Water Resources Report
For
Solace Apartments
El Paso County, CO

July, 2023

Prepared for:
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JR Project No. 25174.00

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Appendix

1.1. Purpose

This document is intended to serve as the potable water report for Solace Apartments. The purpose of this document is to show that the proposed water demands and fire scenario is within the acceptable criteria of the Cherokee Hills Metropolitan District.

1.2. Summary of Proposed Development

The proposed Solace Apartments, known as "Solace" from herein, is a parcel of land located in Section 7, Township 14 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. Solace is a 28.99 acre, urban, multifamily-development, and is comprised of 16 apartment buildings with a total of 342 units and associated infrastructure. Solace is bound by existing industrial developments to the North and vacant land to the West. Galley Road bounds the property to the south and existing light industrial businesses to the east. Solace will be broken into two phases, with lot 1 (phase 1) one containing the majority of the development and lot 2 (phase 2) consisting of the northern part of the development. Lot 1 of Solace will include 234 units and lot 2 will contain 108 units for a total of 342 units. Please see the site plan in appendix B for the developments phasing. A vicinity map of the area is presented in Appendix A. As previously mentioned, the Cherokee Hills Metropolitan District will provide and service the water and sanitary sewer to this development. Refer to the vicinity map and proposed site plan in Appendix A and Appendix B, respectively.

1.3. Potable Water Supply

The Solace site is located in the service area for the Cherokee Metropolitan District. Cherokee Metropolitan District will supply water to the proposed development via its existing water supply system via three connections discussed in the next section. A demand of 90.5 acre-feet of water per year has been determined to be needed at full build out. Per the phasing of the Solace development, lot one has a demand 62.2 acre-feet of water per year and lot 2 will have a demand of 28.2 acre-feet of water per year. Potable water demand was calculated to be 70.82 acre-feet per year with 19.6 acre-feet per year for landscape irrigation demand. The District has agreed to service the entire project. See appendix for the district letter of commitment.

1.4. Potable Water Service

The development will be served by standard 1.5 inch PVC service taps and 8-inch PVC water main lines. The Potable Water Demand Spreadsheet was set up to model demand from individual junctions, as shown in Appendix D. The proposed potable network at the northern boundary of the site will connect to an existing 8" waterline

in Ainsworth St. and an existing 8" waterline in Paonia St. On the southern boundary of the site, the waterline will connect to an existing 8" X 12" Tee, perpendicular to the 26" waterline in Galley RD. The potable water analysis presented within this report conforms to the ultimate built-out condition and does not include any phasing. Cherokee Metro provided some pressure readings near the potable water tie-in locations to be used for modeling. The pressure near the southern boundary was measured to be 134psi. The pressure at a hydrant near the proposed connection at Paonia Street was measured to be 126psi. The pressure at a hydrant at the southern portion of Ainsworth Street was measured to be approximately 126psi.

Each junction demands correspond to an individual apartment unit. In total, there are 342 apartment units. In addition, the demand from the clubhouse was assumed 200 gpd/1,000 SF. The demand from each individual node corresponds to the closest centroid near adjacent apartment units grouped together or the clubhouse. In prior reports approved by Cherokee Hills Metro District, the modeled multi-family residential demand was 0.2 acre feet per year. Summer time peak hour loadings are 5 times the average day demand. Maximum day demands are 2.8 times the average day demand.

The total irrigated area for this site is equal to 15.2 acres. Both normal irrigation and xeriscape irrigation will be used on the site. Xeriscape has the ability to reduce the site's water demand by approximately 50 percent. Normal irrigation requires 2.43 ac-ft/yr/ac and xeriscape requires 1.22 ac-ft/yr/ac. The total irrigation water required was calculated to be 19.6 ac-ft/yr.

Bentley's WaterCAD V8 XM was utilized to analyze the potable water system model. The overall schematic of the WaterCAD analysis (with corresponding pipe labels and Junction labels) is shown in Appendix C. A Hazen Williams roughness Coefficient of 130 was used to model each pipe link. Overall, the max day, max hour, and max day + Fire demand models account for unit demand, irrigation demand and demand from the clubhouse and swimming pool. The values and inputs of each modeled WaterCAD scenario are shown in the demand table in Appendix D. The calculated irrigation demands were distributed evenly throughout each model node.

The proposed system of potable water conduits has an 8" system loop. There are no dead ends within the model. Each existing connection corresponds to a reservoir; the HGL of each reservoir was calculated by adding the elevation of the connection with the assumed pressure head of 130 psi. The result of the overall analysis in WaterCAD is shown in Appendix D.

DESIGN CONDITIONS

(1) Maximum hourly flow with a minimum system pressure of 40 pounds per square inch (psi) and maximum velocities of 5 feet per second.

(2) Maximum daily flow plus fire demand with a minimum system pressure of 30 psi.

(3) A Fire demand of 2,000 (gpm) + max day flow; at the highest node in the site.

1.5. District Capacity

As shown in Appendix E, Cherokee Hills Metropolitan District committed to serve the proposed development. The service commitment letter states that "the District's Water Reclamation Facility (WRF) has the required capacity to meet the sewer demand for this development". Thus, according to the service commitment letter, the proposed development of this site will not cause a capacity issue with the District, and the District has facilities in place to accept the wastewater discharge from this site. Refer to the Service Commitment Letter in Appendix E for the volumes of capacity and current utilization of the existing treatment plant.

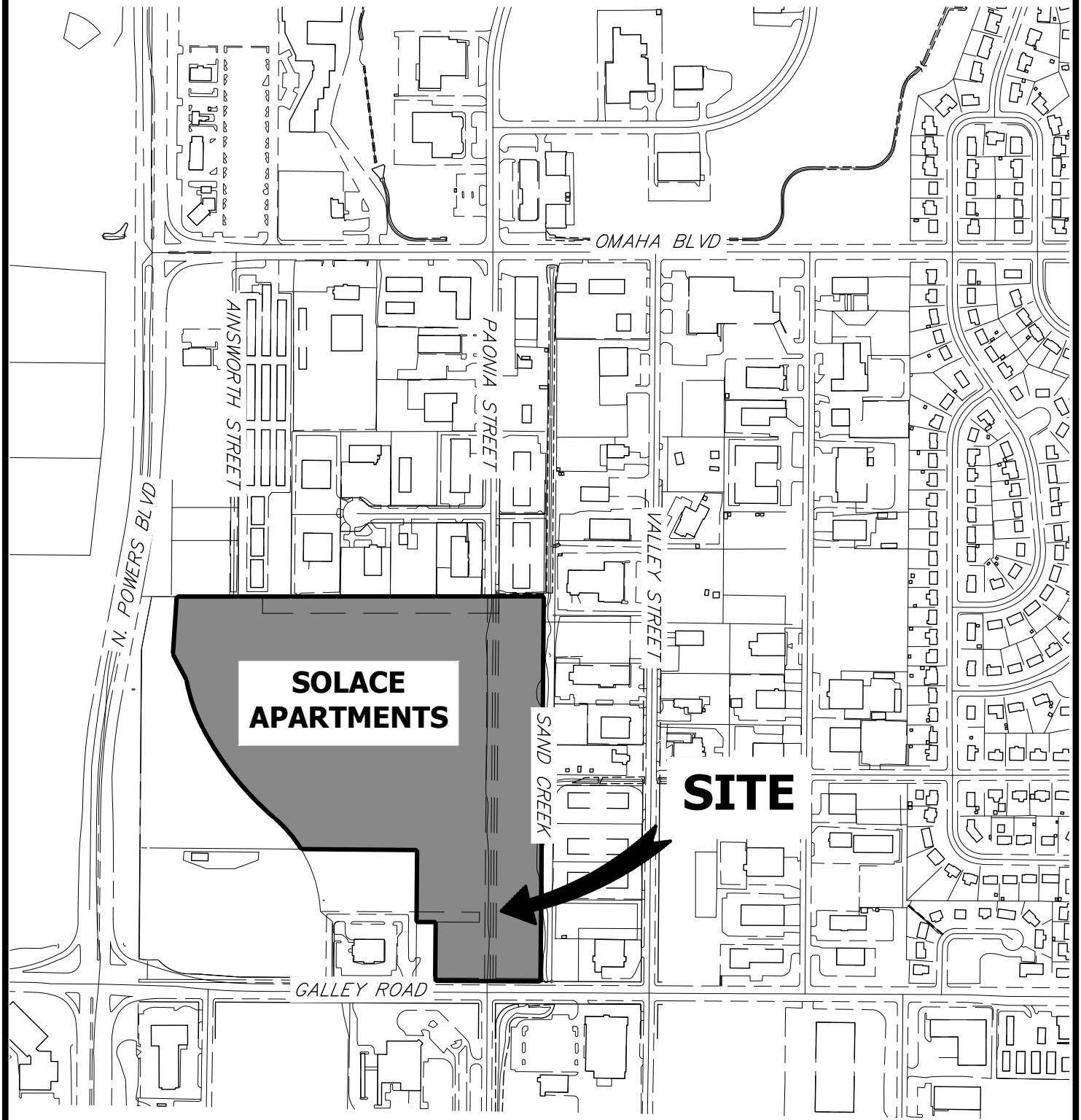
1.6. Waivers from Criteria

There are no waivers requested for the specifications or the criteria established by the Cherokee Metropolitan District for this project.

1.7. Compliance Pageswith Standards

The water distribution system, design and modeling results conform to all applicable criteria set forth by Cherokee Metropolitan District.

