EXHIBIT E

Water and Sewer Report (Pinnacle Design Consulting Group)

Sewer and Water Systems Serving the following Proposed Development

1. Property Overview

Address: 7051 County Road 335, New Castle Colorado, Lot 1 of the Riverside Park Planned Unit Development
Type of Property: Commercial
Total Area: 5.84 acres and zoned Highway Business / Planned Unit Development

2. Water Supply System

2.1 Water Source

The water supply for 7051 County Road 335 New Castle is sourced from the town of New Castle municipal system. The water is treated and delivered through the municipal water distribution system.

2.2 Water Main Connection

The property will be connected to a 10" water main located on the east side of the property.

2.3 Water Pressure and Piping

The existing residual pressure is approximately 65 to 70 psi.

The plan is to tap the water at the east side of the property and run an 8" diameter water main towards the west. This is shown on the utility plan.

2.4 Internal Piping

As part of the water service, we are proposing that the mixed use building be served by a 8" diameter water service which will accommodate the anticipated fire sprinkler and domestic demand. For the hotel, we are proposing a 4" water service.

2.5 Fire Suppression System

The property will be equipped with a fire suppression system connected to the water supply. This system will include sprinklers and hydrants. See utility plan.

2.6 EQR Summary

The total Water Service Fixture Units (WSFU) for the hotel were found to be 611.

The total WSFU for the mixed use building were found to be 54.
Based upon Chart A of the Uniform 2024 Plumbing Code the demand was found to be 611 gpm and 50 gpm respectively.

The total EQR for the project was found to be 38.89 EQR's. This equates to a total fee of $377,213.60.

See Water Service Calculations in the Appendix.

3. Sewer System

3.1 Sewer Connection

Currently, sanitary sewer exists along the north side of County Road 335 and on the east side of the property. The existing line that services the existing Riverside Park P.U.D. is a combination of gravity and forced main.

The property will be connected to the municipal sewer system through an 8" sewer line located along the east property line which feeds into the Riverside Park P.U.D. lift station.

Based upon the hotel Water Service Fixture Units being calculated at 611 WSFU, the peak demand will be approximately 170 gpm. Therefore a 6" sewer service line will be more than adequate to handle the flow. The mixed-use building was calculated to be 54 for Buildings B, so a 4" diameter sewer service line will also be adequate to facilitate the mixed-use building flow requirements. See sewer service pipe calculations in the Appendix.

There is a portion of both the hotel and mixed-use building that will require an internal grinder pump to convey effluent from the bottom floors. The plumbing contractor will size the capacity of each grinder sump pump based on the Lower Level gpm requirements shown in the Appendix.

The sewer lines will be installed in accordance with the Town of New Castle requirements.

The developer will work with the Riverside Park P.U.D. to increase the pumping requirement of the existing lift station to account for the increased demand.

See previous sewer report for EQR summary and fee.

See Sewer Service Calculation in the Appendix.

APPENDIX

Fixture Units

Hotel

Fixture	Quantity	WSFU	Total Fixture
toilet	76	3	228
lavatory	76	1.5	114
shower	72	2	144
kitchen sink	21	2	42
dishwasher	7	1	7
hot tub	1	10	10
pool	1	10	10
reg washer	2	2	4
industrial washer	2	5	10
laundry sink	2	1.5	3
ice machine	5	1.5	7.5
hand sink	3	2	6
pre-wash sink	2	2	4
component sink	1	2	2
industrial dishwasher	1	1.5	1.5
mop sink	6	3	18
Total			611
Demand in Gallons Per Minute			170 GPM

