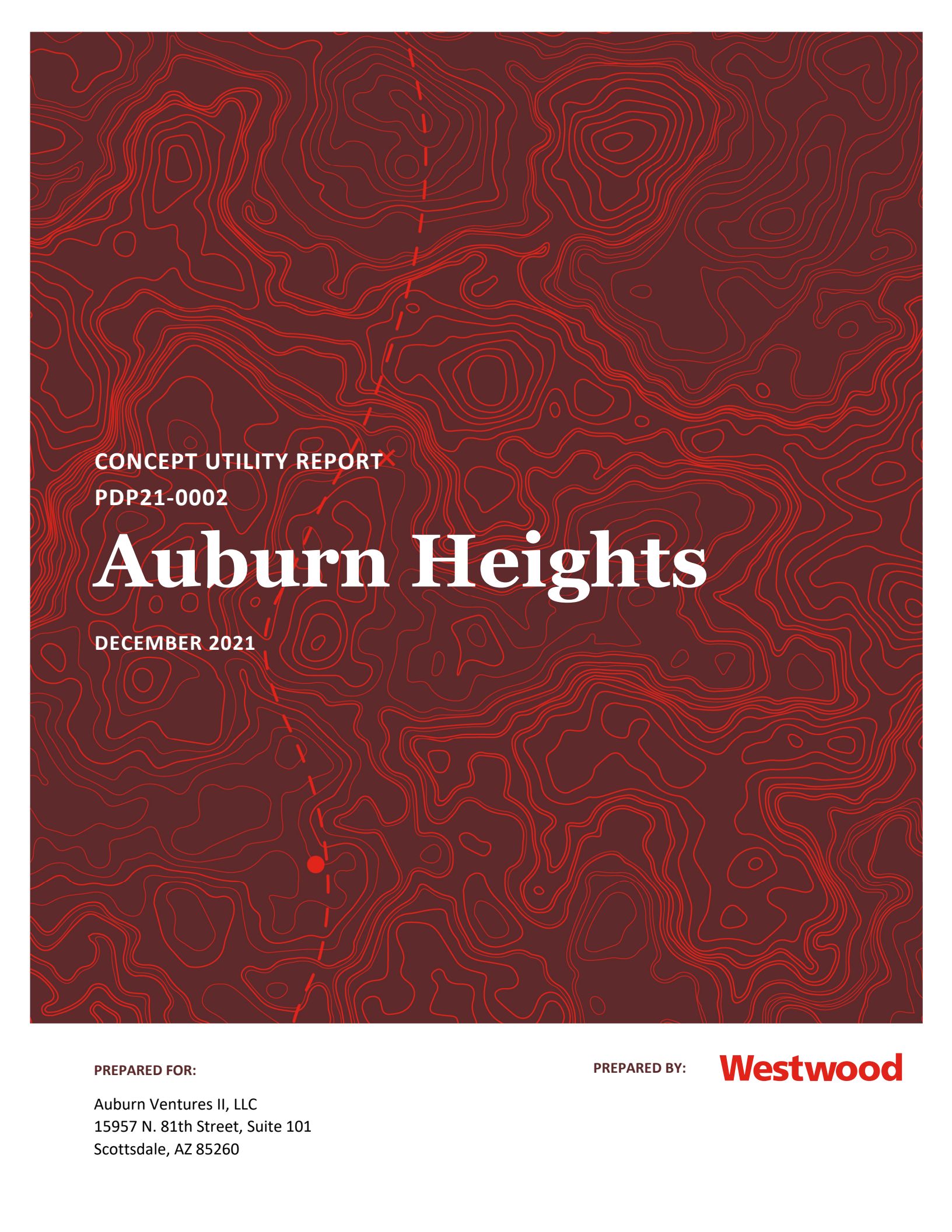




CONCEPT UTILITY REPORT

PDP21-0002

Auburn Heights

DECEMBER 2021

PREPARED FOR:

Auburn Ventures II, LLC
15957 N. 81th Street, Suite 101
Scottsdale, AZ 85260

PREPARED BY:

Westwood

Concept Utility Report

Auburn Heights, PDP21-0002

Town of Castle Rock, Douglas County, Colorado

Prepared For:

John Chicon
Auburn Ventures II, LP
15957 N. 81st Street
Suite 101
Scottsdale, AZ 85260
Phone: (860)241-0140

Prepared By:

Melinda Lundquist, P.E.
Westwood Professional Services
10333 E. Dry Creek Rd
Suite 240
Englewood, CO 80112
(720) 482-3539

Date: December 2021

Engineer's Statement:

The enclosed utility report, and exhibits, were prepared by me or under my direct supervision and is correct to the best of my knowledge and belief. Said utility report has been prepared in accordance with applicable Town of Castle Rock criteria and is in conformance with the master utility plans for the affected area. I accept responsibility for any liability caused by negligent acts, errors, or omissions on my part in preparing this report.

Signature: _____

Melinda E. Lundquist
Registered Professional Engineer
State of Colorado No. 38413

Owner/Developer's Statement:

As Owner/Developer of Land(s) identified within this report; I agree to proceed, implement and comply with all recommendations and requirements outlined herein.

Name of Developer

Authorized Signature

Table of Contents

1.0 General Location and Description1

2.0 Water Distribution System1

3.0 Wastewater Collection Sewer System.....5

4.0 References.....9

Tables

Table 1 Water Demand Summary2

Table 2 WaterGEMS Results4

Table 3 Wastewater Demand Summary6

Appendices

Appendix A – Water Demands

Appendix B – Water Storage

Appendix C – Water Hydraulic Analysis and Modeling

Appendix D – Wastewater Flows

Appendix E – Wastewater Hydraulic Modeling

Appendix F – Existing Wastewater System Analysis

Appendix G – Maps and Plans

1.0 General Location and Description

A. Project Location

Auburn Heights is located in a portion of the south half of Section 3, Township 8 South, Range 67 West of the 6th Principle Meridian, Town of Castle Rock, County of Douglas. The site is Lot 2 of the platted development Auburn Ridge. The site is located west of Auburn Drive, south of East Wolfensberger Road and north of West Plum Creek Parkway. The northwest property line is bounded by Omni Gulch. The Auburn Ridge Apartments (Auburn Ridge, Lot 1) lies along the northeastern property line and Filing 2 of the Castle Highlands Development borders the southern portion of the property. See Appendix G for a vicinity map that depicts the project in context to the surrounding roadways and known developments.

B. Description of Property

The total area of the Auburn Heights development is approximately six (6) acres and is currently undeveloped. This site is proposed to be developed as an apartment complex with five (5) residential buildings with a total of 104 proposed units, a clubhouse, and nine (9) freestanding garages. See Appendix G for the general utilities plan for the proposed site displaying the locations and sizes of the existing utilities and proposed tie in locations to the existing facilities. Multi-family residential uses have a single-family equivalent 0.65 per dwelling unit. The clubhouse will be analyzed as a retail/office use which has a single-family equivalent of 0.0005 per square foot. At build out, a total single-family equivalent of seventy (70) is proposed for the development. The existing ground cover is open native grassland with the exception of an existing stockpile produced from the Auburn Ridge Lot 1 development. The site generally drains from the south to the north or northwest. A portion of the site sheet flows directly into Omni Gulch and to the existing pond constructed during the development of Lot 1 of Auburn Ridge. The southeastern portion of the site drains to Auburn Drive. The soils onsite are classified as NRCS hydraulic soils group C composed primarily of Bresser-Truckton Sandy Loams and Newlin Gravely Sandy Loam.

2.0 Water Distribution System

A. Existing Water System

1. Existing Distribution System

An existing twenty (20) inch diameter water main has been constructed in Auburn drive on the east side of the property. On the southwest portion of the site there is an existing twelve (12) inch water line which crosses Omni Gulch and cuts through the Castle Highlands Filing 2 development ultimately connecting to the existing twenty (20) inch waterline in Auburn Drive. Northeast of the project site is eight (8) inch water line that was constructed with the Auburn Ridge Lot 1 development. This water line also connects to the twenty (20) inch line in Auburn Drive. See Appendix G for the existing water distribution network. The project site is proposing one connection to each of the waterline mentioned above to provide a looped system. See Appendix G for the general utilities plan for locations and sizes of the existing water distribution network and proposed tie in locations. It is expected that the pressure of the existing system is at approximately ninety-one (91) pounds per square inch when Tank 8 is at twenty (20) percent full based on analysis of the system with no demand. Tank 8 is further described

in Section 2.A.1 below. Analysis of the system before demands can be found in Appendix C and is further described in Section 2.D.

2. Existing Supply Facilities

This site is part of the **2017 Water Master Plan** prepared by Castle Rock Water Engineering staff, dated 2017. The site is proposed to utilize the nearest active tank, Tank 8, located at 1420 Coachline Road. Tank 8 has an operational storage volume of 3.13 mega gallons. This tank is within the West-Blue pressure zone which serves a top elevation 6399 feet and a low elevation of 6236 feet (NAVD 88). At one hundred (100) percent full, the tank overflow elevation is 6523.3 feet and at twenty (20) percent full, the tank elevation is at 6503.6.

B. Calculated Water Demands

The water demands for this development will be designed per the requirements of the **Town of Castle Rock Water System Design 2018 Criteria Manual**.

The following is a list of criteria used to develop the water demands for the proposed site:

- Multifamily Residential: 260 gallons per day per dwelling unit
- Retail/Offices: 0.2 gallons per day per square foot
- Maximum Day Demand: 2.5 x Average Day Demand
- Peak Hour Demand: 5.5 x Average Day Demand

The demand of the 104 residential units were calculated using the demand for a multifamily residential use. The Clubhouse, approximately 4,764 square feet, was calculated utilizing a demand for a retail/office use. The demand factors for maximum day and peak hour demands are not applied to the irrigation average day demands. In scenarios that analyze maximum day and peak hour demands, the irrigation average day demand is added to calculated maximum day demand and peak hour demand. See Table 1 below for a summary of the calculated demands.

TABLE 1 WATER DEMAND SUMMARY

	AVERAGE DAILY DEMAND (GPM)	MAXIMUM DAY DEMAND (GPM)	PEAK HOUR DEMAND (GPM)
DOMESTIC DEMAND	19.44	48.60	106.92

For more detailed water demand calculations refer to Appendix A.

C. Proposed Water System

1. Proposed Distribution System

The water system will be designed per the requirements of the **Town of Castle Rock Water System Design 2018 Criteria Manual**. Three (3) connections are proposed to the existing water distribution system. The first proposed connection is to the existing twenty (20) inch watermain in Auburn Drive near the southeastern corner of the project site. The second connection is proposed is to connect to the watermain on the southwestern section of the project site. This watermain crosses Omni Gulch, the project site, and the Castle Highlands Filing 2 development, ultimately connecting to the twenty

(20) inch main in Auburn Drive. The final connection is to the existing eight (8) inch waterline near the northeastern boundary of the site which was constructed with the development of Auburn Ridge Lot 1. Refer to Appendix A for the Water System Layout Plan of the proposed system. Any future development of the existing water infrastructure needed to serve this site is the responsibility of the developer. TITLE OF REPORT IS UPDATED AND PROJECT NUMBER ADDED.

2. Proposed Supply Facilities

The existing supply facility is adequate to serve this development. No new supply facilities are proposed.

3. Land Dedication Requirements

Public utility easements shall be dedicated with a minimum width of twenty (20) feet around any proposed public watermain.

D. Proposed Water System Analysis and Modeling

1. Hydraulic Models

The network analysis for the proposed development was analyzed using WaterGEMS by Bentley. The layout of the distribution system for the proposed development is shown in Appendix A as well as the network analysis. Flows were allocated to each node (pipe junction or external demand) based on the usage needed for each lot. Demands were then determined by land use and unit flows. The water supply connections were modeled as reservoirs. The hydraulic grades for these reservoirs were determined based on the west blue pressure zone. At twenty (20) percent of the tank stage, the HGL utilized is 6503.6 and at one hundred (100) percent, the HGL utilized is 6523.

1. PRESSURES

The system was evaluated with the requirements below:

- Minimum static pressure with zero demand (20% tank storage) = 43 psi
- Maximum static pressure with zero demand (100% tank storage) = 125 psi
- Minimum dynamic pressure (20% tank storage)
 - Peak Hour Demand = 35 psi

2. VELOCITY

The system was evaluated with the requirements below:

- Maximum velocity with Peak Hour Demands = 10 feet per second
- Maximum velocity with Max Day Demands = 5 feet per second

3. HEADLOSS

The system was evaluated with the requirements below:

- Maximum headloss through 16 inch (transmission): 2.0 feet/ 1000 feet
- Maximum headloss through 20 inch (transmission): 1.5 feet/ 1000 feet

2. Hydraulic Modeling Scenarios

Within the model, multiple scenarios were evaluated for conformance with the Town of Castle Rock standards.

- Twenty (20) percent tank stage with zero demand.
- One hundred (100) percent tank stage with zero demand
- Twenty (20) percent tank stage with peak hour demand

Each scenario was initially evaluated with all three (3) connections in service. Then, each scenario was reevaluated with one (1) critical distribution loop out of service. The model removed the westernmost connection to the existing system since the tie in point is at the highest elevation of the three (3) proposed connections.

3. Hydraulic Modeling Output and Required Schematics

The results of the WaterGEMS analysis for the proposed network are presented in Appendix C. This analysis represents the proposed water distribution system, including node locations, pipe locations, and pipe sizes that serve the project site. Based on analysis of the model, all pipes are proposed as eight (8) inch diameter PVC. See Table 2 below for a summary of the WaterGEMS analysis.

TABLE 2 WATERGEMS RESULTS

SCENARIO	MINIMUM PRESSURE		MAX PRESSURE		MAX VELOCITY	
	(PSI)	NODE	(PSI)	NODE	(FPS)	PIPE
20% TANK STAGE WITH NO DEMANDS	91	J-1, J-2, J-5	98	J-7	-	-
100% TANK STAGE WITH NO DEMANDS	99	J-1	106	J-7	-	-
20% TANK STAGE WITH PEAK DEMANDS	91	J-1, J-2, J-5	98	J-7	0.33	P-5
20% TANK STAGE MAX DAY	91	J-1, J-2, J-5	98	J-7	0.15	P-5
20% TANK STAGE WITH NO DEMANDS LOOP OUT OF SERVICE	91	J-1, J-2, J-5	98	J-7	-	-
100% TANK STAGE WITH NO DEMANDS LOOP OUT OF SERVICE	99	J-1	106	J-7	-	-
20% TANK STAGE WITH PEAK DEMANDS LOOP OUT OF SERVICE	91	J-1, J-2, J-5	98	J-7	0.56	P-5
20% TANK STAGE MAX DAY LOOP OUT OF SERVICE	91	J-1, J-2, J-5	98	J-7	0.25	P-5

The results of the system analysis indicate that the proposed water system conforms to the **Town of Castle Rock Water System Design 2018 Criteria Manual**. Any subsequent changes to the proposed water distribution system as described within this report will require a reanalysis of the system. Further analysis will require hydraulic modeling for max daily demand plus fire flow. Modeling completed will use the assigned fire flow from the Fire Department.