APPENDIX A: VICINITY MAP



VICINITY MAP
SOLACE APARTMENTS
JOB NO. 25174.00
12/31/2019

500 250 0 500 1000

ORIGINAL SCALE: 1" = 500'

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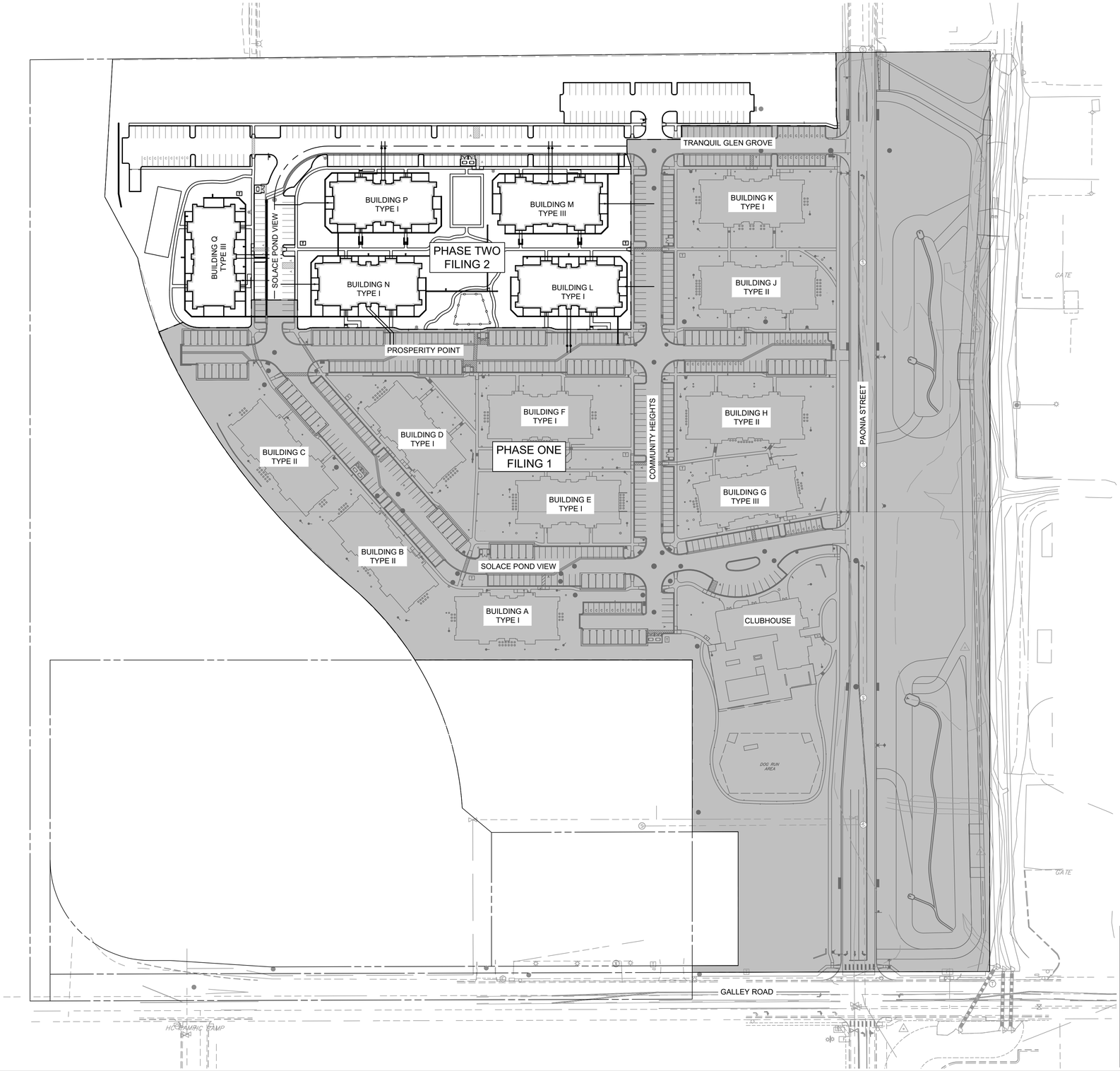
APPENDIX B: PROPOSED SITE PLAN



GRAPHIC SCALE IN FEET
0 40 80 160

UNIT BREAKDOWN

PHASE ONE

5 - TYPE I BUILDINGS
4 - TYPE II BUILDINGS
1 - TYPE III BUILDING
1 - CLUBHOUSE

PHASE TWO

3 - TYPE I BUILDINGS
2 - TYPE III BUILDINGS

BUILDING TYPE BREAKDOWN

TYPE I
12 TYPE 1.0 - 1 BR (789 SF)
8 TYPE 2.0 - 2 BR (1093 SF)
3 TYPE 2.0E - 2 BR (1088 SF)
1 TYPE 2.0A - 2 BR (1093 SF)

TYPE II
11 TYPE 2.0 - 2 BR (1093 SF)
12 TYPE 2.1 - 2 BR (1097 SF)
1 TYPE 2.0A - 2 BR (1093 SF)

TYPE III
12 TYPE 2.1 - 2 BR (1097 SF)
3 TYPE 3.0 - 3 BR (1528 SF)
2 TYPE 3.0E - 3 BR (1521 SF)
1 TYPE 3.0A - 3 BR (1521 SF)

TOTAL UNIT BREAKDOWN

PHASE ONE
60 TYPE 1.0 - 1 BR (789 SF)
84 TYPE 2.0 - 2 BR (1093 SF)
15 TYPE 2.0E - 2 BR (1088 SF)
9 TYPE 2.0A - 2 BR (1093 SF)
60 TYPE 2.1 - 2 BR (1097 SF)
3 TYPE 3.0 - 3 BR (1528 SF)
2 TYPE 3.0E - 3 BR (1521 SF)
1 TYPE 3.0A - 3 BR (1521 SF)
1 CLUBHOUSE (9060 SF)

PHASE TWO
36 TYPE 1.0 - 1 BR (789 SF)
24 TYPE 2.0 - 2 BR (1093 SF)
9 TYPE 2.0E - 2 BR (1088 SF)
3 TYPE 2.0A - 2 BR (1093 SF)
24 TYPE 2.1 - 2 BR (1097 SF)
6 TYPE 3.0 - 3 BR (1528 SF)
4 TYPE 3.0E - 3 BR (1521 SF)
2 TYPE 3.0A - 3 BR (1521 SF)

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

NO.	REVISION	BY	DATE	APPR.

Kimley»Horn
2022 KIMLEY-HORN AND ASSOCIATES, INC.
2 North Nevada Avenue, Suite 300
Colorado Springs, Colorado 80903 (719) 453-0180

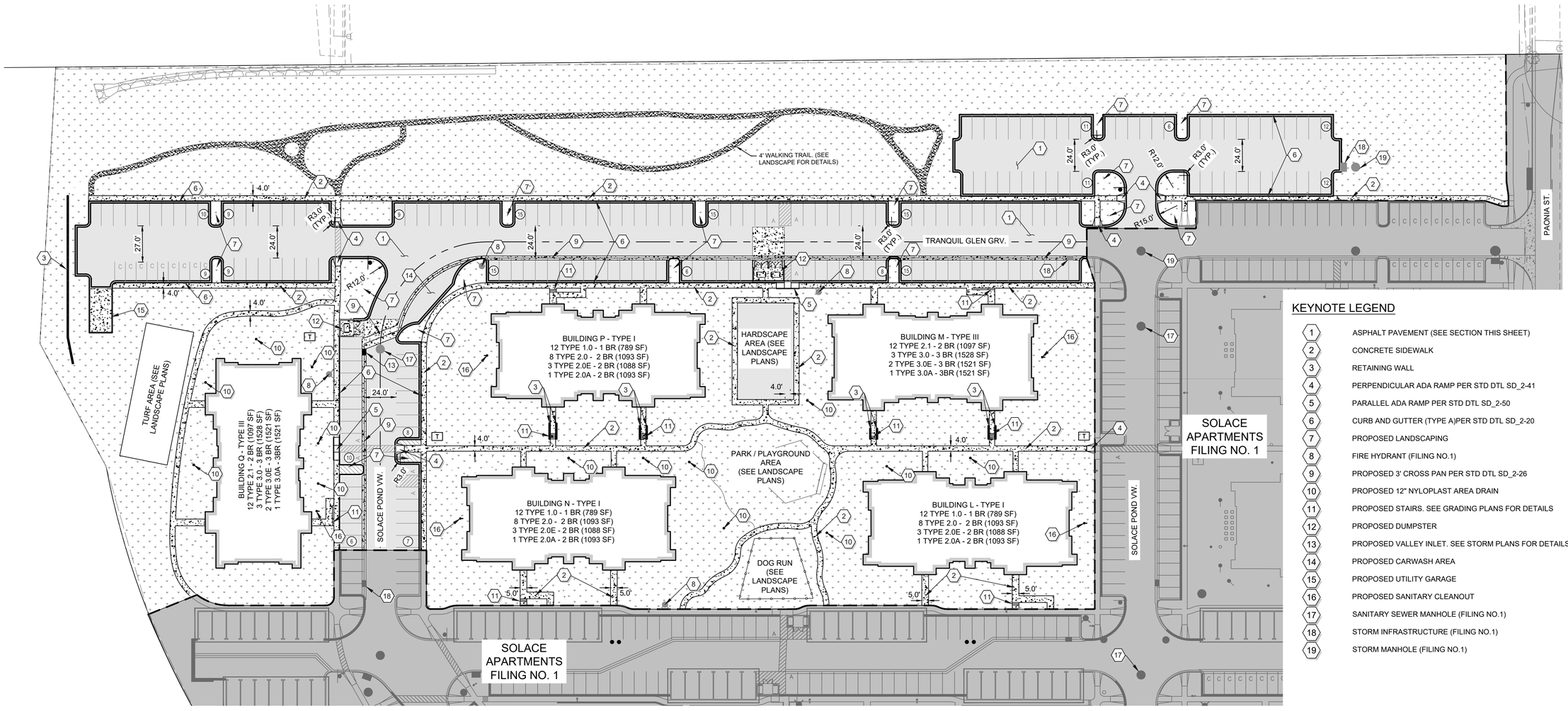
DESIGNED BY: MVZ
DRAWN BY: MVZ/RES
CHECKED BY: EJG
DATE: 11/28/2022

SOLACE APARTMENTS FILING NO. 2
CONSTRUCTION DOCUMENTS
OVERALL SITE PLAN

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION
Kimley»Horn
Kimley-Horn and Associates, Inc.