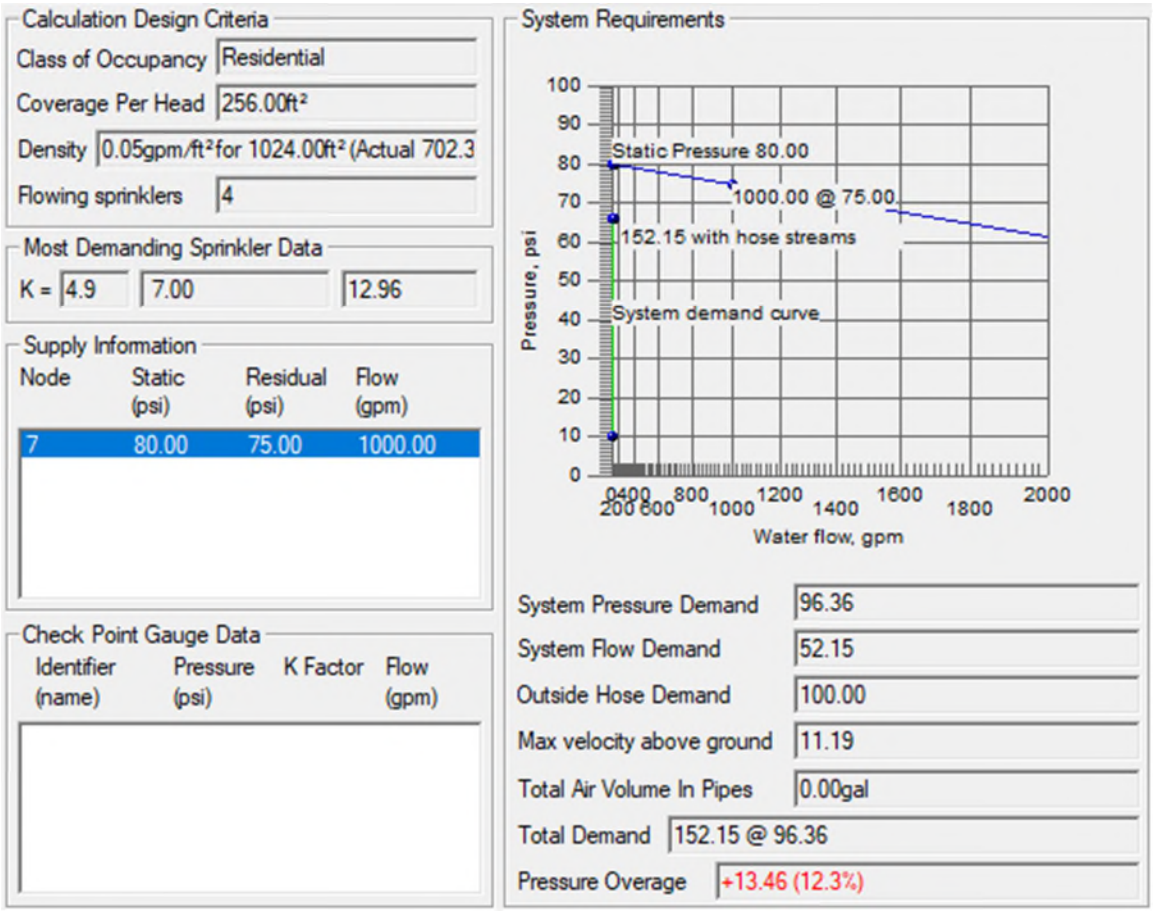
Fixture Units

Mixed Use B

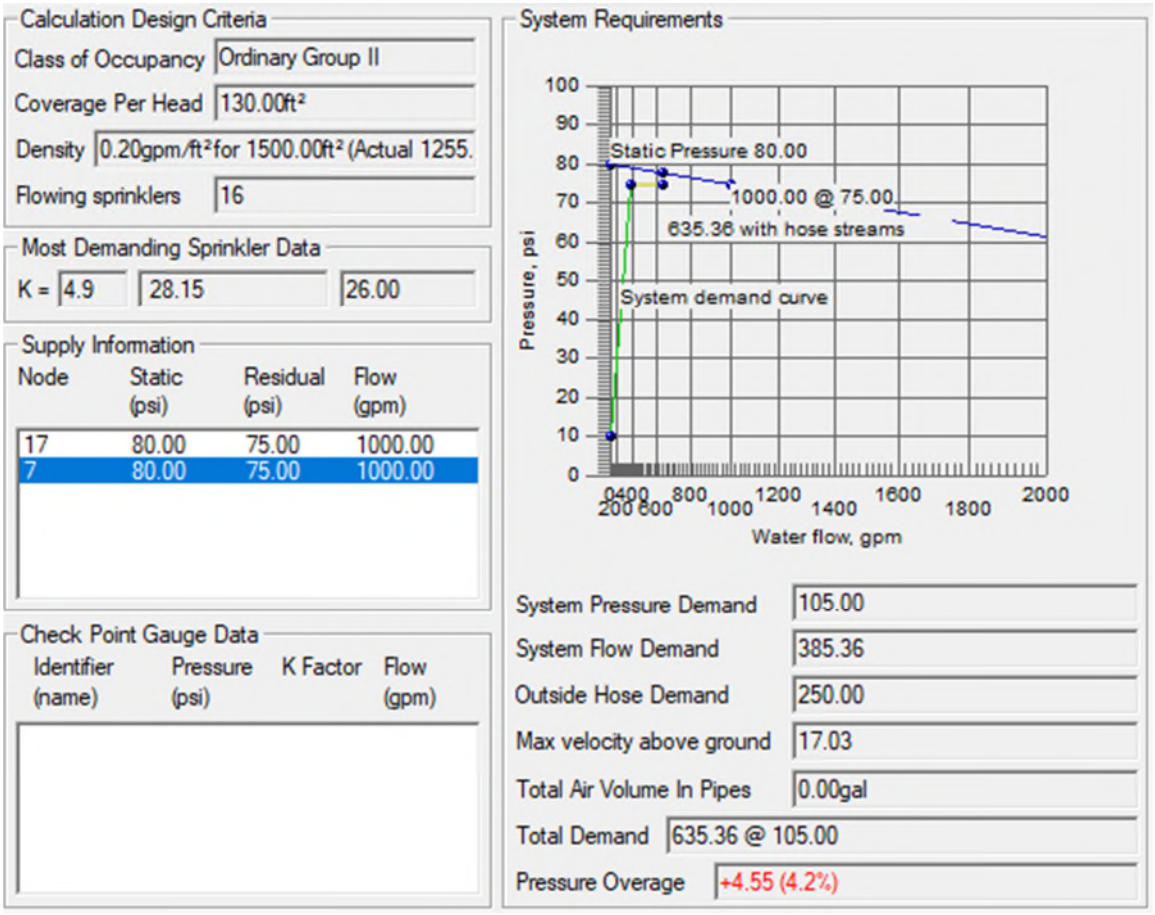
Fixture	Quantity	WSFU	Total Fixture
toilet	4	3	12
lavatories	4	1.5	6
showers	4	2	8
reg kitchen sinks	4	2	8
reg dishwashers	4	1.5	6
refrigerators	4	1	4
reg washers	4	1	4
ice machines	3	2	6
Total			54

Demand in Gallons Per Minute 50 GPM

The fire demand for the hotel is 152.15 gpm:



The fire flow demand for the Mixed Use Building is 635.36 gpm:



ACTUAL EQR	HOTEL LOWER LEVEL	HOTEL MAIN LEVEL	HOTEL UPPER LEVEL	HOTEL TOTALS	MIXED USE BUILDING B LOWER LEVEL	MIXED USE BUILDING B MAIN LEVEL	MIXED USE BUILDING B UPPER LEVEL	MIXED USE BUILDING B TOTALS	TOTALS	Multiplier	EQR FEE
1-2 BEDROOM APARTMENT (0.8)	0	0	0	**0**	3.2	0	0	**3.2**	**3.2**		$31,040.00
HOTELS									**0**		$0.00
FIRST UNIT OR MANAGER'S APT (1)	0	0	0	**0**	0	0	0	**0**	**0**		$0.00
EACH ADD'L UNIT W/O COOKING FACILITIES (0.4)	5.6	8.8	6	**20.4**	0	0	0	**0**	**20.4**		$197,880.00
EACH ADD'L UNIT WITH COOKING FACILITIES (0.5)	1	1	8	**10**	0	0	0	**0**	**10**		$97,000.00
EACH COIN-OPERATED WASHING MACHINE (0.5)	1	0	0	**1**	0	0	0	**0**	**1**		$9,700.00
BARS/RESTAURANTS									**0**		$0.00
FOR A BUSINESS WITH LESS THAN 25 SEATING CAPACITY (1.0)	0	1	0	**1**	0	2	0	**2**	**3**		$29,100.00
FOR EACH SEAT IN EXCESS OF 24 SEATS (0.024)	0	0	0	**0**	0	0.288	0	**0.288**	**0.288**		$2,793.60
STORES/OFFICES									**0**		$0.00
ONE BATHROOM (1.0)	0	0	0	**0**	0	0	0	**0**	**0**		$0.00
FOR EACH ADDITIONAL WATER FIXTURE NOT LISTED (0.2)	0	0	0	**0**	0	0	0	**0**	**0**		$0.00
SWIMMING POOLS: FOR EACH 25,000 GAL CAPACITY OR FRACTION THEREOF (1.0)	1	0	0	**1**	0	0	0	**0**	**1**		$9,700.00
0.9732096	**8.60**	**10.80**	**14.00**	**33.40**	**3.20**	**2.29**	**0.00**	**5.49**	**38.89**		**$377,213.60**

Water Service Sizing Calculations

Water Flow Rates per Use

	GPM
Hotel	170
Mixed Use B	50

Assume a velocity of 5 ft/s

The Diameter is found by the following:

$D = (Q/2.44V)^{0.5}$

Where:

Q = Flow Rate, *GPM*
V = Velocity, *ft/s*

The nominal diameters are therefore as follows:

	Diameter, *in*	Diameter, *in* Proposed
Hotel	3.73	4
Mixed Use B	2.02	2

The headloss will then be as follows:

$H = 10.4L(Q/C)^{1.85}D^{-4.87}$

Where:

L = Length, *ft*

Q = Flow, *GPM*

C= Hazen-Williams C factor

D= pipe inside diameter, *in*

Use	Length, *ft*	Headloss, *ft*	Pressure Loss, *psi*
Hotel	51	1.02	0.44
Mixed Use B	64	3.89	1.68

Water Flow Rates per Use
Fire Flows for Sprinklers

	GPM
Hotel	152.15
Mixed Use B	635.36

Assume a velocity of 5 ft/s

The nominal diameters are therefore as follows:

	Diameter, *in*	Diameter, *in* Proposed
Hotel	3.53	4
Mixed Use B	7.22	8

The headloss will then be as follows:

Use	Length, *ft*	Headloss, *ft*	Pressure Loss, *psi*
Hotel	51	0.83	0.36
Mixed Use B	64	0.50	0.22

Use 4" and 8" diameter pipes for the water services

Headloss in Valves and Meters not included.