3.0 Wastewater Collection Sewer System

A. Existing Wastewater System

An existing eight (8) inch diameter sanitary sewer main has been constructed in Auburn Drive on the east side of the property. This line flows north to Wolfensberger Road and is located in the East Plum Creek Red Hawk North 3 Sub-basin. Another existing eight (8) inch diameter sanitary sewer main was constructed as part of the Castle Highlands Filing 2 project near the southwest corner of the site and flows southeast to Auburn Drive. The most downstream manhole adjacent to the project site for this existing main has an invert elevation that is over fifteen (15) feet higher than the proposed connection to existing main in Auburn Drive. This project has proposed to connect to the existing main in Auburn Drive since the tie in point would be at a deeper elevation. The site has been included in the **Castle Highlands Final Utility Study**, prepared by JR Engineering. The area included in the study includes Castle Highlands Filing 2, Auburn Ridge Apartments (Lot 1, Auburn Ridge), Auburn Brook Apartments (Lot 3, Auburn Ridge), Reserve at Castle Highlands (Castle Highlands Filing 1), and the project site. The project site is the last remaining piece to be developed that was included in the utility study. The assumed number of maximum units of the study was compared to the actual constructed number of units. The number of units for each apartment complex was determined by the approved Site Development Plan (SDP) for each development (see Appendix G). Based on the total of single family and multifamily units constructed, the number of multifamily units assumed in the **Castle Highlands Final Utility Study** has already been exceeded without the addition of the units proposed by this project. The utility study assumed 320 multifamily residential units however 386 multifamily units have already been constructed. The calculated demand for all developments based on the **Town of Castle Rock Wastewater Collection Design 2018 Criteria Manual** can be viewed in Appendix F. To be conservative, flows from each development are assumed to connect to the existing eight (8) inch diameter sanitary sewer main in Auburn Drive.

Other utility reports completed in this area include the **Final Utility Report Auburn Glen, Castle Highlands Filing 2, Lot 1, Block 7**, prepared by Manhard Consulting LTD, and the **Final Utility Report Lot 2A, Block 7 Castle Highlands Filing No. 2 5th Amendment**, prepared by Vermilion Peak Engineering. These utility reports were completed for the apartments that are now known as the Auburn Brook Apartments and the Auburn Ridge Apartments respectively. However, both utility reports do not appear to consider this project site in any offsite calculations.

In the **2016 Wastewater Master Plan**, prepared by the Castle Rock Engineering staff, a capital improvement project (CIP) downstream of the project site has been identified. As part of the CIP, Malibu Street Upsize, an existing fifteen (15) inch pipe will be upsized to a twenty-four (24) inch diameter sewer main. At the time of developing this report, it is our understanding that the CIP are already underway. Since the proposed development relies on the Malibu Sewer Upsize project, the development will be required to pay a share based on the required capacity.

B. Calculated Wastewater Flows

The water system will be designed per the requirements of the **Town of Castle Rock Wastewater Collection Design 2018 Criteria Manual**.

The following is a list of criteria used to determine the wastewater demands for the proposed site:

- Multifamily Residential: 130 gallons per day per dwelling unit
- Retail/Offices: 0.1 gallons per day per square foot
- Peaking Factor (PF): $PF = 3.65 \times ADF^{-0.168}$ where F is the average Flow in MGD, and PF is no greater than 5.

The Peak Design Flow Rate is used to size any corresponding wastewater facilities. This is calculated by multiplying the peaking factor by the Average Daily Flow plus and an infiltration and Inflow allowance equal to ten (10) percent of the average daily flow. See table 3 below for a summary of the calculated demands. The average daily flow of the 104 residential units were calculated using the demand for a multifamily residential use. The Clubhouse average daily flow was calculated using the demand of a retail/office use. Any future development of the existing wastewater infrastructure needed to serve this site is the responsibility of the developer.

TABLE 3 WASTEWATER DEMAND SUMMARY

	AVERAGE DAILY FLOW (ADF)	INFILTRATION AND INFLOW (10% ADF)	PEAK DESIGN FLOW (PDF)
DEMAND (GPD)	13996.4	1399.64	71381.64

For a more detailed wastewater demand calculations, refer to Appendix D.

C. Proposed Wastewater System

1. Proposed Collection System

The wastewater system will be designed per the requirements of the **Town of Castle Rock Wastewater Design 2018 Criteria Manual**. A sanitary sewer main is proposed onsite that will ultimately connect to the eight (8) inch sanitary sewer main in Auburn Drive. This main will collect wastewater from buildings 1, 2, 3, and 5 and convey flows to the mainline. Separate services are proposed for building 4 and the clubhouse that will directly tie to the existing sanitary sewer line in Auburn Drive.

2. Proposed Wastewater Facilities

The capacity of the existing eight (8) inch sanitary sewer main in Auburn Drive was evaluated. To be conservative, flows from each development within the study area of **Castle Highlands Final Utility Study** are assumed to connect to the existing eight (8) inch diameter sanitary sewer main in Auburn Drive. The calculated demand for all developments based on the **Town of Castle Rock Wastewater Collection Design 2018 Criteria Manual** can be viewed in Appendix F. Using the hydraulic model discussed below, it was determined that the existing sanitary sewer has the capacity for all the needed demand from the developments mentioned in the study as well as the project site. To be conservative, the existing line was evaluated at the minimum and maximum allowable slope to convey that the standards have been met in both scenarios. In the scenario evaluating the system at the minimum slope, the pipe is at sixty-seven (67) percent full, which is lower than the maximum standard of seventy-five (75) percent full. Also, in the scenario evaluating the system at the maximum slope, the pipe velocity is 8.51 feet per second which does not exceed the maximum ten (10) feet per second

found in the standards. The existing facilities in Auburn Drive appear to be adequate to serve this development, therefore no new wastewater facilities are proposed. See Appendix F for the existing facilities analysis.

3. Land Dedication Requirements

Public utility easements shall be dedicated with a minimum width of twenty (20) feet around any proposed public sanitary sewer.

D. Proposed Wastewater System Analysis and Modeling

1. Hydraulic Model

The network analysis for the proposed development was analyzed using FlowMaster by Bentley. The routed peak flows were evaluated to ensure that the capacity of the proposed wastewater collection system is adequate. Flows were allocated to each design point based on the usage needed for each lot. Demands were then determined by land use and unit flows. The layout of the collection system for the proposed development is shown in Appendix D as well as the network analysis.

The following is a list of criteria used to develop the wastewater system design for the proposed site:

- Minimum velocity of two (2) feet per second.
- Maximum velocity shall not exceed ten (10) feet per second.
- Sanitary Sewer shall be sized to convey the Peak Design Flow within flowing no more than seventy-five (75) percent of maximum pipe flow capacity.
- The Manning Formula ($n=0.011$) was utilized.
- The minimum diameter of sanitary sewer mains shall be eight (8) inches.
- Pipes with a diameter of ten (10) inches shall have a minimum slope of 0.28% and a maximum slope of 5.5%.
- Six (6) inch service lines shall have a minimum grade of two (2) percent.

2. Hydraulic Modeling Scenarios

Each design point was evaluated at the minimum and maximum allowable slope to analyze the conformance with the Town of Castle Rock Standards.

3. Hydraulic Modeling Output and Required Schematics

The results of the FlowMaster analysis for the proposed network are presented in Appendix E. This analysis represents the proposed wastewater collection system, including design points, pipe locations, and pipe sizes that serve the project site. Based on the analysis of the network, all sanitary sewer mains to be constructed with this development are proposed to be ten (10) inch diameter PVC pipes. By upsizing the proposed sanitary sewer onsite to ten (10) inches, this allows for a minimum grade of 0.28 percent rather than the minimum grade of 0.4 percent for an eight (8) inch line per the **Town of Castle Rock Wastewater Collection Design 2018 Criteria Manual**. Building 3 causes the most restrictive scenario where the lowest finished floor elevation is at an elevation of 6286.52 feet. When designing the sanitary sewer pipe at the minimum slope for a ten (10) inch pipe from the proposed tie in point to the existing line in Auburn Drive while maintaining a 0.3 foot drop between manholes, the service of the building will tie into the main at an approximate elevation of 6280.50 feet. Utilizing the ten (10) inch main with a shallower minimum slope allows the main to be at a deeper elevation

at Building 3 where additional depth is needed. Additionally, the services that are proposed to tie directly into the Auburn Drive are proposed to be six (6) inch services.

Per Section 4.2.2 if the Town of Castle Rock Wastewater standards, the wastewater system shall be designed to provide a minimum velocity of two (2) feet per second at the Peak Design Flow. Due to the minimal demand generated onsite, all pipes do not meet this requirement at the minimum slope. Even if the pipes are installed at the maximum slope, there will be sections of pipe that will not meet the required velocity. Since the sanitary sewer main is already at the minimum allowable diameter, a variance is requested.

The sanitary sewer system will connect to the existing eight (8) inch wastewater collection system in Auburn Drive. The results of the system analysis indicate that the proposed sanitary system conforms to the **Town of Castle Rock Wastewater Design 2018 Criteria Manual** with the exception of the requested deviation to Section 4.4.2 previously outlined.

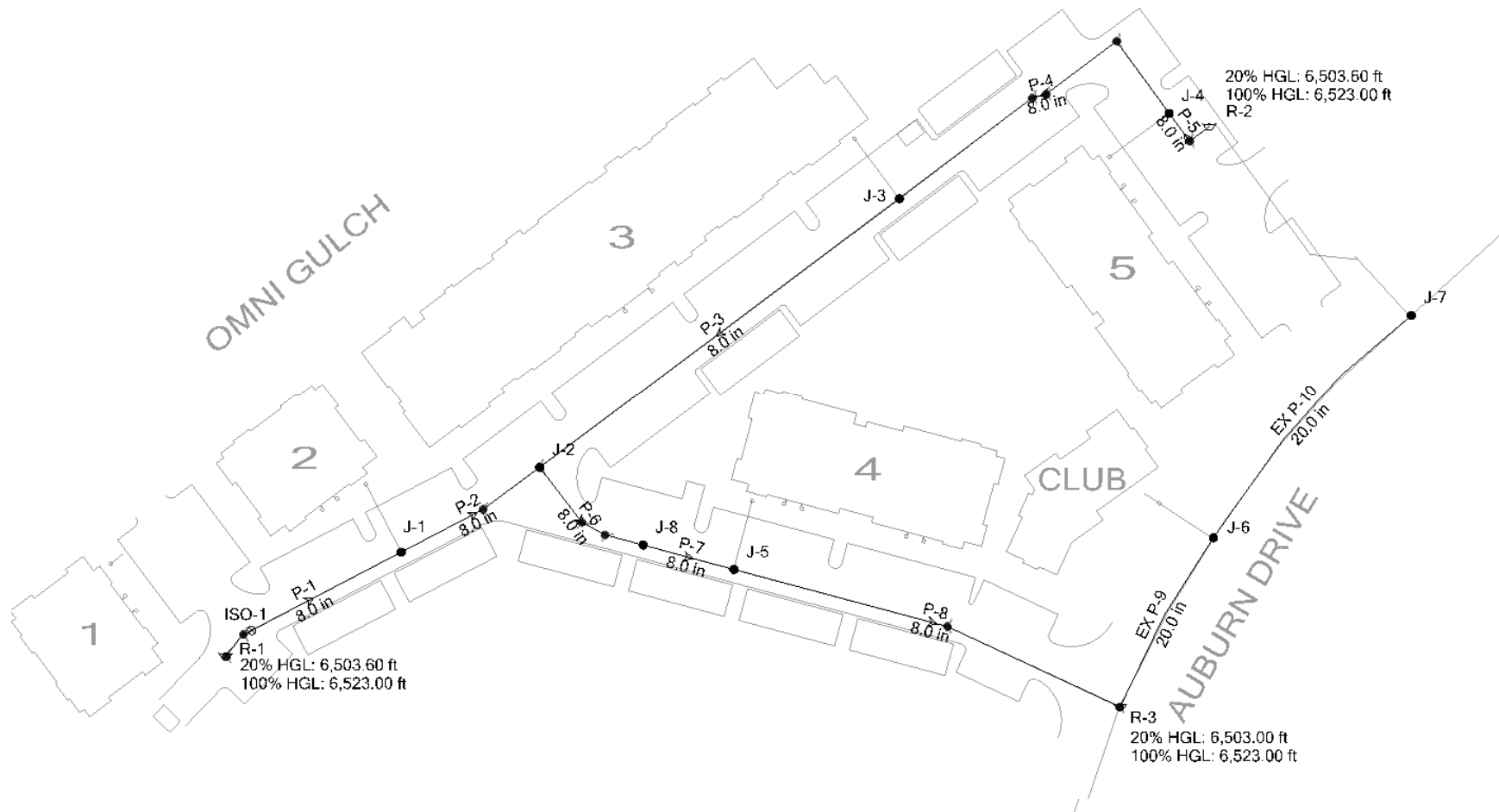
4.0 References

1. Town of Castle Rock, *Town of Castle Rock Water System Design 2018 Criteria Manual*, December 2018.
2. Town of Castle Rock, *2017 Water Master Plan*, 2017
3. Town of Castle Rock, *Town of Castle Rock Wastewater Collection Design 2018 Criteria Manual*, December 2018.
4. JR Engineering, LTC, *Castle Highlands Final Utility Study*, December 1999
5. Town of Castle Rock, *2016 Wastewater Master Plan*, 2016
6. Lot 1, Auburn Ridge Final PD Site Plan
7. Site Development Plan, Amendment No. 2, Lot 3, Auburn Ridge, Amendment No. 1
8. Final PD Site Plan Castle Highlands Filing 1, 1st Amendment
9. Manhard Consulting LTD, *Final Utility Report Auburn Glen Castle Highlands Filing 2, Lot 1, Block 7*, May 2017
10. Vermilion Peak Engineering, *Final Utility Report Lot 2A, Block 7, Castle Highlands Filing No. 2, 5th Amendment*, November 2012
11. Bentley FlowMaster V8i , 08.11.01.03
12. Bentley WaterGEMS V8i, 10.03.01.08