PROJECT NO.
096668009

SHEET
EXH

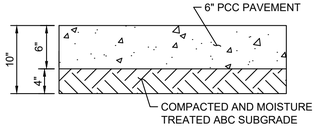


KEYNOTE LEGEND

1. ASPHALT PAVEMENT (SEE SECTION THIS SHEET)
2. CONCRETE SIDEWALK
3. RETAINING WALL
4. PERPENDICULAR ADA RAMP PER STD DTL SD_2-41
5. PARALLEL ADA RAMP PER STD DTL SD_2-50
6. CURB AND GUTTER (TYPE A)PER STD DTL SD_2-20
7. PROPOSED LANDSCAPING
8. FIRE HYDRANT (FILING NO.1)
9. PROPOSED 3' CROSS PAN PER STD DTL SD_2-26
10. PROPOSED 12" NYLOPLAST AREA DRAIN
11. PROPOSED STAIRS. SEE GRADING PLANS FOR DETAILS
12. PROPOSED DUMPSTER
13. PROPOSED VALLEY INLET. SEE STORM PLANS FOR DETAILS
14. PROPOSED CARWASH AREA
15. PROPOSED UTILITY GARAGE
16. PROPOSED SANITARY CLEANOUT
17. SANITARY SEWER MANHOLE (FILING NO.1)
18. STORM INFRASTRUCTURE (FILING NO.1)
19. STORM MANHOLE (FILING NO.1)

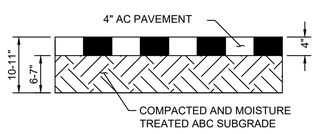
LEGEND

- PROPERTY LINE
- PHASING LINE
- STANDARD DUTY ASPHALT PAVING
- CONCRETE PAVING
- LANDSCAPE AREA
- PHASE ONE (FILING NO 1)
- (#) PARKING COUNT



NOTE: PAVEMENT CROSS SECTION IS PROVIDED FOR REFERENCE ONLY. CONTRACTOR TO REFER TO GEOTECHNICAL REPORT FOR PAVEMENT SECTIONS.

STANDARD DUTY CONCRETE
(SIDEWALKS AND DUMPSTERS)



NOTE: PAVEMENT CROSS SECTION IS PROVIDED FOR REFERENCE ONLY. CONTRACTOR TO REFER TO GEOTECHNICAL REPORT FOR PAVEMENT SECTIONS.

STANDARD DUTY ASPHALT
N.T.S.

THESE PLAN AND GENERAL NOTES REFER TO:
GEOTECHNICAL ENGINEERING REPORT
FIRM: CL THOMPSON.
PROJECT #: CS19163-105
DATE: DECEMBER 10, 2019
INCLUDING ALL REVISIONS AND ADDENDA TO THIS REPORT THAT MAY HAVE BEEN RELEASED AFTER THE NOTED DATE.

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

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

NO.	REVISION	BY	DATE	APPR.

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2022 KIMLEY-HORN AND ASSOCIATES, INC.
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OVERALL SITE PLAN

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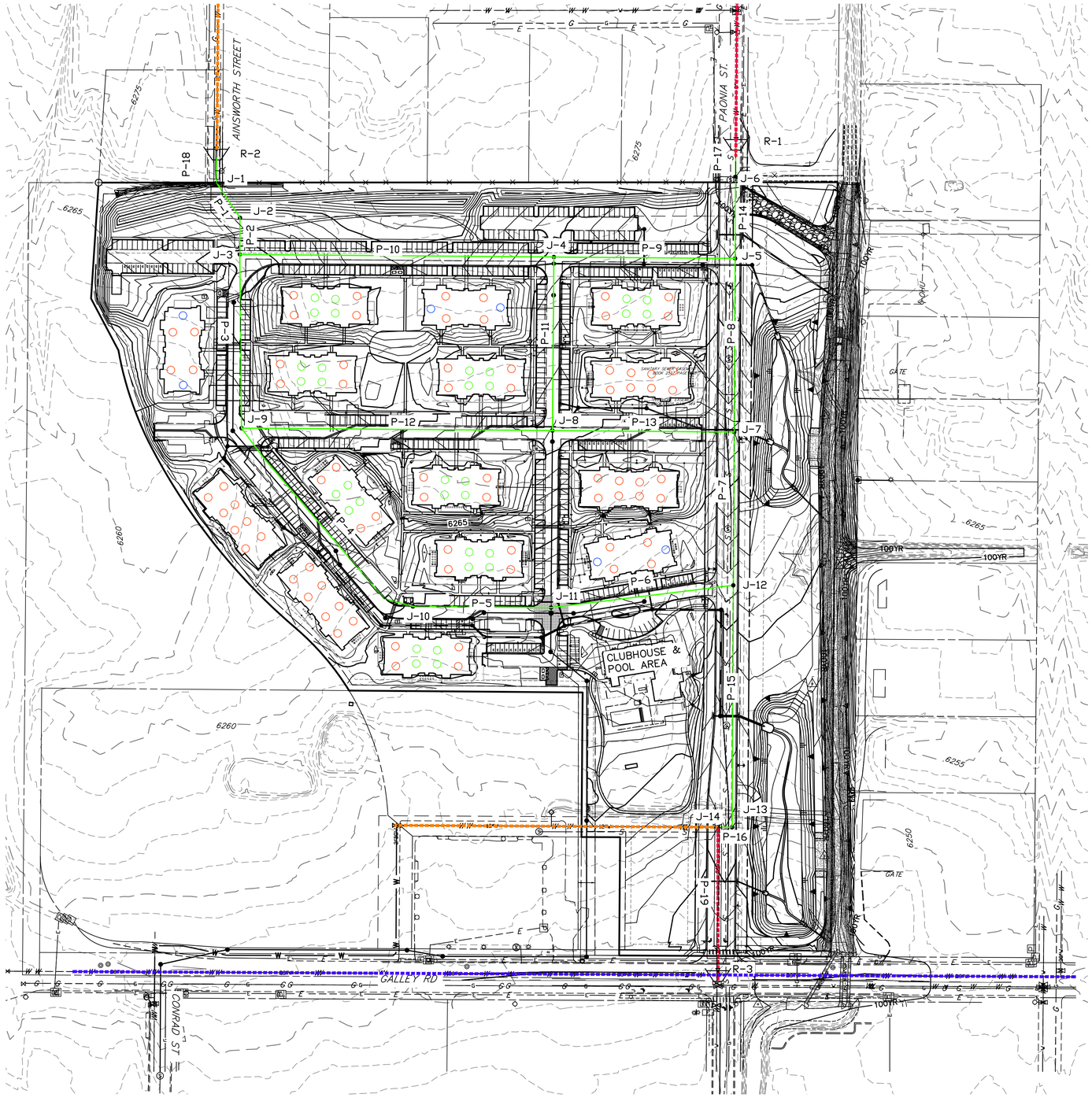
Kimley-Horn and Associates, Inc.

PROJECT NO.
096668009

SHEET
C-101

APPENDIX C: UTILITY SERVICE PLAN

WATER UTILITY PLAN



LEGEND

- 8" ø PROPOSED WATERLINE
- 8" ø EXISTING WATERLINE
- 12" ø EXISTING WATERLINE
- 26" ø EXISTING WATERLINE

RESERVOIR

JUNCTION

INDEX CONTOUR — EXISTING 6100 — PROPOSED GRADE 6100

INTERMEDIATE CONTOUR

1 BEDROOM UNIT

2 BEDROOM UNIT

3 BEDROOM UNIT

NOTE: ALL APARTMENTS ARE 3 STORIES AND HAVE THE SAME FLOOR PLAN ON EACH FLOOR.

NOTE: FOR THE PURPOSE OF THIS POTABLE WATER REPORT, ALL UNITS WERE ASSUMED TO HAVE 7/10 THE DEMAND OF A TYPICAL SINGLE FAMILY UNIT OF (375 GALLONS PER DAY).

N

100 50 0 100 200

ORIGINAL SCALE: 1" = 100'

WATER UTILITY
SOLACE APARTMENTS
JOB NO. 2517400
11/30/2022
SHEET 1 OF 1

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Fort Collins 970-491-9888 • www.jrengineering.com

APPENDIX D: POTABLE DEMAND ANALYSIS AND WATERCAD RESULTS

Project Name	Solace Apartments
Project Number	2517400
Date	3/7/2023
Created By	LGO/QNL
Checked By	DRC

Cherokee Hills MD Residential Criteria	Multiply by
Average Day Demand (gpud)	179
Max Day Factor	2.8
Peak Hour Factor	5
Fire Flow (gpm)	2000
Club House	200gpd/1,000SF

178.55 gpud derived to match 0.2 AFY/ Unit as provided by district

Definition of Units:
gpud = gallons per unit per day
gpiad = gallons per irrigated acre per day (based on a 180 day irrigation season)
gpgad = gallons per gross acre per day
gpsd = gallons per student per day
n.a. = not applicable

TABLE 1 - DEMAND SUMMARY

	Potable Demand					Irrigation Demand	Potable + Irrigation Demand	
Junction	No. of Units	Average Day (gpm)	Max Day (gpm)	Fire Flow Demands (gpm)	Peak Hour (gpm)	Irrigation (gpm)	Modeled Demand (gpm)	
J-1	0	0.0	0.0	0	0.0	0.7	0.7	
J-2	0	0.0	0.0	0	0.0	0.7	0.7	
LOT 2 (PHASE 2) J-3*	42	5.2	14.6	2000	26.0	0.7	5.9	
J-4	54	6.7	18.7	0	33.5	0.7	7.4	
J-5	12	1.5	4.2	0	7.4	0.7	2.2	
J-6	0	0.0	0.0	0	0.0	0.7	0.7	
J-7	0	0.0	0.0	0	0.0	1.0	1.0	
J-8	72	8.9	25.0	0	44.6	1.0	9.9	
J-9	72	8.9	25.0	0	44.6	1.0	9.9	
LOT 1 (PHASE 1) J-10	60	7.4	20.8	0	37.2	1.0	8.4	
J-11	30	3.7	10.4	0	18.6	1.0	4.7	
J-12	CLUBHOUSE(10820 SF)	1.5	4.2	0	7.5	1.0	2.5	
J-13	0	0.0	0.0	0	0.0	1.0	1.0	
J-14	0	0.0	0.0	0	0.0	1.0	1.0	
TOTAL	342	43.9	122.9	2000.0	219.5	**12.2**	**56.1**	**GPM**
		42.4 gpm (Units) + 1.5 gpm (Clubhouse) = 43.9 gpm				LOT 2 - (PHASE 2)TOTAL	**28.2**	**AFY**
		43.9 gpm (total) = 70.8 afy				LOT 1 - (PHASE 1) TOTAL	**62.2**	**AFY**
							90.5	**AFY**