Larger of the diameters based on fire flow and domestic

	Diameter, *in*
Hotel	4
Mixed Use B	8

Channel Report

4 Inch PVC flowing Full at 2% Grade

Circular

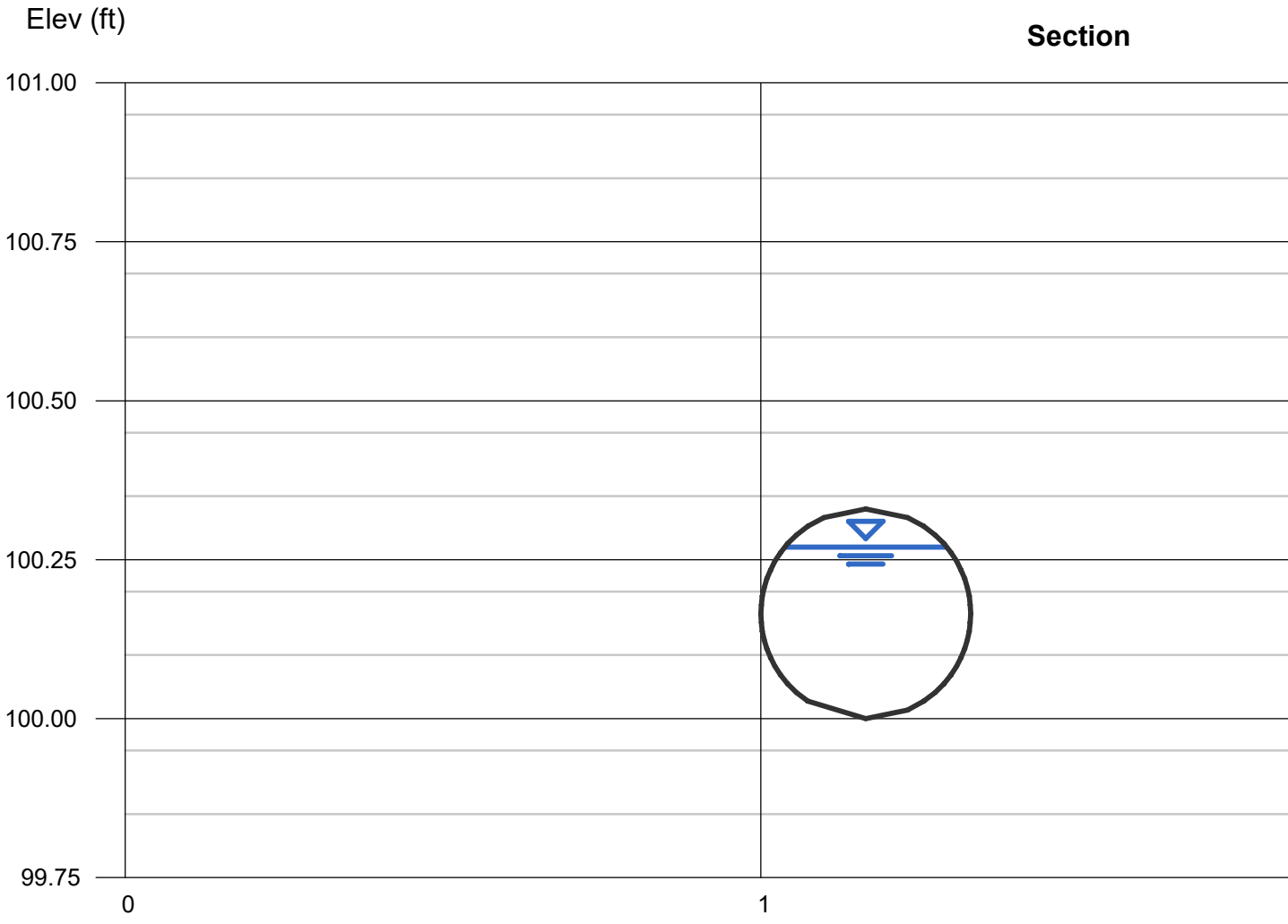
Diameter (ft)	= 0.33
Invert Elev (ft)	= 100.00
Slope (%)	= 2.00
N-Value	= 0.012

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.28

Highlighted

Depth (ft)	= 0.27
Q (cfs)	= 0.280
Area (sqft)	= 0.08
Velocity (ft/s)	= 3.73
Wetted Perim (ft)	= 0.75
Crit Depth, Yc (ft)	= 0.30
Top Width (ft)	= 0.25
EGL (ft)	= 0.49



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Nov 25 2024

6 inch sewer service flowing full

Circular

Diameter (ft)	= 0.50
Invert Elev (ft)	= 100.00
Slope (%)	= 2.00
N-Value	= 0.011

Calculations

Compute by:	Known Depth
Known Depth (ft)	= 0.50

Highlighted

Depth (ft)	= 0.50
Q (cfs)	= 0.937
Area (sqft)	= 0.20
Velocity (ft/s)	= 4.77
Wetted Perim (ft)	= 1.57
Crit Depth, Yc (ft)	= 0.47
Top Width (ft)	= 0.00
EGL (ft)	= 0.85