Appendix A

WATER DEMANDS

Auburn Heights Water Distribution System



**AUBURN HEIGHTS
WATER DEMAND CALCULATIONS
TOWN OF CASTLE ROCK**

Building Number	Junction	Units	Square Footage (ft)	Average Daily Demand (ADD) (GPM)	Maximum Day Demand (MDD)(GPM)	Peak Hour Demand (PHD)(GPM)	Required Fire Flow
1	J-1	8	11019	1.44	3.61	7.94	1500.00
2	J-1	8	11019	1.44	3.61	7.94	1500.00
3	J-3	52	65061	9.39	23.47	51.64	3500.00
4	J-5	16	21638	2.89	7.22	15.89	2000.00
5	J-4	20	27126	3.61	9.03	19.86	2250.00
Clubhouse	J-6	--	4764	0.66	1.65	3.64	1750.00
Total		104	4764	19.44	48.60	106.92	

1. Multi-Family Residential demand assumed to be 260 gpd/dweeling unit
2. Clubhouse demand assumed to be 0.2 gpd/SF utilizing retail/office design demand.
3. Max Day Factor = 2.5 x average daily demand
4. Peak Hour Factor = 5.5 x average daily demand

Appendix B

WATER STORAGE

**AUBURN HEIGHTS
WATER STORAGE CALCULATIONS
TOWN OF CASTLE ROCK**

Storage Requirements				
Capacity of Tank 8	3.13 MG			
Maximum Day Demand	50.59 gpm	=	0.07	MG
Fire Flow Demand	3500 gpm for 3 hours	=	0.63	MG
Total			0.70	MG

1. Assumes building with the highest required fire flow, building 3, plus the total maximum day demand for all units

Appendix C

WATER HYDRAULIC ANALYSIS AND MODELING

Auburn Heights
Active Scenario: No Demand
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,503.60	0.01	6,503.60
R-2	6,503.60	-0.01	6,503.60
R-3	6,503.60	0.00	6,503.60

Auburn Heights
Active Scenario: No Demand
FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	6,292.54	0.00	6,503.60	91
J-3	6,284.45	0.00	6,503.60	95
J-4	6,280.10	0.00	6,503.60	97
J-5	6,292.28	0.00	6,503.60	91
J-1	6,294.20	0.00	6,503.60	91
J-6	6,287.88	0.00	6,503.60	93
J-7	6,278.11	0.00	6,503.60	98

Auburn Heights
Active Scenario: No Demand
FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Material	Hazen- Williams C	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Headloss (ft)
P-3	292	J-2	J-3	PVC	120.0	8.0	0.01	0.00	0.000	0.00
P-4	232	J-3	J-4	PVC	120.0	8.0	0.01	0.00	0.000	0.00
P-5	38	J-4	R-2	PVC	120.0	8.0	0.01	0.00	0.000	0.00
P-8	267	R-3	J-5	PVC	120.0	8.0	0.00	0.00	0.000	0.00
P-2	106	J-1	J-2	PVC	120.0	8.0	0.01	0.00	0.000	0.00
EX P-9	126	R-3	J-6	Ductile Iron	120.0	20.0	0.00	0.00	0.000	0.00
EX P-10	195	J-6	J-7	Ductile Iron	120.0	20.0	0.00	0.00	0.000	0.00
P-1	134	R-1	J-1	PVC	120.0	8.0	0.01	0.00	0.000	0.00

Auburn Heights

Active Scenario: No Demand - Loop Out of Service

FlexTable: Isolation Valve Table

ID	Label	Is Operable?	Diameter (Valve) (in)	Elevation (ft)	Referenced Pipe	Flow (gpm)	Is Closed?
89	ISO-1	True	8.0	6,295.56	P-1	0.00	True

Auburn Heights

Active Scenario: No Demand - Loop Out of Service

FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,503.60	0.00	6,503.60
R-2	6,503.60	0.00	6,503.60
R-3	6,503.60	0.00	6,503.60

Auburn Heights

Active Scenario: No Demand - Loop Out of Service

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	6,292.54	0.00	6,503.60	91
J-3	6,284.45	0.00	6,503.60	95
J-4	6,280.10	0.00	6,503.60	97
J-5	6,292.28	0.00	6,503.60	91
J-1	6,294.20	0.00	6,503.60	91
J-6	6,287.88	0.00	6,503.60	93
J-7	6,278.11	0.00	6,503.60	98

Auburn Heights
Active Scenario: No Demand - Loop Out of Service

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Material	Hazen- Williams C	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Headloss (ft)
P-3	292	J-2	J-3	PVC	120.0	8.0	0.00	0.00	0.000	0.00
P-4	232	J-3	J-4	PVC	120.0	8.0	0.00	0.00	0.000	0.00
P-5	38	J-4	R-2	PVC	120.0	8.0	0.00	0.00	0.000	0.00
P-8	267	R-3	J-5	PVC	120.0	8.0	0.00	0.00	0.000	0.00
P-2	106	J-1	J-2	PVC	120.0	8.0	0.00	0.00	0.000	0.00
EX P-9	126	R-3	J-6	Ductile Iron	120.0	20.0	0.00	0.00	0.000	0.00
EX P-10	195	J-6	J-7	Ductile Iron	120.0	20.0	0.01	0.00	0.000	0.00
P-1	134	R-1	J-1	PVC	120.0	8.0	0.00	0.00	0.000	0.00

Auburn Heights
Active Scenario: No Demand
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,523.00	0.01	6,523.00
R-2	6,523.00	-0.01	6,523.00
R-3	6,523.00	0.00	6,523.00

Auburn Heights
Active Scenario: No Demand
FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	6,292.54	0.00	6,523.00	100
J-3	6,284.45	0.00	6,523.00	103
J-4	6,280.10	0.00	6,523.00	105
J-5	6,292.28	0.00	6,523.00	100
J-1	6,294.20	0.00	6,523.00	99
J-6	6,287.88	0.00	6,523.00	102
J-7	6,278.11	0.00	6,523.00	106

Auburn Heights
Active Scenario: No Demand
FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Material	Hazen- Williams C	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Headloss (ft)
P-3	292	J-2	J-3	PVC	120.0	8.0	0.01	0.00	0.000	0.00
P-4	232	J-3	J-4	PVC	120.0	8.0	0.01	0.00	0.000	0.00
P-5	38	J-4	R-2	PVC	120.0	8.0	0.01	0.00	0.000	0.00
P-8	267	R-3	J-5	PVC	120.0	8.0	0.00	0.00	0.000	0.00
P-2	106	J-1	J-2	PVC	120.0	8.0	0.01	0.00	0.000	0.00
EX P-9	126	R-3	J-6	Ductile Iron	120.0	20.0	0.00	0.00	0.000	0.00
EX P-10	195	J-6	J-7	Ductile Iron	120.0	20.0	0.00	0.00	0.000	0.00
P-1	134	R-1	J-1	PVC	120.0	8.0	0.01	0.00	0.000	0.00

Auburn Heights

Active Scenario: No Demand - Loop Out of Service

FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,523.00	0.00	6,523.00
R-2	6,523.00	0.00	6,523.00
R-3	6,523.00	0.00	6,523.00

Auburn Heights

Active Scenario: No Demand - Loop Out of Service

FlexTable: Isolation Valve Table

ID	Label	Is Operable?	Diameter (Valve) (in)	Elevation (ft)	Referenced Pipe	Flow (gpm)	Is Closed?
89	ISO-1	True	8.0	6,295.56	P-1	0.00	True

Auburn Heights

Active Scenario: No Demand - Loop Out of Service

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	6,292.54	0.00	6,523.00	100
J-3	6,284.45	0.00	6,523.00	103
J-4	6,280.10	0.00	6,523.00	105
J-5	6,292.28	0.00	6,523.00	100
J-1	6,294.20	0.00	6,523.00	99
J-6	6,287.88	0.00	6,523.00	102
J-7	6,278.11	0.00	6,523.00	106

Auburn Heights
Active Scenario: No Demand - Loop Out of Service

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Material	Hazen- Williams C	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Headloss (ft)
P-3	292	J-2	J-3	PVC	120.0	8.0	0.00	0.00	0.000	0.00
P-4	232	J-3	J-4	PVC	120.0	8.0	0.00	0.00	0.000	0.00
P-5	38	J-4	R-2	PVC	120.0	8.0	0.00	0.00	0.000	0.00
P-8	267	R-3	J-5	PVC	120.0	8.0	0.00	0.00	0.000	0.00
P-2	106	J-1	J-2	PVC	120.0	8.0	0.00	0.00	0.000	0.00
EX P-9	126	R-3	J-6	Ductile Iron	120.0	20.0	0.00	0.00	0.000	0.00
EX P-10	195	J-6	J-7	Ductile Iron	120.0	20.0	0.01	0.00	0.000	0.00
P-1	134	R-1	J-1	PVC	120.0	8.0	0.00	0.00	0.000	0.00

Auburn Heights
Active Scenario: Average Day
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,503.60	6.46	6,503.60
R-2	6,503.60	9.42	6,503.60
R-3	6,503.60	3.56	6,503.60

Auburn Heights
Active Scenario: Average Day
FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	6,292.54	0.00	6,503.60	91
J-3	6,284.45	9.39	6,503.60	95
J-4	6,280.10	3.61	6,503.60	97
J-5	6,292.28	2.89	6,503.60	91
J-1	6,294.20	2.88	6,503.60	91
J-6	6,287.88	0.66	6,503.60	93
J-7	6,278.11	0.00	6,503.60	98

Auburn Heights
Active Scenario: Average Day
FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Material	Hazen- Williams C	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Headloss (ft)
P-3	292	J-2	J-3	PVC	120.0	8.0	3.58	0.02	0.000	0.00
P-4	232	J-3	J-4	PVC	120.0	8.0	-5.81	0.04	0.000	0.00
P-5	38	J-4	R-2	PVC	120.0	8.0	-9.42	0.06	0.000	0.00
P-8	267	R-3	J-5	PVC	120.0	8.0	2.89	0.02	0.000	0.00
P-2	106	J-1	J-2	PVC	120.0	8.0	3.58	0.02	0.000	0.00
EX P-9	126	R-3	J-6	Ductile Iron	120.0	20.0	0.67	0.00	0.000	0.00
EX P-10	195	J-6	J-7	Ductile Iron	120.0	20.0	0.00	0.00	0.000	0.00
P-1	134	R-1	J-1	PVC	120.0	8.0	6.46	0.04	0.000	0.00

Auburn Heights
Active Scenario: Max Day
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,503.60	16.16	6,503.60
R-2	6,503.60	23.54	6,503.60
R-3	6,503.60	8.88	6,503.60

Auburn Heights
Active Scenario: Max Day
FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	6,292.54	0.00	6,503.60	91
J-3	6,284.45	23.48	6,503.60	95
J-4	6,280.10	9.02	6,503.60	97
J-5	6,292.28	7.22	6,503.60	91
J-1	6,294.20	7.20	6,503.60	91
J-6	6,287.88	1.65	6,503.60	93
J-7	6,278.11	0.00	6,503.60	98

Auburn Heights
Active Scenario: Max Day
FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Material	Hazen- Williams C	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Headloss (ft)
P-3	292	J-2	J-3	PVC	120.0	8.0	8.96	0.06	0.000	0.00
P-4	232	J-3	J-4	PVC	120.0	8.0	-14.51	0.09	0.000	0.00
P-5	38	J-4	R-2	PVC	120.0	8.0	-23.54	0.15	0.000	0.00
P-8	267	R-3	J-5	PVC	120.0	8.0	7.22	0.05	0.000	0.00
P-2	106	J-1	J-2	PVC	120.0	8.0	8.96	0.06	0.000	0.00
EX P-9	126	R-3	J-6	Ductile Iron	120.0	20.0	1.66	0.00	0.000	0.00
EX P-10	195	J-6	J-7	Ductile Iron	120.0	20.0	0.01	0.00	0.000	0.00
P-1	134	R-1	J-1	PVC	120.0	8.0	16.16	0.10	0.000	0.00

Auburn Heights
Active Scenario: Max Day - Loop Out of Service
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,503.60	0.00	6,503.60
R-2	6,503.60	39.81	6,503.60
R-3	6,503.60	8.76	6,503.60

Auburn Heights
Active Scenario: Max Day - Loop Out of Service
FlexTable: Isolation Valve Table

ID	Label	Is Operable?	Diameter (Valve) (in)	Elevation (ft)	Referenced Pipe	Flow (gpm)	Is Closed?
89	ISO-1	True	8.0	6,295.56	P-1	0.00	True

Auburn Heights
Active Scenario: Max Day - Loop Out of Service

FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	6,292.54	0.00	6,503.59	91
J-3	6,284.45	23.48	6,503.59	95
J-4	6,280.10	9.02	6,503.60	97
J-5	6,292.28	7.22	6,503.60	91
J-1	6,294.20	7.20	6,503.59	91
J-6	6,287.88	1.65	6,503.60	93
J-7	6,278.11	0.00	6,503.60	98

Auburn Heights
Active Scenario: Max Day - Loop Out of Service
FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Material	Hazen- Williams C	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Headloss (ft)
P-3	292	J-2	J-3	PVC	120.0	8.0	-7.20	0.05	0.000	0.00
P-4	232	J-3	J-4	PVC	120.0	8.0	-30.67	0.20	0.000	0.01
P-5	38	J-4	R-2	PVC	120.0	8.0	-39.70	0.25	0.000	0.00
P-8	267	R-3	J-5	PVC	120.0	8.0	7.22	0.05	0.000	0.00
P-2	106	J-1	J-2	PVC	120.0	8.0	-7.20	0.05	0.000	0.00
EX P-9	126	R-3	J-6	Ductile Iron	120.0	20.0	1.54	0.00	0.000	0.00
EX P-10	195	J-6	J-7	Ductile Iron	120.0	20.0	-0.11	0.00	0.000	0.00
EX P-11	187	J-7	R-2	PVC	120.0	8.0	-0.11	0.00	0.000	0.00
P-1	134	R-1	J-1	PVC	120.0	8.0	0.00	0.00	0.000	0.00

Auburn Heights
Active Scenario: Peak Hour
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,503.60	35.55	6,503.60
R-2	6,503.60	51.79	6,503.60
R-3	6,503.60	19.52	6,503.60

Auburn Heights
Active Scenario: Peak Hour
FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	6,292.54	0.00	6,503.59	91
J-3	6,284.45	51.65	6,503.59	95
J-4	6,280.10	19.85	6,503.60	97
J-5	6,292.28	15.89	6,503.60	91
J-1	6,294.20	15.84	6,503.59	91
J-6	6,287.88	3.63	6,503.60	93
J-7	6,278.11	0.00	6,503.60	98

Auburn Heights
Active Scenario: Peak Hour
FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Material	Hazen- Williams C	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Headloss (ft)
P-3	292	J-2	J-3	PVC	120.0	8.0	19.71	0.13	0.000	0.00
P-4	232	J-3	J-4	PVC	120.0	8.0	-31.93	0.20	0.000	0.01
P-5	38	J-4	R-2	PVC	120.0	8.0	-51.79	0.33	0.000	0.00
P-8	267	R-3	J-5	PVC	120.0	8.0	15.89	0.10	0.000	0.00
P-2	106	J-1	J-2	PVC	120.0	8.0	19.71	0.13	0.000	0.00
EX P-9	126	R-3	J-6	Ductile Iron	120.0	20.0	3.63	0.00	0.000	0.00
EX P-10	195	J-6	J-7	Ductile Iron	120.0	20.0	0.00	0.00	0.000	0.00
P-1	134	R-1	J-1	PVC	120.0	8.0	35.55	0.23	0.000	0.01