DISTRICT ESTIMATE VERIFICATON

TABLE 2 - POTABLE DEMAND (PER UNIT) - Provided by Water District

	Type	AFY/UNIT	UNIT	GPM	AFY	
Lot 1 - Phase 1	Multifamily	0.2	234	29.0	46.8	
Lot 2 - Phase 2	Multifamily	0.2	108	13.4	21.6	
Clubhouse				1.5	2.42	
		TOTAL	342	43.9	**70.82**	Potable Demand

DISTRICT ESTIMATE VERIFICATON

TABLE 3 - IRRIGATION DEMAND - Derived From Landscape Area

	Type	AFY/AC	AREA (AC)	GPM	AFY	
Lot 1 - Phase 1	Landscaping	2.43	0.8	1.2	2.0	
Lot 1 - Phase 1	Xeriscape	1.22	9.0	6.8	11.0	
Lot 2 - Phase 2	Landscaping	2.43	0.1	0.1	0.2	
Lot 2 - Phase 2	Xeriscape	1.22	5.3	4.0	6.4	
		TOTAL	15.2	12.2	**19.6**	Irrigation Demand
				56.1	**90.5**	**Potable + Irrigation Demand**

Notes:
1) Conversion for AFY to GPM = (1/365)*(1/24)*(1/60)*(325851). (*0.61996)
2) 4.74 Acres east of Paonia Street assumed to be native seed and not irrigated for these demands.
3) Xeriscape is half of the demand of regular landscaping.
* Indicates worst case junction with Fire Flow of 2,000 gpm applied to node.

Max Day Junction Table				
Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	6,267.80	8.76	6,556.50	124.9
J-2	6,268.00	8.76	6,556.30	124.8
J-3	6,264.00	23.31	6,556.10	126.4
J-4	6,264.60	27.47	6,555.90	126
J-5	6,261.80	12.92	6,555.80	127.2
J-6	6,263.80	8.76	6,555.70	126.3
J-7	6,256.80	6.96	6,555.90	129.4
J-8	6,261.40	31.91	6,555.90	127.4
J-9	6,261.20	31.91	6,556.00	127.5
J-10	6,254.90	27.75	6,555.90	130.2
J-11	6,252.10	17.36	6,555.90	131.4
J-12	6,251.40	11.17	6,555.90	131.8
J-13	6,245.80	6.96	6,555.90	134.2
J-14	6,245.80	6.96	6,555.90	134.2

Max Day Pipe Table						
Label	Length (ft)	Diameter (in)	Hazen-Williams C	Flow (Absolute) (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	75	8	130	334.54	2.14	0.002
P-2	65	8	130	325.78	2.08	0.002
P-3	309	8	130	163.54	1.04	0.001
P-4	448	8	130	64.88	0.41	0
P-5	245	8	130	37.13	0.24	0
P-6	327	8	130	19.77	0.13	0
P-7	272	8	130	51.12	0.33	0
P-8	308	8	130	89.31	0.57	0
P-9	322	8	130	101.14	0.65	0
P-10	557	8	130	138.93	0.89	0
P-11	308	8	130	10.32	0.07	0
P-12	552	8	130	66.74	0.43	0
P-13	323	8	130	45.15	0.29	0
P-14	145	8	120	177.53	1.13	0.001
P-15	430	8	130	42.51	0.27	0
P-16	25	8	130	49.47	0.32	0
P-17	1,000	8	130	168.77	1.08	0.001
P-18	1,000	8	130	343.3	2.19	0.003
P-19	1,000	8	130	56.43	0.36	0

Peak Hour Junction Table				
Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	6,267.80	15.65	6,556.00	124.7
J-2	6,268.00	15.65	6,555.80	124.5
J-3	6,264.00	41.64	6,555.60	126.2
J-4	6,264.60	49.06	6,555.40	125.8
J-5	6,261.80	23.08	6,555.30	127
J-6	6,263.80	15.65	6,555.30	126.1
J-7	6,256.80	12.44	6,555.40	129.2
J-8	6,261.40	56.99	6,555.40	127.2
J-9	6,261.20	56.99	6,555.40	127.3
J-10	6,254.90	49.57	6,555.40	130
J-11	6,252.10	31	6,555.40	131.2
J-12	6,251.40	19.96	6,555.40	131.5
J-13	6,245.80	12.44	6,555.50	134
J-14	6,245.80	12.44	6,555.50	134

Peak Hour Pipe Table						
Label	Length (ft)	Diameter (in)	Hazen-Williams C	Flow (Absolute) (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	75	8	130	361.53	2.31	0.003
P-2	65	8	130	345.88	2.21	0.003
P-3	309	8	130	167.36	1.07	0.001
P-4	448	8	130	51.8	0.33	0
P-5	245	8	130	2.23	0.01	0
P-6	327	8	130	28.77	0.18	0
P-7	272	8	130	63.51	0.41	0
P-8	308	8	130	68.42	0.44	0
P-9	322	8	130	72.05	0.46	0
P-10	557	8	130	136.87	0.87	0
P-11	308	8	130	15.77	0.1	0
P-12	552	8	130	58.58	0.37	0
P-13	323	8	130	17.36	0.11	0
P-14	145	8	120	117.39	0.75	0
P-15	430	8	130	112.24	0.72	0
P-16	25	8	130	124.68	0.8	0
P-17	1,000	8	130	101.74	0.65	0
P-18	1,000	8	130	377.18	2.41	0.003
P-19	1,000	8	130	137.12	0.88	0

Max Day Plus Fire Flow (2,000 GPM @ J-3) Junction Table				
Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	6,267.80	8.76	6,542.70	119
J-2	6,268.00	8.76	6,541.50	118.4
J-3	6,264.00	2,023.31	6,540.50	119.6
J-4	6,264.60	27.47	6,543.50	120.7
J-5	6,261.80	12.92	6,544.90	122.5
J-6	6,263.80	8.76	6,546.40	122.2
J-7	6,256.80	6.96	6,544.70	124.6
J-8	6,261.40	31.91	6,543.60	122.1
J-9	6,261.20	31.91	6,542.50	121.7
J-10	6,254.90	27.75	6,543.50	124.9
J-11	6,252.10	17.36	6,544.10	126.3
J-12	6,251.40	11.17	6,545.10	127.1
J-13	6,245.80	6.96	6,548.20	130.9
J-14	6,245.80	6.96	6,548.40	130.9

Max Day Plus Fire Flow (2,000 GPM @ J-3) Pipe Table						
Label	Length (ft)	Diameter (in)	Hazen-Williams C	Flow (Absolute) (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-1	75	8	130	931.46	5.95	0.016
P-2	65	8	130	922.7	5.89	0.016
P-3	309	8	130	579.64	3.7	0.007
P-4	448	8	130	317.54	2.03	0.002
P-5	245	8	130	345.29	2.2	0.003
P-6	327	8	130	362.65	2.31	0.003
P-7	272	8	130	235.83	1.51	0.001
P-8	308	8	130	180.69	1.15	0.001
P-9	322	8	130	464.79	2.97	0.004
P-10	557	8	130	520.97	3.33	0.005
P-11	308	8	130	83.64	0.53	0
P-12	552	8	130	294.01	1.88	0.002
P-13	323	8	130	409.57	2.61	0.003
P-14	145	8	120	658.41	4.2	0.01
P-15	430	8	130	609.65	3.89	0.007
P-16	25	8	130	616.61	3.94	0.007
P-17	1,000	8	130	667.17	4.26	0.009
P-18	1,000	8	130	940.22	6	0.016
P-19	1,000	8	130	623.57	3.98	0.008

PHASE 1

CRITICAL ANALYSIS

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P.O.C. NUMBER: 01
Water Source Information:

FLOW AVAILABLE
Point of Connection Size: 1 1/2"
Flow Available: 40.32 gpm

PRESSURE AVAILABLE
Static Pressure at POC: 90.00 PSI
Pressure Available: 90.00 psi

DESIGN ANALYSIS
Maximum Station Flow: 39.41 gpm
Flow Available at POC: 40.32 gpm
Residual Flow Available: 0.91 gpm

Critical Station: 2
Design Pressure: 45.00 psi
Friction Loss: 5.60 psi
Fittings Loss: 0.56 psi
Elevation Loss: 0.00 psi
Loss through Valve: 3.51 psi
Pressure Req. at Critical Station: 54.67 psi
Loss for Fittings: 0.73 psi
Loss for Main Line: 7.34 psi
Loss for POC to Valve Elevation: 0.00 psi
Loss for Backflow: 15.94 psi
Loss for Master Valve: 9.74 psi
Critical Station Pressure at POC: 88.42 psi
Pressure Available: 90.00 psi
Residual Pressure Available: 1.58 psi

P.O.C. NUMBER: 02
Water Source Information:

FLOW AVAILABLE
Point of Connection Size: 1 1/2"
Flow Available: 40.32 gpm

PRESSURE AVAILABLE
Static Pressure at POC: 90.00 PSI
Pressure Available: 90.00 psi

DESIGN ANALYSIS
Maximum Station Flow: 40.05 gpm
Flow Available at POC: 40.32 gpm
Residual Flow Available: 0.27 gpm

Critical Station: 11
Design Pressure: 30.00 psi
Friction Loss: 5.17 psi
Fittings Loss: 0.52 psi
Elevation Loss: 0.00 psi
Loss through Valve: 20.70 psi
Pressure Req. at Critical Station: 56.38 psi
Loss for Fittings: 0.47 psi
Loss for Main Line: 4.67 psi
Loss for POC to Valve Elevation: 0.00 psi
Loss for Backflow: 16.01 psi
Loss for Master Valve: 10.03 psi
Critical Station Pressure at POC: 87.56 psi
Pressure Available: 90.00 psi
Residual Pressure Available: 2.44 psi

P.O.C. NUMBER: 03
Water Source Information:

FLOW AVAILABLE
Point of Connection Size: 1 1/2"
Flow Available: 40.32 gpm

PRESSURE AVAILABLE
Static Pressure at POC: 90.00 PSI
Pressure Available: 90.00 psi

DESIGN ANALYSIS
Maximum Station Flow: 22.74 gpm
Flow Available at POC: 40.32 gpm
Residual Flow Available: 17.58 gpm

Critical Station: 11
Pressure Req. at Critical Station: 49.42 psi
Loss for Fittings: 1.99 psi
Loss for Main Line: 19.91 psi
Loss for POC to Valve Elevation: 0.00 psi
Loss for Backflow: 14.48 psi
Loss for Master Valve: 2.37 psi
Critical Station Pressure at POC: 88.17 psi
Pressure Available: 90.00 psi
Residual Pressure Available: 1.83 psi

P.O.C. NUMBER: 04
Water Source Information:

FLOW AVAILABLE
Point of Connection Size: 1 1/2"
Flow Available: 40.32 gpm

PRESSURE AVAILABLE
Static Pressure at POC: 90.00 PSI
Pressure Available: 90.00 psi

DESIGN ANALYSIS
Maximum Station Flow: 19.60 gpm
Flow Available at POC: 40.32 gpm
Residual Flow Available: 20.72 gpm

Critical Station: 11
Pressure Req. at Critical Station: 55.27 psi
Loss for Fittings: 0.46 psi
Loss for Main Line: 4.60 psi
Loss for POC to Valve Elevation: 0.00 psi
Loss for Backflow: 14.11 psi
Loss for Master Valve: 2.78 psi
Critical Station Pressure at POC: 77.22 psi
Pressure Available: 90.00 psi
Residual Pressure Available: 12.78 psi

P.O.C. NUMBER: 05
Water Source Information:

FLOW AVAILABLE
Point of Connection Size: 1 1/2"
Flow Available: 40.32 gpm

PRESSURE AVAILABLE
Static Pressure at POC: 90.00 PSI
Pressure Available: 90.00 psi

DESIGN ANALYSIS
Maximum Station Flow: 18.90 gpm
Flow Available at POC: 40.32 gpm
Residual Flow Available: 21.42 gpm

Critical Station: 11
Pressure Req. at Critical Station: 52.87 psi
Loss for Fittings: 0.66 psi
Loss for Main Line: 6.58 psi
Loss for POC to Valve Elevation: 0.00 psi
Loss for Backflow: 14.24 psi
Loss for Master Valve: 2.64 psi
Critical Station Pressure at POC: 76.99 psi
Pressure Available: 90.00 psi
Residual Pressure Available: 13.01 psi

VALVE SCHEDULE

NUMBER	MODEL	SIZE	TYPE	GPM	WIRE	PSI	PSI @ POC	PRECIP
1	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	35.93		49.83	80.15	0.65 in/h
2	RAIN BIRD PEB	1-1/2"	TURF ROTARY	39.41		54.67	88.42	0.7 in/h
3	RAIN BIRD XCZ-100-PRB-COM	1"	BUBBLER	10.50		43.24	60.79	0.91 in/h
4	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	31.41		48.72	75.9	0.65 in/h
5	RAIN BIRD PEB	1"	TURF ROTARY	14.05		49.35	67.83	0.58 in/h
6	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	36.43		50.96	86.98	0.65 in/h
7	RAIN BIRD PEB	1-1/2"	TURF ROTARY	32.80		55.83	87.19	0.58 in/h
8	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	25.45		44.84	68.27	0.65 in/h
9	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	30.66		48.36	72.54	0.64 in/h
10	RAIN BIRD PEB	1"	TURF ROTARY	5.69		47.26	65.18	0.62 in/h
11	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	40.05		56.39	87.56	0.64 in/h
12	RAIN BIRD PEB	1-1/2"	TURF ROTARY	37.56		53.66	82.09	0.49 in/h
13	RAIN BIRD PEB	1-1/2"	TURF ROTARY	30.49		53.99	77.51	0.47 in/h
14	RAIN BIRD XCZ-100-PRB-COM	1"	BUBBLER	10.50		43.25	60.53	0.92 in/h
15	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	25.27		45.78	68.13	0.64 in/h
16	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	32.00		49.56	75.82	0.64 in/h
17	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	34.84		50.93	75.52	0.65 in/h
18	RAIN BIRD PEB	1"	TURF ROTARY	18.63		53.9	83.62	0.38 in/h
19	RAIN BIRD PEB	1"	TURF ROTARY	17.21		54.67	82.66	0.35 in/h
20	RAIN BIRD PEB	1-1/2"	TURF ROTOR	37.94		51.91		0.62 in/h
21	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.32		52.63		0.61 in/h
22	RAIN BIRD PEB	1-1/2"	TURF ROTOR	17.16		50.02	78.16	0.59 in/h
23	RAIN BIRD PEB	1-1/2"	TURF ROTARY	38.60		51.86		0.66 in/h
24	RAIN BIRD PEB	1-1/2"	TURF ROTOR	37.98		52.84		0.71 in/h
25	RAIN BIRD PEB	1-1/2"	TURF ROTOR	37.98		51.72		0.67 in/h
26	RAIN BIRD PEB	1-1/2"	TURF ROTOR	16.38		51.12	79.93	0.85 in/h
27	RAIN BIRD PEB	1"	TURF ROTOR	26.59		52.42		0.66 in/h
28	RAIN BIRD PEB	1"	TURF ROTARY	29.92		57.6		0.66 in/h
29	RAIN BIRD PEB	1"	TURF ROTOR	29.56		53.28		0.63 in/h
30	RAIN BIRD PEB	1-1/2"	TURF ROTOR	17.66		49.78	77.79	0.93 in/h
31	RAIN BIRD PEB	1-1/2"	TURF ROTOR	30.36		53.17		0.67 in/h
32	RAIN BIRD XCZ-100-PRB-COM	1"	BUBBLER	12.00		45.26		0.91 in/h
33	RAIN BIRD PEB	1-1/2"	TURF ROTOR	34.13		51.33		0.63 in/h
34	RAIN BIRD PEB	1-1/2"	TURF ROTOR	34.17		53.81		0.63 in/h
35	RAIN BIRD PEB	1"	TURF ROTOR	19.05		50.56	79.18	0.61 in/h
36	RAIN BIRD PEB	1-1/2"	TURF ROTOR	30.32		51.79		0.6 in/h
37	RAIN BIRD PEB	1-1/2"	TURF ROTOR	37.90		52.54		0.61 in/h
38	RAIN BIRD PEB	1-1/2"	TURF ROTOR	30.58		54.76		0.59 in/h
39	RAIN BIRD PEB	1-1/2"	TURF ROTOR	37.98		51.46		0.62 in/h
40	RAIN BIRD XCZ-100-PRB-COM	1"	BUBBLER	11.00		44.41		0.92 in/h
41	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.78		52.27		0.73 in/h
42	RAIN BIRD PEB	1-1/2"	TURF ROTOR	37.76		53.22		0.69 in/h
43	RAIN BIRD PEB	1"	TURF ROTOR	29.63		53.96		0.75 in/h
44	RAIN BIRD PEB	1-1/2"	TURF ROTOR	30.56		52.38		0.73 in/h
45	RAIN BIRD PEB	1"	TURF ROTOR	27.08		55.84		0.76 in/h
46	RAIN BIRD PEB	1-1/2"	TURF ROTOR	30.89		55.98		0.71 in/h
47	RAIN BIRD PEB	1-1/2"	TURF ROTOR	38.36		51.62		0.69 in/h
48	RAIN BIRD PEB	1-1/2"	TURF ROTOR	34.42		53.7		0.68 in/h
49	RAIN BIRD PEB	1-1/2"	TURF ROTARY	35.73		52.55		0.85 in/h
50	RAIN BIRD XCZ-100-PRB-COM	1"	AREA FOR DRIPLINE	15.30		44.09		0.65 in/h
51	RAIN BIRD PEB	1-1/2"	TURF ROTARY	30.41		53.32		0.62 in/h
52	RAIN BIRD PEB	1-1/2"	TURF ROTOR	39.90		51.81		0.56 in/h
53	RAIN BIRD PEB	1-1/2"	TURF ROTOR	30.32		53.57		0.6 in/h
54	RAIN BIRD PEB	1-1/2"	TURF ROTOR	36.22		51.56		0.57 in/h
55	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.40		52.36		0.68 in/h
56	RAIN BIRD PEB	1-1/2"	TURF ROTARY	37.67		51.11		0.66 in/h
57	RAIN BIRD PEB	1-1/2"	TURF ROTARY	39.27		52.96		0.65 in/h
58	RAIN BIRD PEB	1-1/2"	TURF ROTARY	33.78		51.44		0.61 in/h
59	RAIN BIRD XCZ-100-PRB-COM	1"	AREA FOR DRIPLINE	15.18		47.51	64.84	0.64 in/h
60	RAIN BIRD PEB	1"	TURF ROTARY	13.01		49.35	66.67	0.37 in/h
61	RAIN BIRD PEB	1-1/2"	TURF ROTARY	11.62		51.1	69.43	0.34 in/h
62	RAIN BIRD XCZ-100-PRB-COM	1"	BUBBLER	9.50		42.05	61	0.96 in/h
63	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	31.23		48.88		0.65 in/h
64	RAIN BIRD PEB	1"	TURF ROTARY	19.81		50.79		0.52 in/h
65	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	30.10		48.91		0.64 in/h
66	RAIN BIRD PEB	1"	TURF ROTARY	25.12		50.78		0.59 in/h
67	RAIN BIRD PEB	1"	TURF ROTOR	28.77		53.01		0.61 in/h
68	RAIN BIRD PEB	1"	TURF ROTARY	25.80		51.77		0.69 in/h
69	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	37.37		52.82		0.64 in/h
70	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	31.79		47.27		0.64 in/h
71	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	26.85		46.62		0.64 in/h
72	RAIN BIRD PEB	1-1/2"	TURF ROTARY	17.81		50.5	76.24	0.46 in/h
73	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	25.25		43.62		0.64 in/h
74	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	23.03		44.81		0.65 in/h
75	RAIN BIRD XCZ-100-PRB-COM	1"	BUBBLER	14.50		47.71	71.62	0.9 in/h
76	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	36.82		51.47		0.64 in/h
77	RAIN BIRD XCZ-100-PRB-COM	1"	AREA FOR DRIPLINE	17.19		48.37	70.29	0.65 in/h
78	RAIN BIRD PEB	1"	TURF ROTARY	16.01		49.23	76.36	0.51 in/h
79	RAIN BIRD XCZ-100-PRB-COM	1"	AREA FOR DRIPLINE	16.65		48.44	69.93	0.65 in/h
80	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	38.44		53.45		0.64 in/h
81	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	29.36		47.15		0.64 in/h
82	RAIN BIRD PEB	1"	TURF ROTARY	13.81		49.75	68.23	0.55 in/h
83	RAIN BIRD XCZ-100-PRB-COM	1"	BUBBLER	5.50		39.83	54.61	0.9 in/h
84	RAIN BIRD PEB	1"	TURF ROTARY	14.59		49.29	68.56	0.81 in/h
85	RAIN BIRD PEB	1-1/2"	TURF ROTOR	19.08		53.08	71.98	0.86 in/h
86	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	32.78		48.18		0.64 in/h
87	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	24.92		44.4		0.65 in/h
88	RAIN BIRD PEB	1-1/2"	TURF ROTARY	18.84		50.25	71.88	0.76 in/h
89	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	33.91		49.62		0.64 in/h
90	RAIN BIRD PEB	1"	TURF ROTARY	5.90		47.08	62.29	0.64 in/h
91	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	28.37		47.05		0.65 in/h
92	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	31.36		49.5		0.64 in/h
93	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIPLINE	31.55		50.23		0.64 in/h
	Common Wire				9,528			

