205	acre-feet

Water Quality Capture Volume (WQCV)

Required 100-Year detention volume

Stage-Storage Calculation

Zone 1 Volume (WQCV) =	1,288	acre-feet
Zone 2 Volume (10-year - Zone 1) =	2,556	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	1,361	acre-feet
Total Detention Basin Volume =	5,205	acre-feet
Initial Surcharge Volume (SV) =	user	ft³
Initial Surcharge Depth (SD) =	user	ft
Total Available Detention Depth (H _{total}) =	user	ft
Depth of Trickle Channel (H _{TC}) =	user	ft
Slope of Trickle Channel (S _{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S _{main}) =	user	H:V
Basin Length-to-Width Ratio (R _{L:W}) =	user	
Initial Surcharge Area (A _{sv}) =	user	ft²
Surcharge Volume Length (L _{sv}) =	user	ft
Surcharge Volume Width (W _{sv}) =	user	ft
Depth of Basin Floor (H _{100yr}) =	user	ft
Length of Basin Floor (L _{100yr}) =	user	ft
Width of Basin Floor (W _{100yr}) =	user	ft
Area of Basin Floor (A _{100yr}) =	user	ft²
Volume of Basin Floor (V _{100yr}) =	user	ft³
Depth of Main Basin (H _{main}) =	user	ft
Length of Main Basin (L _{main}) =	user	ft
Width of Main Basin (W _{main}) =	user	ft
Area of Main Basin (A _{main}) =	user	ft²
Volume of Main Basin (V _{main}) =	user	ft³
Calculated Total Basin Volume (V _{total}) =	user	acre-feet

Optional User Override 1-hr Precipitation		inches
		inches

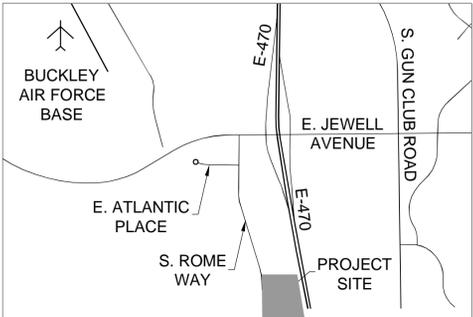
Provided 100-Year detention volume

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft²)	Optional Override Area (ft²)	Area (acre)	Volume (ft³)	Volume (ac-ft)
Top of Micropool	0.00				48,511	1,114		11,785	0.271
	0.25				50,990	1,171		24,365	0.559
	0.50				52,240	1,199		37,256	0.855
	1.00				53,495	1,228		50,460	1.158
	1.25				54,757	1,257		63,979	1.469
	1.50				56,025	1,286		77,814	1.786
	1.75				57,299	1,315		91,967	2.111
	2.00				58,580	1,345		106,439	2.444
	2.25				59,867	1,374		121,831	2.797
	2.50				61,160	1,404		136,959	3.144
	2.75				62,459	1,434		152,411	3.499
	3.00				63,765	1,464		168,189	3.861
	3.25				65,077	1,494		184,295	4.231
	3.50				66,395	1,524		200,729	4.608
	3.75				67,720	1,555		217,493	4.993
	4.00				69,051	1,585		234,589	5.385
	4.25				70,388	1,616		252,019	5.786
	4.50				71,731	1,647		269,784	6.193
	4.75				73,081	1,678		287,886	6.609
	5.00				74,437	1,709		306,325	7.032
	5.25				75,799	1,740		325,105	7.463
	5.50				77,168	1,772		344,226	7.902
	5.75				78,542	1,803		363,689	8.349
	6.00				79,923	1,835		383,498	8.804

APPENDIX D – DRAINAGE MAP



K:\DEV_C\1\096648000_470 Storage\470 Storage\Construction Documents\096648000_DRN_04.dwg, M:\proj_10/17/2017_9_15_AM...
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VICINITY MAP
1"=2000'

DETENTION SUMMARY

	REQUIRED POND VOLUME (AC-FT)	RELEASE RATE (CFS)
10-YR	3.84	10.7
100-YR	5.21	35.5

BASIS OF BEARINGS

BEARINGS ARE BASED ON THE EAST LINE OF THE SE 1/4 OF SECTION 25 TOWNSHIP 4 SOUTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN BEARING N00°28'24"W PER THE CITY OF AURORA, COLORADO HORIZONTAL CONTROL NETWORK AND BOUNDED BY THE MONUMENTS SHOWN HEREON.

BENCHMARK

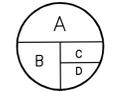
CITY OF AURORA BM#4S6625SE002 - RAILROAD SPIKE IN POWER POLE - WEST SIDE OF GUN CLUB ROAD (HWY 30) 0.25 MILES NORTH OF YALE LAND LINE. ELEVATION: 5671.27 FEET (NAVD 1988 DATUM).

FLOOD ZONE DESIGNATION

THE SITE IS LOCATED WITHIN FEMA FLOOD ZONE X WITH A 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD.

LEGEND

- PROPERTY LINE
- - - EXISTING EASEMENT
- - - PROPOSED EASEMENT
- SETBACK LINE
- ▬ DRAINAGE BOUNDARY
- - - 5800 EXISTING CONTOURS
- 5800 PROPOSED CONTOURS
- EXISTING STORM SEWER PIPE
- PROPOSED STORM SEWER PIPE



- A - DRAINAGE BASIN
- B - BASIN ACREAGE
- C - 2-YEAR RUNOFF COEFF.
- D - 100-YEAR RUNOFF COEF.