Auburn Heights
Active Scenario: Peak Hour - Loop Out of Service
FlexTable: Reservoir Table

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	6,503.60	0.00	6,503.60
R-2	6,503.60	87.34	6,503.60
R-3	6,503.60	19.53	6,503.60

Auburn Heights
Active Scenario: Peak Hour - Loop Out of Service
FlexTable: Isolation Valve Table

ID	Label	Is Operable?	Diameter (Valve) (in)	Elevation (ft)	Referenced Pipe	Flow (gpm)	Is Closed?
89	ISO-1	True	8.0	6,295.56	P-1	0.00	True

Auburn Heights
Active Scenario: Peak Hour - Loop Out of Service
FlexTable: Junction Table

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	6,292.54	0.00	6,503.56	91
J-3	6,284.45	51.65	6,503.56	95
J-4	6,280.10	19.85	6,503.59	97
J-5	6,292.28	15.89	6,503.60	91
J-1	6,294.20	15.84	6,503.55	91
J-6	6,287.88	3.63	6,503.60	93
J-7	6,278.11	0.00	6,503.60	98

Auburn Heights
Active Scenario: Peak Hour - Loop Out of Service
FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Material	Hazen- Williams C	Diameter (in)	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)	Headloss (ft)
P-3	292	J-2	J-3	PVC	120.0	8.0	-15.84	0.10	0.000	0.00
P-4	232	J-3	J-4	PVC	120.0	8.0	-67.49	0.43	0.000	0.03
P-5	38	J-4	R-2	PVC	120.0	8.0	-87.34	0.56	0.000	0.01
P-8	267	R-3	J-5	PVC	120.0	8.0	15.89	0.10	0.000	0.00
P-2	106	J-1	J-2	PVC	120.0	8.0	-15.84	0.10	0.000	0.00
EX P-9	126	R-3	J-6	Ductile Iron	120.0	20.0	3.64	0.00	0.000	0.00
EX P-10	195	J-6	J-7	Ductile Iron	120.0	20.0	0.01	0.00	0.000	0.00
P-1	134	R-1	J-1	PVC	120.0	8.0	0.00	0.00	0.000	0.00

Appendix D

WASTEWATER FLOWS

AUBURN HEIGHTS
WASTEWATER DEMAND CALCULATIONS
TOWN OF CASTLE ROCK

Building Number	Units	Square Footage (ft)	Average Daily Flow (ADF) (gpd)	Peaking Factor	Infiltration and Inflow (10% ADF)	Peak Design Flow (PDF) (gpd)
1	8	11019	1040	5	104	5304
2	8	11019	1040	5	104	5304
3	52	65061	6760	5	676	34476
4	16	21638	2080	5	208	10608
5	20	27126	2600	5	260	13260
Clubhouse	--	4764	476.4	5	47.64	2429.64
Total	104	140627	13996.4	-	1399.64	71381.64

1. Multi-Family Residential demand assumed to be 130 gpd/dwelling unit
2. Clubhouse demand assumed to be 0.1 gpd/SF utilizing retail/office design demand.
3. Peaking Factor shall be a maximum of 5

AUBURN HEIGHTS
WASTEWATER ROUTING CALCULATIONS
TOWN OF CASTLE ROCK

Routing Design Point	Included Upstream Routing DP's	Design Point Loading (GPD)	Cumulative Loading (GPD)	Pipe Diameter (in)	Min Slope (%)	Max Slope	Min Velocity (ft/s)	Percent Full (%)
DP1	--	5304.00	5304.00	10	0.28	5.5	0.69	5.6
DP2	DP1	5304.00	10608.00	10	0.28	5.5	0.85	7.7
DP3	DP1-DP2	34476.00	45084.00	10	0.28	5.5	1.32	15.3
DP4	DP1-DP3	13260.00	58344.00	10	0.28	5.5	1.42	17.4
DP5	--	2429.64	2429.64	6	2.0	2.0	1.16	4.6
DP6	--	10608.00	10608.00	6	2.0	2.0	1.81	9.2

1. DP5 and DP6 are designed as 6 inch services.

Appendix E

WASTEWATER HYDRAULIC MODELING

Design Point 1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.011
Channel Slope	0.280 %
Diameter	10.0 in
Discharge	5,304.00 gpd
Results	
Normal Depth	0.6 in
Flow Area	0.0 ft ²
Wetted Perimeter	0.4 ft
Hydraulic Radius	0.4 in
Top Width	0.38 ft
Critical Depth	0.5 in
Percent Full	5.6 %
Critical Slope	0.614 %
Velocity	0.69 ft/s
Velocity Head	0.01 ft
Specific Energy	0.05 ft
Froude Number	0.686
Maximum Discharge	952,548.42 gpd
Discharge Full	885,510.11 gpd
Slope Full	0.000 %
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	6.8 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.6 in
Critical Depth	0.5 in
Channel Slope	0.280 %
Critical Slope	0.614 %

Design Point 2

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Roughness Coefficient	0.011
Channel Slope	0.280 %
Diameter	10.0 in
Discharge	10,608.00 gpd
Results	
Normal Depth	0.8 in
Flow Area	0.0 ft ²
Wetted Perimeter	0.5 ft
Hydraulic Radius	0.5 in
Top Width	0.44 ft
Critical Depth	0.7 in
Percent Full	7.7 %
Critical Slope	0.560 %
Velocity	0.85 ft/s
Velocity Head	0.01 ft
Specific Energy	0.08 ft
Froude Number	0.718
Maximum Discharge	952,548.42 gpd
Discharge Full	885,510.11 gpd
Slope Full	0.000 %
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	9.4 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.8 in
Critical Depth	0.7 in
Channel Slope	0.280 %
Critical Slope	0.560 %

Design Point 3

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Roughness Coefficient	0.011
Channel Slope	0.280 %
Diameter	10.0 in
Discharge	45,084.00 gpd
Results	
Normal Depth	1.5 in
Flow Area	0.1 ft ²
Wetted Perimeter	0.7 ft
Hydraulic Radius	0.9 in
Top Width	0.60 ft
Critical Depth	1.4 in
Percent Full	15.3 %
Critical Slope	0.467 %
Velocity	1.32 ft/s
Velocity Head	0.03 ft
Specific Energy	0.15 ft
Froude Number	0.781
Maximum Discharge	952,548.42 gpd
Discharge Full	885,510.11 gpd
Slope Full	0.001 %
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	18.8 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.5 in
Critical Depth	1.4 in
Channel Slope	0.280 %
Critical Slope	0.467 %

Design Point 4

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.011
Channel Slope	0.280 %
Diameter	10.0 in
Discharge	58,344.00 gpd
Results	
Normal Depth	1.7 in
Flow Area	0.1 ft ²
Wetted Perimeter	0.7 ft
Hydraulic Radius	1.1 in
Top Width	0.63 ft
Critical Depth	1.5 in
Percent Full	17.4 %
Critical Slope	0.456 %
Velocity	1.42 ft/s
Velocity Head	0.03 ft
Specific Energy	0.18 ft
Froude Number	0.790
Maximum Discharge	952,548.42 gpd
Discharge Full	885,510.11 gpd
Slope Full	0.001 %
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	21.3 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.7 in
Critical Depth	1.5 in
Channel Slope	0.280 %
Critical Slope	0.456 %

Worksheet for Design Point 5

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Roughness Coefficient	0.011
Channel Slope	2.000 %
Diameter	6.0 in
Discharge	2,429.64 gpd
Results	
Normal Depth	0.3 in
Flow Area	0.0 ft ²
Wetted Perimeter	0.2 ft
Hydraulic Radius	0.2 in
Top Width	0.21 ft
Critical Depth	0.4 in
Percent Full	4.6 %
Critical Slope	0.671 %
Velocity	1.16 ft/s
Velocity Head	0.02 ft
Specific Energy	0.04 ft
Froude Number	1.650
Maximum Discharge	651,968.15 gpd
Discharge Full	606,084.03 gpd
Slope Full	0.000 %
Flow Type	Supercritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	4.6 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.3 in
Critical Depth	0.4 in
Channel Slope	2.000 %
Critical Slope	0.671 %

Worksheet for Design Point 6

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Roughness Coefficient	0.011
Channel Slope	2.000 %
Diameter	6.0 in
Discharge	10,608.00 gpd
Results	
Normal Depth	0.6 in
Flow Area	0.0 ft ²
Wetted Perimeter	0.3 ft
Hydraulic Radius	0.4 in
Top Width	0.29 ft
Critical Depth	0.8 in
Percent Full	9.2 %
Critical Slope	0.550 %
Velocity	1.81 ft/s
Velocity Head	0.05 ft
Specific Energy	0.10 ft
Froude Number	1.798
Maximum Discharge	651,968.15 gpd
Discharge Full	606,084.03 gpd
Slope Full	0.001 %
Flow Type	Supercritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	9.2 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.6 in
Critical Depth	0.8 in
Channel Slope	2.000 %
Critical Slope	0.550 %

Appendix F

EXISTING WASTEWATER SYSTEM ANALYSIS

AUBURN HEIGHTS
WASTEWATER OFFSITE DEMAND CALCULATIONS
TOWN OF CASTLE ROCK

Development	Units	Use	Average Daily Flow (ADF) (gpd)	Peaking Factor	Infiltration and Inflow (10% ADF)	Peak Design Flow (PDF) (gpd)
Auburn Brook Apartments	96	RMF	12480	5	1248	63648
Auburn Ridge Apartments	90	RMF	11700	5	1170	59670
Reserve at Castle Highlands	200	RMF	26000	5	2600	132600
Castle Highlands Filing 2	131	RSF	26200	5	2620	133620
Total	517		76380		7638	389538
Auburn Heights (Project Site)			13996.4	5	1399.64	71381.64
Total			90376.4		9037.64	460919.64

1. Residential Multi-Family (RMF) demand assumed to be 130 gpd/dwelling unit
2. Residential Single-Family (RSF) demand assumed to be 200 gpd/dwelling unit
3. Number of units for the Auburn Brook Apartments was determined using the Site Development Plan, Amendment No. 2, Lot 3, Auburn Ridge, Amendment No. 1.
4. Number of units for the Auburn Ridge Apartments was determined using the Lot 1, Auburn Ridge Final PD Site Plan.
5. Number of units for the Reserve at Castle Highlands was determined using Final PD Site Plan Castle Highlands Filing 1, 1st Amendment.
3. Peaking Factor shall be a maximum of 5

Worksheet for Existing Auburn Drive SS - MAX SLOPE

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Roughness Coefficient	0.011
Channel Slope	7.500 %
Diameter	8.0 in
Discharge	460,919.00 gpd
Results	
Normal Depth	2.3 in
Flow Area	0.1 ft ²
Wetted Perimeter	0.8 ft
Hydraulic Radius	1.3 in
Top Width	0.60 ft
Critical Depth	4.8 in
Percent Full	29.0 %
Critical Slope	0.558 %
Velocity	8.51 ft/s
Velocity Head	1.12 ft
Specific Energy	1.32 ft
Froude Number	4.028
Maximum Discharge	2,719,017.33 gpd
Discharge Full	2,527,658.74 gpd
Slope Full	0.249 %
Flow Type	Supercritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	29.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	2.3 in
Critical Depth	4.8 in
Channel Slope	7.500 %
Critical Slope	0.558 %

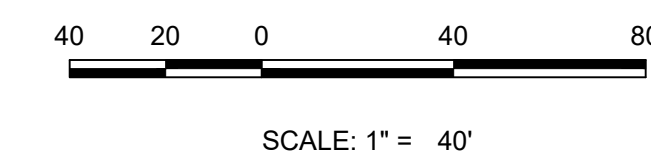
Worksheet for Existing Auburn Drive SS - MIN SLOPE

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.011
Channel Slope	0.400 %
Diameter	8.0 in
Discharge	460,919.00 gpd
Results	
Normal Depth	5.4 in
Flow Area	0.2 ft ²
Wetted Perimeter	1.3 ft
Hydraulic Radius	2.3 in
Top Width	0.63 ft
Critical Depth	4.8 in
Percent Full	67.0 %
Critical Slope	0.557 %
Velocity	2.87 ft/s
Velocity Head	0.13 ft
Specific Energy	0.57 ft
Froude Number	0.802
Maximum Discharge	627,930.16 gpd
Discharge Full	583,737.78 gpd
Slope Full	0.249 %
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	29.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	5.4 in
Critical Depth	4.8 in
Channel Slope	0.400 %
Critical Slope	0.557 %

Appendix G

MAPS AND PLANS

BASIS OF BEARING:
THE EAST LINE, NE 1/4, NW 1/4, SEC 10 BEARS N0°35'11"E PER THE FINAL PLAT FOR CASTLE
HIGHLANDS FILING NO. 2. IT IS MONUMENTED AT THE NORTH 1/4 CORNER SECTION 10 BY A 2-1/2"
ALUMINUM CAP STAMPED "HANNIGAN AND ASSOCIATES 1/4 COR S3S10 T8S, R67 W 1995 PLS
25629" AND AT THE SE CORNER, N 1/2, NW 1/4, SECTION 10 BY A 3-1/2" ALUMINUM CAP STAMPED
"T8T T8S R76W CN 1/16 S10 L5 12046 1984".



	PROPOSED CAP WITH END OF LINE BLOWOFF		CENTERLINE
	PROPOSED REDUCER		RIGHT-OF-WAY
	PROPOSED VALVE		PROPERTY LINE
	PROPOSED FIRE HYDRANT		EDGE OF PAVEMENT
	PROPOSED WL FITTING WITH THRUST BLOCK		PROPOSED DIRECTION OF FLOW
	PROPOSED FLARED END SECTION		PROPOSED SLOPE & DIRECTION
	PROPOSED LOW POINT BLOW-OFF		EXISTING 5' CONTOUR
	PROPOSED AIR VALVE		EXISTING 1' CONTOUR
	EXISTING BLOW OFF VALVE		PROPOSED 5' CONTOUR
	EXISTING VALVE		PROPOSED 1' CONTOUR
	EXISTING FIRE HYDRANT		BASE FLOOD ELEVATION
	PROPOSED LIGHT POLE		PROPOSED STORM DRAIN
	PROPOSED SIDEWALK		PROPOSED SEWER LINE WITH MANHOLE
	PROPOSED SIDEWALK RAMP		PROPOSED SEWER LATERAL
10.00	EXISTING ELEVATION		PROPOSED WATER LINE
10.00	PROPOSED DESIGN ELEVATION		PROPOSED WATER LATERAL W/ METER
	PROPOSED STORM DRAIN INLET		SECTION LINE
	PROPOSED STORM DRAIN MANHOLE		EXISTING FIBER OPTIC LINE
	PROPOSED RETAINING WALL		EXISTING OVERHEAD HIGH VOLTAGE LINE
	PROPOSED BUILDING STEP		EXISTING WATER LINE
	TURN DOWN EDGE SIDEWALK		EXISTING ELECTRIC LINE
			EXISTING SANITARY SEWER LINE
			PROPOSED PEDESTRIAN RAIL
			PROPOSED EXPOSED FOUNDATION

NOTE:

1. DIMENSIONS ARE CENTERLINE OF PIPE, UNLESS OTHERWISE STATED.
2. ALL SANITARY SEWER MAIN SHALL BE 8 (INCH) DIAMETER PVC UNLESS OTHERWISE STATED
3. ALL WATER MAINS SHALL BE 8 (INCH) DIAMETER PVC UNLESS OTHERWISE STATED.