WATERING SCHEDULE

NUMBER	MODEL	TYPE	PRECIP	IN./WEEK	MIN./WEEK	GAL./WEEK	GAL./DA
1	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.65 in/h	0.67	63	2,264	
2	RAIN BIRD PEB	TURF ROTARY	0.7 in/h	1	86	3,389	1,130
3	RAIN BIRD XCZ-100-PRB-COM	BUBBLER	0.91 in/h	0.67	45	472.5	
4	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.65 in/h	0.67	63	1,979	
5	RAIN BIRD PEB	TURF ROTARY	0.58 in/h	1	105	1,475	491.6
6	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.65 in/h	0.67	63	2,295	
7	RAIN BIRD PEB	TURF ROTARY	0.58 in/h	1	104	3,411	1,137
8	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.65 in/h	0.67	63	1,604	
9	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	1,932	
10	RAIN BIRD PEB	TURF ROTARY	0.62 in/h	1	97	552.1	184.0
11	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	2,523	
12	RAIN BIRD PEB	TURF ROTARY	0.49 in/h	1	122	4,582	1,527
13	RAIN BIRD PEB	TURF ROTARY	0.47 in/h	1	128	3,903	1,301
14	RAIN BIRD XCZ-100-PRB-COM	BUBBLER	0.92 in/h	0.67	44	462	
15	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	1,592	
16	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	2,016	
17	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.65 in/h	0.67	63	2,195	
18	RAIN BIRD PEB	TURF ROTARY	0.38 in/h	1	159	2,962	987.5
19	RAIN BIRD PEB	TURF ROTARY	0.35 in/h	1	173	2,977	992.3
20	RAIN BIRD PEB	TURF ROTOR	0.62 in/h	1	97	3,680	1,227
21	RAIN BIRD PEB	TURF ROTOR	0.61 in/h	1	99	3,200	1,067
22	RAIN BIRD PEB	TURF ROTOR	0.59 in/h	1	102	1,750	583.4
23	RAIN BIRD PEB	TURF ROTARY	0.66 in/h	1	91	3,512	1,171
24	RAIN BIRD PEB	TURF ROTOR	0.71 in/h	1	85	3,228	1,076
25	RAIN BIRD PEB	TURF ROTOR	0.67 in/h	1	90	3,418	1,139
26	RAIN BIRD PEB	TURF ROTOR	0.85 in/h	1	71	1,163	387.8
27	RAIN BIRD PEB	TURF ROTOR	0.66 in/h	1	91	2,420	806.6
28	RAIN BIRD PEB	TURF ROTARY	0.66 in/h	1	91	2,723	907.6
29	RAIN BIRD PEB	TURF ROTOR	0.63 in/h	1	96	2,837	945.8
30	RAIN BIRD PEB	TURF ROTOR	0.93 in/h	1	65	1,148	382.6
31	RAIN BIRD PEB	TURF ROTOR	0.67 in/h	1	91	2,763	920.9
32	RAIN BIRD XCZ-100-PRB-COM	BUBBLER	0.91 in/h	0.67	45	540	
33	RAIN BIRD PEB	TURF ROTOR	0.63 in/h	1	96	3,276	1,092
34	RAIN BIRD PEB	TURF ROTOR	0.63 in/h	1	95	3,246	1,082
35	RAIN BIRD PEB	TURF ROTOR	0.61 in/h	1	99	1,886	628.7
36	RAIN BIRD PEB	TURF ROTOR	0.6 in/h	1	100	3,032	1,011
37	RAIN BIRD PEB	TURF ROTOR	0.61 in/h	1	98	3,714	1,238
38	RAIN BIRD PEB	TURF ROTOR	0.59 in/h	1	102	3,119	1,040
39	RAIN BIRD PEB	TURF ROTOR	0.62 in/h	1	97	3,684	1,228
40	RAIN BIRD XCZ-100-PRB-COM	BUBBLER	0.92 in/h	0.67	44	484	
41	RAIN BIRD PEB	TURF ROTOR	0.73 in/h	1	83	2,721	906.9
42	RAIN BIRD PEB	TURF ROTOR	0.69 in/h	1	87	3,285	1,095
43	RAIN BIRD PEB	TURF ROTOR	0.75 in/h	1	80	2,370	790.0
44	RAIN BIRD PEB	TURF ROTOR	0.73 in/h	1	83	2,536	845.4
45	RAIN BIRD PEB	TURF ROTOR	0.76 in/h	1	79	2,139	713.1
46	RAIN BIRD PEB	TURF ROTOR	0.71 in/h	1	85	2,626	875.2
47	RAIN BIRD PEB	TURF ROTOR	0.69 in/h	1	87	3,337	1,112
48	RAIN BIRD PEB	TURF ROTOR	0.68 in/h	1	89	3,063	1,021
49	RAIN BIRD PEB	TURF ROTARY	0.85 in/h	1	71	2,537	845.5
50	RAIN BIRD XCZ-100-PRB-COM	AREA FOR DRIPLINE	0.65 in/h	0.67	63	964.1	
51	RAIN BIRD PEB	TURF ROTARY	0.62 in/h	1	98	2,980	993.3
52	RAIN BIRD PEB	TURF ROTOR	0.56 in/h	1	107	4,269	1,423
53	RAIN BIRD PEB	TURF ROTOR	0.6 in/h	1	100	3,032	1,011
54	RAIN BIRD PEB	TURF ROTOR	0.57 in/h	1	105	3,803	1,268
55	RAIN BIRD PEB	TURF ROTOR	0.68 in/h	1	89	2,883	961.1
56	RAIN BIRD PEB	TURF ROTARY	0.66 in/h	1	91	3,428	1,143
57	RAIN BIRD PEB	TURF ROTARY	0.65 in/h	1	92	3,613	1,204
58	RAIN BIRD PEB	TURF ROTARY	0.61 in/h	1	98	3,310	1,103
59	RAIN BIRD XCZ-100-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	956.1	
60	RAIN BIRD PEB	TURF ROTARY	0.37 in/h	1	162	2,108	702.8
61	RAIN BIRD PEB	TURF ROTARY	0.34 in/h	1	176	2,045	681.6
62	RAIN BIRD XCZ-100-PRB-COM	BUBBLER	0.96 in/h	0.67	43	408.5	
63	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.65 in/h	0.67	63	1,967	
64	RAIN BIRD PEB	TURF ROTARY	0.52 in/h	1	116	2,297	765.8
65	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	1,896	
66	RAIN BIRD PEB	TURF ROTARY	0.59 in/h	1	102	2,562	854.1
67	RAIN BIRD PEB	TURF ROTOR	0.61 in/h	1	98	2,819	939.8
68	RAIN BIRD PEB	TURF ROTARY	0.69 in/h	1	87	2,244	748.1
69	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	2,354	
70	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	2,003	
71	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	1,691	
72	RAIN BIRD PEB	TURF ROTARY	0.46 in/h	1	130	2,316	771.9
73	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	1,591	
74	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.65 in/h	0.67	63	1,451	
75	RAIN BIRD XCZ-100-PRB-COM	BUBBLER	0.9 in/h	0.67	45	652.5	
76	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	2,320	
77	RAIN BIRD XCZ-100-PRB-COM	AREA FOR DRIPLINE	0.65 in/h	0.67	63	1,083	
78	RAIN BIRD PEB	TURF ROTARY	0.51 in/h	1	119	1,906	635.2
79	RAIN BIRD XCZ-100-PRB-COM	AREA FOR DRIPLINE	0.65 in/h	0.67	63	1,049	
80	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	2,422	
81	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	1,850	
82	RAIN BIRD PEB	TURF ROTARY	0.55 in/h	1	110	1,520	506.5
83	RAIN BIRD XCZ-100-PRB-COM	BUBBLER	0.9 in/h	0.67	45	247.5	
84	RAIN BIRD PEB	TURF ROTARY	0.81 in/h	1	75	1,095	364.9
85	RAIN BIRD PEB	TURF ROTOR	0.86 in/h	1	71	1,355	451.6
86	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	2,065	
87	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.65 in/h	0.67	63	1,570	
88	RAIN BIRD PEB	TURF ROTARY	0.76 in/h	1	79	1,488	496.0
89	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	2,136	
90	RAIN BIRD PEB	TURF ROTARY	0.64 in/h	1	95	560.6	186.9
91	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.65 in/h	0.67	63	1,788	
92	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	1,976	
93	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIPLINE	0.64 in/h	0.67	63	1,988	
		TOTALS:			7,812	210,086	51,100