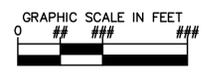
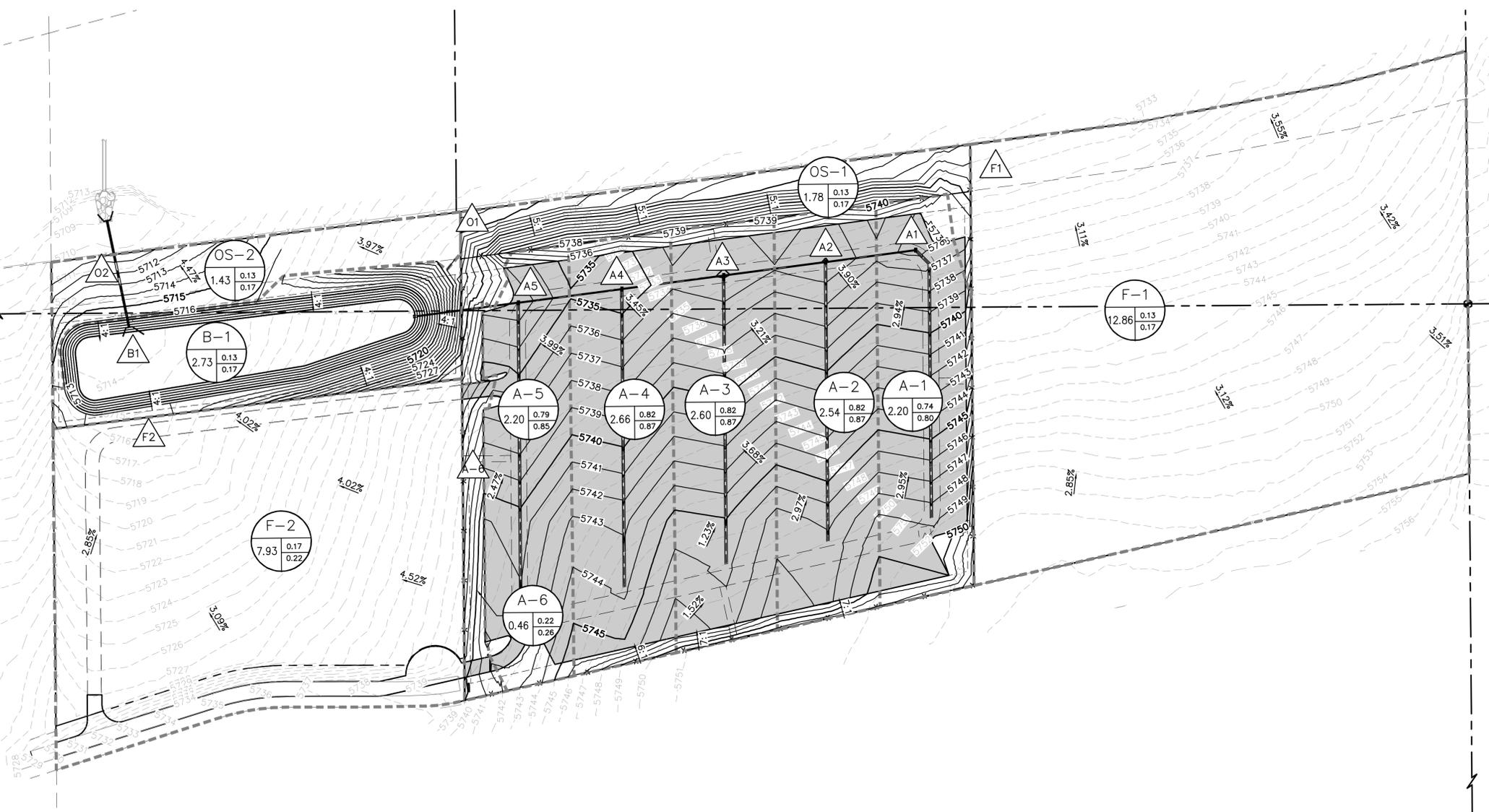
DESIGN POINT

FLOW ARROW

Site Runoff Summary

DESIGN POINT	DRAIN BASIN	AREA (Ac)	Q ₂ (CFS)	Q ₁₀₀ (CFS)	Q ₂ (CFS)	Q ₁₀₀ (CFS)
A-1	A-1	2.20	0.87	0.87	0.87	0.87
A-2	A-2	2.54	0.87	0.87	0.87	0.87
A-3	A-3	2.60	0.87	0.87	0.87	0.87
A-4	A-4	2.66	0.87	0.87	0.87	0.87
A-5	A-5	2.20	0.87	0.87	0.87	0.87
A-6	A-6	0.46	0.22	0.26	0.22	0.26
B-1	B-1	2.73	0.13	0.17	0.13	0.17
OS-1	OS-1	1.78	0.13	0.17	0.13	0.17
OS-2	OS-2	1.43	0.13	0.17	0.13	0.17
F-1	F-1	12.86	0.13	0.17	0.13	0.17
F-2	F-2	7.93	0.17	0.22	0.17	0.22
TOTAL					77.2	222.2

- NOTES:
- PROPOSED STORM SEWER IS TO BE PRIVATELY OWNED AND MAINTAINED.
 - CITY OF AURORA PLAN REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH CITY OF AURORA DESIGN CRITERIA AND THE CITY CODE. THE CITY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF DESIGN, OF DIMENSIONS AND ELEVATIONS WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE. THE CITY OF AURORA, THROUGH THE APPROVAL OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT



811 Know what's below. Call before you dig.

NO.	REVISION	BY	DATE	APPR.

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DESIGNED BY: KBK
 DRAWN BY: BKM
 CHECKED BY: RJP
 DATE: XX/XX/2017

470 STORAGE
 AURORA, COLORADO
 CONSTRUCTION DOCUMENTS
 DRAINAGE MAP

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096565000
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096648000_DRN_OA