I HEREBY AFFIRM THAT THESE FINAL CONSTRUCTION PLANS WERE PREPARED UNDER MY DIRECT SUPERVISION, IN ACCORDANCE WITH ALL APPLICABLE TOWN OF CASTLE ROCK AND STATE OF COLORADO STANDARDS AND STATUTES, RESPECTIVELY; AND THAT I AM FULLY RESPONSIBLE FOR ALL DESIGN AND REVISIONS RELATIVE TO SAID PLANS.

TOWN OF CASTLE ROCK APPROVAL
PLANS ARE HEREBY APPROVED FOR ONE YEAR FROM
DATE OF DEVELOPMENT SERVICES APPROVAL

DEVELOPMENT SERVICES

Date _____

SHEET NUMBER 4	DRAWN BY:	KMG	SCALE:	AUBURN HEIGHTS CONSTRUCTION DRAWINGS GENERAL UTILITY PLAN	AUBURN VENTURES II, LP ATTN: JOHN CICHON 15957 N 81 TH STREET SUITE 101 SCOTTSDALE, ARIZONA, 85260	 10333 E DRY CREEK RD. ENGLEWOOD, CO 80112 TEL: 720.482.9526 Westwoods.com Westwood Professional Services, Inc.				
	CHECKED BY:		AS SHOWN							
		MEL	FILE NO:							
	DATE:	DECEMBER 2021	R0031207.00							
							No.	Revisions	Date	Appr.

PROJECTS\31207 AUBURN HTS\CAD\ENGINEERING\SHEET SETS\CD\UTILITY PLAN.DWG, KMGRAY, 12/15/21



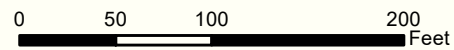
CALL 811
TWO WORKING DAYS
BEFORE YOU DIG
1-800-922-1987

AUBURN HEIGHTS VICINITY MAP





- | | | | |
|--|-----------------------------|--|---------------|
| | Water Valve | | Culvert |
| | Fire Hydrant | | Storm Inlet |
| | Water Lateral | | Storm Manhole |
| | Active Water Main | | Storm Outfall |
| | Sanitary Sewer Manhole | | Storm Pipe |
| | Sanitary Sewer Gravity Main | | Storm Pond |
| | Sanitary Sewer Lateral | | |



Date: 3/11/2021 1 inch = 100 feet



Disclaimer: The data presented has been compiled from various sources, each of which introduces varying degrees of inaccuracies or inconsistencies. Such discrepancies in data are inherent and in supplying this product the Town of Castle Rock assumes no liability for its use or accuracy. Questions or comments regarding the cartographic composition of this map including, but not limited to, errors, omissions, corrections, and/or updates, should be directed to the Utilities Department, Town of Castle Rock, (720) 733-6087. Copyright 2020, Town of Castle Rock Utilities Mapping.

SITE DEVELOPMENT PLAN, AMENDMENT NO. 2

LOT 3, AUBURN RIDGE, AMENDMENT NO. 1

4.78 ACRES

LOCATED IN THE SOUTHEAST QUARTER OF SECTION 3, TOWNSHIP 8 SOUTH, RANGE 67 WEST OF THE
6TH PRINCIPAL MERIDIAN TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS, STATE OF COLORADO

OWNERSHIP CERTIFICATION:

THE UNDERSIGNED ARE ALL OF THE OWNERS OF THE PROPERTY DESCRIBED HEREIN
IN THE TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS AND STATE OF COLORADO.

AUBURN DEVELOPERS III, LLC, A COLORADO LIMITED LIABILITY COMPANY

SIGNED THIS 29th DAY OF March, 2019

NOTARY BLOCK

SUBSCRIBED AND SWORN TO BEFORE ME THIS 29th DAY OF March, 2019

BY Mark Breen AS Manager OF
AUBURN DEVELOPERS III, LLC.

WITNESS MY HAND AND OFFICIAL SEAL.

Janet Malefors

NOTARY PUBLIC

MY COMMISSION EXPIRES February 19, 2022

TITLE CERTIFICATION:

I, Brenda Becker, AN AUTHORIZED REPRESENTATIVE OF

Land Title Guarantee Company, A TITLE INSURANCE COMPANY LICENSED TO DO
BUSINESS IN THE STATE OF COLORADO, HAVE MADE AN EXAMINATION OF THE PUBLIC
RECORDS AND STATE THAT ALL OWNERS, MORTGAGEES AND LIENHOLDERS OF THE PROPERTY
ARE LISTED IN THE CERTIFICATE OF OWNERSHIP AND LIENHOLDER SUBORDINATION
CERTIFICATE

Brenda Becker

AUTHORIZED REPRESENTATIVE

Land Title Guarantee Company

TITLE INSURANCE COMPANY

SIGNED THIS 3rd DAY OF April, 2019

NOTARY BLOCK

SUBSCRIBED AND SWORN TO BEFORE ME THIS 3rd DAY OF April, 2019

2019 BY Brenda Becker AS AUTHORIZED REPRESENTATIVE

WITNESS MY HAND AND OFFICIAL SEAL.

Nicole Ludwig

NOTARY PUBLIC

MY COMMISSION EXPIRES 12/8/20

STATEMENT OF DIRECTOR OF DEVELOPMENT SERVICES APPROVAL:

THIS SITE DEVELOPMENT PLAN AMENDMENT WAS APPROVED BY THE DIRECTOR OF
DEVELOPMENT SERVICES OF THE TOWN OF CASTLE ROCK, COLORADO

on the 5th DAY of April, 2019

Bill Deterville

DIRECTOR OF DEVELOPMENT SERVICES

CIVIL ENGINEER'S STATEMENT:

I, Paul Mulcahy, BEING A REGISTERED PROFESSIONAL ENGINEER IN

THE STATE OF COLORADO, HEREBY ATTEST THAT ALL GRADING, UTILITY AND DRAINAGE

IMPROVEMENTS IDENTIFIED ON THIS SITE DEVELOPMENT PLAN HAVE BEEN DESIGNED

AND ENGINEERED IN CONFORMANCE WITH ALL TOWN OF CASTLE ROCK PUBLIC WORKS

CONSTRUCTION STANDARDS.

Paul Mulcahy

REGISTERED PROFESSIONAL ENGINEER

DATE 4/4/2019

DOUGLAS COUNTY CLERK AND RECORDER'S CERTIFICATE:

THIS SITE DEVELOPMENT PLAN WAS FILED FOR RECORD IN THE OFFICE OF THE COUNTY CLERK

AND RECORDER OF DOUGLAS COUNTY AT 12:12 PM THE 8th DAY OF April, 2019

AT

RECEPTION NO. 2019018072

DOUGLAS COUNTY CLERK AND RECORDER

BY Heidi Mann

DEPUTY

GENERAL NOTES

WATER RIGHTS DEDICATION STATEMENT

THE PROVISION OF MUNICIPAL WATER TO THIS SUBDIVISION IS SUBJECT TO THE TERMS AND CONDITIONS OF THE AUBURN RIDGE ANNEXATION
AND DEVELOPMENT AGREEMENT RECORDED UNDER RECEPTION NO. 2013004871 DATED JANUARY 18, 2013, AND ACCORDINGLY 29.65 SFE ARE DEBITED
FROM THE WATER BANK.

1. The Town of Castle Rock requires that maintenance access be provided to all storm drainage facilities to assure continuous operational capability of the system. The Property Owner, subsequent owners, heirs, successors and assigns shall be responsible for the maintenance of all drainage facilities including, but not limited to, inlets, pipes, culverts, channels, ditches, hydraulic structures, and detention basins located on this property, unless modified by the Subdivision Improvements Agreement. Should the Owner fail to adequately maintain said facilities, the Town shall have the right to enter said property for the purposes of operation and maintenance. All such maintenance costs will be assessed to the Property Owner, subsequent owners, heirs, successors and assigns. The maintenance costs shall include all actual costs for labor, equipment and materials and a 25% fee.

2. Pursuant to Section 4.3E and 8.2.3A of the Town of Castle Rock Landscape Regulations the Property Owner, subsequent owners, heirs, successors and assigns shall be responsible for the proper maintenance of the area subject to the approved Site Development Plan. Landscaping within public rights-of-way is to be maintained by the adjacent private property owner or the Homeowner/Property Owner Association, as applicable. Landscaping shall be continuously maintained including necessary watering, weeding, pruning, mowing, pest control, and replacement of dead or diseased plant material. Upon written notice by the Town, the Owner will have 45 days to cure or replace damaged or dead landscape material. In the case of diseased landscape material, a shorter compliance period may be specified in said notice. The Town of Castle Rock Water Conservation Ordinance regulates times of seasonal irrigation and prohibits the wasting of potable water through improper irrigation.

3. The landscape and irrigation plans contained in the Site Development Plan are conceptual only and subject to change with review of the Construction Documents.

4. According to FEMA Preliminary Flood Insurance Rate Map Number 08035C0169G, Dated July 11, 2014, a portion of the site lies within a Shaded Zone X Floodplain.

5. Any street signs, striping, street lights and curb ramps are conceptual only and subject to Town review with the Construction Documents. These items shall comply with the Town of Castle Rock's regulations, standards and requirements.

6. The Developer shall conform to the Town of Castle Rock "Water Use Management Program Implementation Policy", as amended from time to time, for this project.

7. Approval of this conceptual Site Development Plan does not constitute approval of any deviations from Town of Castle Rock regulations and standards. All deviations from Town regulations and standards are subject to the appropriate procedures for approval.

8. No solid object (excluding fire hydrants, traffic control devices and traffic signs) exceeding thirty (30) inches in height above the flowline elevations of the adjacent street, including but not limited to buildings, utility cabinets, walls, fences, landscape plantings, crops, cut slopes, and berms shall be placed within sight distance lines and sight distance easements.

9. The purpose/use of all tracts and the dedication of all "tracts", to whom the tracts will be dedicated with the Plat and who will be responsible for "maintenance".

10. All Utility, Drainage, Emergency Access, Sight Distance and Public Access/Trail Easements as shown on the Site Development Plan shall be granted to the Town of Castle Rock with the Plat.

11. This Property is zoned planned development under the Auburn Ridge PD recorded under Reception No. 2019018071

12. All emergency access roads, emergency access gates and signage shall comply with the Town of Castle Rock Fire Department requirements and shall be maintained by Auburn Ridge Ventures II and/or Celtic Property Management, LLC.

13. Unless otherwise noted, all lots shall have a 10-foot Utility Easement along the front and rear lot lines and along all public rights-of-way and shall have 5-foot Utility Easements along each side lot line. These Utility Easements are for the installation, maintenance and operation of utilities and drainage facilities including, but not limited to street lights, electric lines, gas lines, cable television lines, fiber optic lines and telephone lines, as well as perpetual right for ingress and egress for installation, maintenance and replacement of such lines.

14. Retaining walls - sections of retaining walls 4-feet in height or higher or tiered walls must be designed by a Structural Engineer licensed in the State of Colorado and must receive a Building Permit from the Town of Castle Rock prior to the issuance of the Public Works Permit. Retaining wall color and design will match Lot 1 - Auburn Ridge Senior Apartments.

15. A sign permit for each sign must be obtained from the Town of Castle Rock Building Division prior to placing any signs on the property. All signs must comply with the provisions of Title 19 (sign code regulations) of the municipal code.

16. Proposed tap sizes:

Building 1, 2, 3, 4, 5 and 6 - 1-1/2" Tap/Meter with a 2" service line to the building, 6" Sanitary, 6" Fire

Building 7 and 8 - 3/4" Tap/Meter with 1" Service line to the building, 4" Sanitary, 6" Fire

Clubhouse - 1-1/2" Tap/Meter with a 3" Service line to the building, 6" Sanitary, 6" Fire

Irrigation - 3/4" Tap

FIRE NOTES

1. If fire apparatus access roads or water supply for fire protection is required to be installed, such protection shall be installed and made serviceable prior to vertical construction.

2. Fire hydrant(s) are required to be installed and made serviceable prior to and during the time of construction.

3. Approved fire apparatus access roads shall be provided for every facility, building or portion of a building constructed or moved into, or within the jurisdiction. The fire apparatus access road shall extend to within 150 feet of all portions of the facility and all portions of the exterior walls of the first story of the buildings measured by an approved route around the exterior of the building or facility.

4. Dead-end fire access roads in excess of 150 feet shall provide an approved area for turning around fire apparatus.

5. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet, exclusive of shoulders, except for approved security gates and an unobstructed vertical clearance of not less than 13 feet, 6 inches.

6. Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus weighing at least 75,000 pounds, and shall be surfaced so as to provide all-weather driving capabilities. The term all-weather driving capabilities has been interpreted to mean either concrete or asphalt, or other approved driving surface designed by an engineer and approved by the Fire Department.

7. "No Parking Fire Lane" signs are required in areas that meet the following criteria and in areas designated by the Fire Prevention Bureau. Signs shall be posted on both sides of the access road or private roadway less than 26 feet wide. Signs shall be posted on one side of fire access roadways, public or private roadways or driveways between 26 feet wide and 32 feet wide. No signage is required for fire access roadways, public or private roadways or driveways greater than or equal to 32 feet wide.