PHASE 2

CRITICAL ANALYSIS

Generated: 2022-12-22 08:53

P.O.C. NUMBER: 01
Water Source Information:

FLOW AVAILABLE
Point of Connection Size: 1 1/2"
Flow Available 40.32 GPM

PRESSURE AVAILABLE
Static Pressure at POC: 90 PSI
Pressure Available: 90 PSI

DESIGN ANALYSIS
Maximum Station Flow: 36.98 GPM
Flow Available at POC: 40.32 GPM
Residual Flow Available: 3.34 GPM

Critical Station: 33
Design Pressure: 45 PSI
Friction Loss: 4.1 PSI
Fittings Loss: 0.41 PSI
Elevation Loss: 0 PSI
Loss through Valve: 3.57 PSI
Pressure Req. at Critical Station: 53.1 PSI
Loss for Fittings: 1.47 PSI
Loss for Main Line: 14.7 PSI
Loss for POC to Valve Elevation: 0 PSI
Loss for Backflow: 12.1 PSI
Loss for Master Valve: 3.57 PSI
Critical Station Pressure at POC: 84.9 PSI
Pressure Available: 90 PSI
Residual Pressure Available: 5.12 PSI

P.O.C. NUMBER: 02
Water Source Information:

FLOW AVAILABLE
Point of Connection Size: 1 1/2"
Flow Available 40.32 GPM

PRESSURE AVAILABLE
Static Pressure at POC: 90 PSI
Pressure Available: 90 PSI

DESIGN ANALYSIS
Maximum Station Flow: 36.55 GPM
Flow Available at POC: 40.32 GPM
Residual Flow Available: 3.77 GPM

Critical Station: 25
Design Pressure: 45 PSI
Friction Loss: 4.04 PSI
Fittings Loss: 0.4 PSI
Elevation Loss: 0 PSI
Loss through Valve: 3.58 PSI
Pressure Req. at Critical Station: 53.0 PSI
Loss for Fittings: 1.15 PSI
Loss for Main Line: 11.5 PSI
Loss for POC to Valve Elevation: 0 PSI
Loss for Backflow: 12.1 PSI
Loss for Master Valve: 3.58 PSI
Critical Station Pressure at POC: 81.4 PSI
Pressure Available: 90 PSI
Residual Pressure Available: 8.62 PSI

VALVE SCHEDULE

NUMBER	MODEL	SIZE	TYPE	GPM	WIRE	PSI	PSI @ POC	PRECIP
1	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIP EMITTERS	7.86		35.6	51.9	0.3 in/h
2	RAIN BIRD XCZ-100-PRB-COM	1"	BUBBLER	10.5		43.2	59.5	0.97 in/h
3	RAIN BIRD PEB	1"	AREA FOR DRIP EMITTERS	15.29		36.0	52.3	0.52 in/h
4	RAIN BIRD PEB	1-1/2"	TURF ROTARY	36.55		52.0	69.1	0.44 in/h
5	RAIN BIRD PEB	1-1/2"	TURF ROTARY	21.18		54.3	70.9	0.5 in/h
6	RAIN BIRD PEB	1-1/2"	TURF ROTARY	33.54		53.6	71.4	0.47 in/h
7	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	BUBBLER	11.5		32.7	49.2	1.02 in/h
8	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.12		51.8	71.6	1.11 in/h
9	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.12		50.9	70.7	0.4 in/h
10	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.12		50.5	70.4	0.58 in/h
11	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.12		50.7	72.6	0.49 in/h
12	RAIN BIRD XCZ-100-PRB-COM	1"	BUBBLER	13		45.2	62.6	0.95 in/h
13	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.12		51.0	73.0	0.57 in/h
14	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.12		52.1	74.5	0.7 in/h
15	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	BUBBLER	17.5		40.2	58.6	0.96 in/h
16	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.12		50.4	72.9	0.69 in/h
17	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIP EMITTERS	3.38		31.7	48.1	0.37 in/h
18	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.12		49.8	73.5	0.41 in/h
19	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.12		50.8	75.7	0.64 in/h
20	RAIN BIRD PEB	1-1/2"	TURF ROTOR	28.21		52.4	75.5	0.44 in/h
21	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.12		51.8	77.5	0.69 in/h
22	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.09		54.2	80.0	0.47 in/h
23	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	BUBBLER	13		34.9	53.5	0.97 in/h
24	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.12		51.8	80.2	0.91 in/h
25	RAIN BIRD PEB	1-1/2"	TURF ROTOR	32.1		53.0	81.4	0.63 in/h
26	RAIN BIRD PEB	1-1/2"	TURF ROTOR	20.37		53.7	75.5	0.39 in/h
27	RAIN BIRD PEB	1-1/2"	TURF ROTARY	34.35		54.5	81.1	0.69 in/h
28	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIP EMITTERS	28.85		48.4	67.2	0.38 in/h
29	RAIN BIRD PEB	1-1/2"	TURF ROTARY	36.98		51.6	72.5	0.97 in/h
30	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	BUBBLER	15.5		35.6	52.9	0.96 in/h
31	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	AREA FOR DRIP EMITTERS	20.6		44.9	67.5	0.33 in/h
32	RAIN BIRD XCZ-150-PRB-COM	1-1/2"	BUBBLER	13.5		35.5	54.7	0.98 in/h
33	RAIN BIRD PEB	1-1/2"	TURF ROTARY	33.44		53.1	84.9	0.89 in/h
34	RAIN BIRD PEB	1-1/2"	TURF ROTARY	15.91		51.3	68.0	0.39 in/h
	Common Wire				2,394			

WATERING SCHEDULE

NUMBER	MODEL	TYPE	PRECIP	SUN	MON	TUE	WED	THU	FRI	SAT	IN./WEEK	MIN./WEEK	GAL./WEEK	GAL./DAY
1	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIP EMITTERS	0.3 in/h								0.67	133	1,045	
2	RAIN BIRD XCZ-100-PRB-COM	BUBBLER	0.97 in/h								0.67	42	441	
3	RAIN BIRD PEB	AREA FOR DRIP EMITTERS	0.52 in/h								0.67	78	1,193	
4	RAIN BIRD PEB	TURF ROTARY	0.44 in/h		45 min		45 min		45 min		1	135	4,934	1,645
5	RAIN BIRD PEB	TURF ROTARY	0.5 in/h		40 min		40 min		40 min		1	120	2,542	847
6	RAIN BIRD PEB	TURF ROTARY	0.47 in/h		43 min		43 min		43 min		1	128	4,294	1,431
7	RAIN BIRD XCZ-150-PRB-COM	BUBBLER	1.02 in/h								0.67	40	460	
8	RAIN BIRD PEB	TURF ROTOR	1.11 in/h		18 min		18 min		18 min		1	54	1,734	578
9	RAIN BIRD PEB	TURF ROTOR	0.4 in/h		51 min		51 min		51 min		1	151	4,850	1,617
10	RAIN BIRD PEB	TURF ROTOR	0.58 in/h		35 min		35 min		35 min		1	103	3,308	1,103
11	RAIN BIRD PEB	TURF ROTOR	0.49 in/h		41 min		41 min		41 min		1	122	3,919	1,306
12	RAIN BIRD XCZ-100-PRB-COM	BUBBLER	0.95 in/h								0.67	43	559	
13	RAIN BIRD PEB	TURF ROTOR	0.57 in/h		35 min		35 min		35 min		1	105	3,373	1,124
14	RAIN BIRD PEB	TURF ROTOR	0.7 in/h		29 min		29 min		29 min		1	86	2,762	921
15	RAIN BIRD XCZ-150-PRB-COM	BUBBLER	0.96 in/h								0.67	42	735	
16	RAIN BIRD PEB	TURF ROTOR	0.69 in/h		29 min		29 min		29 min		1	87	2,794	931
17	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIP EMITTERS	0.37 in/h								0.67	111	376	
18	RAIN BIRD PEB	TURF ROTOR	0.41 in/h		49 min		49 min		49 min		1	146	4,690	1,563
19	RAIN BIRD PEB	TURF ROTOR	0.64 in/h		32 min		32 min		32 min		1	94	3,019	1,006
20	RAIN BIRD PEB	TURF ROTOR	0.44 in/h		46 min		46 min		46 min		1	138	3,893	1,298
21	RAIN BIRD PEB	TURF ROTOR	0.69 in/h		29 min		29 min		29 min		1	87	2,794	931
22	RAIN BIRD PEB	TURF ROTOR	0.47 in/h		43 min		43 min		43 min		1	128	4,108	1,369
23	RAIN BIRD XCZ-150-PRB-COM	BUBBLER	0.97 in/h								0.67	42	546	
24	RAIN BIRD PEB	TURF ROTOR	0.91 in/h		22 min		22 min		22 min		1	66	2,120	707
25	RAIN BIRD PEB	TURF ROTOR	0.63 in/h		32 min		32 min		32 min		1	96	3,082	1,027
26	RAIN BIRD PEB	TURF ROTOR	0.39 in/h		52 min		52 min		52 min		1	155	3,157	1,052
27	RAIN BIRD PEB	TURF ROTARY	0.69 in/h		29 min		29 min		29 min		1	87	2,989	996
28	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIP EMITTERS	0.38 in/h								0.67	107	3,087	
29	RAIN BIRD PEB	TURF ROTARY	0.97 in/h		21 min		21 min		21 min		1	63	2,330	777
30	RAIN BIRD XCZ-150-PRB-COM	BUBBLER	0.96 in/h								0.67	42	651	
31	RAIN BIRD XCZ-150-PRB-COM	AREA FOR DRIP EMITTERS	0.33 in/h								0.67	124	2,555	
32	RAIN BIRD XCZ-150-PRB-COM	BUBBLER	0.98 in/h								0.67	42	567	
33	RAIN BIRD PEB	TURF ROTARY	0.89 in/h		23 min		23 min		23 min		1	68	2,274	758
34	RAIN BIRD PEB	TURF ROTARY	0.39 in/h		52 min		52 min		52 min		1	155	2,467	822
		TOTALS:			796		796		796			3,220	83,647	23,811

Know what's below. Call before you dig.

NO.	REVISION	BY	DATE	APPR.

Kimley»Horn
© 2023 KIMLEY-HORN AND ASSOCIATES, INC.
2 North Nevada Avenue, Suite 300
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: MVZ
DRAWN BY: MVZ/RES
CHECKED BY: EJG
DATE: 02/07/2023

SOLACE APARTMENTS FILING NO. 2
CONSTRUCTION DOCUMENTS AND
GRADING AND EROSION PLANS
IRRIGATION DETAILS

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION
Kimley»Horn
Kimley-Horn and Associates, Inc.

PROJECT NO.
096668009

SHEET
L-806

APPENDIX E: SERVICE COMMITMENT LETTER

CHEROKEE METROPOLITAN DISTRICT

6250 Palmer Park Blvd., Colorado Springs, CO 80915-2842
Telephone: (719) 597-5080 Fax: (719) 597-5145

Water Provider's Supplement to the Water Resources Report for Solace Phases 1 & 2

Commitment Number 2023-03

July 19th, 2023

This document was prepared to satisfy the requirements of El Paso County for a Water Provider's Report in support of **the development of Solace at Cimmaron Hills Phases 1 & 2** at the **Northwest corner of Galley Road and Paonia Street.**

Introduction

Cherokee Metropolitan District (CMD) is a Title 32 special District which provides water and wastewater to an approximately 5000-acre enclave of unincorporated El Paso county surrounded by the City of Colorado Springs. Currently CMD serves approximately 8000 residential customers and 600 commercial customers in addition to bulk users in eastern El Paso County including Schriever Air Force Base.

CMD water is sourced entirely from groundwater in two regions. The majority is withdrawn from the alluvial Upper Black Squirrel (UBS) Aquifer in eastern El Paso County through 20 wells. The remainder is sourced from two wells in deep bedrock aquifers in the northern part of the county on the "Sundance Ranch" property. Water from eight of the 20 wells in the eastern part of the county can only be used to serve a fixed set of customers. Water for the main service area of CMD comes only from the remaining 12 wells in UBS along with the two wells in Black Forest.

Calculation of Anticipated Water Demand

Estimated water demand for the proposed development was calculated in two parts: domestic use and irrigation use. Cherokee's historic 10-year maximum average per-customer use for multi-family apartments similar to the proposed development is 0.20 AFY. The proposed development will include 234 units in the first phase and 108 units in the second phase which yields a domestic water supply requirement of 68.4 AFY. In addition to apartments, there is a clubhouse building and pool which. Based on building square footage and water use from similar existing developments in the District has an estimated water use of 2.5 AFY.

The project's outdoor irrigation area includes two types of terrain: traditional landscaping and xeriscaping. Water use for traditional landscaping was calculated with the County's presumptive use value of 2.43 feet per year. The combined traditionally landscaped area across both phases is 0.9 acres, yielding a 2.2 AFY demand from this area. Water use for xeriscaped areas was conservatively estimated to be half the water use of traditional landscaping. The total area of xeriscaping across both project phases is 14.3 acres, yielding a water demand of 17.4 AFY. The total water demand for this development is expected to be 90.5 AFY.

Water Supplies

Of Cherokee's 23 wells, eight wells are restricted to serving a maximum of 653 AFY to specified in-basin customers. Excess allocation for these wells is unavailable for new developments, even if they are inside the Basin, so this water is tracked separately from CMD's general supply portfolio. CMD's other alluvial wells and Denver Basin wells are available for export outside the UBS basin. The total annual volume available to CMD from these exportable

supplies is 3,953.5 AFY (Table 1). The physical yield of these wells is significantly higher than their annual appropriation, allowing flexibility in satisfying summer peak demand.

Table 1: Water rights and tributary status of Exportable Wells

Well Number	Water Right (AFY)	2022 Use (AFY)	Permit Number	Aquifer	Aquifer Status
Well 9	176	153.5	14145-FP-R	UBS Alluvium	Tributary
Well 10	176	163.6	14146-FP-R	UBS Alluvium	Tributary
Well 11	244	165.3	6821-FP-R	UBS Alluvium	Tributary
Well 12	244	127.4	11198-FP	UBS Alluvium	Tributary
Well 13	1268	1174.9	49988-F	UBS Alluvium	Tributary
Well 14	0	0	52429-F	UBS Alluvium	Tributary
Well 15*	281	105.4	54070-F	UBS Alluvium	Tributary
Well 16*	219	75.6	54069-F	UBS Alluvium	Tributary
Well 17*	175	16.3	63094-F	UBS Alluvium	Tributary
Well 18	225	39.7	16253-RFP-R	UBS Alluvium	Tributary
Well 19	95	44	20567-RFP-R	UBS Alluvium	Tributary
Well 20	400	133.2	4332-RFP	UBS Alluvium	Tributary
Well 21	258.5	74.8	81782-F	UBS Alluvium	Tributary
Well 22	153.5	0	27571-F, 27572-F	UBS Alluvium	Tributary
DN-4**	105	74.8	78315-F	Denver Aquifer	Non-Tributary
AR-1**	306	217.1	75881-F	Arapahoe Aquifer	Non-Tributary
DA-1	40.3	0	83604-F	Dawson Aquifer	Not-Non-Tributary
DA-4	64.5	0	83603-F	Dawson Aquifer	Not-Non-Tributary
Total	**4364.8**	**2547.0**			

*Wells 15-17 can produce a total of 609 AFY instead of their nominal total of 675 AFY. This limitation is reflected in the 3984.7 AFY total available production.

**CMD holds additional water rights and well sites in the Dawson, Denver, and Arapahoe Aquifers associated with the Sundance Ranch property. The volume presented is the reliable annual yield of each well.

CMD has 4364.8 AFY of exportable water supply available in its portfolio from alluvial and deep bedrock aquifers. Further development in the Denver Basin is not planned at this time and instead CMD is focusing on acquiring new renewable supplies proximate to existing infrastructure.

Water Commitments

CMD's water commitments stand at 4049.7 AFY before the addition of the proposed development (Table 3). Previous commitments to each phase of the Solace development were removed from the ledger when the new commitment to both phases was issued in March 2023.

Table 3: CMD Commitments before addition of new development

Commitment Category	Volume (AFY)
In-District pre 2015	2693
In-District post 2015	687.7
Schriever Space Force Base	537
Mayberry Communities	82
Construction	25
Parks	25
Total Commitments	**4049.7**

Water Balance

With 4,364.8 AFY of exportable supply and 4049.7 AFY of commitments, CMD has a water balance of 315.1 AFY before the subject development. After commitment of 90.5 AFY to this development, the District will have 224.6 AFY remaining for additional commitments.

Table 4: Water balance with new development

Water Balance Before New Commitment	315.1 AFY
New Commitment: Solace Phases 1 & 2.	90.5 AFY
Water Balance Remaining	**290.5 AFY**

Other Relevant Information

Recent Water Acquisitions/Losses

CMD has not acquired any new water rights since 2015 but has been developing owned water rights. CMD has not engaged in any water trades nor lost any water rights in the last year. The District is not currently under contract to purchase new water rights although CMD is investigating purchases of renewable water rights proximate to its existing infrastructure on an ongoing basis.

New Augmentation Plans

CMD is currently pursuing a replacement plan in partnership with Meridian Service Metropolitan District (MSMD) in order to maximize the efficiency of its water supplies.

Major Water System Capital Improvements

CMD has been actualizing owned water by drilling wells and beginning production on several well sites. In February 2020 CMD brought its well 21 (81782-F) online after a year of planning and construction. The District completed drilling of the Albrecht Well (Well 22) in fall 2022 and expect to connect to the system in 2024.

Smaller-scale improvements to the distribution system to improve reliability and resiliency have been ongoing and include deeper computer integration, upgrades to treatment systems, rehabilitation of tanks, and emergency generator refurbishment.

CHEROKEE METROPOLITAN DISTRICT

6250 Palmer Park Blvd., Colorado Springs, CO 80915-2842
Telephone: (719) 597-5080 Fax: (719) 597-5145

March 21st, 2023
CS Powers & Galley
510 S Neil Street
Champaign, IL 61820

Sent via email: shane.brown@kimley-horn.com

Re: Water and Sewer Service to **Solace Apartments Phase 1 & Phase 2**
Commitment Letter No. **2023-03 (Revision of 2022-13 and 2021-09)**

Dear CS Powers and Galley,

As requested, this document will serve is as a formal Letter of Commitment from the Cherokee Metropolitan District to provide municipal water and sewer services for the Solace Apartments Phases 1 and 2 located at the northeastern corner of Powers Boulevard and Galley Road. The proposed location for this development is located within the District's established boundaries and therefore is eligible for service connections from the District.

Cherokee Metropolitan District staff, along with the developer, have determined that the following will be the total water demand required by this development:

Type of Use	**Demand (AF/yr)**
Domestic	70.8
Irrigation	19.6
Total	**90.4**

Based on a conservatively low 0% consumptive use of domestic water, the development is expected to produce 63,200 gallons of wastewater per day, representing 2.4% of CMD's wastewater capacity. This usage is in line with anticipated wastewater demand for this area of the District. This 0% consumptive use is calculated for the purposes of ensuring CMD wastewater collection and treatment infrastructure is capable of treating the maximum possible volume of wastewater generated from this development. This is not intended in any way to limit consumptive uses of potable water on the subject property.

This water commitment is hereby made exclusively for this specific development project at this site within the District. To confirm this commitment you must provide the District with a copy of the final plat approval from El Paso County Development Services within 12 months of the date of this letter.

Otherwise, the District may use this allocation for other developments requesting a water commitment. If the subject project is re-platted, you must submit a new commitment request prior to submitting the re-plat to El Paso County, which may result in a recalculation of the water demand for the project.

If I may be of further assistance please contact me at your convenience.

Sincerely,

Amy Lathen
General Manager

Cc: Peter Johnson; Water Counsel w/ encl: sent via email
Steve Hasbrouck; Board President w/ encl: sent via email
Jeff Munger; Water Resource Engineer: sent via email
Kevin Brown; Jr. Engineer: sent via email