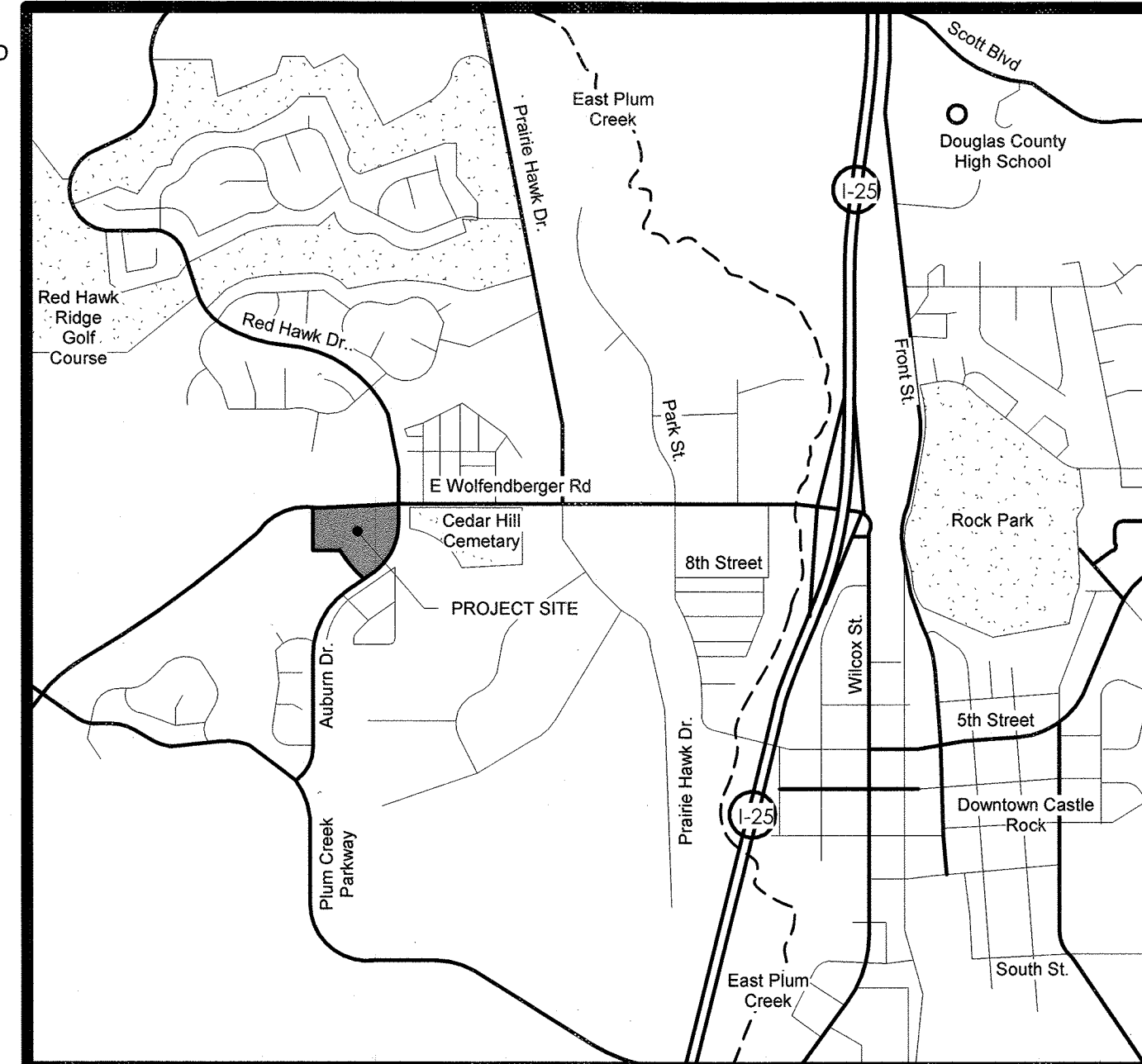
8. It is the responsibility of the property owner to maintain drive lanes for emergency vehicle ingress and egress, including snow removal.

BASIS OF BEARINGS:

Bearings used herein are based on the east line of the Northeast 1/4 of Section 10, Township 8 South, Range 67 West of the 6th Principal Meridian, as shown on the Castle Highlands Filing No. 2, County of Douglas, State of Colorado, being N 00°35'11" E, as monumented and occupied.

BENCHMARK:

Douglas County Monument 3.011025 witnessed by a brown, carsonite post located 230 feet west from the west end of Atchison Court along a dirt access road. Elevation = 6351.35 (NAVD 88)



VICINITY MAP

SCALE: N.T.S.

LEGAL DESCRIPTION

LOT 3, AUBURN RIDGE, AMENDMENT NO. 1,
ACCORDING TO THE RECORDED PLAT
THEREOF, COUNTY OF DOUGLAS, STATE
OF COLORADO.

SHEET INDEX

- COVER SHEET
- ARCHITECTURAL SITE PLAN
- LANDSCAPE PLANS AND SCHEDULES
- BUILDING 2 & 3 ELEVATIONS
- BUILDING 6 ELEVATIONS
- BUILDING 7 ELEVATIONS
- BUILDING 8 ELEVATIONS
- CLUBHOUSE ELEVATIONS
- ACCESSORY STRUCTURE ELEVATIONS
- LIGHTING PLAN

PURPOSE STATEMENT

The purpose of this Amendment # 2 is to add a new
archway entry sign to the property and address
comments from TCO site inspection dated
November 2nd, 2018

SITE DATA:

SITE BREAKDOWN:

TOTAL NET SITE AREA:	208,217 S.F.	4.78 AC	100%
DRIVE, WALKS & PARKING:	96,625 S.F.	2.22 AC	46.40%
BUILDING COVERAGE:	64,651 S.F.	1.48 AC	31.05%
LANDSCAPE:	46,941 S.F.	1.08 AC	22.55%
TOTAL:	208,217 S.F.	4.78 AC	100.00%

DENSITY CALCULATION:

AREA A DWELLING UNITS:	24 UNITS ON 1.56 ACRES	15.4 UNITS/ACRE
AREA B DWELLING UNITS:	72 UNITS ON 3.22 ACRES	22.4 UNITS/ACRE
TOTAL NUMBER OF DWELLING UNITS:	96 UNITS ON 4.78 ACRES	20.1 UNITS/ACRE

BUILDING COVERAGE:

BUILDING	FOOTPRINT AREA	GROSS FLOOR AREA	SFE
BLDG 1:	11,212 S.F.	28,167 S.F.	3.33
BLDG 2 & 3:	20,000 S.F.	60,000 S.F.	6.66
BLDG 4, 5 & 6:	17,433 S.F.	34,866 S.F.	9.99
BLDG 7:	2,278 S.F.	4,556 S.F.	1.00
BLDG 8:	2,435 S.F.	4,870 S.F.	1.00
CLUBHOUSE:	4,283 S.F.	4,283 S.F.	6.67
GARAGE TYPE 1 (1)	1,470 S.F.	1,470 S.F.	NA
GARAGE TYPE 2 (1)	2,750 S.F.	2,750 S.F.	NA
GARAGE TYPE 3 (3)	2,790 S.F.	2,790 S.F.	NA
IRRIGATION	NA	NA	1.00
TOTAL:	64,651 S.F.	143,752 S.F.	29.65

MAXIMUM ALLOWED BUILDING AREA : 40% = 83,286.80 S.F.

PARKING REQUIRED:

PD REQUIRED PARKING	(28) 1 BEDROOM (1.5) = 42 CARS (68) 2/3 BEDROOM (2) = 136 CARS VISITOR (14 UNITS) = 24 CARS
HANDICAP PARKING	201-300 = 7 SPACES REQUIRED OF TOTAL (TOTAL PARKING SPACES IN LOT) (1 VAN, 6 STANDARD REQUIRED) = 202 TOTAL SPACES
TOTAL REQUIRED	

PARKING PROVIDED:

STANDARD SURFACE PARKING STALLS: (9'-0" x 16'-0" with a 2' overhang)	131
STANDARD SURFACE PARKING STALLS: (9'-0" x 18'-0")	20
STANDARD SURFACE PARALLEL PARKING STALLS: (9'-0" x 24'-0")	3
STANDARD GARAGE PARKING: (10'-4" x 20'-0", 10'-4" x 23'-0")	41
TOTAL STANDARD PARKING:	(195)
HANDICAP PARKING STALLS: GARAGE PARKING (14'-2" X 20'-0")	1
STANDARD SURFACE: (9'-0" x 16'-0" with a 2' overhang)	5
VAN ACCESSIBLE: (9'-0" x 16'-0" with a 2' overhang)	1
TOTAL HANDICAP STALLS	(7)
TOTAL PARKING PROVIDED:	202 TOTAL SPACES ON SITE

PROPOSED BUILDING HEIGHTS:

BUILDING 1	44' - 0.25" MAX. RIDGE HEIGHT
BUILDING 2 & 3	43' - 4.5" MAX. RIDGE HEIGHT
BUILDING 4, 5 & 6	34' - 8" MAX. RIDGE HEIGHT
BUILDING 7	25' - 3" MAX. RIDGE HEIGHT
BUILDING 8	26' - 10" MAX. RIDGE HEIGHT
CLUBHOUSE	20' - 8" MAX. RIDGE HEIGHT
DETACHED GARAGE	17' - 8" MAX. RIDGE HEIGHT

SETBACK DATA:

15'-0" SIDE TO AUBURN DRIVE
15'-0" SIDE TO WOLFENBERGER ROAD
10'-0" SIDE TO AUBURN RIDGE PHASE I
10'-0" TO WEST SIDE (INTERIOR LOT)

20'-0" AUBURN RIDGE PHASE I SET BACK
TOTAL BETWEEN PHASE I AND III = 30'-0"
4'-11" MINIMUM BUILDING SEPERATION

LIST OF CONTACTS:

ARCHITECT:	CIVIL ENGINEER / SURVEYOR:	WATER AND SANITATION SEWER:	PHONE, INTERNET, & CABLE:
PWN ARCHITECTS AND PLANNERS, INC. 4949 S. SYRACUSE ST., SUITE 320 DENVER, CO 80237	MANHARD CONSULTING 10835 DOVER STREET, SUITE 700 WESTMINSTER, CO 80021	TOWN OF CASTLE ROCK UTILITIES DEPARTMENT 175 KELLOGG COURT CASTLE ROCK, CO 80109	COMCAST 8222 S YOSEMITE ST, SUITE 110 CENTENNIAL, CO 80112
OWNER:	LANDSCAPE ARCHITECT:	GAS AND ELECTRIC:	
AUBURN DEVELOPERS III, LLC 15957 N 81ST STREET, SUITE 101 SCOTTSDALE, AZ 58260	GROUNDED BY DESIGN P.O. BOX 1953 WHEAT RIDGE, CO 80034	INTERMOUNTAIN RURAL ELECTRIC ASSOC. SEDALIA HEADQUARTERS 5496 NORTH US HWY 85 P.O. DRAWER A SEDALIA, CO 80135	CENTURY LINK 4400 FRONT STREET CASTLE ROCK, CO 80104

COVER SHEET

SITE DEVELOPMENT PLAN,
AMENDMENT NO.2
LOT 3, AUBURN RIDGE,
AMENDMENT NO. 1
SDP 19-0002
PLANS PREPARED FOR:

AUBURN DEVELOPERS III, LLC.

15957 N 81ST STREET, SUITE 101
SCOTTSDALE, AZ 58260

SHEET
1 OF 10



PWN Architects and Planners, Inc.

4949 S. Syracuse St. | Suite 320
Denver, CO 80237
voice: 303.649.9880 fax: 303.649.9870
pwnarchitects.com

LOT 1, AUBURN RIDGE FINAL PD SITE PLAN

3.23 ACRES

A PORTION OF SECTION 3, TOWNSHIP 8 SOUTH, RANGE 67 WEST OF THE 6TH P.M.
TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS, STATE OF COLORADO

SURVEYOR'S CERTIFICATE:

I, Brian Krumbein, A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE
STATE OF COLORADO, DO HEREBY CERTIFY THAT THE SURVEY AND LEGAL DESCRIPTION
REPRESENTED BY LOT 1, AUBURN RIDGE WAS MADE UNDER MY SUPERVISION AND THE
MONUMENTS SHOWN THEREON ACTUALLY EXIST AND THIS SITE PLAN ACCURATELY REPRESENTS
THAT SURVEY.

Brian Krumbein
REGISTERED LAND SURVEYOR



OWNERSHIP CERTIFICATION:

THE UNDERSIGNED ARE ALL OF THE OWNERS OF CERTAIN LANDS KNOWN HERIN AS LOT 1, AUBURN RIDGE
IN THE TOWN OF CASTLE ROCK.

Jessica Breen
AUBURN VENTURES, LP, A COLORADO LIMITED PARTNERSHIP

SIGNED THIS 12th DAY OF March, 2013

NOTARY BLOCK
SUBSCRIBED AND SWORN TO BEFORE ME THIS 12th DAY OF March, 2013
BY Jessica Breen

Adam Taffe
WITNESS MY HAND AND OFFICIAL SEAL



NOTARY PUBLIC

MY COMMISSION EXPIRES 10/25/2013

TITLE CERTIFICATION:

I, Brandon Bueh, A
TITLE INSURANCE COMPANY LICENSED TO DO BUSINESS IN THE STATE OF COLORADO, HAVE
MADE AN EXAMINATION OF THE PUBLIC RECORDS AND STATE THAT ALL OWNERS, MORTGAGEES
AND LIENHOLDERS OF THE PROPERTY ARE LISTED IN THE CERTIFICATE OF OWNERSHIP AND
LIENHOLDER SUBORDINATION CERTIFICATE
SIGNED THIS 12th DAY OF March, 2013

Brandon Bueh
AUTHORIZED REPRESENTATIVE

Land Title Guarantee Company
TITLE INSURANCE COMPANY

NOTARY BLOCK

SUBSCRIBED AND SWORN TO BEFORE ME THIS 20th DAY OF March, 2013

BY

WITNESS MY HAND AND OFFICIAL SEAL



NOTARY PUBLIC

MY COMMISSION EXPIRES 1-15-15

TOWN CERTIFICATION:

THIS FINAL PD SITE PLAN WAS APPROVED BY THE TOWN OF CASTLE ROCK, COLORADO, ON THE

20th DAY OF April, 2013

Brandon Bueh

DIRECTOR OF DEVELOPMENT SERVICES

DATE 4/20/13

DOUGLAS COUNTY CLERK AND RECORDER'S CERTIFICATE:

THIS FINAL PD SITE PLAN WAS FILED FOR RECORD IN THE OFFICE OF THE COUNTY CLERK
AND RECORDER OF DOUGLAS COUNTY AT (TIME) ON THE 7 DAY OF April, 2013 AT
RECEPTION NO. 2013065915
DOUGLAS COUNTY CLERK AND RECORDER

BY: Tulay Koc
DEPUTY



Planning Commission Recommendation

This Final PD Site Plan was recommended for approval
by the Planning Commission of the Town of Castle Rock,
Colorado on the 8th day of November, 2012.

Kate Lee
Chair

4/25/13
Date

Brandon Bueh
Director of Development Services

4/22/13
Date

Town Council Approval

This Final PD Site Plan was approved by the Town
Council of Castle Rock, Colorado, on the 10th day
of January, 2013.

Paul Donohue
Mayor

6-4-13
Date

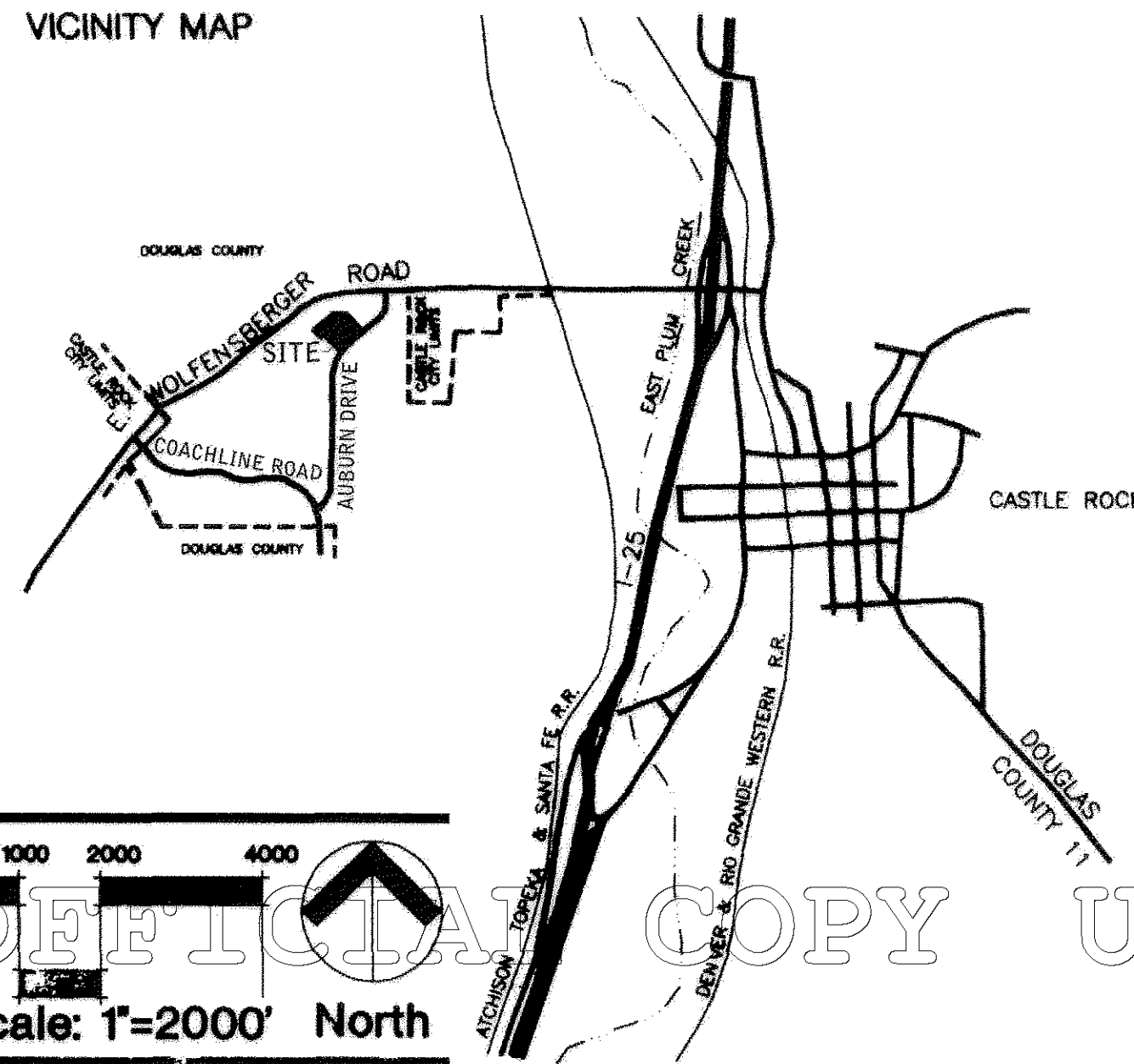
Paul Donohue
Attest:

6-4-13
Date

Paul Donohue
Town Clerk



VICINITY MAP



SHEET NUMBER	SHEET NAME
1	COVER SHEET
2	SITE PLAN
3	PHASING PLAN
4	GRADING PLAN
5	UTILITY PLAN
6	LANDSCAPE PLAN
7	LANDSCAPE SCHEDULES
8	LANDSCAPE DETAILS
9	PRELIMINARY IRRIGATION PLAN
10	PRELIMINARY IRRIGATION SCHEDULE
11	PRELIMINARY IRRIGATION DETAILS
12	PRELIMINARY IRRIGATION DETAILS
13	PRELIMINARY IRRIGATION DETAILS
14	PRELIMINARY IRRIGATION DETAILS
15	BUILDING ELEVATIONS
16	BUILDING ELEVATIONS
17	BUILDING ELEVATIONS
18	PHOTOMETRIC PLAN
19	PHOTOMETRIC DATA

LEGAL DESCRIPTION

LOT 1, AUBURN RIDGE, ACCORDING TO THE
RECORDED PLAT THEREOF, COUNTY OF
DOUGLAS, STATE OF COLORADO.

GENERAL NOTES

1. The Town of Castle Rock requires that maintenance access be provided to all storm drainage facilities to assure continuous operational capability of the system. The Property Owner, subsequent owners, heirs, successors and assigns shall be responsible for the maintenance of all drainage facilities including, but not limited to: inlets, pipes, culverts, channels, ditches, hydraulic structures, and detention basins located on this property unless modified by the Subdivision Improvements Agreement. Should the Owner fail to adequately maintain said facilities, the Town shall have the right to enter said property for the purposes of operation and maintenance. All such maintenance costs will be assessed to the Property Owner, subsequent owners, heirs, successors and assigns. The maintenance costs shall include all actual costs for labor, equipment and materials and a 15% fee.

2. Pursuant to Section 3.3.4E5-7 and 4.2.5 of the Town of Castle Rock Landscape Regulations, the Owner of the property, subsequent owners, heirs, successors and assigns shall be responsible for the proper maintenance of the area subject to the approved Final PD Site Plan. Landscaping within public rights-of-way is to be maintained by the adjacent private property owner or the Homeowners Association, if applicable. Landscaping shall be continuously maintained including necessary watering, weeding, pruning, mowing, pest control, and replacement of dead or diseased plant material. Upon written notice by the Town, the Owner will have six (6) months to cure or replace damaged or dead landscape material. In the case of diseased landscape material, a shorter compliance period may be specified in said notice. The Town of Castle Rock Water Conservation Ordinance regulates times of seasonal irrigation and prohibits the wasting of potable water through improper irrigation.

3. No FEMA regulated floodplains or wetlands exist on the site.

4. Any street signs, striping and street lights are conceptual only and subject to Town review with the CDs. These items shall comply with the Town of Castle Rock's regulations, standards and requirements.

5. The Developer shall conform to the Town of Castle Rock 'Water Use Management Program Implementation Policy', as amended from time to time, for this project.

6. Approval of the Final PD Site Plan does not constitute approval of any deviations from Town of Castle Rock regulations and standards. All deviations from Town regulations and standards are subject to the appropriate procedures for approval.

7. No solid object exceeding 30" in height above the flowline elevation of the adjacent street, including but not limited to buildings, utility cabinets, walls, fences, trees, landscape plantings, cut slopes and berms, shall be placed in Sight Distance Easements as shown on this Plan.

WATER RIGHTS DEDICATION STATEMENT

THE PROVISION OF MUNICIPAL WATER TO THIS SUBDIVISION IS SUBJECT TO THE TERMS AND CONDITIONS OF THE AUBURN RIDGE ANNEXATION AND DEVELOPMENT AGREEMENT RECORDED SIMULTANEOUSLY HERewith, AND ACCORDINGLY 7.34 SFE ARE DEBITED HERewith.

LIST OF CONTACTS:

ARCHITECT:

PWN ARCHITECTS
9250 E. COSTILLA AVE., SUITE 620
GREENWOOD VILLAGE, CO 80112

OWNER:

AUBURN VENTURES LP
15957 N 81ST STREET, SUITE 101
SCOTTSDALE, AZ 85260

CIVIL ENGINEER / SURVEYOR:

JONES ENGINEERING ASSOCIATES
2120 W. LITTLETON BLVD., SUITE 205
LITTLETON, CO 80120

LANDSCAPE ARCHITECT:

GROUND BY DESIGN
P.O. BOX 1953
WHEAT RIDGE, CO 80034

SITE DATA:

SITE BREAKDOWN:

PHASE I:

TOTAL NET SITE AREA:	140,700 S.F.	3.23 AC	100%
DRIVE, WALKS & PARKING:	61,858 S.F.	1.42 AC	43.96%
BUILDING COVERAGE:	34,282 S.F.	0.79 AC	24.46%
HARDSCAPE TOTAL:	96,140 S.F.	2.21 AC	68.42%
OPEN SPACE/LANDSCAPE:	44,560 S.F.	1.02 AC	31.58%

PHASE II:

TOTAL NET SITE AREA:	263,538 S.F.	6.05 AC	100%
ALLOWABLE BUILDING COVERAGE:			40%

DENSITY CALCULATION:

PHASE I:

TOTAL NUMBER OF DWELLING UNITS:	90
90 UNITS ON 3.23 ACRES:	28 UNITS/ACRE

PHASE II:

TOTAL NUMBER OF DWELLING UNITS:	103
103 UNITS ON 6.05 ACRES:	17 UNITS/ACRE

BUILDING COVERAGE:

	GROUND	1ST FLOOR	2ND FLOOR	
BLDG 1 - MAIN BUILDING:	31,575 S.F.	31,173 S.F.	31,173 S.F.	= 93,928 G.S.F.
BLDG 2 - STORAGE UNITS:	898 S.F.			
BLDG 3 - DETACHED GARAGE:	1,809 S.F.			
TOTAL:	34,282 S.F.			

PARKING REQUIRED:

UNIT A (1 BEDROOM)	54 UNITS			
UNIT B (2 BEDROOMS)	24 UNITS			
UNIT C (2 BEDROOMS)	12 UNITS			
PUD REQUIRED PARKING	90 UNITS	x	1.20	= 108
HANDICAP PARKING	101-150	=	5 SPACES REQUIRED OF TOTAL	(1 VAN, 4 STANDARD REQUIRED)
TOTAL REQUIRED	108 TOTAL SPACES			

PARKING PROVIDED:

STANDARD SURFACE PARKING STALLS:	100
STANDARD GARAGE PARKING:	7
TOTAL STANDARD PARKING	107
HANDICAP PARKING STALLS:	
STANDARD SURFACE:	4
VAN ACCESSIBLE:	1
GARAGE:	1
TOTAL HANDICAP STALLS	6

TOTAL PARKING PROVIDED: 113 TOTAL SPACES ON SITE

PROPOSED BUILDING HEIGHTS:

MAIN BUILDING	45' - 0" MAX. RIDGE HEIGHT
MAIN BUILDING - TOWER FEATURE	60' - 0" MAX. HEIGHT
STORAGE UNITS	15' - 6" MAX. RIDGE HEIGHT
DETACHED GARAGE	15' - 6" MAX. RIDGE HEIGHT

SETBACK DATA:

15'-0" FRONT SETBACK
20'-0" REAR SETBACK
10'-0" SIDE SETBACK

LOT 1, AUBURN RIDGE FINAL PD SITE PLAN

FPD 12-0006

PLANS PREPARED FOR:

AUBURN VENTURES LP

15957 N 81ST STREET, SUITE 101
SCOTTSDALE, AZ 85260

SHEET
1 OF 19



PWN Architects and Planners, Inc.

9250 E Costilla Avenue | Suite 620
Greenwood Village, CO 80112
voice 303.649.9880 fax 303.649.9870
pwnarchitects.com

FINAL PD SITE PLAN
CASTLE HIGHLANDS FILING NO.1, 1ST AMENDMENT
A PART OF THE S 1/2 OF SECTION 3 AND THE N 1/2 OF SECTION 10, T.8S., R.67W., 6TH P.M.
TOWN OF CASTLE ROCK, COUNTY OF DOUGLAS, STATE OF COLORADO

BUILDING MIX		UNIT MIX			
TYPE	QUANTITY	UNIT MIX / BUILDING			NO. OF UNITS
		'A' 1 BR	'B' 2 BR	'C' 3 BR	
I	3	-	8	4	36
II	7	4	8	-	84
III	5	8	4	4	80
PROJECT TOTAL	15	68	100	32	200

* (I) MANAGER UNIT & (II) MODEL UNIT

GROSS BUILDING FLOOR AREA			
BLDG.	1ST.FLR.	2ND.FLR.	TOTAL GROSS FLOOR AREA
I	6,790 SF	6,734 SF	13,524 SF x 3 BLDGS. = 40,572 SF
II	5,738 SF	5,862 SF	11,388 SF x 7 BLDGS. = 79,716 SF
III	7,712 SF	7,588 SF	15,280 SF x 5 BLDGS. = 76,400 SF
GARAGE	200,900 SF		108 SPACES = 23,800 SF
CLUB.	3,502 SF		3,502 SF x 1 BLDG. = 3,502 SF
TOTAL			= 223,790 SF

DEFINITIONS (THIS PROJECT ONLY)

ACCESSIBLE UNIT:
A UNIT THAT CAN BE REACHED BY A PERSON IN A WHEELCHAIR BY USE OF A SIDEWALK WITHOUT OBSTRUCTION FROM STAIRS.

ADAPTABLE UNIT:
A UNIT THAT CAN BE ALTERED IN THE FUTURE TO ACCOMMODATE THE NEEDS OF PERSONS WITH DISABILITIES. ALL FIRST FLOOR UNITS HAVE BEEN DESIGNED TO ACCOMMODATE FUTURE ALTERATIONS.

SITE DATA

ZONING: CASTLE HIGHLANDS PD

BUILDING SETBACKS & SEPARATIONS:
FRONT SETBACK: 15'
PERIMETER SETBACK: 25'
MIN. BLDG. SEPARATION: 10'

MAXIMUM BUILDING COVERAGE: 40 %

MAXIMUM BUILDING HEIGHT: 35'

LAND USE:

W/O AUBURN DRIVE R.O.W.

W/ AUBURN DRIVE R.O.W.

ACREAGE	11.527 AC	13.75 AC
SQUARE FOOTAGE	502,116 SF	598,039 SF
DENSITY	17.35 UNITS/ACRE	14.55 UNITS/ACRE
FLOOR AREA RATIO	1 : 2.24	1 : 2.67

LAND USE (WITHOUT AUBURN DRIVE RIGHT OF WAY)

OPEN SPACE:			
SIDEWALKS	36,328 SF	0.90 ACRES	7.83 %
LANDSCAPE	222,789 SF	5.11 ACRES	44.37 %
DETENTION	8,712 SF	0.20 ACRES	1.74 %
	270,800 SF	6.21 ACRES	53.94 %

BUILDING COVERAGE:

APARTMENTS	102,203 SF
GARAGES	23,800 SF
CLUBHOUSE	3,502 SF
	129,305 SF
	2.97 ACRES
	25.75 %

PARKING & DRIVES: 102,002 SF 2.34 ACRES 20.31 %

PARKING

REQUIRED:

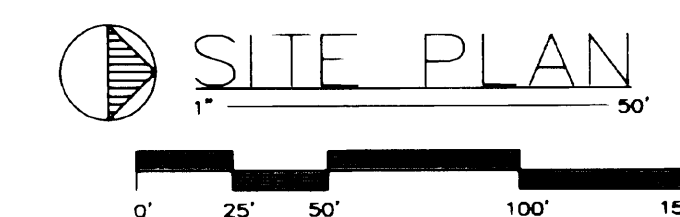
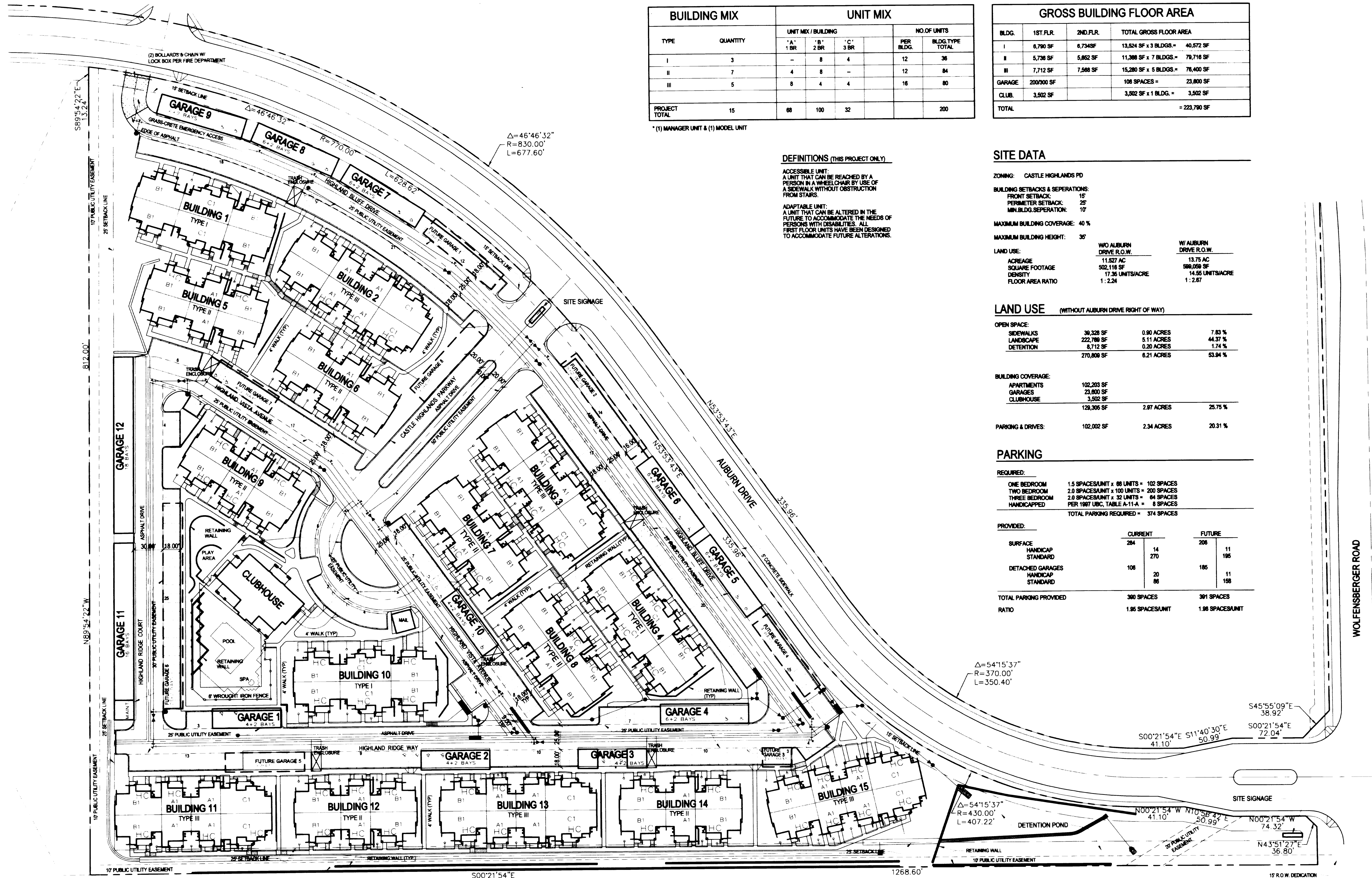
ONE BEDROOM	1.5 SPACES/UNIT x 68 UNITS = 102 SPACES
TWO BEDROOM	2.0 SPACES/UNIT x 100 UNITS = 200 SPACES
THREE BEDROOM	2.0 SPACES/UNIT x 32 UNITS = 64 SPACES
HANDICAPPED	PER 1997 UBC, TABLE A-11-A = 8 SPACES
TOTAL PARKING REQUIRED	= 374 SPACES

PROVIDED:

SURFACE	HANDICAP STANDARD	CURRENT		FUTURE	
		284	14	206	11
			270		195
DETACHED GARAGES		106		186	
HANDICAP STANDARD			20		11
			86		196

TOTAL PARKING PROVIDED: 360 SPACES 361 SPACES

RATIO: 1.96 SPACES/UNIT 1.96 SPACES/UNIT



FINAL PD SITE PLAN

CASTLE HIGHLANDS
FILING NO.1
1ST AMENDMENT

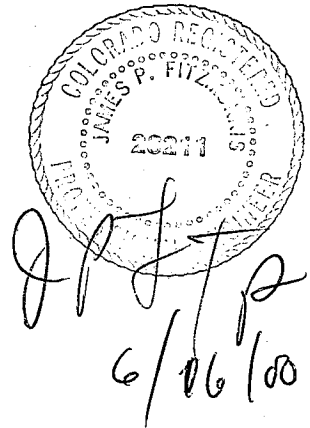
**CASTLE HIGHLANDS
FINAL UTILITY STUDY**

Prepared for:

CASTLE ROCK EQUITIES
6950 E. Belleview, Suite 202
Englewood, Colorado 80111
(303) 740-9788
Contact: Mr. Sam N. Perry

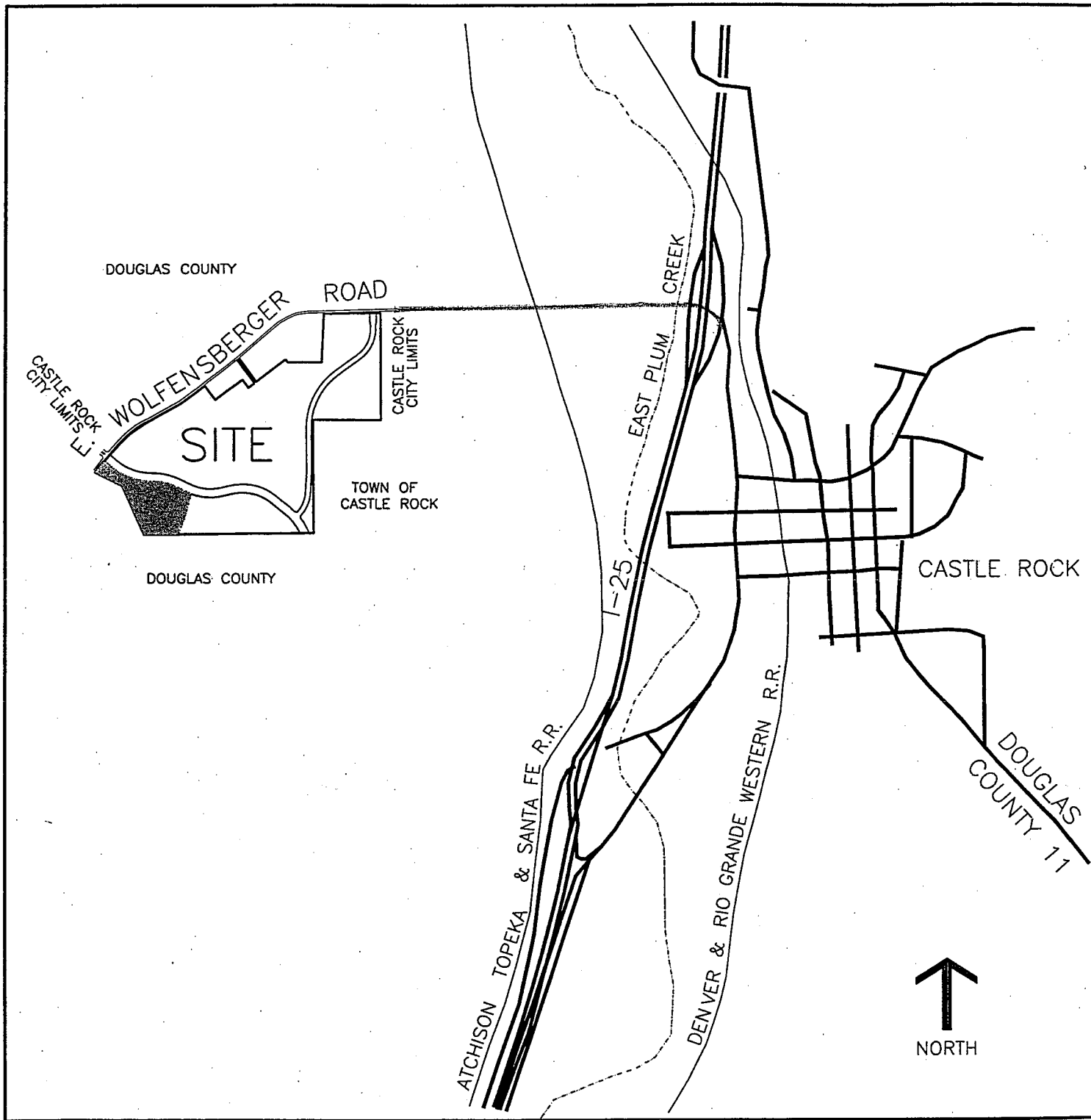
Prepared by:

JR ENGINEERING, LTD.
6020 Greenwood Plaza Boulevard
Englewood, Colorado 80111
(303) 740-9393
Contact: Mr. James P. Fitzmorris



June 23, 1999
Revised: December 10, 1999

Project Number 2316.05



V I C I N I T Y M A P

FIGURE 1

UTILITY ANALYSIS

Sanitary Sewer System

The site is located in the East Plum Creek Red Hawk North Basin, and more specifically, the East Plum Creek Red Hawk North 3 sub-basin. This basin is mostly undeveloped. Its collection system is an 8" sanitary sewer line that runs up Park Street (Town of Castle Rock Sanitary Sewer Facility Plan Final Report (July 1998)-Section 7). The proposed system will connect to the existing sewer line at the intersection of Santa Fe and Wolfensberger Road. It is approximately 1500 feet east from the site. The flows from the site are within the capacity of an 8" sewer line, and thus the proposed sewer will be of 8" diameter.

The Town of Castle Rock has four metering devices located throughout the sewer collection system. Each device has a study area. Castle Highlands is found in the TCR Main Study Area. This area involves the Downtown, Citadel Business, and Wolfensberger Business areas. Since this is the oldest part of town, infiltration and inflow (I/I) greatly effect this study area. (Town of Castle Rock Sanitary Sewer Facility Plan Final Report (July 1998)-Section 4).

Section 4, of the Town of Castle Rock Sanitary Sewer Facility Plan Final Report (July 1998), shows the I/I value for old sewer lines is 50 gpd/SFE and 25 gpd/SFE for new sewer lines. Since Castle Highlands is a new subdivision, 25 gpd/SFE was used for this report. Criteria used for these calculations were found in the Town of Castle Rock Public Works Regulations (October 1, 1998). Table 2 summarizes the calculations (see Appendix A for criteria and Appendix B for calculations).

Table 2: Summary of Final Sanitary Sewer Demands, Castle Highlands, Colorado.

Single Family-Residential: RSF

Multi-Family-Residential: RMF

Commercial/Retail/Office: COM

Type	Approximate Area (AC)	Max. Units	Rate	Avg. Daily Sewer Flow +I/I (GPD)	Peak Sewer Flow +I/I (GPD)	Minimum Connector Sewer Size
RSF	31.89	131 du	200/du	29,450	68,750	8"
RMF	20.05	320 du	130/du	46,800	109,200	8"
COM	4.49	13.5 SFE	600/ac	3,031	7,072	8"



Concept Utility Letter Checklist

The Concept Utility Letter must be in conformance with the latest Town of Castle Rock Water and Wastewater System Design Criteria Manuals, available on the Town's website.

The Concept Utility Letter may be submitted in letter format, signed and sealed by a Professional Engineer licensed in the State of Colorado. The purpose of the Concept Utility Letter is to confirm that the utilities proposed for the development can be feasibly connected to the Town's water distribution system and/or wastewater collection system, that the Town's system can adequately support the development, and to ensure consistency with the Town's Water/Wastewater Master Plans.

The preparer should contact and work with the Town Utility Engineering Staff regarding any design, utility master planning and existing system questions (720-733-6000). Whenever possible, water and wastewater utility reports should be combined into a single document provided that separate sections clearly identify the information associated with each of the two systems. The following outline sets forth the **required minimum** content to be provided in the Concept Utility Letter that shall be submitted with the Planned Development Plan (PDP). A copy of this checklist must be submitted with the Concept Utility Letter.

Please check off the following items to assure your letter is complete. Appropriate notations shall be provided with the checklist. For example, if a specific item is not addressed or not applicable, an explanation needs to be provided.

Included	N/A	
		PROJECT INFORMATION
X		A. Name of Project, including legal name of development
X		B. Address
X		C. Owner
X		D. Developer
X		E. Engineer
X		F. Submittal date and revision dates as applicable
X		PROJECT LOCATION AND DESCRIPTION
X		A. Site Location
X		B. Description of Property and Land Use
		EXISTING WATER SYSTEM
X		A. Existing Distribution System
X		B. Existing Supply Facilities
		PROPOSED WATER SYSTEM
X		A. Proposed Distribution System
X		B. Proposed Supply Facilities

Concept Utility Letter – Formatting Checklist

Included	N/A	
		EXISTING WASTEWATER SYSTEM
X		A. Existing Collection System
		PROPOSED WASTEWATER SYSTEM
X		A. Proposed Collection System
X		B. Proposed Wastewater Facilities
X		REFERENCES
		APPENDICES
X		Appendix A — Copies of all pertinent information from reference materials
X		Appendix B — Vicinity Map
X		Appendix C — Planned Development Plan
X		Appendix D — Utility Map(s) provided by Castle Rock Water, Engineering Division

Notes/Comments: