



CANYONS SOUTH – FILINGS 2 AND 3

Final Utility Report

**PROJECT NUMBERS: CD21-0018
CD21-0023
CD22-0015
MAY 2022**

For:

**HT Canyons South Development LP
1144 15th Street, Suite 2600
Denver, CO 80202**

Prepared By:

**Calibre Engineering, Inc.
9090 S. Ridgeline Blvd. Suite 105
Highlands Ranch, CO 80129**

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CANYONS SOUTH – FILINGS 2 AND 3

FINAL UTILITY REPORT

Page i of ii

UTILITY REPORT APPROVAL BLOCKS

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 and Pinery Water and Wastewater District criteria for water systems and sanitary systems 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: _____

Brian K. Moss, Registered Professional Engineer

State Of Colorado No. 37702

(Affix Seal)



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.

Chad Murphy,
HT Canyons South Development LP

Name of Developer

Signature Page Follows

Authorized Signature

HT CANYONS SOUTH DEVELOPMENT LP

By: HT Canyons South Development LLC, its general partner

By: HT Canyons South LP, its sole member

By: Hines Canyons South LLC, its general partner

By: Hines Canyons South Associates LP, its sole member

By: Hines Investment Management Holdings Limited Partnership,
its general partner

By:

Name: Chad Murphy

Title: Managing Director



CANYONS SOUTH – FILINGS 2 AND 3

FINAL UTILITY REPORT

Page ii of ii

TABLE OF CONTENTS

SCOPE	1
1.0 GENERAL LOCATION AND DESCRIPTION	1
2.0 DOMESTIC WATER	2
3.0 SANITARY SEWER.....	6
4.0 CONCLUSIONS	8
REFERENCES.....	9

APPENDICES

- A. Water Demands
- B. Water Storage
- C. Water Hydraulic Analysis and Modeling
- D. Wastewater Flows
- E. Wastewater Hydraulic Modeling
- F. Maps and Plans
- G. Referenced Documents

Canyons South – Filings 2 and 3

Final Utility Report

Page 1 of 9

SCOPE

The purpose of this study is to determine and analyse the water demands and sanitary sewer generations associated with the development of the Canyons South – Filings 2 and 3 property. This part of the Canyons South development will be developed in two phases, Filings 2 and 3. The water model provided is for the proposed water system of the entire Filings 2 and 3 developments.

The water model provided represents the current Filings 2 and 3 developments as well as existing Filing 1A and future phases of the Canyons South development. The water model is intended to demonstrate that the infrastructure proposed is adequate to support the ultimate buildout of the entire Canyons South development.

1.0 GENERAL LOCATION AND DESCRIPTION

1.1 Location

The project is located as follows:

- See the Vicinity Map in Appendix E.
- Canyons South – Filings 2 and 3 project site is in the following areas:
 - The southeast and southwest quarters of Section 19, Township 7 South, Range 66 West of the 6th Principal Meridian
 - The northeast quarter of Section 30, Township 7 South, Range 66 West of the 6th Principal Meridian
- The site is bounded on the northwest by N. Crowfoot Valley Road and on the southwest by Tower Road.
- Portions of the Castle Oaks development are south and southeast of the site and Liberty Village is east of the site. The Pradera development is northeast of the site.

1.2 Description of Property

The following are characteristics of the site:

- Canyons South – Filings 2 and 3 will cover approximately 314 acres.
- The total number of SFE's for the Filings 2 and 3 developments will be 363.6.
- Filings 2 and 3 includes 290 single-family detached lots on approximately 314 acres. There will be a middle school on a 25-acre parcel, a 2.1-acre park, and a 3.5-acre park. The remainder of the acreage will be open space.
- Currently, the exact size of the middle school is unknown.
- For sewage demands, Pinery Water and Wastewater District guidelines have been used. For water demands, Castle Rock guidelines have been used.
- There are no mapped floodplains in Filing 2 or Filing 3. Almost all of this development is in the upper portions of the Scott Gulch drainageway.
- Canyons South – Filings 2 and 3 has no significant geologic or topographic features.

Canyons South – Filings 2 and 3

Final Utility Report

Page 2 of 9

- There are no irrigation canals or irrigation ditches on the property.
- There are no On-Site Wastewater Treatment Systems (OWTS). There are water wells on the site, however, none are currently in use.

2.0 DOMESTIC WATER

2.1 Calculated Demands

- Average Day Demands
 - The domestic demand for the single-family residences is based on the TOCR value of 400 gpd per unit which includes irrigation demand. The Average Day Demand for Canyons South – Filings 2 and 3 is 105 gpm. The projected full buildout demand is 295 gpm per the approved Filing 1A report (See Appendix G for approved report excerpt).
 - As stated above, the water demand for the middle school is 8,500 gpd per school per Section 4.4.1 of the TOCR Water System Design Criteria Manual to include irrigation flow rates.
- Max Day Demands
 - The Max Day Demand is computed from the Average Day Demand and the Max Day factor of 2.5 plus irrigation demand. The Max Day Demand for Filings 2 and 3 is 234 gpm. The estimated Max Day Demand for the full buildout is 717 gpm per the approved Filing 1A report (See Appendix G for approved report excerpt).
 - For the middle school, it was assumed that the building is Type IIA construction, less than 72,000 sf and sprinklered. Per the 2018 edition of the IFC, Table B105.1(2), this would require a fire flow of 3,750 gpm for 3 hours. The sprinkler system would reduce the fire flow requirement by up to 75-percent but not less than 1,500 gpm for 2 hours.
 - Per Castle Rock FD, the residential fire flow used for this report is 1,500 gpm for residences under 3,600 sf. Some lot groupings are expected to have larger square footage homes. It has been assumed for these lots that the homes will be in the range of 3,601 to 4,800 sf and from 7,701 to 9,400 sf. The fire flow rates for these lots have been taken from IFC Table B105.1(2) as 1,750 gpm and 2,500 gpm respectively. Due to resulting high pipe velocities, all homes exceeding 7,700 sf are required to be constructed with an automatic sprinkler system, reducing the required fire flow rate to the minimum 1,500 gpm. Refer to the Fire Flow Confirmation Memo included in Appendix B.
 - Irrigation flows are limited to the middle school and parks. The values used are taken from Section 4.4.1 of the TOCR Water System Design Criteria Manual. Irrigation flows for residential units are included in the 400 gpd/dwelling unit Average Day Demand rate.
 - The required storage volume for Canyons South – Filings 2 and 3 is 1.01 MG. The current tank in the Red Pressure Zone is Tank 14 with a capacity of 2 MG. A second

Canyons South – Filings 2 and 3

Final Utility Report

Page 3 of 9

Red Zone tank is planned to be adjacent to Tank 14 or Tank 16 and will provide an additional 2 MG of storage.

- Peak Hour Demands
 - The peak hour demand for Canyons South – Filings 2 and 3 is 494 gpm. For the full buildout of Canyons South, the peak hour demand is estimated at 1,559 gpm per the approved Filing 1A report (See Appendix G for approved report excerpt).
 - Irrigation demands are estimated at 18 gpm for the middle school and two parks.

2.2 Existing Water System

- The Canyons South – Filings 2 and 3 will tie-in to the existing water system near the intersection of N. Crowfoot Valley Road and Longstory Avenue and the existing connection in Salud Lane constructed in Filing 1A.
 - There are no known restrictions on water for the proposed Canyons South – Filings 2 and 3.
 - The current total booster pump capacity for the Red Zone, with the largest pump out of service, is 6,260 gpm (see Table 1.4.2-5 – Town of Castle Rock Water Distribution System Pump Station Characteristics included in Appendix F).
 - Hydraulic Grade Lines (HGL's) were provided by Castle Rock Water for the Red Zone. The HGL's are 6680 for a full tank and 6661 for the tank 20% full. These were utilized for the reservoir elevations in the water model.
- Existing Supply Facilities
 - Service to the Canyons South – Filings 2 and 3 is not specifically addressed in the 2017 Town of Castle Rock Water Master Plan. However, under Developer Funded Projects, the Canyons South Developer is specifically mentioned in the N. Crowfoot to Crimson Sky 16-inch transmission main installation.
 - From existing pressure zone maps, it appears that the Red Zone will be supplying water to the subject project. The junction elevations for Canyons South – Filings 2 and 3 range between 6,328 ft to 6,468 ft.
 - The closest Red Zone tank to the Canyons South – Filings 2 and 3 project is Tank 14 which is currently a 2 MG tank. A second Red Zone tank is planned to be adjacent to Tank 14 or Tank 16 and will provide an additional 2MG of storage. The current Filings 2 and 3 storage requirement is 1.01 MG.

2.3 Proposed Water System

- Description of water distribution system
- The proposed water system for Filings 2 and 3 will include a total of ten connections. Filing 2 will have a total of six connections including one connection to the existing 8-inch water main in Salud Lane and five connections to the 12-inch water main in Longstory Avenue from Rockhop Point, Doubletrack Lane, Freestone Court, Rucksack Court, and

Canyons South – Filings 2 and 3

Final Utility Report

Page 4 of 9

Descent Street to complete the water loop. Filing 3 will have a total of four connections including one connection in Filing 1 to the existing 8-inch water main in Offbeaten Place from Backdrop Court and three connections to the 12-inch water main in Longstory Avenue from Backdrop Court, Ridgewalk Point, and Fervid Street. The water system is within the existing Red Zone system. In a separate phase of the development, the existing 16-inch pipe in N. Crowfoot Valley Road will be continued from the point of connection north of Macanta Boulevard northeast to the limits of Filings 2 and 3. The 12-inch line will also continue in Longstory Avenue north to N. Crowfoot Valley Road. Eight-inch pipe will serve all the residential areas. Any future development of the existing water infrastructure needed to serve this site is the responsibility of the developer.

- The pressure in the Red Zone is too high to service all portions of the Filings 2 and 3 site without installing PRVs. Two 8" PRVs are currently proposed in the model. PRV-1 is located at the intersection of Longstory Avenue and Descent Street. PRV-2 is located at the intersection of Excursion Street and Doubletrack Lane. The initial PRV settings include a Setting Type of Hydraulic Grade and Hydraulic Grade Setting of 6,515 ft., which maintained a minimum pressure of 43 psi and a maximum pressure of 84 psi in the Purple Zone.
- There are no assumptions made in the 2017 Water Master Plan for the Canyons South development except for the developer participation in the 16" transmission main that will move water from RHR to tank 16. This assumption is still valid.
- No additional supply facilities are required for Canyons South – Filings 2 and 3. The planned additional Red Zone tank would enhance water storage for the full buildout of the Canyons South Development.
 - The Filings 2 and 3 developments is in the Purple Zone which is a lower pressure zone than the Red Zone. However, the proposed water system for Filings 2 and 3 will connect into the existing Red Zone waterline located in N. Crowfoot Valley Road. The pressure in the Red Zone is too high to service all portions of the Filings 2 and 3 sites without installing PRVs. Two PRVs are currently proposed in the model and shown on the Water Exhibit included in Appendix F.
- Required Fire Flow – For modeling purposes, the full un-sprinklered fire flow rates were used for the standard and medium residential homes only. Sprinklered fire flow rates were applied to the large residential homes and the middle school. The Filing 1A portion of the WaterCAD model was updated accordingly for the large residential homes, recreation center, and the elementary school. The fire flow rates used for Filings 2 and 3 are the following:
 - Single-Family Residential – Homes are planned to be standard stick-built construction and will have varying square footages from less than 3,600 sf, 3,601 to 4,800 sf (medium residential), and 7,701 sf to 9,400 sf (large residential). The minimum fire flow for the housing areas is 1,500 gpm per Castle Rock Fire Department. For medium residential, a fire flow of 1,750 gpm is required. For large residential, a fire flow of 2,500 gpm. The duration is 2 hours.

Canyons South – Filings 2 and 3

Final Utility Report

Page 5 of 9

- Middle School – The school is assumed to be less than 72,000 sf, Type IIA construction, and sprinklered with an automatic fire sprinkler system. Per Table B105.1(2) of the IFC, the required fire flow without sprinkler reduction is 3,750 gpm for 3 hours. The IFC does allow a reduction of the required fire flow of up to 75-percent with a sprinkler system. The minimum fire flow per Town of Castle Rock standards is 1,500 gpm.
- Land Dedication Requirements
 - There are a few locations that the looping of the water lines required the lines to be outside of the public right of way. These areas will have dedicated easements for utility access. These easements are not included in the Plat and will be dedicated by separate document to the Town of Castle Rock.
 - Portions of the proposed water system are located within open space for looping purposes including Doubletrack Lane to Treadway Point, Freestone Court to Longstory Avenue, and Backdrop Court to Offbeaten Place in Filing 1A. Areas where main infrastructure is located outside of public right-of-way are provided with a maintenance access path per Town of Castle Rock standards. Maintenance paths have been provided to all water main that is located outside of paved roadway per Town of Castle Rock standards.

2.4 Proposed Water System Analysis and Modeling

- WaterCAD 2018 has been used to model the water system for Canyons South Filings 2 and 3. The starting HGL's used for the Red Zone system are 6,680 ft. for full tank and 6,661 ft. for the 20% level tank. See Appendix C for water modeling results.
- Hydraulic Modeling Scenarios:
 - The static pressures for the different HGL's are as follows:
 - For the full tank (high tank), pressures range between 52 to 126 psi.
 - For the tank 20% full (low tank), pressures range between 52 and 118 psi.
 - Junctions DP2, DP3, J-206 to J-209, J-232, J-233, J-243, J-246, J-249, and J-255 report higher pressures in excess of 125 psi. These nodes are in intersections or cul-de-sacs and are not servicing lots.
 - All hydraulic modeling has been performed with the Tank at 20% of capacity (HGL 6,661 ft.).
 - For the MDD + Fire Flow scenario, pipe P-200 at the northeastern most connection to the existing 16" water main in N. Crowfoot Valley Road was closed. Pressures and pipe velocities are within TOCR design requirements. All junctions were subject to fire flow of 1,500 gpm except for:

- DP14 was chosen for the middle school fire flow and domestic demand. The fire flow requirement is 3,750 gpm. The sprinkler reduction rate of 1,500 gpm was used in the model.
 - DP9, DP10, and DP11 were chosen as the lots that will likely include medium residential homes between 3,601 and 4,800 sf. A fire flow of 1,750 gpm was applied at these nodes.
 - J-240 and J-241 were chosen as the lots that will likely include larger homes between 7,701 and 9,400 sf and dead-end mains. The sprinkler reduction rate of 1,500 gpm was applied to the end of the cul-de-sac as a maximum fire flow. Homes larger than 7,700 sf shall be sprinklered to reduce high velocities produced from a 2,500-gpm fire flow demand.
- **Hydraulic Modeling Results**
 - The Junction reports for two static scenarios, the MDD + Fire Flow scenario and the PHD scenario are in Appendix C.
 - The total domestic demand for the MDD scenario is 234 gpm. The maximum fire flow (total needed) is 1,768 gpm. For the PHD, the total demand is 494 gpm.
 - The pipe reports for the hydraulic scenarios are in Appendix C.
 - The proposed system performs well using the Red Pressure Zone. Select locations have static pressures (low tank) on the high side at 118 to 139 psi. However, the system pressures are below the required 125 psi. Velocities under the MDD + Fire Flow scenario top out at 12.81 fps, less than the maximum 15 fps. Pipe velocities in other scenarios are well below the published maximums. The two junctions representing dead-end lines (J-240 and J-241) show fire flow available, while remaining under 15 fps within the pipe.

3.0 SANITARY SEWER

3.1 Site Location

- See section 1.1 for Site Location Information
- See Section 1.2 for Description of Property and Land Use.

3.2 Calculated Flows

- Due to the Canyons South – Filings 2 and 3 sewer discharging into the Pinery Water and Wastewater District, sewer generation calculations have been computed using the Pinery Water & Wastewater District Technical Specifications, April 1998. Construction specifications shall follow the Town of Castle Rock Wastewater Collection Design Criteria Manual.
- There are 290 residential lots, a middle school, and two parks planned for Filings 2 and 3. For the full buildout of Canyons South Filing 1A, 323 single-family homes, an elementary

Canyons South – Filings 2 and 3

Final Utility Report

Page 7 of 9

school, and an amenity center were assumed (See Appendix G for approved report excerpt).

- The Average Daily Flows for Canyons South – Filings 2 and 3 are calculated to be 70 gpm.
- The Peak Design Flow total for the individual basins of Canyons South Filings 2 and 3 is calculated to be 256 gpm using a Peaking Factor of 4.0.

3.3 Existing Wastewater System

- The Canyons South Development will discharge all sanitary flows to the Pinery Water and Wastewater District. The connection point for the discharge is in the west end of the Pradera development at a metering station to be constructed with the Canyons South development. Reference Canyons South-Filing 1 Sanitary Sewer Outfall Final Wastewater Utility Report, Project Number CD18-0033 and Canyons South Filing No. 1A Proposed Sanitary Sewer Outfall Plans for metering station and Pinery wastewater system information.
- The Canyons South Downstream Pinery Wastewater System Evaluation dated April 2015 prepared by Matrix Design Group has been referenced for design, connection, and downstream capacity. Calibre Engineering supports the report and its findings of the downstream sanitary system within the Pradera development.

3.4 Proposed Wastewater System

- Proposed Collection System
 - The sanitary demands for Canyons South – Filings 2 and 3 can be met with the use of 8-inch pipe at minimum slope. See Appendix E for pipe calculations. Some areas of Canyons South – Filings 2 and 3 system include pipe at the maximum slope, but velocities are well below the 10 fps limit.
 - The proposed sanitary outfall system will consist of 8-inch main and tie to the sanitary outfall system for the Canyons South Development. The sanitary outfall system has been shown to have capacity for the Canyons South Development Filing No. 2 including 290 single-family homes and one middle school.
 - The Canyons South Development will ultimately discharge all wastewater to the Pinery Water and Wastewater District in accordance with the TOCR Wastewater Master Plan. In addition, a flow measuring station will be installed at the lowest point on the Canyons South system. The stated assumptions in the TOCR Wastewater Master Plan is that the Canyons South project will discharge all wastewater to the Pinery and install a flow metering station are still valid. Town of Castle Rock ownership will begin at the metering station and the sanitary system upstream and within the Canyons South development. The Pinery Water and Wastewater District will own and maintain the metering station and the sanitary system downstream. Reference Canyons South-Filing 1 Sanitary Sewer Outfall Final Wastewater Utility Report, Project Number CD18-0033 for sanitary outfall and metering information.

Canyons South – Filings 2 and 3

Final Utility Report

Page 8 of 9

- The only proposed wastewater facility required for the Canyons South Development is the installation of a flow metering station at the developments discharge point to the Pinery.
- Land Dedication Requirements
 - Sanitary sewer lines that are not in the public ROW will have utility easements dedicated for access and maintenance purposes.
 - Some collectors are running through open space with steeper slopes. Areas where main infrastructure is located outside of public right-of-way are provided with a maintenance access path per Town of Castle Rock standards. Manholes that do not lie within direct access from the maintenance path have been placed within 300' of an upstream and a downstream manhole for jetting.

3.5 Proposed Wastewater System Analysis and Modeling

- Pipes for the Canyons South – Filings 2 and 3 wastewater system have been modeled using Bentley Flow Master.
- Pipe analysis is included in Appendix C.
- Generated flows will be per the Pinery Water and Wastewater District Technical Criteria.
- Pipe velocities for both the ADF and the PDF are within 2 fps and 10 fps. Pipes are considered full at a d/D of 75%.

4.0 CONCLUSIONS

- The proposed water improvements will provide service to Canyons South – Filings 2 and 3 in general accordance with Town's standards and specifications.
- The proposed sanitary sewer improvements will provide service to the Canyons South – Filings 2 and 3 development in general accordance with the Town's standards and specifications and the Pinery Water & Wastewater Technical Specifications.

Canyons South – Filings 2 and 3

Final Utility Report

Page 9 of 9

REFERENCES

1. *Town of Castle Rock Water System Design Criteria Manual*, Town of Castle Rock, December 2018.
2. *Town of Castle Rock Wastewater Collection Design Criteria Manual*, Town of Castle Rock, December 2018
3. *Town of Castle Rock 2006 Water Facilities Master Plan*, 2006.
4. *Town of Castle Rock Water Master Plan 2017 Update*, 2017.
5. *Pinery Water & Wastewater District Technical Specifications*, Pinery Water & Wastewater District, Douglas County, April 1998.
6. *Canyons South Downstream Pinery Wastewater System Evaluation Sanitary Sewer Report*, Matrix Design Group, April 2015.
7. *International Fire Code*, International Code Council, 2018.
8. *Castle Rock/ Canyons South Water Service Intergovernmental Agreement*, Town of Castle Rock, June 14, 2005.

Canyons South – Filings 2 and 3

Final Utility Report

Page 9 of 9

REFERENCES

1. *Town of Castle Rock Water System Design Criteria Manual*, Town of Castle Rock, December 2018.
2. *Town of Castle Rock Wastewater Collection Design Criteria Manual*, Town of Castle Rock, December 2018
3. *Town of Castle Rock 2006 Water Facilities Master Plan*, 2006.
4. *Town of Castle Rock Water Master Plan 2017 Update*, 2017.
5. *Pinery Water & Wastewater District Technical Specifications*, Pinery Water & Wastewater District, Douglas County, April 1998.
6. *Canyons South Downstream Pinery Wastewater System Evaluation Sanitary Sewer Report*, Matrix Design Group, April 2015.
7. *International Fire Code*, International Code Council, 2018.
8. *Castle Rock/ Canyons South Water Service Intergovernmental Agreement*, Town of Castle Rock, June 14, 2005.

APPENDIX A

WATER DEMANDS

CANYONS SOUTH FILINGS 2 AND 3

PROJECTED WATER DEMAND GENERATION



RESIDENTIAL	400 GPUD	Middle School	Park
MAX. DAY / AVG. DAY	2.50	Base Demand	Irrigation Demand
PEAK HOUR / FLOW RATIO	5.50	8,500 GPD/SCHOOL	3,750 GPD/IRR. ACRE
		5,250 GPD/TOTAL AC ²	

FIRE DEMAND

RESIDENTIAL UNITS	1,500 GPM	MED RES ³	1,750 GPM
MIDDLE SCHOOL ¹	3,750 GPM	LG RES ³	2,500 GPM

BASIN	LAND USE	ACRES	NO. OF LOTS	AVG. DAY DEMAND (GPM)	AVG. DAY DEMAND (GPD)	AVG. DAY DEMAND (AC-FT/YR)	MAX. DAY DEMAND (GPD)	MAX. DAY DEMAND (GPM)	PEAK HOUR DEMAND (GPM)	PEAK HOUR DEMAND (GPD)	IRRIGATION DEMAND (GPM) ⁴	IRRIGATION DEMAND (GPD) ⁴	MAX. DAY + FIRE FLOW + IRR(GPM)
K1	RESIDENTIAL		3	0.8	1,200	1.3	3,000	2.1	4.6	6,600	0.0	0	1,502
K2	RESIDENTIAL		22	6.1	8,800	9.9	22,000	15.3	33.6	48,400	0.0	0	1,515
K2-A	PARK	3.46	1	9.0	12,975	14.5	12,975	9.0	9.0	12,975	9.0	12,975	1,509
K3	RESIDENTIAL		26	7.2	10,400	11.7	26,000	18.1	39.7	57,200	0.0	0	1,518
K4	RESIDENTIAL		21	5.8	8,400	9.4	21,000	14.6	32.1	46,200	0.0	0	1,515
K5	RESIDENTIAL		9	2.5	3,600	4.0	9,000	6.3	13.8	19,800	0.0	0	1,506
K6	RESIDENTIAL		21	5.8	8,400	9.4	21,000	14.6	32.1	46,200	0.0	0	1,515
K7	RESIDENTIAL		13	3.6	5,200	5.8	13,000	9.0	19.9	28,600	0.0	0	1,509
K8	RESIDENTIAL		33	9.2	13,200	14.8	33,000	22.9	50.4	72,600	0.0	0	1,523
K9	MED RES		14	3.9	5,600	6.3	14,000	9.7	21.4	30,800	0.0	0	1,510
K10	MED RES		7	1.9	2,800	3.1	7,000	4.9	10.7	15,400	0.0	0	1,505
K11	MED RES		4	1.1	1,600	1.8	4,000	2.8	6.1	8,800	0.0	0	1,503
K12	LG RES		27	7.5	10,800	12.1	27,000	18.8	41.3	59,400	0.0	0	1,519
L1	RESIDENTIAL		62	17.2	24,800	27.8	62,000	43.1	94.7	136,400	0.0	0	1,543
L2	RESIDENTIAL		28	7.8	11,200	12.5	28,000	19.4	42.8	61,600	0.0	0	1,519
L3	PARK	2.12	1	5.5	7,935	8.9	7,935	5.5	5.5	7,935	5.5	7,935	1,506
L4	MIDDLE SCHOOL		1	9.5	13,750	15.4	26,500	18.4	36.1	52,000	3.6	5,250	1,518
TOTALS			293	105	150,660	169	337,410	234	494	710,910	18	26,160	25,734

¹ The fire flow for the middle school is based on Type IIA construction with a maximum floor size of 72,000 sq. ft. per Table B105.1(2) of the 2018 IFC.

² The irrigation demand for the middle school is based on 5,250 GPD per school site. Total acreage is assumed to equal 1 for the school site parcel.

³ The fire flow demand for the medium and large residences is based on square footages between 3,601 and 4,800sf for medium and between 7,701 and 9,400 sf for large residences. Flow rates per Table B105.1(2).

⁴ Residential irrigation demand is included in the 400 gpd/dwelling unit Average Day Demand rate and is shown as zero demand in the residential irrigation demand column.

APPENDIX B

WATER STORAGE

August 25, 2021

Castle Rock Fire and Rescue Department

300 Perry St
Castle Rock, CO 80104

Confirmation Memo for Required Fire Flow – Canyons South – Filing 2

Dear Sir or Ma'am,

The Canyons South development is a proposed single-family residential development located south of N. Crowfoot Valley Road and east of Tower Road. The proposed Filing 2 project consists of 290 single-family lots and open space over an area of approximately 314 acres. One parcel in Filing 2 will be preserved for the addition of a middle school. The overall Canyons South development will ultimately include a total of 968 single-family homes, an elementary school, a middle school, and a recreation center. This confirmation memo will apply to Filing 2 only. The homes proposed for Filing 2 are standard Type VB single-family residential homes. Home sizes will include homes from less than 3,600 square feet, homes between 3,601 and 4,800 square feet, and custom homes between 7,701 and 9,400 square feet. The proposed middle school will be of Type IIA construction and will be approximately 72,000 square feet or less. The middle school is planned to be sprinklered.

Single-Family Residential Required FF (Less than 3,600 sf)	<u>1000</u>	gpm for	<u>1</u>	hrs
Single-Family Residential Required FF (Between 3,601 to 4,800 sf)	<u>1750</u>	gpm for	<u>2</u>	hrs
Single-Family Residential Required FF (Between 7,701 to 9,400 sf)	<u>2500</u>	gpm for	<u>2</u>	hrs
Middle School Required FF	<u>3750</u>	gpm for	<u>3</u>	hrs

Castle Rock Fire & Rescue Department



These plans have been reviewed and accepted subject to any/all corrections in compliance with the International Fire Code as amended and adopted by the Town of Castle Rock.

Comments and Corrections will be in the attached plan review letter and/or marked on the plans.

All projects are subject to changes in the field in accordance with the current codes and ordinances.

Completed by:

Kevin Sullivan

ICC Cert #: 206210450

Castle Rock Fire and Rescue
Authorized Signature

Date

Please let me know if you have any questions regarding the Canyons South Development.

Sincerely,



Andrea Lowery, P.E.

Project Engineer

CALIBRE ENGINEERING, Inc.



CANYONS SOUTH FILINGS 2 AND 3 STORAGE REQUIREMENTS

STORAGE REQUIRED:			Storage (gal)	Storage (MG)
Max Day Demand	234	gpm	337,410	0.34
Fire Flow Demand	3,750	gpm for 3 hrs	675,000	0.68
		Total	1,012,410	1.01

APPENDIX C

WATER HYDRAULIC ANALYSIS AND MODELING

Active Scenario: Static - Low Tank

FlexTable: Reservoir Table

ID	Label	Elevation (ft)	Zone	Flow (Out net) (gpm)	Hydraulic Grade (ft)
571	R-1 (High Tank)	6,680.00	<None>	0	6,680.00
573	R-2 (Low Tank)	6,661.00	<None>	0	6,661.00
285	R-3 (High Tank)	6,680.00	<None>	0	6,680.00
289	R-4 (Low Tank)	6,661.00	<None>	0	6,661.00

Active Scenario: Static - High Tank

FlexTable: PRV Table

ID	Label	Elevation (ft)	Diameter (Valve) (in)	Minor Loss Coefficient (Local)	Hydraulic Grade Setting (Initial) (ft)	Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)
827	PRV-1	6,339.99	8.0	0.000	6,515.00	76	0	6,680.00	6,515.06
696	PRV-2	6,406.88	8.0	0.000	6,515.00	49	0	6,680.00	6,515.06
Headloss (ft)		Status (Initial)	Controlled?						
164.94		Active	False						
0.00		Active	False						

Active Scenario: Static - Low Tank

FlexTable: PRV Table

ID	Label	Elevation (ft)	Diameter (Valve) (in)	Minor Loss Coefficient (Local)	Hydraulic Grade Setting (Initial) (ft)	Pressure Setting (Initial) (psi)	Flow (gpm)	Hydraulic Grade (From) (ft)	Hydraulic Grade (To) (ft)
827	PRV-1	6,339.99	8.0	0.000	6,515.00	76	0	6,661.00	6,515.06
696	PRV-2	6,406.88	8.0	0.000	6,515.00	47	0	6,661.00	6,515.06
Headloss (ft)		Status (Initial)	Controlled?						
145.94		Active	False						
0.00		Active	False						

Active Scenario: Static - High Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
729	DP1	6,341.54	<Collection: 0 items>	0	6,515.06	75
30	DP2	6,339.48	<Collection: 0 items>	0	6,680.00	147
42	DP3	6,383.46	<Collection: 0 items>	0	6,680.00	128
97	DP4	6,423.24	<Collection: 0 items>	0	6,680.00	111
38	DP5	6,419.85	<Collection: 0 items>	0	6,680.00	113
40	DP6	6,435.27	<Collection: 0 items>	0	6,680.00	106
56	DP7	6,439.73	<Collection: 0 items>	0	6,680.00	104
52	DP9	6,446.23	<Collection: 0 items>	0	6,680.00	101
61	DP10	6,446.82	<Collection: 0 items>	0	6,680.00	101
793	DP11	6,456.51	<Collection: 0 items>	0	6,680.00	97
118	DP12	6,444.75	<Collection: 0 items>	0	6,680.00	102
83	DP12A	6,452.12	<Collection: 0 items>	0	6,680.00	99
125	DP13	6,437.44	<Collection: 0 items>	0	6,680.00	105
170	DP14	6,434.85	<Collection: 0 items>	0	6,680.00	106
355	J-71	6,445.66	<Collection: 1 items>	0	6,680.00	101
140	J-79	6,449.52	<Collection: 1 items>	0	6,680.00	100
175	J-124	6,446.18	<Collection: 1 items>	0	6,680.00	101
790	J-201	6,434.20	<Collection: 0 items>	0	6,680.00	106
791	J-202	6,430.86	<Collection: 0 items>	0	6,680.00	108
166	J-203	6,435.72	<Collection: 1 items>	0	6,680.00	106
163	J-204	6,444.71	<Collection: 1 items>	0	6,680.00	102
161	J-205	6,414.12	<Collection: 1 items>	0	6,680.00	115
159	J-206	6,383.04	<Collection: 1 items>	0	6,680.00	128
156	J-207	6,340.54	<Collection: 1 items>	0	6,680.00	147
154	J-208	6,352.62	<Collection: 1 items>	0	6,680.00	142
152	J-209	6,382.37	<Collection: 1 items>	0	6,680.00	129
149	J-210	6,419.88	<Collection: 1 items>	0	6,680.00	113
51	J-211	6,452.72	<Collection: 1 items>	0	6,680.00	98
143	J-212	6,453.44	<Collection: 1 items>	0	6,680.00	98
756	J-213	6,412.86	<Collection: 0 items>	0	6,680.00	116
201	J-214	6,451.50	<Collection: 1 items>	0	6,680.00	99
78	J-215	6,447.88	<Collection: 1 items>	0	6,680.00	100
198	J-216	6,446.58	<Collection: 1 items>	0	6,680.00	101
74	J-217	6,450.41	<Collection: 1 items>	0	6,680.00	99
109	J-218	6,446.39	<Collection: 1 items>	0	6,680.00	101
54	J-219	6,443.07	<Collection: 1 items>	0	6,680.00	103
195	J-220	6,442.07	<Collection: 1 items>	0	6,680.00	103
103	J-221	6,435.63	<Collection: 1 items>	0	6,680.00	106
267	J-222	6,440.71	<Collection: 1 items>	0	6,680.00	104
264	J-223	6,422.34	<Collection: 1 items>	0	6,680.00	111
221	J-224	6,424.32	<Collection: 1 items>	0	6,680.00	111
218	J-225	6,435.31	<Collection: 1 items>	0	6,680.00	106

Active Scenario: Static - High Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
700	J-226	6,459.84	<Collection: 1 items>	0	6,680.00	95
192	J-227	6,393.83	<Collection: 1 items>	0	6,515.06	52
91	J-228	6,367.32	<Collection: 1 items>	0	6,515.06	64
243	J-229	6,346.68	<Collection: 1 items>	0	6,515.06	73
32	J-230	6,329.69	<Collection: 1 items>	0	6,515.06	80
838	J-231	6,328.90	<Collection: 0 items>	0	6,515.06	81
839	J-232	6,339.93	<Collection: 0 items>	0	6,680.00	147
45	J-233	6,368.74	<Collection: 1 items>	0	6,680.00	135
706	J-234	6,422.36	<Collection: 1 items>	0	6,680.00	111
709	J-235	6,435.65	<Collection: 1 items>	0	6,680.00	106
64	J-236	6,437.59	<Collection: 1 items>	0	6,680.00	105
115	J-237	6,441.39	<Collection: 1 items>	0	6,680.00	103
583	J-238	6,446.35	<Collection: 1 items>	0	6,680.00	101
94	J-239	6,346.93	<Collection: 0 items>	0	6,515.06	73
671	J-240	6,452.06	<Collection: 1 items>	0	6,680.00	99
672	J-241	6,451.43	<Collection: 1 items>	0	6,680.00	99
597	J-242	6,423.17	<Collection: 1 items>	0	6,680.00	111
795	J-243	6,360.03	<Collection: 0 items>	0	6,680.00	138
87	J-244	6,452.22	<Collection: 0 items>	0	6,680.00	99
794	J-245	6,414.59	<Collection: 0 items>	0	6,680.00	115
828	J-246	6,376.18	<Collection: 0 items>	0	6,680.00	131
844	J-249	6,338.73	<Collection: 0 items>	0	6,680.00	148
780	J-250	6,393.27	<Collection: 0 items>	0	6,680.00	124
240	J-251	6,440.64	<Collection: 1 items>	0	6,680.00	104
119	J-252	6,440.58	<Collection: 1 items>	0	6,680.00	104
237	J-253	6,436.55	<Collection: 1 items>	0	6,680.00	105
121	J-254	6,434.90	<Collection: 1 items>	0	6,680.00	106
133	J-255	6,380.40	<Collection: 1 items>	0	6,680.00	130
357	J-256	6,387.68	<Collection: 1 items>	0	6,680.00	126
717	J-257	6,427.45	<Collection: 1 items>	0	6,680.00	109
713	J-258	6,429.37	<Collection: 1 items>	0	6,680.00	108
721	J-259	6,401.98	<Collection: 1 items>	0	6,680.00	120
804	J-260	6,330.40	<Collection: 0 items>	0	6,515.06	80
808	J-261	6,452.55	<Collection: 0 items>	0	6,680.00	98

Active Scenario: Static - Low Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
729	DP1	6,341.54	<Collection: 0 items>	0	6,515.06	75
30	DP2	6,339.48	<Collection: 0 items>	0	6,661.00	139
42	DP3	6,383.46	<Collection: 0 items>	0	6,661.00	120
97	DP4	6,423.24	<Collection: 0 items>	0	6,661.00	103
38	DP5	6,419.85	<Collection: 0 items>	0	6,661.00	104
40	DP6	6,435.27	<Collection: 0 items>	0	6,661.00	98
56	DP7	6,439.73	<Collection: 0 items>	0	6,661.00	96
52	DP9	6,446.23	<Collection: 0 items>	0	6,661.00	93
61	DP10	6,446.82	<Collection: 0 items>	0	6,661.00	93
793	DP11	6,456.51	<Collection: 0 items>	0	6,661.00	88
118	DP12	6,444.75	<Collection: 0 items>	0	6,661.00	94
83	DP12A	6,452.12	<Collection: 0 items>	0	6,661.00	90
125	DP13	6,437.44	<Collection: 0 items>	0	6,661.00	97
170	DP14	6,434.85	<Collection: 0 items>	0	6,661.00	98
355	J-71	6,445.66	<Collection: 1 items>	0	6,661.00	93
140	J-79	6,449.52	<Collection: 1 items>	0	6,661.00	91
175	J-124	6,446.18	<Collection: 1 items>	0	6,661.00	93
790	J-201	6,434.20	<Collection: 0 items>	0	6,661.00	98
791	J-202	6,430.86	<Collection: 0 items>	0	6,661.00	100
166	J-203	6,435.72	<Collection: 1 items>	0	6,661.00	97
163	J-204	6,444.71	<Collection: 1 items>	0	6,661.00	94
161	J-205	6,414.12	<Collection: 1 items>	0	6,661.00	107
159	J-206	6,383.04	<Collection: 1 items>	0	6,661.00	120
156	J-207	6,340.54	<Collection: 1 items>	0	6,661.00	139
154	J-208	6,352.62	<Collection: 1 items>	0	6,661.00	133
152	J-209	6,382.37	<Collection: 1 items>	0	6,661.00	121
149	J-210	6,419.88	<Collection: 1 items>	0	6,661.00	104
51	J-211	6,452.72	<Collection: 1 items>	0	6,661.00	90
143	J-212	6,453.44	<Collection: 1 items>	0	6,661.00	90
756	J-213	6,412.86	<Collection: 0 items>	0	6,661.00	107
201	J-214	6,451.50	<Collection: 1 items>	0	6,661.00	91
78	J-215	6,447.88	<Collection: 1 items>	0	6,661.00	92
198	J-216	6,446.58	<Collection: 1 items>	0	6,661.00	93
74	J-217	6,450.41	<Collection: 1 items>	0	6,661.00	91
109	J-218	6,446.39	<Collection: 1 items>	0	6,661.00	93
54	J-219	6,443.07	<Collection: 1 items>	0	6,661.00	94
195	J-220	6,442.07	<Collection: 1 items>	0	6,661.00	95
103	J-221	6,435.63	<Collection: 1 items>	0	6,661.00	98
267	J-222	6,440.71	<Collection: 1 items>	0	6,661.00	95
264	J-223	6,422.34	<Collection: 1 items>	0	6,661.00	103
221	J-224	6,424.32	<Collection: 1 items>	0	6,661.00	102
218	J-225	6,435.31	<Collection: 1 items>	0	6,661.00	98

Active Scenario: Static - Low Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
700	J-226	6,459.84	<Collection: 1 items>	0	6,661.00	87
192	J-227	6,393.83	<Collection: 1 items>	0	6,515.06	52
91	J-228	6,367.32	<Collection: 1 items>	0	6,515.06	64
243	J-229	6,346.68	<Collection: 1 items>	0	6,515.06	73
32	J-230	6,329.69	<Collection: 1 items>	0	6,515.06	80
838	J-231	6,328.90	<Collection: 0 items>	0	6,515.06	81
839	J-232	6,339.93	<Collection: 0 items>	0	6,661.00	139
45	J-233	6,368.74	<Collection: 1 items>	0	6,661.00	126
706	J-234	6,422.36	<Collection: 1 items>	0	6,661.00	103
709	J-235	6,435.65	<Collection: 1 items>	0	6,661.00	97
64	J-236	6,437.59	<Collection: 1 items>	0	6,661.00	97
115	J-237	6,441.39	<Collection: 1 items>	0	6,661.00	95
583	J-238	6,446.35	<Collection: 1 items>	0	6,661.00	93
94	J-239	6,346.93	<Collection: 0 items>	0	6,515.06	73
671	J-240	6,452.06	<Collection: 1 items>	0	6,661.00	90
672	J-241	6,451.43	<Collection: 1 items>	0	6,661.00	91
597	J-242	6,423.17	<Collection: 1 items>	0	6,661.00	103
795	J-243	6,360.03	<Collection: 0 items>	0	6,661.00	130
87	J-244	6,452.22	<Collection: 0 items>	0	6,661.00	90
794	J-245	6,414.59	<Collection: 0 items>	0	6,661.00	107
828	J-246	6,376.18	<Collection: 0 items>	0	6,661.00	123
844	J-249	6,338.73	<Collection: 0 items>	0	6,661.00	139
780	J-250	6,393.27	<Collection: 0 items>	0	6,661.00	116
240	J-251	6,440.64	<Collection: 1 items>	0	6,661.00	95
119	J-252	6,440.58	<Collection: 1 items>	0	6,661.00	95
237	J-253	6,436.55	<Collection: 1 items>	0	6,661.00	97
121	J-254	6,434.90	<Collection: 1 items>	0	6,661.00	98
133	J-255	6,380.40	<Collection: 1 items>	0	6,661.00	121
357	J-256	6,387.68	<Collection: 1 items>	0	6,661.00	118
717	J-257	6,427.45	<Collection: 1 items>	0	6,661.00	101
713	J-258	6,429.37	<Collection: 1 items>	0	6,661.00	100
721	J-259	6,401.98	<Collection: 1 items>	0	6,661.00	112
804	J-260	6,330.40	<Collection: 0 items>	0	6,515.06	80
808	J-261	6,452.55	<Collection: 0 items>	0	6,661.00	90

Active Scenario: Max Day - Low Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
729	DP1	6,341.54	<Collection: 0 items>	2	6,515.06	75
30	DP2	6,339.48	<Collection: 0 items>	15	6,660.88	139
42	DP3	6,383.46	<Collection: 0 items>	30	6,660.87	120
97	DP4	6,423.24	<Collection: 0 items>	8	6,660.82	103
38	DP5	6,419.85	<Collection: 0 items>	3	6,660.82	104
40	DP6	6,435.27	<Collection: 0 items>	12	6,660.82	98
56	DP7	6,439.73	<Collection: 0 items>	9	6,660.83	96
52	DP9	6,446.23	<Collection: 0 items>	10	6,660.83	93
61	DP10	6,446.82	<Collection: 0 items>	18	6,660.85	93
793	DP11	6,456.51	<Collection: 0 items>	3	6,660.89	88
118	DP12	6,444.75	<Collection: 0 items>	35	6,660.92	94
83	DP12A	6,452.12	<Collection: 0 items>	6	6,660.86	90
125	DP13	6,437.44	<Collection: 0 items>	6	6,660.93	97
170	DP14	6,434.85	<Collection: 0 items>	18	6,660.94	98
355	J-71	6,445.66	<Collection: 1 items>	0	6,660.89	93
140	J-79	6,449.52	<Collection: 1 items>	0	6,660.88	91
175	J-124	6,446.18	<Collection: 1 items>	0	6,660.99	93
790	J-201	6,434.20	<Collection: 0 items>	6	6,660.86	98
791	J-202	6,430.86	<Collection: 0 items>	3	6,660.86	100
166	J-203	6,435.72	<Collection: 1 items>	0	6,660.94	97
163	J-204	6,444.71	<Collection: 1 items>	0	6,660.92	94
161	J-205	6,414.12	<Collection: 1 items>	0	6,660.91	107
159	J-206	6,383.04	<Collection: 1 items>	0	6,660.90	120
156	J-207	6,340.54	<Collection: 1 items>	0	6,660.88	139
154	J-208	6,352.62	<Collection: 1 items>	0	6,660.87	133
152	J-209	6,382.37	<Collection: 1 items>	0	6,660.87	120
149	J-210	6,419.88	<Collection: 1 items>	0	6,660.87	104
51	J-211	6,452.72	<Collection: 1 items>	0	6,660.87	90
143	J-212	6,453.44	<Collection: 1 items>	0	6,660.87	90
756	J-213	6,412.86	<Collection: 0 items>	0	6,660.91	107
201	J-214	6,451.50	<Collection: 1 items>	0	6,660.86	91
78	J-215	6,447.88	<Collection: 1 items>	0	6,660.85	92
198	J-216	6,446.58	<Collection: 1 items>	0	6,660.84	93
74	J-217	6,450.41	<Collection: 1 items>	0	6,660.84	91
109	J-218	6,446.39	<Collection: 1 items>	0	6,660.83	93
54	J-219	6,443.07	<Collection: 1 items>	0	6,660.83	94
195	J-220	6,442.07	<Collection: 1 items>	0	6,660.82	95
103	J-221	6,435.63	<Collection: 1 items>	0	6,660.82	97
267	J-222	6,440.71	<Collection: 1 items>	3	6,660.82	95
264	J-223	6,422.34	<Collection: 1 items>	3	6,660.82	103
221	J-224	6,424.32	<Collection: 1 items>	0	6,660.82	102
218	J-225	6,435.31	<Collection: 1 items>	0	6,660.82	98

Active Scenario: Max Day - Low Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
700	J-226	6,459.84	<Collection: 1 items>	0	6,660.87	87
192	J-227	6,393.83	<Collection: 1 items>	0	6,515.06	52
91	J-228	6,367.32	<Collection: 1 items>	9	6,515.06	64
243	J-229	6,346.68	<Collection: 1 items>	0	6,515.06	73
32	J-230	6,329.69	<Collection: 1 items>	0	6,515.06	80
838	J-231	6,328.90	<Collection: 0 items>	0	6,515.06	81
839	J-232	6,339.93	<Collection: 0 items>	0	6,660.87	139
45	J-233	6,368.74	<Collection: 1 items>	0	6,660.87	126
706	J-234	6,422.36	<Collection: 1 items>	0	6,660.87	103
709	J-235	6,435.65	<Collection: 1 items>	0	6,660.86	97
64	J-236	6,437.59	<Collection: 1 items>	0	6,660.86	97
115	J-237	6,441.39	<Collection: 1 items>	0	6,660.86	95
583	J-238	6,446.35	<Collection: 1 items>	0	6,660.85	93
94	J-239	6,346.93	<Collection: 0 items>	0	6,515.06	73
671	J-240	6,452.06	<Collection: 1 items>	6	6,660.84	90
672	J-241	6,451.43	<Collection: 1 items>	7	6,660.86	91
597	J-242	6,423.17	<Collection: 1 items>	0	6,660.93	103
795	J-243	6,360.03	<Collection: 0 items>	3	6,660.87	130
87	J-244	6,452.22	<Collection: 0 items>	0	6,660.89	90
794	J-245	6,414.59	<Collection: 0 items>	6	6,660.82	107
828	J-246	6,376.18	<Collection: 0 items>	0	6,660.87	123
844	J-249	6,338.73	<Collection: 0 items>	0	6,660.87	139
780	J-250	6,393.27	<Collection: 0 items>	0	6,660.92	116
240	J-251	6,440.64	<Collection: 1 items>	0	6,660.93	95
119	J-252	6,440.58	<Collection: 1 items>	0	6,660.93	95
237	J-253	6,436.55	<Collection: 1 items>	0	6,660.93	97
121	J-254	6,434.90	<Collection: 1 items>	0	6,660.93	98
133	J-255	6,380.40	<Collection: 1 items>	0	6,660.88	121
357	J-256	6,387.68	<Collection: 1 items>	0	6,660.88	118
717	J-257	6,427.45	<Collection: 1 items>	4	6,660.92	101
713	J-258	6,429.37	<Collection: 1 items>	3	6,660.92	100
721	J-259	6,401.98	<Collection: 1 items>	4	6,660.89	112
804	J-260	6,330.40	<Collection: 0 items>	0	6,515.06	80
808	J-261	6,452.55	<Collection: 0 items>	0	6,660.88	90

Active Scenario: Max Day - Low Tank
FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
176	P-200	733	DP14	J-124	12.0	PVC	120.0	-138	0.39	0.000
598	P-201	278	DP13	J-242	8.0	PVC	120.0	0	0.00	0.000
169	P-202	49	J-203	DP14	12.0	PVC	120.0	-91	0.26	0.000
311	P-203	398	DP12	J-203	12.0	PVC	120.0	-91	0.26	0.000
307	P-204	43	J-204	DP12	12.0	PVC	120.0	-71	0.20	0.000
299	P-205	625	J-205	J-204	12.0	PVC	120.0	-71	0.20	0.000
757	P-206(1)	552	J-206	J-213	12.0	PVC	120.0	-71	0.20	0.000
758	P-206(2)	42	J-213	J-205	12.0	PVC	120.0	-71	0.20	0.000
640	P-207	927	DP2	J-206	12.0	PVC	120.0	-71	0.20	0.000
158	P-208	59	J-207	DP2	12.0	PVC	120.0	-28	0.08	0.000
157	P-209	529	J-208	J-207	12.0	PVC	120.0	-28	0.08	0.000
155	P-210	548	J-209	J-208	12.0	PVC	120.0	-28	0.08	0.000
153	P-211	38	DP3	J-209	12.0	PVC	120.0	-28	0.08	0.000
316	P-212	696	J-210	DP3	12.0	PVC	120.0	-21	0.06	0.000
707	P-213(1)	616	J-211	J-234	12.0	PVC	120.0	4	0.01	0.000
708	P-213(2)	41	J-234	J-210	12.0	PVC	120.0	-21	0.06	0.000
146	P-214	33	J-212	J-211	12.0	PVC	120.0	43	0.12	0.000
809	P-215	106	J-79	J-261	12.0	PVC	120.0	80	0.23	0.000
810	P-215(1)	312	J-261	J-226	12.0	PVC	120.0	80	0.23	0.000
702	P-215(2)	310	J-226	J-212	12.0	PVC	120.0	43	0.12	0.000
840	P-216	78	DP2	J-232	8.0	PVC	120.0	28	0.18	0.000
841	P-216(1)	16	J-232	PRV-1	8.0	PVC	120.0	20	0.12	0.000
826	P-217	318	PRV-1	J-231	8.0	PVC	120.0	14	0.09	0.000
226	P-219	414	J-231	J-230	8.0	PVC	120.0	14	0.09	0.000
805	P-220	45	J-230	J-260	8.0	PVC	120.0	14	0.09	0.000
806	P-221	413	J-260	J-239	8.0	PVC	120.0	14	0.09	0.000
244	P-222	32	J-239	J-229	8.0	PVC	120.0	2	0.01	0.000
245	P-223	309	J-229	DP1	8.0	PVC	120.0	2	0.01	0.000
685	P-224	444	J-239	J-228	8.0	PVC	120.0	12	0.08	0.000
193	P-225	441	J-228	J-227	8.0	PVC	120.0	3	0.02	0.000
194	P-226	217	PRV-2	J-227	8.0	PVC	120.0	-3	0.02	0.000
694	P-227	260	PRV-2	DP5	8.0	PVC	120.0	0	0.00	0.000
107	P-228	380	DP5	DP6	8.0	PVC	120.0	-3	0.02	0.000
104	P-229	34	DP6	J-221	8.0	PVC	120.0	3	0.02	0.000
99	P-230	357	DP4	DP5	8.0	PVC	120.0	3	0.02	0.000
223	P-231	88	J-224	DP4	8.0	PVC	120.0	17	0.11	0.000
222	P-232	319	J-225	J-224	8.0	PVC	120.0	17	0.11	0.000
219	P-233	216	DP7	J-225	8.0	PVC	120.0	17	0.11	0.000
57	P-234	302	J-219	DP7	12.0	PVC	120.0	44	0.13	0.000
111	P-235	322	J-218	J-219	12.0	PVC	120.0	44	0.13	0.000
110	P-236	25	DP9	J-218	12.0	PVC	120.0	44	0.13	0.000

Active Scenario: Max Day - Low Tank

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
114	P-237	456	DP10	DP9	8.0	PVC	120.0	36	0.23	0.000
329	P-238	323	J-211	DP10	8.0	PVC	120.0	39	0.25	0.000
265	P-239	291	DP5	J-223	8.0	PVC	120.0	2	0.01	0.000
266	P-240	450	J-223	J-222	8.0	PVC	120.0	-1	0.00	0.000
268	P-241	466	J-221	J-222	8.0	PVC	120.0	3	0.02	0.000
269	P-242	75	J-222	H-20	8.0	PVC	120.0	0	0.00	0.000
75	P-243	369	DP9	J-217	8.0	PVC	120.0	-18	0.12	0.000
77	P-244	100	J-217	J-240	8.0	PVC	120.0	6	0.04	0.000
199	P-245	300	J-217	J-216	8.0	PVC	120.0	-24	0.15	0.000
200	P-246	497	J-216	J-215	8.0	PVC	120.0	-24	0.15	0.000
81	P-247	323	DP12A	J-215	8.0	PVC	120.0	24	0.15	0.000
618	P-248	349	DP3	J-246	8.0	PVC	120.0	-5	0.03	0.000
830	P-249	338	J-246	J-233	8.0	PVC	120.0	-5	0.03	0.000
796	P-250	391	J-233	J-243	8.0	PVC	120.0	-5	0.03	0.000
847	P-251(2)	262	J-249	J-232	8.0	PVC	120.0	-9	0.06	0.000
236	P-252	327	DP4	J-245	8.0	PVC	120.0	6	0.04	0.000
209	P-254	338	J-236	J-201	8.0	PVC	120.0	6	0.04	0.000
710	P-255	142	J-236	J-235	8.0	PVC	120.0	-21	0.13	0.000
711	P-256	164	J-235	J-202	8.0	PVC	120.0	3	0.02	0.000
117	P-257	376	J-237	J-236	8.0	PVC	120.0	-15	0.09	0.000
585	P-258	431	J-238	J-237	8.0	PVC	120.0	-15	0.09	0.000
584	P-259	56	DP10	J-238	8.0	PVC	120.0	-15	0.09	0.000
712	P-260	324	J-234	J-235	8.0	PVC	120.0	24	0.16	0.000
703	P-261	250	J-226	DP12A	8.0	PVC	120.0	37	0.24	0.000
86	P-262	150	DP11	J-244	8.0	PVC	120.0	-3	0.02	0.000
202	P-264	47	DP12A	J-214	8.0	PVC	120.0	7	0.04	0.000
203	P-265	564	J-214	J-241	8.0	PVC	120.0	7	0.04	0.000
196	P-266(1)	116	DP7	J-220	8.0	PVC	120.0	18	0.12	0.000
197	P-266(2)	424	J-220	DP6	8.0	PVC	120.0	18	0.12	0.000
172	P-280	196	DP14	DP13	8.0	PVC	120.0	29	0.18	0.000
241	P-281	335	DP13	J-251	8.0	PVC	120.0	23	0.15	0.000
242	P-282	56	J-251	J-252	8.0	PVC	120.0	23	0.15	0.000
120	P-283	194	DP12	J-252	8.0	PVC	120.0	-16	0.10	0.000
238	P-284	334	J-252	J-253	8.0	PVC	120.0	4	0.03	0.000
718	P-285(1)	330	J-253	J-257	8.0	PVC	120.0	4	0.03	0.000
719	P-285(2)	32	J-257	H-31	8.0	PVC	120.0	0	0.00	0.000
122	P-286	515	J-252	J-254	8.0	PVC	120.0	4	0.02	0.000
714	P-287(1)	389	J-254	J-258	8.0	PVC	120.0	4	0.02	0.000
715	P-287(2)	120	J-258	H-30	8.0	PVC	120.0	0	0.00	0.000
624	P-288	349	DP3	J-255	8.0	PVC	120.0	-18	0.11	0.000
358	P-289	451	J-255	J-256	8.0	PVC	120.0	-18	0.11	0.000

Active Scenario: Max Day - Low Tank

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
724	P-290	51	J-259	H-32	8.0	PVC	120.0	0	0.00	0.000
722	P-290(1)	397	J-256	J-259	8.0	PVC	120.0	-18	0.11	0.000
627	P-291	396	J-259	J-71	8.0	PVC	120.0	-22	0.14	0.000
781	P-292	303	J-258	J-250	8.0	PVC	120.0	0	0.00	0.000
782	P-293	147	J-250	J-257	8.0	PVC	120.0	0	0.00	0.000

Active Scenario: Peak Hour - Low Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
729	DP1	6,341.54	<Collection: 0 items>	5	6,515.05	75
30	DP2	6,339.48	<Collection: 0 items>	34	6,660.22	139
42	DP3	6,383.46	<Collection: 0 items>	66	6,660.15	120
97	DP4	6,423.24	<Collection: 0 items>	18	6,659.90	102
38	DP5	6,419.85	<Collection: 0 items>	8	6,659.90	104
40	DP6	6,435.27	<Collection: 0 items>	26	6,659.90	97
56	DP7	6,439.73	<Collection: 0 items>	20	6,659.93	95
52	DP9	6,446.23	<Collection: 0 items>	21	6,659.96	92
61	DP10	6,446.82	<Collection: 0 items>	40	6,660.05	92
793	DP11	6,456.51	<Collection: 0 items>	6	6,660.15	88
118	DP12	6,444.75	<Collection: 0 items>	78	6,660.57	93
83	DP12A	6,452.12	<Collection: 0 items>	14	6,660.07	90
125	DP13	6,437.44	<Collection: 0 items>	6	6,660.63	97
170	DP14	6,434.85	<Collection: 0 items>	36	6,660.66	98
355	J-71	6,445.66	<Collection: 1 items>	0	6,660.16	93
140	J-79	6,449.52	<Collection: 1 items>	0	6,660.15	91
175	J-124	6,446.18	<Collection: 1 items>	0	6,660.96	93
790	J-201	6,434.20	<Collection: 0 items>	14	6,660.08	98
791	J-202	6,430.86	<Collection: 0 items>	8	6,660.09	99
166	J-203	6,435.72	<Collection: 1 items>	0	6,660.65	97
163	J-204	6,444.71	<Collection: 1 items>	0	6,660.56	93
161	J-205	6,414.12	<Collection: 1 items>	0	6,660.46	107
159	J-206	6,383.04	<Collection: 1 items>	0	6,660.37	120
156	J-207	6,340.54	<Collection: 1 items>	0	6,660.22	138
154	J-208	6,352.62	<Collection: 1 items>	0	6,660.19	133
152	J-209	6,382.37	<Collection: 1 items>	0	6,660.15	120
149	J-210	6,419.88	<Collection: 1 items>	0	6,660.13	104
51	J-211	6,452.72	<Collection: 1 items>	0	6,660.12	90
143	J-212	6,453.44	<Collection: 1 items>	0	6,660.12	89
756	J-213	6,412.86	<Collection: 0 items>	0	6,660.46	107
201	J-214	6,451.50	<Collection: 1 items>	0	6,660.07	90
78	J-215	6,447.88	<Collection: 1 items>	0	6,660.05	92
198	J-216	6,446.58	<Collection: 1 items>	0	6,660.00	92
74	J-217	6,450.41	<Collection: 1 items>	0	6,659.98	91
109	J-218	6,446.39	<Collection: 1 items>	0	6,659.96	92
54	J-219	6,443.07	<Collection: 1 items>	0	6,659.94	94
195	J-220	6,442.07	<Collection: 1 items>	0	6,659.93	94
103	J-221	6,435.63	<Collection: 1 items>	0	6,659.90	97
267	J-222	6,440.71	<Collection: 1 items>	6	6,659.90	95
264	J-223	6,422.34	<Collection: 1 items>	6	6,659.90	103
221	J-224	6,424.32	<Collection: 1 items>	0	6,659.91	102
218	J-225	6,435.31	<Collection: 1 items>	0	6,659.92	97

Active Scenario: Peak Hour - Low Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
700	J-226	6,459.84	<Collection: 1 items>	0	6,660.12	87
192	J-227	6,393.83	<Collection: 1 items>	0	6,515.05	52
91	J-228	6,367.32	<Collection: 1 items>	9	6,515.05	64
243	J-229	6,346.68	<Collection: 1 items>	0	6,515.05	73
32	J-230	6,329.69	<Collection: 1 items>	0	6,515.06	80
838	J-231	6,328.90	<Collection: 0 items>	0	6,515.06	81
839	J-232	6,339.93	<Collection: 0 items>	0	6,660.21	139
45	J-233	6,368.74	<Collection: 1 items>	0	6,660.17	126
706	J-234	6,422.36	<Collection: 1 items>	0	6,660.12	103
709	J-235	6,435.65	<Collection: 1 items>	0	6,660.09	97
64	J-236	6,437.59	<Collection: 1 items>	0	6,660.08	96
115	J-237	6,441.39	<Collection: 1 items>	0	6,660.07	95
583	J-238	6,446.35	<Collection: 1 items>	0	6,660.05	92
94	J-239	6,346.93	<Collection: 0 items>	0	6,515.05	73
671	J-240	6,452.06	<Collection: 1 items>	12	6,659.98	90
672	J-241	6,451.43	<Collection: 1 items>	15	6,660.07	90
597	J-242	6,423.17	<Collection: 1 items>	0	6,660.63	103
795	J-243	6,360.03	<Collection: 0 items>	8	6,660.19	130
87	J-244	6,452.22	<Collection: 0 items>	0	6,660.15	90
794	J-245	6,414.59	<Collection: 0 items>	14	6,659.90	106
828	J-246	6,376.18	<Collection: 0 items>	0	6,660.16	123
844	J-249	6,338.73	<Collection: 0 items>	0	6,660.20	139
780	J-250	6,393.27	<Collection: 0 items>	0	6,660.58	116
240	J-251	6,440.64	<Collection: 1 items>	0	6,660.59	95
119	J-252	6,440.58	<Collection: 1 items>	0	6,660.58	95
237	J-253	6,436.55	<Collection: 1 items>	0	6,660.58	97
121	J-254	6,434.90	<Collection: 1 items>	0	6,660.58	98
133	J-255	6,380.40	<Collection: 1 items>	0	6,660.15	121
357	J-256	6,387.68	<Collection: 1 items>	0	6,660.16	118
717	J-257	6,427.45	<Collection: 1 items>	9	6,660.58	101
713	J-258	6,429.37	<Collection: 1 items>	8	6,660.58	100
721	J-259	6,401.98	<Collection: 1 items>	9	6,660.16	112
804	J-260	6,330.40	<Collection: 0 items>	0	6,515.06	80
808	J-261	6,452.55	<Collection: 0 items>	0	6,660.14	90

Active Scenario: Peak Hour - Low Tank

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
176	P-200	733	DP14	J-124	12.0	PVC	120.0	-347	0.98	0.000
598	P-201	278	DP13	J-242	8.0	PVC	120.0	0	0.00	0.000
169	P-202	49	J-203	DP14	12.0	PVC	120.0	-241	0.68	0.000
311	P-203	398	DP12	J-203	12.0	PVC	120.0	-241	0.68	0.000
307	P-204	43	J-204	DP12	12.0	PVC	120.0	-210	0.60	0.000
299	P-205	625	J-205	J-204	12.0	PVC	120.0	-210	0.60	0.000
757	P-206(1)	552	J-206	J-213	12.0	PVC	120.0	-210	0.60	0.000
758	P-206(2)	42	J-213	J-205	12.0	PVC	120.0	-210	0.60	0.000
640	P-207	927	DP2	J-206	12.0	PVC	120.0	-210	0.60	0.000
158	P-208	59	J-207	DP2	12.0	PVC	120.0	-117	0.33	0.000
157	P-209	529	J-208	J-207	12.0	PVC	120.0	-117	0.33	0.000
155	P-210	548	J-209	J-208	12.0	PVC	120.0	-117	0.33	0.000
153	P-211	38	DP3	J-209	12.0	PVC	120.0	-117	0.33	0.000
316	P-212	696	J-210	DP3	12.0	PVC	120.0	-92	0.26	0.000
707	P-213(1)	616	J-211	J-234	12.0	PVC	120.0	-37	0.10	0.000
708	P-213(2)	41	J-234	J-210	12.0	PVC	120.0	-92	0.26	0.000
146	P-214	33	J-212	J-211	12.0	PVC	120.0	49	0.14	0.000
809	P-215	106	J-79	J-261	12.0	PVC	120.0	130	0.37	0.000
810	P-215(1)	312	J-261	J-226	12.0	PVC	120.0	130	0.37	0.000
702	P-215(2)	310	J-226	J-212	12.0	PVC	120.0	49	0.14	0.000
840	P-216	78	DP2	J-232	8.0	PVC	120.0	60	0.38	0.000
841	P-216(1)	16	J-232	PRV-1	8.0	PVC	120.0	22	0.14	0.000
826	P-217	318	PRV-1	J-231	8.0	PVC	120.0	15	0.10	0.000
226	P-219	414	J-231	J-230	8.0	PVC	120.0	15	0.10	0.000
805	P-220	45	J-230	J-260	8.0	PVC	120.0	15	0.10	0.000
806	P-221	413	J-260	J-239	8.0	PVC	120.0	15	0.10	0.000
244	P-222	32	J-239	J-229	8.0	PVC	120.0	5	0.03	0.000
245	P-223	309	J-229	DP1	8.0	PVC	120.0	5	0.03	0.000
685	P-224	444	J-239	J-228	8.0	PVC	120.0	11	0.07	0.000
193	P-225	441	J-228	J-227	8.0	PVC	120.0	2	0.01	0.000
194	P-226	217	PRV-2	J-227	8.0	PVC	120.0	-2	0.01	0.000
694	P-227	260	PRV-2	DP5	8.0	PVC	120.0	0	0.00	0.000
107	P-228	380	DP5	DP6	8.0	PVC	120.0	-7	0.04	0.000
104	P-229	34	DP6	J-221	8.0	PVC	120.0	7	0.05	0.000
99	P-230	357	DP4	DP5	8.0	PVC	120.0	6	0.04	0.000
223	P-231	88	J-224	DP4	8.0	PVC	120.0	38	0.24	0.000
222	P-232	319	J-225	J-224	8.0	PVC	120.0	38	0.24	0.000
219	P-233	216	DP7	J-225	8.0	PVC	120.0	38	0.24	0.000
57	P-234	302	J-219	DP7	12.0	PVC	120.0	98	0.28	0.000
111	P-235	322	J-218	J-219	12.0	PVC	120.0	98	0.28	0.000
110	P-236	25	DP9	J-218	12.0	PVC	120.0	98	0.28	0.000

Active Scenario: Peak Hour - Low Tank

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
114	P-237	456	DP10	DP9	8.0	PVC	120.0	80	0.51	0.000
329	P-238	323	J-211	DP10	8.0	PVC	120.0	86	0.55	0.000
265	P-239	291	DP5	J-223	8.0	PVC	120.0	5	0.03	0.000
266	P-240	450	J-223	J-222	8.0	PVC	120.0	-1	0.01	0.000
268	P-241	466	J-221	J-222	8.0	PVC	120.0	7	0.05	0.000
269	P-242	75	J-222	H-20	8.0	PVC	120.0	0	0.00	0.000
75	P-243	369	DP9	J-217	8.0	PVC	120.0	-39	0.25	0.000
77	P-244	100	J-217	J-240	8.0	PVC	120.0	12	0.08	0.000
199	P-245	300	J-217	J-216	8.0	PVC	120.0	-52	0.33	0.000
200	P-246	497	J-216	J-215	8.0	PVC	120.0	-52	0.33	0.000
81	P-247	323	DP12A	J-215	8.0	PVC	120.0	52	0.33	0.000
618	P-248	349	DP3	J-246	8.0	PVC	120.0	-30	0.19	0.000
830	P-249	338	J-246	J-233	8.0	PVC	120.0	-30	0.19	0.000
796	P-250	391	J-233	J-243	8.0	PVC	120.0	-30	0.19	0.000
847	P-251(2)	262	J-249	J-232	8.0	PVC	120.0	-38	0.24	0.000
236	P-252	327	DP4	J-245	8.0	PVC	120.0	14	0.09	0.000
209	P-254	338	J-236	J-201	8.0	PVC	120.0	14	0.09	0.000
710	P-255	142	J-236	J-235	8.0	PVC	120.0	-47	0.30	0.000
711	P-256	164	J-235	J-202	8.0	PVC	120.0	8	0.05	0.000
117	P-257	376	J-237	J-236	8.0	PVC	120.0	-34	0.21	0.000
585	P-258	431	J-238	J-237	8.0	PVC	120.0	-34	0.21	0.000
584	P-259	56	DP10	J-238	8.0	PVC	120.0	-34	0.21	0.000
712	P-260	324	J-234	J-235	8.0	PVC	120.0	55	0.35	0.000
703	P-261	250	J-226	DP12A	8.0	PVC	120.0	81	0.51	0.000
86	P-262	150	DP11	J-244	8.0	PVC	120.0	-6	0.04	0.000
202	P-264	47	DP12A	J-214	8.0	PVC	120.0	15	0.10	0.000
203	P-265	564	J-214	J-241	8.0	PVC	120.0	15	0.10	0.000
196	P-266(1)	116	DP7	J-220	8.0	PVC	120.0	40	0.26	0.000
197	P-266(2)	424	J-220	DP6	8.0	PVC	120.0	40	0.26	0.000
172	P-280	196	DP14	DP13	8.0	PVC	120.0	69	0.44	0.000
241	P-281	335	DP13	J-251	8.0	PVC	120.0	64	0.41	0.000
242	P-282	56	J-251	J-252	8.0	PVC	120.0	64	0.41	0.000
120	P-283	194	DP12	J-252	8.0	PVC	120.0	-47	0.30	0.000
238	P-284	334	J-252	J-253	8.0	PVC	120.0	9	0.06	0.000
718	P-285(1)	330	J-253	J-257	8.0	PVC	120.0	9	0.06	0.000
719	P-285(2)	32	J-257	H-31	8.0	PVC	120.0	0	0.00	0.000
122	P-286	515	J-252	J-254	8.0	PVC	120.0	8	0.05	0.000
714	P-287(1)	389	J-254	J-258	8.0	PVC	120.0	8	0.05	0.000
715	P-287(2)	120	J-258	H-30	8.0	PVC	120.0	0	0.00	0.000
624	P-288	349	DP3	J-255	8.0	PVC	120.0	-10	0.06	0.000
358	P-289	451	J-255	J-256	8.0	PVC	120.0	-10	0.06	0.000

Active Scenario: Peak Hour - Low Tank

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
724	P-290	51	J-259	H-32	8.0	PVC	120.0	0	0.00	0.000
722	P-290(1)	397	J-256	J-259	8.0	PVC	120.0	-10	0.06	0.000
627	P-291	396	J-259	J-71	8.0	PVC	120.0	-19	0.12	0.000
781	P-292	303	J-258	J-250	8.0	PVC	120.0	0	0.00	0.000
782	P-293	147	J-250	J-257	8.0	PVC	120.0	0	0.00	0.000

Scenario: Max Day + Fire Flow
Current Time Step: 0.000 h
Fire Flow Node FlexTable: Fire Flow Report

Label	Fire Flow Iterations	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Pressure (Zone Lower Limit) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)	Is Fire Flow Run Balanced?	Velocity of Maximum Pipe (ft/s)
DP1	2	True	1,500	1,750	1,502	1,752	20	58	20	51	J-227	51	J-227	True	11.18
DP2	2	True	1,500	1,750	1,515	1,765	20	135	20	52	J-227	52	J-227	True	2.89
DP3	2	True	1,500	1,750	1,530	1,780	20	116	20	52	J-227	52	J-227	True	2.61
DP4	2	True	1,500	1,750	1,508	1,758	20	83	20	52	J-227	52	J-227	True	7.34
DP5	2	True	1,500	1,750	1,503	1,753	20	85	20	52	J-227	52	J-227	True	7.34
DP6	2	True	1,500	1,750	1,512	1,762	20	78	20	52	J-227	52	J-227	True	7.34
DP7	2	True	1,500	1,750	1,509	1,759	20	82	20	52	J-227	52	J-227	True	7.34
DP9	2	True	1,750	2,000	1,760	2,010	20	79	20	52	J-227	52	J-227	True	8.36
DP10	2	True	1,750	2,000	1,768	2,018	20	84	20	52	J-227	52	J-227	True	7.16
DP11	2	True	1,750	2,000	1,753	2,003	20	72	20	52	J-227	52	J-227	True	12.78
DP12	2	True	1,500	1,750	1,535	1,785	20	91	20	52	J-227	52	J-227	True	3.85
DP12A	2	True	1,500	1,750	1,506	1,756	20	82	20	52	J-227	52	J-227	True	8.61
DP13	2	True	1,500	1,750	1,506	1,756	20	93	20	52	J-227	52	J-227	True	7.25
DP14	2	True	1,500	2,000	1,518	2,018	20	95	20	52	J-227	52	J-227	True	4.59
H-20	2	True	1,500	1,750	1,500	1,750	20	70	20	52	J-227	52	J-227	True	11.17
H-30	2	True	1,500	1,750	1,500	1,750	20	87	20	52	J-227	52	J-227	True	11.17
H-31	2	True	1,500	1,750	1,500	1,750	20	89	20	52	J-227	52	J-227	True	11.17
H-32	2	True	1,500	1,750	1,500	1,750	20	100	20	52	J-227	52	J-227	True	11.17
J-71	2	True	1,500	1,750	1,500	1,750	20	83	20	52	J-227	52	J-227	True	6.82
J-79	2	True	1,500	1,750	1,500	1,750	20	88	20	52	J-227	52	J-227	True	3.27
J-124	2	True	1,500	1,750	1,500	1,750	20	93	20	52	J-227	52	J-227	True	2.63
J-201	2	True	1,500	1,750	1,506	1,756	20	80	20	52	J-227	52	J-227	True	11.21
J-202	2	True	1,500	1,750	1,503	1,753	20	87	20	52	J-227	52	J-227	True	11.19
J-203	2	True	1,500	1,750	1,500	1,750	20	95	20	52	J-227	52	J-227	True	4.03
J-204	2	True	1,500	1,750	1,500	1,750	20	91	20	52	J-227	52	J-227	True	3.83
J-205	2	True	1,500	1,750	1,500	1,750	20	104	20	52	J-227	52	J-227	True	3.50
J-206	2	True	1,500	1,750	1,500	1,750	20	117	20	52	J-227	52	J-227	True	3.24
J-207	2	True	1,500	1,750	1,500	1,750	20	135	20	52	J-227	52	J-227	True	3.08
J-208	2	True	1,500	1,750	1,500	1,750	20	129	20	52	J-227	52	J-227	True	2.75
J-209	2	True	1,500	1,750	1,500	1,750	20	117	20	52	J-227	52	J-227	True	3.11
J-210	2	True	1,500	1,750	1,500	1,750	20	100	20	52	J-227	52	J-227	True	2.65
J-211	2	True	1,500	1,750	1,500	1,750	20	86	20	52	J-227	52	J-227	True	2.85
J-212	2	True	1,500	1,750	1,500	1,750	20	86	20	52	J-227	52	J-227	True	2.87
J-213	2	True	1,500	1,750	1,500	1,750	20	104	20	52	J-227	52	J-227	True	3.48
J-214	2	True	1,500	1,750	1,500	1,750	20	81	20	52	J-227	52	J-227	True	11.2
J-215	2	True	1,500	1,750	1,500	1,750	20	81	20	52	J-227	52	J-227	True	7.40
J-216	2	True	1,500	1,750	1,500	1,750	20	80	20	52	J-227	52	J-227	True	6.04
J-217	2	True	1,500	1,750	1,500	1,750	20	79	20	52	J-227	52	J-227	True	6.35
J-218	2	True	1,500	1,750	1,500	1,750	20	81	20	52	J-227	52	J-227	True	7.34
J-219	2	True	1,500	1,750	1,500	1,750	20	82	20	52	J-227	52	J-227	True	7.34
J-220	2	True	1,500	1,750	1,500	1,750	20	79	20	52	J-227	52	J-227	True	9.08
J-221	2	True	1,500	1,750	1,500	1,750	20	78	20	52	J-227	52	J-227	True	9.22
J-222	2	True	1,500	1,750	1,503	1,753	20	72	20	52	J-227	52	J-227	True	7.34
J-223	2	True	1,500	1,750	1,503	1,753	20	81	20	52	J-227	52	J-227	True	7.34
J-224	2	True	1,500	1,750	1,500	1,750	20	83	20	52	J-227	52	J-227	True	7.34
J-225	2	True	1,500	1,750	1,500	1,750	20	81	20	52	J-227	52	J-227	True	8.34
J-226	2	True	1,500	1,750	1,500	1,750	20	83	20	52	J-227	52	J-227	True	3.00
J-227	2	True	1,500	1,750	1,500	1,750	20	49	20	61	J-228	61	J-228	True	8.66
J-228	2	True	1,500	1,750	1,509	1,759	20	57	20	50	J-227	50	J-227	True	6.97
J-229	2	True	1,500	1,750	1,500	1,750	20	64	20	51	J-227	51	J-227	True	11.18
J-230	2	True	1,500	1,750	1,500	1,750	20	73	20	51	J-227	51	J-227	True	6.73
J-231	2	True	1,500	1,750	1,500	1,750	20	76	20	52	J-227	52	J-227	True	8.16
J-232	2	True	1,500	1,750	1,500	1,750	20	134	20	52	J-227	52	J-227	True	9.19
J-233	2	True	1,500	1,750	1,500	1,750	20	117	20	52	J-227	52	J-227	True	6.06
J-234	2	True	1,500	1,750	1,500	1,750	20	99	20	52	J-227	52	J-227	True	2.63
J-235	2	True	1,500	1,750	1,500	1,750	20	89	20	52	J-227	52	J-227	True	7.51
J-236	2	True	1,500	1,750	1,500	1,750	20	88	20	52	J-227	52	J-227	True	6.85
J-237	2	True	1,500	1,750	1,500	1,750	20	86	20	52	J-227	52	J-227	True	5.90
J-238	2	True	1,500	1,750	1,500	1,750	20	85	20	52	J-227	52	J-227	True	7.84
J-239	2	True	1,500	1,750	1,500	1,750	20	64	20	51	J-227	51	J-227	True	5.75
J-240	2	True	1,500	2,000	1,506	2,006	20	71	20	52	J-227	52	J-227	True	12.80
J-241	2	True	1,500	2,000	1,507	2,007	20	60	20	52	J-227	52	J-227	True	12.81
J-242	2	True	1,500	1,750	1,500	1,750	20	92	20	52	J-227	52	J-227	True	11.17
J-243	2	True	1,500	1,750	1,503	1,753	20	121	20	52	J-227	52	J-227	True	6.68
J-244	2	True	1,500	1,750	1,500	1,750	20	82	20	52	J-227	52	J-227	True	11.19
J-245	2	True	1,500	1,750	1,506	1,756	20	79	20	52	J-227	52	J-227	True	11.21
J-246	2	True	1,500	1,750	1,500	1,750	20	115	20	52	J-227	52	J-227	True	7.43
J-249	2	True	1,500	1,750	1,500	1,750	20	132	20	52	J-227	52	J-227	True	7.59
J-250	2	True	1,500	1,750	1,500	1,750	20	105	20	52	J-227	52	J-227	True	7.06
J-251	2	True	1,500	1,750	1,500	1,750	20	91	20	52	J-227	52	J-227	True	6.60
J-252	2	True	1,500	1,750	1,500	1,750	20	91	20	52	J-227	52	J-227	True	7.06
J-253	2	True	1,500	1,750	1,500	1,750	20	88	20	52	J-227	52	J-227	True	7.91
J-254	2	True	1,500	1,750	1,500	1,750	20	88	20	52	J-227	52	J-227	True	7.17
J-255	2	True	1,500	1,750	1,500	1,750	20	113	20	52	J-227	52	J-227	True	7.72
J-256	2	True	1,500	1,750	1,500	1,750	20	108	20	52	J-227	52	J-227	True	6.40
J-257	2	True	1,500	1,750	1,504	1,754	20	90	20	52	J-227	52	J-227	True	7.06
J-258	2	True	1,500	1,750	1,503	1,753	20	89	20	52	J-227	52	J-227	True	7.06
J-259	2	True	1,500	1,750	1,504	1,754	20	101	20	52	J-227	52	J-227	True	5.79
J-260	2	True	1,500	1,750	1,500	1,750	20	72	20	51	J-227	51	J-227	True	6.60
J-261	2	True	1,500	1,750	1,500	1,750	20	86	20	52	J-227	52	J-227	True	3.19

J:\Hines CSI\UTILITY\Filings 2 and 3\Canyons South Filing 2_WaterCADdwg_20210709.wtg

Scenario: Max Day + Fire Flow J-240 w/Critical Loop Out

Current Time Step: 0.000 h

Fire Flow Node FlexTable: Fire Flow Report

Label	Fire Flow Iterations	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Pressure (Zone Lower Limit) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)	Is Fire Flow Run Balanced?	Velocity of Maximum Pipe (ft/s)
DP1	2	True	1,500	1,750	1,502	1,752	20	58	20	51	J-227	51	J-227	True	11.18
DP2	2	True	1,500	1,750	1,515	1,765	20	124	20	52	J-227	52	J-227	True	4.14
DP3	2	True	1,500	1,750	1,530	1,780	20	108	20	52	J-227	52	J-227	True	4.14
DP4	2	True	1,500	1,750	1,508	1,758	20	77	20	52	J-227	52	J-227	True	7.27
DP5	2	True	1,500	1,750	1,503	1,753	20	79	20	52	J-227	52	J-227	True	7.27
DP6	2	True	1,500	1,750	1,512	1,762	20	72	20	52	J-227	52	J-227	True	7.27
DP7	2	True	1,500	1,750	1,509	1,759	20	76	20	52	J-227	52	J-227	True	7.27
DP9	2	True	1,750	2,000	1,760	2,010	20	71	20	52	J-227	52	J-227	True	8.28
DP10	2	True	1,750	2,000	1,768	2,018	20	76	20	52	J-227	52	J-227	True	7.12
DP11	2	True	1,750	2,000	1,753	2,003	20	67	20	52	J-227	52	J-227	True	12.78
DP12	2	True	1,500	1,750	1,535	1,785	20	70	20	52	J-227	52	J-227	True	5.15
DP12A	2	True	1,500	1,750	1,506	1,756	20	77	20	52	J-227	52	J-227	True	8.66
DP13	2	True	1,500	1,750	1,506	1,756	20	70	20	52	J-227	52	J-227	True	6.82
DP14	2	True	1,500	2,000	1,518	2,018	20	66	20	52	J-227	52	J-227	True	5.86
H-20	2	True	1,500	1,750	1,500	1,750	20	64	20	52	J-227	52	J-227	True	11.17
H-30	2	True	1,500	1,750	1,500	1,750	20	65	20	52	J-227	52	J-227	True	11.17
H-31	2	True	1,500	1,750	1,500	1,750	20	67	20	52	J-227	52	J-227	True	11.17
H-32	2	True	1,500	1,750	1,500	1,750	20	95	20	52	J-227	52	J-227	True	11.17
J-71	2	True	1,500	1,750	1,500	1,750	20	79	20	52	J-227	52	J-227	True	7.30
J-79	2	True	1,500	1,750	1,500	1,750	20	83	20	52	J-227	52	J-227	True	4.75
J-124	2	True	1,500	1,750	1,500	1,750	20	93	20	52	J-227	52	J-227	True	2.55
J-201	2	True	1,500	1,750	1,506	1,756	20	74	20	52	J-227	52	J-227	True	11.21
J-202	2	True	1,500	1,750	1,503	1,753	20	81	20	52	J-227	52	J-227	True	11.19
J-203	2	True	1,500	1,750	1,500	1,750	20	73	20	52	J-227	52	J-227	True	5.15
J-204	2	True	1,500	1,750	1,500	1,750	20	70	20	52	J-227	52	J-227	True	5.15
J-205	2	True	1,500	1,750	1,500	1,750	20	86	20	52	J-227	52	J-227	True	5.15
J-206	2	True	1,500	1,750	1,500	1,750	20	101	20	52	J-227	52	J-227	True	5.15
J-207	2	True	1,500	1,750	1,500	1,750	20	123	20	52	J-227	52	J-227	True	4.14
J-208	2	True	1,500	1,750	1,500	1,750	20	119	20	52	J-227	52	J-227	True	4.38
J-209	2	True	1,500	1,750	1,500	1,750	20	100	20	52	J-227	52	J-227	True	8.15
J-210	2	True	1,500	1,750	1,500	1,750	20	93	20	52	J-227	52	J-227	True	4.32
J-211	2	True	1,500	1,750	1,500	1,750	20	80	20	52	J-227	52	J-227	True	4.46
J-212	2	True	1,500	1,750	1,500	1,750	20	79	20	52	J-227	52	J-227	True	4.47
J-213	2	True	1,500	1,750	1,500	1,750	20	86	20	52	J-227	52	J-227	True	5.15
J-214	2	True	1,500	1,750	1,500	1,750	20	76	20	52	J-227	52	J-227	True	11.21
J-215	2	True	1,500	1,750	1,500	1,750	20	75	20	52	J-227	52	J-227	True	7.44
J-216	2	True	1,500	1,750	1,500	1,750	20	74	20	52	J-227	52	J-227	True	6.08
J-217	2	True	1,500	1,750	1,500	1,750	20	73	20	52	J-227	52	J-227	True	6.30
J-218	2	True	1,500	1,750	1,500	1,750	20	76	20	52	J-227	52	J-227	True	7.27
J-219	2	True	1,500	1,750	1,500	1,750	20	76	20	52	J-227	52	J-227	True	7.27
J-220	2	True	1,500	1,750	1,500	1,750	20	73	20	52	J-227	52	J-227	True	9.08
J-221	2	True	1,500	1,750	1,500	1,750	20	72	20	52	J-227	52	J-227	True	9.22
J-222	2	True	1,500	1,750	1,503	1,753	20	66	20	52	J-227	52	J-227	True	7.27
J-223	2	True	1,500	1,750	1,503	1,753	20	75	20	52	J-227	52	J-227	True	7.27
J-224	2	True	1,500	1,750	1,500	1,750	20	77	20	52	J-227	52	J-227	True	7.27
J-225	2	True	1,500	1,750	1,500	1,750	20	75	20	52	J-227	52	J-227	True	8.34
J-226	2	True	1,500	1,750	1,500	1,750	20	77	20	52	J-227	52	J-227	True	4.56
J-227	2	True	1,500	1,750	1,500	1,750	20	49	20	61	J-228	61	J-228	True	8.66
J-228	2	True	1,500	1,750	1,509	1,759	20	57	20	50	J-227	50	J-227	True	6.97
J-229	2	True	1,500	1,750	1,500	1,750	20	64	20	51	J-227	51	J-227	True	11.18
J-230	2	True	1,500	1,750	1,500	1,750	20	73	20	51	J-227	51	J-227	True	6.73
J-231	2	True	1,500	1,750	1,500	1,750	20	76	20	52	J-227	52	J-227	True	8.16
J-232	2	True	1,500	1,750	1,500	1,750	20	123	20	52	J-227	52	J-227	True	8.15
J-233	2	True	1,500	1,750	1,500	1,750	20	108	20	52	J-227	52	J-227	True	6.35
J-234	2	True	1,500	1,750	1,500	1,750	20	92	20	52	J-227	52	J-227	True	4.33
J-235	2	True	1,500	1,750	1,500	1,750	20	83	20	52	J-227	52	J-227	True	7.31
J-236	2	True	1,500	1,750	1,500	1,750	20	81	20	52	J-227	52	J-227	True	6.69
J-237	2	True	1,500	1,750	1,500	1,750	20	79	20	52	J-227	52	J-227	True	6.00
J-238	2	True	1,500	1,750	1,500	1,750	20	79	20	52	J-227	52	J-227	True	7.94
J-239	2	True	1,500	1,750	1,500	1,750	20	64	20	51	J-227	51	J-227	True	5.75
J-240	2	True	1,500	2,000	1,506	2,006	20	64	20	52	J-227	52	J-227	True	12.80
J-241	2	True	1,500	2,000	1,507	2,007	20	53	20	52	J-227	52	J-227	True	12.81
J-242	2	True	1,500	1,750	1,500	1,750	20	69	20	52	J-227	52	J-227	True	11.17
J-243	2	True	1,500	1,750	1,503	1,753	20	111	20	52	J-227	52	J-227	True	6.24
J-244	2	True	1,500	1,750	1,500	1,750	20	77	20	52	J-227	52	J-227	True	11.19
J-245	2	True	1,500	1,750	1,506	1,756	20	73	20	52	J-227	52	J-227	True	11.21
J-246	2	True	1,500	1,750	1,500	1,750	20	106	20	52	J-227	52	J-227	True	7.68
J-249	2	True	1,500	1,750	1,500	1,750	20	121	20	52	J-227	52	J-227	True	6.98
J-250	2	True	1,500	1,750	1,500	1,750	20	83	20	52	J-227	52	J-227	True	7.39
J-251	2	True	1,500	1,750	1,500	1,750	20	69	20	52	J-227	52	J-227	True	6.91
J-252	2	True	1,500	1,750	1,500	1,750	20	69	20	52	J-227	52	J-227	True	7.39
J-253	2	True	1,500	1,750	1,500	1,750	20	66	20	52	J-227	52	J-227	True	7.91
J-254	2	True	1,500	1,750	1,500	1,750	20	66	20	52	J-227	52	J-227	True	7.39
J-255	2	True	1,500	1,750	1,500	1,750	20	107	20	52	J-227	52	J-227	True	6.81
J-256	2	True	1,500	1,750	1,500	1,750	20	102	20	52	J-227	52	J-227	True	5.75
J-257	2	True	1,500	1,750	1,504	1,754	20	68	20	52	J-227	52	J-227	True	7.39
J-258	2	True	1,500	1,750	1,503	1,753	20	67	20	52	J-227	52	J-227	True	7.39
J-259	2	True	1,500	1,750	1,504	1,754	20	96	20	52	J-227	52	J-227	True	6.33
J-260	2	True	1,500	1,750	1,500	1,750	20	72	20	51	J-227	51	J-227	True	6.60
J-261	2	True	1,500	1,750	1,500	1,750	20	81	20	52	J-227	52	J-227	True	4.70

J:\Hines CSI\UTILITY\Filings 2 and 3\Canyons South Filing 2_WaterCADdwg_20210709.wtg

Active Scenario: Max Day + Fire Flow J-240 w/Critical Loop Out

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
	Closed Pipe									
176	P-200	733	DP14	J-124	12.0	PVC	120.0	0	0.00	0.000
598	P-201	278	DP13	J-242	8.0	PVC	120.0	0	0.00	0.000
169	P-202	49	J-203	DP14	12.0	PVC	120.0	21	0.06	0.000
311	P-203	398	DP12	J-203	12.0	PVC	120.0	21	0.06	0.000
307	P-204	43	J-204	DP12	12.0	PVC	120.0	67	0.19	0.000
299	P-205	625	J-205	J-204	12.0	PVC	120.0	67	0.19	0.000
757	P-206(1)	552	J-206	J-213	12.0	PVC	120.0	67	0.19	0.000
758	P-206(2)	42	J-213	J-205	12.0	PVC	120.0	67	0.19	0.000
640	P-207	927	DP2	J-206	12.0	PVC	120.0	67	0.19	0.000
158	P-208	59	J-207	DP2	12.0	PVC	120.0	74	0.21	0.000
157	P-209	529	J-208	J-207	12.0	PVC	120.0	74	0.21	0.000
155	P-210	548	J-209	J-208	12.0	PVC	120.0	74	0.21	0.000
153	P-211	38	DP3	J-209	12.0	PVC	120.0	74	0.21	0.000
316	P-212	696	J-210	DP3	12.0	PVC	120.0	76	0.22	0.000
707	P-213(1)	616	J-211	J-234	12.0	PVC	120.0	88	0.25	0.000
708	P-213(2)	41	J-234	J-210	12.0	PVC	120.0	76	0.22	0.000
146	P-214	33	J-212	J-211	12.0	PVC	120.0	134	0.38	0.000
809	P-215	106	J-79	J-261	12.0	PVC	120.0	177	0.50	0.000
810	P-215(1)	312	J-261	J-226	12.0	PVC	120.0	177	0.50	0.000
702	P-215(2)	310	J-226	J-212	12.0	PVC	120.0	134	0.38	0.000
840	P-216	78	DP2	J-232	8.0	PVC	120.0	-8	0.05	0.000
841	P-216(1)	16	J-232	PRV-1	8.0	PVC	120.0	11	0.07	0.000
826	P-217	318	PRV-1	J-231	8.0	PVC	120.0	11	0.07	0.000
226	P-219	414	J-231	J-230	8.0	PVC	120.0	11	0.07	0.000
805	P-220	45	J-230	J-260	8.0	PVC	120.0	11	0.07	0.000
806	P-221	413	J-260	J-239	8.0	PVC	120.0	11	0.07	0.000
244	P-222	32	J-239	J-229	8.0	PVC	120.0	2	0.01	0.000
245	P-223	309	J-229	DP1	8.0	PVC	120.0	2	0.01	0.000
685	P-224	444	J-239	J-228	8.0	PVC	120.0	9	0.06	0.000
193	P-225	441	J-228	J-227	8.0	PVC	120.0	0	0.00	0.000
194	P-226	217	PRV-2	J-227	8.0	PVC	120.0	0	0.00	0.000
694	P-227	260	PRV-2	DP5	8.0	PVC	120.0	0	0.00	0.000
107	P-228	380	DP5	DP6	8.0	PVC	120.0	-3	0.02	0.000
104	P-229	34	DP6	J-221	8.0	PVC	120.0	3	0.02	0.000
99	P-230	357	DP4	DP5	8.0	PVC	120.0	3	0.02	0.000
223	P-231	88	J-224	DP4	8.0	PVC	120.0	17	0.11	0.000
222	P-232	319	J-225	J-224	8.0	PVC	120.0	17	0.11	0.000
219	P-233	216	DP7	J-225	8.0	PVC	120.0	17	0.11	0.000
57	P-234	302	J-219	DP7	12.0	PVC	120.0	44	0.13	0.000
111	P-235	322	J-218	J-219	12.0	PVC	120.0	44	0.13	0.000
110	P-236	25	DP9	J-218	12.0	PVC	120.0	44	0.13	0.000

Active Scenario: Max Day + Fire Flow J-240 w/Critical Loop Out

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
114	P-237	456	DP10	DP9	8.0	PVC	120.0	29	0.19	0.000
329	P-238	323	J-211	DP10	8.0	PVC	120.0	46	0.29	0.000
265	P-239	291	DP5	J-223	8.0	PVC	120.0	2	0.01	0.000
266	P-240	450	J-223	J-222	8.0	PVC	120.0	-1	0.00	0.000
268	P-241	466	J-221	J-222	8.0	PVC	120.0	3	0.02	0.000
269	P-242	75	J-222	H-20	8.0	PVC	120.0	0	0.00	0.000
75	P-243	369	DP9	J-217	8.0	PVC	120.0	-25	0.16	0.000
77	P-244	100	J-217	J-240	8.0	PVC	120.0	6	0.04	0.000
199	P-245	300	J-217	J-216	8.0	PVC	120.0	-30	0.19	0.000
200	P-246	497	J-216	J-215	8.0	PVC	120.0	-30	0.19	0.000
81	P-247	323	DP12A	J-215	8.0	PVC	120.0	30	0.19	0.000
618	P-248	349	DP3	J-246	8.0	PVC	120.0	23	0.15	0.000
830	P-249	338	J-246	J-233	8.0	PVC	120.0	23	0.15	0.000
796	P-250	391	J-233	J-243	8.0	PVC	120.0	23	0.15	0.000
847	P-251(2)	262	J-249	J-232	8.0	PVC	120.0	19	0.12	0.000
236	P-252	327	DP4	J-245	8.0	PVC	120.0	6	0.04	0.000
209	P-254	338	J-236	J-201	8.0	PVC	120.0	6	0.04	0.000
710	P-255	142	J-236	J-235	8.0	PVC	120.0	-8	0.05	0.000
711	P-256	164	J-235	J-202	8.0	PVC	120.0	3	0.02	0.000
117	P-257	376	J-237	J-236	8.0	PVC	120.0	-2	0.01	0.000
585	P-258	431	J-238	J-237	8.0	PVC	120.0	-2	0.01	0.000
584	P-259	56	DP10	J-238	8.0	PVC	120.0	-2	0.01	0.000
712	P-260	324	J-234	J-235	8.0	PVC	120.0	12	0.07	0.000
703	P-261	250	J-226	DP12A	8.0	PVC	120.0	44	0.28	0.000
86	P-262	150	DP11	J-244	8.0	PVC	120.0	-3	0.02	0.000
202	P-264	47	DP12A	J-214	8.0	PVC	120.0	7	0.04	0.000
203	P-265	564	J-214	J-241	8.0	PVC	120.0	7	0.04	0.000
196	P-266(1)	116	DP7	J-220	8.0	PVC	120.0	18	0.12	0.000
197	P-266(2)	424	J-220	DP6	8.0	PVC	120.0	18	0.12	0.000
172	P-280	196	DP14	DP13	8.0	PVC	120.0	3	0.02	0.000
241	P-281	335	DP13	J-251	8.0	PVC	120.0	-3	0.02	0.000
242	P-282	56	J-251	J-252	8.0	PVC	120.0	-3	0.02	0.000
120	P-283	194	DP12	J-252	8.0	PVC	120.0	11	0.07	0.000
238	P-284	334	J-252	J-253	8.0	PVC	120.0	4	0.03	0.000
718	P-285(1)	330	J-253	J-257	8.0	PVC	120.0	4	0.03	0.000
719	P-285(2)	32	J-257	H-31	8.0	PVC	120.0	0	0.00	0.000
122	P-286	515	J-252	J-254	8.0	PVC	120.0	4	0.02	0.000
714	P-287(1)	389	J-254	J-258	8.0	PVC	120.0	4	0.02	0.000
715	P-287(2)	120	J-258	H-30	8.0	PVC	120.0	0	0.00	0.000
624	P-288	349	DP3	J-255	8.0	PVC	120.0	-50	0.32	0.000
358	P-289	451	J-255	J-256	8.0	PVC	120.0	-50	0.32	0.000

Active Scenario: Max Day + Fire Flow J-240 w/Critical Loop Out

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
724	P-290	51	J-259	H-32	8.0	PVC	120.0	0	0.00	0.000
722	P-290(1)	397	J-256	J-259	8.0	PVC	120.0	-50	0.32	0.000
627	P-291	396	J-259	J-71	8.0	PVC	120.0	-54	0.35	0.000
781	P-292	303	J-258	J-250	8.0	PVC	120.0	0	0.00	0.000
782	P-293	147	J-250	J-257	8.0	PVC	120.0	0	0.00	0.000

Scenario: Max Day + Fire Flow J-241 w/Critical Loop Out

Current Time Step: 0.000 h

Fire Flow Node FlexTable: Fire Flow Report

Label	Fire Flow Iterations	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Pressure (Zone Lower Limit) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)	Is Fire Flow Run Balanced?	Velocity of Maximum Pipe (ft/s)
DP1	2	True	1,500	1,750	1,502	1,752	20	58	20	51	J-227	51	J-227	True	11.18
DP2	2	True	1,500	1,750	1,515	1,765	20	124	20	52	J-227	52	J-227	True	4.14
DP3	2	True	1,500	1,750	1,530	1,780	20	108	20	52	J-227	52	J-227	True	4.14
DP4	2	True	1,500	1,750	1,508	1,758	20	77	20	52	J-227	52	J-227	True	7.27
DP5	2	True	1,500	1,750	1,503	1,753	20	79	20	52	J-227	52	J-227	True	7.27
DP6	2	True	1,500	1,750	1,512	1,762	20	72	20	52	J-227	52	J-227	True	7.27
DP7	2	True	1,500	1,750	1,509	1,759	20	76	20	52	J-227	52	J-227	True	7.27
DP9	2	True	1,750	2,000	1,760	2,010	20	71	20	52	J-227	52	J-227	True	8.28
DP10	2	True	1,750	2,000	1,768	2,018	20	76	20	52	J-227	52	J-227	True	7.12
DP11	2	True	1,750	2,000	1,753	2,003	20	67	20	52	J-227	52	J-227	True	12.78
DP12	2	True	1,500	1,750	1,535	1,785	20	70	20	52	J-227	52	J-227	True	5.15
DP12A	2	True	1,500	1,750	1,506	1,756	20	77	20	52	J-227	52	J-227	True	8.66
DP13	2	True	1,500	1,750	1,506	1,756	20	70	20	52	J-227	52	J-227	True	6.82
DP14	2	True	1,500	2,000	1,518	2,018	20	66	20	52	J-227	52	J-227	True	5.86
H-20	2	True	1,500	1,750	1,500	1,750	20	64	20	52	J-227	52	J-227	True	11.17
H-30	2	True	1,500	1,750	1,500	1,750	20	65	20	52	J-227	52	J-227	True	11.17
H-31	2	True	1,500	1,750	1,500	1,750	20	67	20	52	J-227	52	J-227	True	11.17
H-32	2	True	1,500	1,750	1,500	1,750	20	95	20	52	J-227	52	J-227	True	11.17
J-71	2	True	1,500	1,750	1,500	1,750	20	79	20	52	J-227	52	J-227	True	7.30
J-79	2	True	1,500	1,750	1,500	1,750	20	83	20	52	J-227	52	J-227	True	4.75
J-124	2	True	1,500	1,750	1,500	1,750	20	93	20	52	J-227	52	J-227	True	2.55
J-201	2	True	1,500	1,750	1,506	1,756	20	74	20	52	J-227	52	J-227	True	11.21
J-202	2	True	1,500	1,750	1,503	1,753	20	81	20	52	J-227	52	J-227	True	11.19
J-203	2	True	1,500	1,750	1,500	1,750	20	73	20	52	J-227	52	J-227	True	5.15
J-204	2	True	1,500	1,750	1,500	1,750	20	70	20	52	J-227	52	J-227	True	5.15
J-205	2	True	1,500	1,750	1,500	1,750	20	86	20	52	J-227	52	J-227	True	5.15
J-206	2	True	1,500	1,750	1,500	1,750	20	101	20	52	J-227	52	J-227	True	5.15
J-207	2	True	1,500	1,750	1,500	1,750	20	123	20	52	J-227	52	J-227	True	4.14
J-208	2	True	1,500	1,750	1,500	1,750	20	119	20	52	J-227	52	J-227	True	4.38
J-209	2	True	1,500	1,750	1,500	1,750	20	108	20	52	J-227	52	J-227	True	8.15
J-210	2	True	1,500	1,750	1,500	1,750	20	93	20	52	J-227	52	J-227	True	4.32
J-211	2	True	1,500	1,750	1,500	1,750	20	80	20	52	J-227	52	J-227	True	4.46
J-212	2	True	1,500	1,750	1,500	1,750	20	79	20	52	J-227	52	J-227	True	4.47
J-213	2	True	1,500	1,750	1,500	1,750	20	86	20	52	J-227	52	J-227	True	5.15
J-214	2	True	1,500	1,750	1,500	1,750	20	76	20	52	J-227	52	J-227	True	11.21
J-215	2	True	1,500	1,750	1,500	1,750	20	75	20	52	J-227	52	J-227	True	7.44
J-216	2	True	1,500	1,750	1,500	1,750	20	74	20	52	J-227	52	J-227	True	6.08
J-217	2	True	1,500	1,750	1,500	1,750	20	73	20	52	J-227	52	J-227	True	6.30
J-218	2	True	1,500	1,750	1,500	1,750	20	76	20	52	J-227	52	J-227	True	7.27
J-219	2	True	1,500	1,750	1,500	1,750	20	76	20	52	J-227	52	J-227	True	7.27
J-220	2	True	1,500	1,750	1,500	1,750	20	73	20	52	J-227	52	J-227	True	9.08
J-221	2	True	1,500	1,750	1,500	1,750	20	72	20	52	J-227	52	J-227	True	9.22
J-222	2	True	1,500	1,750	1,503	1,753	20	66	20	52	J-227	52	J-227	True	7.27
J-223	2	True	1,500	1,750	1,503	1,753	20	75	20	52	J-227	52	J-227	True	7.27
J-224	2	True	1,500	1,750	1,500	1,750	20	77	20	52	J-227	52	J-227	True	7.27
J-225	2	True	1,500	1,750	1,500	1,750	20	75	20	52	J-227	52	J-227	True	8.34
J-226	2	True	1,500	1,750	1,500	1,750	20	77	20	52	J-227	52	J-227	True	4.56
J-227	2	True	1,500	1,750	1,500	1,750	20	49	20	61	J-228	61	J-228	True	8.66
J-228	2	True	1,500	1,750	1,509	1,759	20	57	20	50	J-227	50	J-227	True	6.97
J-229	2	True	1,500	1,750	1,500	1,750	20	64	20	51	J-227	51	J-227	True	11.18
J-230	2	True	1,500	1,750	1,500	1,750	20	73	20	51	J-227	51	J-227	True	6.73
J-231	2	True	1,500	1,750	1,500	1,750	20	76	20	52	J-227	52	J-227	True	8.16
J-232	2	True	1,500	1,750	1,500	1,750	20	123	20	52	J-227	52	J-227	True	8.15
J-233	2	True	1,500	1,750	1,500	1,750	20	108	20	52	J-227	52	J-227	True	6.35
J-234	2	True	1,500	1,750	1,500	1,750	20	92	20	52	J-227	52	J-227	True	4.33
J-235	2	True	1,500	1,750	1,500	1,750	20	83	20	52	J-227	52	J-227	True	7.31
J-236	2	True	1,500	1,750	1,500	1,750	20	81	20	52	J-227	52	J-227	True	6.69
J-237	2	True	1,500	1,750	1,500	1,750	20	79	20	52	J-227	52	J-227	True	6.00
J-238	2	True	1,500	1,750	1,500	1,750	20	75	20	52	J-227	52	J-227	True	7.94
J-239	2	True	1,500	1,750	1,500	1,750	20	64	20	51	J-227	51	J-227	True	5.75
J-240	2	True	1,500	2,000	1,506	2,006	20	64	20	52	J-227	52	J-227	True	12.80
J-241	2	True	1,500	2,000	1,507	2,007	20	53	20	52	J-227	52	J-227	True	12.81
J-242	2	True	1,500	1,750	1,500	1,750	20	69	20	52	J-227	52	J-227	True	11.17
J-243	2	True	1,500	1,750	1,503	1,753	20	111	20	52	J-227	52	J-227	True	6.24
J-244	2	True	1,500	1,750	1,500	1,750	20	77	20	52	J-227	52	J-227	True	11.19
J-245	2	True	1,500	1,750	1,506	1,756	20	73	20	52	J-227	52	J-227	True	11.21
J-246	2	True	1,500	1,750	1,500	1,750	20	106	20	52	J-227	52	J-227	True	7.68
J-249	2	True	1,500	1,750	1,500	1,750	20	121	20	52	J-227	52	J-227	True	6.98
J-250	2	True	1,500	1,750	1,500	1,750	20	83	20	52	J-227	52	J-227	True	7.39
J-251	2	True	1,500	1,750	1,500	1,750	20	69	20	52	J-227	52	J-227	True	6.91
J-252	2	True	1,500	1,750	1,500	1,750	20	69	20	52	J-227	52	J-227	True	7.39
J-253	2	True	1,500	1,750	1,500	1,750	20	66	20	52	J-227	52	J-227	True	7.91
J-254	2	True	1,500	1,750	1,500	1,750	20	66	20	52	J-227	52	J-227	True	7.39
J-255	2	True	1,500	1,750	1,500	1,750	20	107	20	52	J-227	52	J-227	True	6.81
J-256	2	True	1,500	1,750	1,500	1,750	20	102	20	52	J-227	52	J-227	True	5.75
J-257	2	True	1,500	1,750	1,504	1,754	20	68	20	52	J-227	52	J-227	True	7.39
J-258	2	True	1,500	1,750	1,503	1,753	20	67	20	52	J-227	52	J-227	True	7.39
J-259	2	True	1,500	1,750	1,504	1,754	20	96	20	52	J-227	52	J-227	True	6.33
J-260	2	True	1,500	1,750	1,500	1,750	20	72	20	51	J-227	51	J-227	True	6.60
J-261	2	True	1,500	1,750	1,500	1,750	20	81	20	52	J-227	52	J-227	True	4.70

J:\Hines CSI\UTILITY\Filings 2 and 3\Canyons South Filing 2_WaterCADdwg_20210709.wtg

Active Scenario: Max Day + Fire Flow J-241 w/Critical Loop Out

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
	Closed Pipe									
176	P-200	733	DP14	J-124	12.0	PVC	120.0	0	0.00	0.000
598	P-201	278	DP13	J-242	8.0	PVC	120.0	0	0.00	0.000
169	P-202	49	J-203	DP14	12.0	PVC	120.0	21	0.06	0.000
311	P-203	398	DP12	J-203	12.0	PVC	120.0	21	0.06	0.000
307	P-204	43	J-204	DP12	12.0	PVC	120.0	67	0.19	0.000
299	P-205	625	J-205	J-204	12.0	PVC	120.0	67	0.19	0.000
757	P-206(1)	552	J-206	J-213	12.0	PVC	120.0	67	0.19	0.000
758	P-206(2)	42	J-213	J-205	12.0	PVC	120.0	67	0.19	0.000
640	P-207	927	DP2	J-206	12.0	PVC	120.0	67	0.19	0.000
158	P-208	59	J-207	DP2	12.0	PVC	120.0	74	0.21	0.000
157	P-209	529	J-208	J-207	12.0	PVC	120.0	74	0.21	0.000
155	P-210	548	J-209	J-208	12.0	PVC	120.0	74	0.21	0.000
153	P-211	38	DP3	J-209	12.0	PVC	120.0	74	0.21	0.000
316	P-212	696	J-210	DP3	12.0	PVC	120.0	76	0.22	0.000
707	P-213(1)	616	J-211	J-234	12.0	PVC	120.0	88	0.25	0.000
708	P-213(2)	41	J-234	J-210	12.0	PVC	120.0	76	0.22	0.000
146	P-214	33	J-212	J-211	12.0	PVC	120.0	134	0.38	0.000
809	P-215	106	J-79	J-261	12.0	PVC	120.0	177	0.50	0.000
810	P-215(1)	312	J-261	J-226	12.0	PVC	120.0	177	0.50	0.000
702	P-215(2)	310	J-226	J-212	12.0	PVC	120.0	134	0.38	0.000
840	P-216	78	DP2	J-232	8.0	PVC	120.0	-8	0.05	0.000
841	P-216(1)	16	J-232	PRV-1	8.0	PVC	120.0	11	0.07	0.000
826	P-217	318	PRV-1	J-231	8.0	PVC	120.0	11	0.07	0.000
226	P-219	414	J-231	J-230	8.0	PVC	120.0	11	0.07	0.000
805	P-220	45	J-230	J-260	8.0	PVC	120.0	11	0.07	0.000
806	P-221	413	J-260	J-239	8.0	PVC	120.0	11	0.07	0.000
244	P-222	32	J-239	J-229	8.0	PVC	120.0	2	0.01	0.000
245	P-223	309	J-229	DP1	8.0	PVC	120.0	2	0.01	0.000
685	P-224	444	J-239	J-228	8.0	PVC	120.0	9	0.06	0.000
193	P-225	441	J-228	J-227	8.0	PVC	120.0	0	0.00	0.000
194	P-226	217	PRV-2	J-227	8.0	PVC	120.0	0	0.00	0.000
694	P-227	260	PRV-2	DP5	8.0	PVC	120.0	0	0.00	0.000
107	P-228	380	DP5	DP6	8.0	PVC	120.0	-3	0.02	0.000
104	P-229	34	DP6	J-221	8.0	PVC	120.0	3	0.02	0.000
99	P-230	357	DP4	DP5	8.0	PVC	120.0	3	0.02	0.000
223	P-231	88	J-224	DP4	8.0	PVC	120.0	17	0.11	0.000
222	P-232	319	J-225	J-224	8.0	PVC	120.0	17	0.11	0.000
219	P-233	216	DP7	J-225	8.0	PVC	120.0	17	0.11	0.000
57	P-234	302	J-219	DP7	12.0	PVC	120.0	44	0.13	0.000
111	P-235	322	J-218	J-219	12.0	PVC	120.0	44	0.13	0.000
110	P-236	25	DP9	J-218	12.0	PVC	120.0	44	0.13	0.000

Active Scenario: Max Day + Fire Flow J-241 w/Critical Loop Out

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
114	P-237	456	DP10	DP9	8.0	PVC	120.0	29	0.19	0.000
329	P-238	323	J-211	DP10	8.0	PVC	120.0	46	0.29	0.000
265	P-239	291	DP5	J-223	8.0	PVC	120.0	2	0.01	0.000
266	P-240	450	J-223	J-222	8.0	PVC	120.0	-1	0.00	0.000
268	P-241	466	J-221	J-222	8.0	PVC	120.0	3	0.02	0.000
269	P-242	75	J-222	H-20	8.0	PVC	120.0	0	0.00	0.000
75	P-243	369	DP9	J-217	8.0	PVC	120.0	-25	0.16	0.000
77	P-244	100	J-217	J-240	8.0	PVC	120.0	6	0.04	0.000
199	P-245	300	J-217	J-216	8.0	PVC	120.0	-30	0.19	0.000
200	P-246	497	J-216	J-215	8.0	PVC	120.0	-30	0.19	0.000
81	P-247	323	DP12A	J-215	8.0	PVC	120.0	30	0.19	0.000
618	P-248	349	DP3	J-246	8.0	PVC	120.0	23	0.15	0.000
830	P-249	338	J-246	J-233	8.0	PVC	120.0	23	0.15	0.000
796	P-250	391	J-233	J-243	8.0	PVC	120.0	23	0.15	0.000
847	P-251(2)	262	J-249	J-232	8.0	PVC	120.0	19	0.12	0.000
236	P-252	327	DP4	J-245	8.0	PVC	120.0	6	0.04	0.000
209	P-254	338	J-236	J-201	8.0	PVC	120.0	6	0.04	0.000
710	P-255	142	J-236	J-235	8.0	PVC	120.0	-8	0.05	0.000
711	P-256	164	J-235	J-202	8.0	PVC	120.0	3	0.02	0.000
117	P-257	376	J-237	J-236	8.0	PVC	120.0	-2	0.01	0.000
585	P-258	431	J-238	J-237	8.0	PVC	120.0	-2	0.01	0.000
584	P-259	56	DP10	J-238	8.0	PVC	120.0	-2	0.01	0.000
712	P-260	324	J-234	J-235	8.0	PVC	120.0	12	0.07	0.000
703	P-261	250	J-226	DP12A	8.0	PVC	120.0	44	0.28	0.000
86	P-262	150	DP11	J-244	8.0	PVC	120.0	-3	0.02	0.000
202	P-264	47	DP12A	J-214	8.0	PVC	120.0	7	0.04	0.000
203	P-265	564	J-214	J-241	8.0	PVC	120.0	7	0.04	0.000
196	P-266(1)	116	DP7	J-220	8.0	PVC	120.0	18	0.12	0.000
197	P-266(2)	424	J-220	DP6	8.0	PVC	120.0	18	0.12	0.000
172	P-280	196	DP14	DP13	8.0	PVC	120.0	3	0.02	0.000
241	P-281	335	DP13	J-251	8.0	PVC	120.0	-3	0.02	0.000
242	P-282	56	J-251	J-252	8.0	PVC	120.0	-3	0.02	0.000
120	P-283	194	DP12	J-252	8.0	PVC	120.0	11	0.07	0.000
238	P-284	334	J-252	J-253	8.0	PVC	120.0	4	0.03	0.000
718	P-285(1)	330	J-253	J-257	8.0	PVC	120.0	4	0.03	0.000
719	P-285(2)	32	J-257	H-31	8.0	PVC	120.0	0	0.00	0.000
122	P-286	515	J-252	J-254	8.0	PVC	120.0	4	0.02	0.000
714	P-287(1)	389	J-254	J-258	8.0	PVC	120.0	4	0.02	0.000
715	P-287(2)	120	J-258	H-30	8.0	PVC	120.0	0	0.00	0.000
624	P-288	349	DP3	J-255	8.0	PVC	120.0	-50	0.32	0.000
358	P-289	451	J-255	J-256	8.0	PVC	120.0	-50	0.32	0.000

Active Scenario: Max Day + Fire Flow J-241 w/Critical Loop Out

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
724	P-290	51	J-259	H-32	8.0	PVC	120.0	0	0.00	0.000
722	P-290(1)	397	J-256	J-259	8.0	PVC	120.0	-50	0.32	0.000
627	P-291	396	J-259	J-71	8.0	PVC	120.0	-54	0.35	0.000
781	P-292	303	J-258	J-250	8.0	PVC	120.0	0	0.00	0.000
782	P-293	147	J-250	J-257	8.0	PVC	120.0	0	0.00	0.000

APPENDIX D

WASTEWATER FLOWS

CANYONS SOUTH FILINGS 2 AND 3 SANITARY SEWER GENERATION



RESIDENTIAL	100	GPCD	MIDDLE SCHOOL	8,500	GPD/SCHOOL
CAPITA / UNIT	3.2				

DESIGN POINT	BASIN	LAND USE	NO. OF UNITS	CAPITA	AVG. DAY FLOW (GPD)	AVG. DAY FLOW (GPM)	AVG. DAY FLOW (CFS)	Peaking Factor	PEAK FLOW (GPD)	PEAK FLOW (GPM)	PEAK FLOW (CFS)
DP-1	A1	SF Detached	51	163	16,320	11.3	0.025	4.0	65,280	45	0.101
DP-2	A2	SF Detached	116	371	37,120	25.8	0.057	3.0	111,360	77	0.172
DP-3	A3	SF Detached	33	106	10,560	7.3	0.016	4.0	42,240	29	0.065
DP-4	B1	SF Detached	62	198	19,840	13.8	0.031	4.0	79,360	55	0.123
DP-5	B2	SF Detached	28	90	8,960	6.2	0.014	4.0	35,840	25	0.055
DP-6	C1	Middle School ¹	1	N/A	8,500	5.9	0.013	4.0	34,850	24	0.054
ONSITE SUM			291	928	101,300	70	0.157		368,930	256	0.571

¹ The discharge rate for the middle school is based on Table 4.4.1.1 of the Town of Castle Rock Wastewater Criteria Manual. The 10% allowance for infiltration and inflow was added to the Peak Design Flow (PDF).

APPENDIX E

WASTEWATER HYDRAULIC MODELING

Worksheet for 8" ADF-Min Slope (0.4%)

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.011
Channel Slope	0.004 ft/ft
Diameter	0.67 ft
Discharge	70.00 gal/min
Results	
Normal Depth	0.2 ft
Flow Area	0.1 ft ²
Wetted Perimeter	0.7 ft
Hydraulic Radius	0.1 ft
Top Width	0.60 ft
Critical Depth	0.2 ft
Percent Full	27.9 %
Critical Slope	0.005 ft/ft
Velocity	1.94 ft/s
Velocity Head	0.06 ft
Specific Energy	0.25 ft
Froude Number	0.934
Maximum Discharge	441.90 gal/min
Discharge Full	410.80 gal/min
Slope Full	0.000 ft/ft
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 ft
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	0.0 %
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.2 ft
Critical Depth	0.2 ft
Channel Slope	0.004 ft/ft
Critical Slope	0.005 ft/ft

Worksheet for 8' PDF-Max Slope (7.5%)

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Roughness Coefficient	0.011
Channel Slope	0.075 ft/ft
Diameter	0.67 ft
Discharge	256.00 gal/min
Results	
Normal Depth	0.2 ft
Flow Area	0.1 ft ²
Wetted Perimeter	0.7 ft
Hydraulic Radius	0.1 ft
Top Width	0.59 ft
Critical Depth	0.4 ft
Percent Full	25.6 %
Critical Slope	0.005 ft/ft
Velocity	7.99 ft/s
Velocity Head	0.99 ft
Specific Energy	1.16 ft
Froude Number	4.032
Maximum Discharge	1,913.49 gal/min
Discharge Full	1,778.82 gal/min
Slope Full	0.002 ft/ft
Flow Type	Supercritical
GVF Input Data	
Downstream Depth	0.0 ft
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	25.6 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.2 ft
Critical Depth	0.4 ft
Channel Slope	0.075 ft/ft
Critical Slope	0.005 ft/ft

Worksheet for 8" PDF Min Slope (0.4%)-Capacity Check

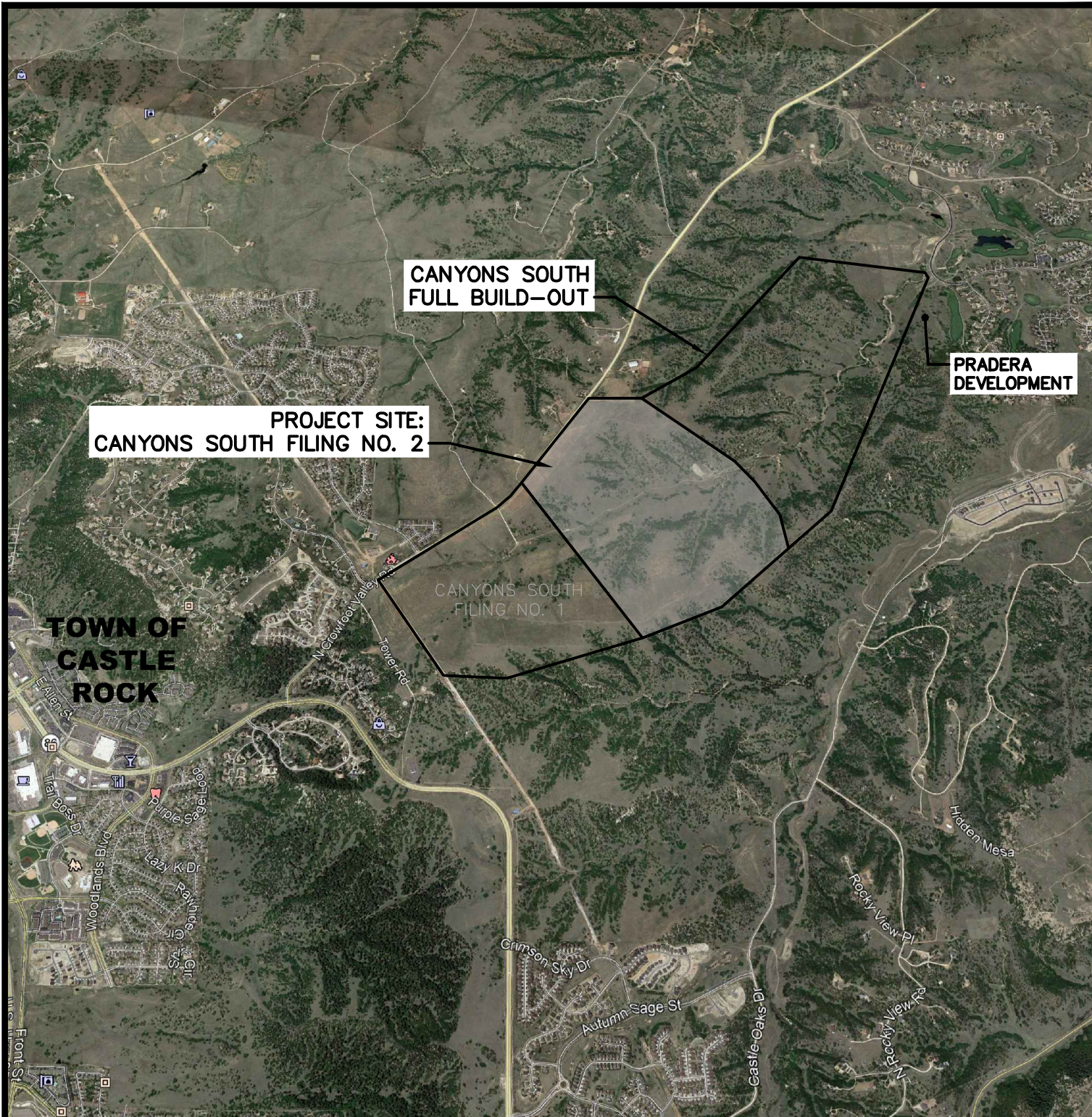
Project Description	
Friction Method	Manning
	Formula
Solve For	Discharge
Input Data	
Roughness Coefficient	0.011
Channel Slope	0.004 ft/ft
Normal Depth	0.5 ft
Diameter	0.67 ft
Results	
Discharge	374.60 gal/min
Flow Area	0.3 ft ²
Wetted Perimeter	1.4 ft
Hydraulic Radius	0.2 ft
Top Width	0.58 ft
Critical Depth	0.4 ft
Percent Full	75.0 %
Critical Slope	0.006 ft/ft
Velocity	2.94 ft/s
Velocity Head	0.13 ft
Specific Energy	0.64 ft
Froude Number	0.742
Maximum Discharge	441.90 gal/min
Discharge Full	410.80 gal/min
Slope Full	0.003 ft/ft
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 ft
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	0.0 %
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.5 ft
Critical Depth	0.4 ft
Channel Slope	0.004 ft/ft
Critical Slope	0.006 ft/ft

Worksheet for 8" PDF Min Slope (0.4%)-Velocity Check

Project Description	
Friction Method	Manning
Solve For	Formula Normal Depth
Input Data	
Roughness Coefficient	0.011
Channel Slope	0.004 ft/ft
Diameter	0.67 ft
Discharge	256.00 gal/min
Results	
Normal Depth	0.4 ft
Flow Area	0.2 ft ²
Wetted Perimeter	1.1 ft
Hydraulic Radius	0.2 ft
Top Width	0.66 ft
Critical Depth	0.4 ft
Percent Full	57.2 %
Critical Slope	0.005 ft/ft
Velocity	2.74 ft/s
Velocity Head	0.12 ft
Specific Energy	0.50 ft
Froude Number	0.861
Maximum Discharge	441.90 gal/min
Discharge Full	410.80 gal/min
Slope Full	0.002 ft/ft
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 ft
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	0.0 %
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.4 ft
Critical Depth	0.4 ft
Channel Slope	0.004 ft/ft
Critical Slope	0.005 ft/ft

APPENDIX F

MAPS AND PLANS



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Calibre

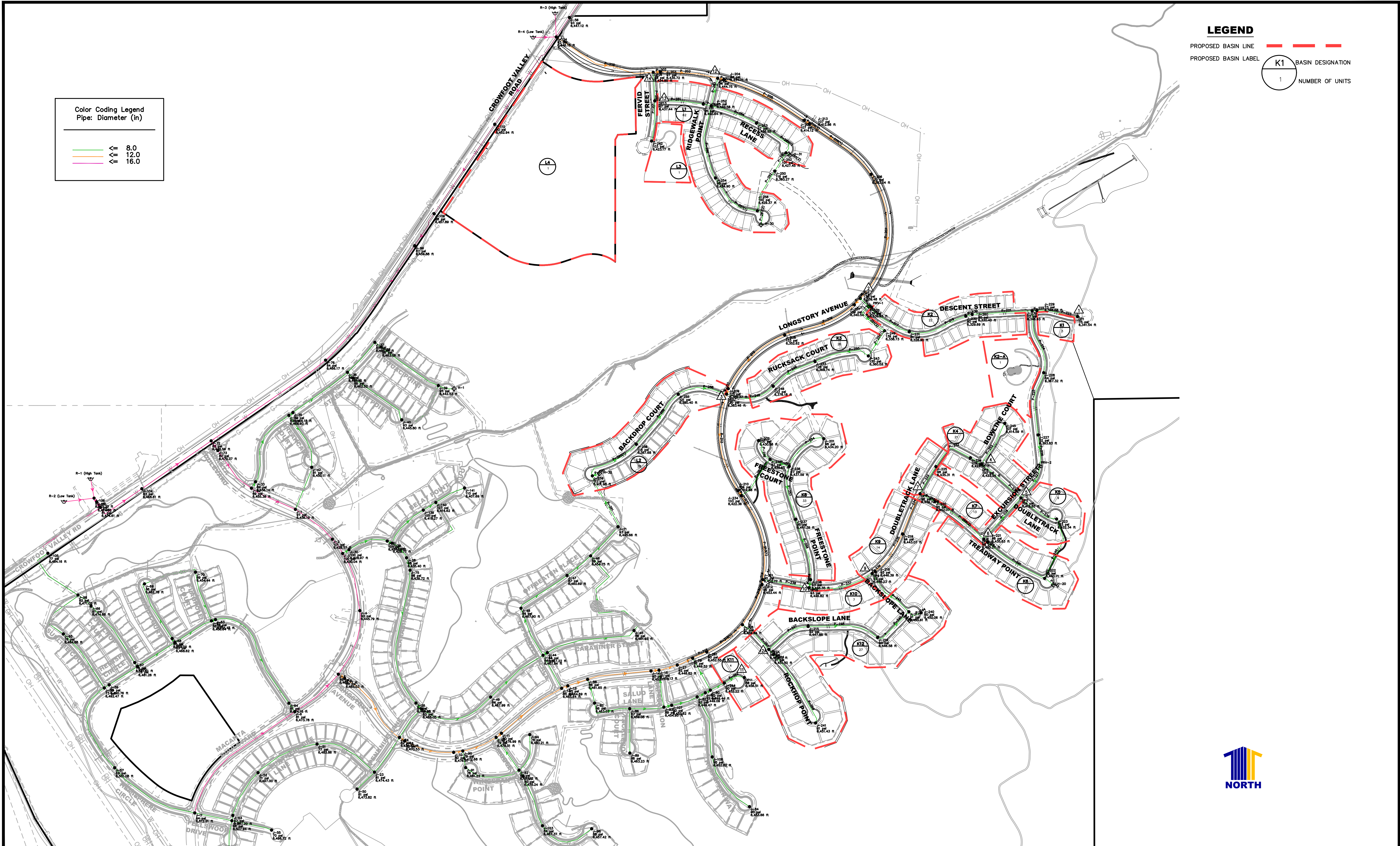
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Construction Management Civil Engineering Surveying

CANYONS SOUTH FILING 2 VICINITY MAP

Sheet
VM

Scale NTS
Date
OCTOBER 2020

PATH: J:\HINES CS\UTILITYFILINGS 2 AND 3\CANYONS SOUTH FILING 2_ WATERCADDWG_20210709.DWG
PLOTTED BY: ANDREA J. LOWERY PLOT DATE: 4/21/2022 11:57 AM
XREFS:



DATE	REVISION	DESCRIPTION



Drawing Name Canyons South Filing 2_ WaterCADDwg_20210709.dwg	0 150 300 600
Job Number HINES CS	1 inch = 300 ft. Horizontal
Prepared For HINES	Designer AJL
	Drafter AJL
	Checked BKM

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9090 South Ridgeline Boulevard, Suite 105
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CANYONS SOUTH - FILINGS 2 AND 3

UTILITY STUDY

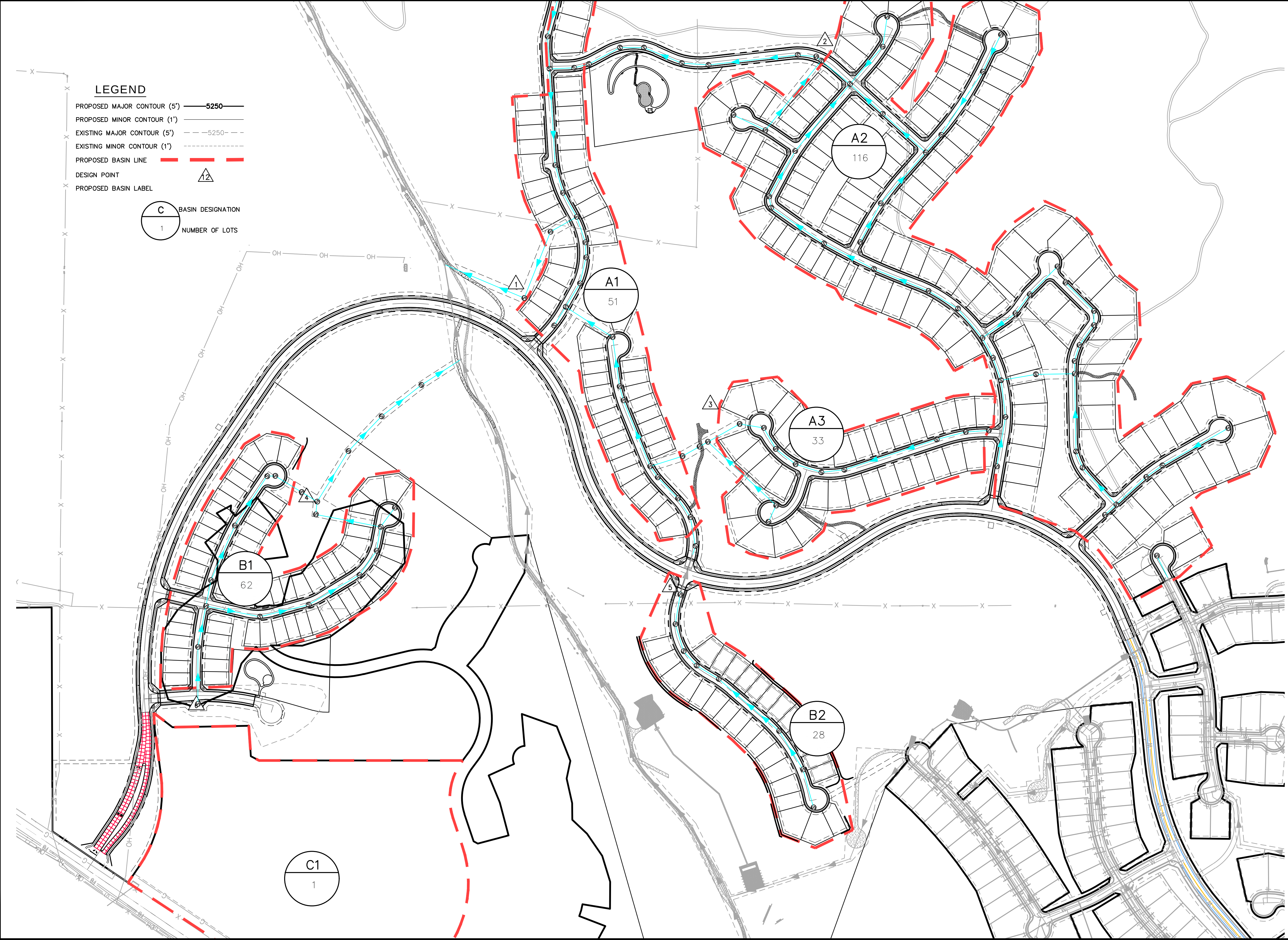
WATER EXHIBIT

Sheet
WT1

Date
APRIL 2022

1 of 1

PATH: J:\HINES CS\CADD\EXHIBITS\X-SS-F2.DWG
PLOTTED BY: ANDREA J. LOWER
PLOT DATE: 4/20/2022 4:18 PM
XREFS:



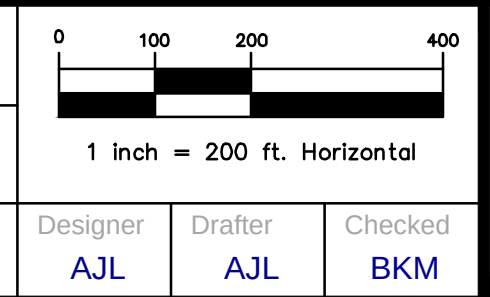
DATE	REVISION	DESCRIPTION



Drawing Name
X-SS-F2.dwg

Job Number
HINES CS

Prepared For
HINES



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CANYONS SOUTH - FILINGS 2 AND 3

UTILITY STUDY

SANITARY SEWER EXHIBIT

Sheet
S1

Date
APRIL 2022

of

CANYONS SOUTH
LONGSTORY AVENUE
PROPOSED SANITARY SEWER AND WATER PLANS

PORTIONS OF SECTION 19, THE EAST ONE-HALF OF SECTION 20 AND SECTION 30 IN TOWNSHIP 7 SOUTH, RANGE 66 WEST OF THE 6TH
PRINCIPAL MERIDIAN TOGETHER WITH PORTIONS OF THE SOUTHEAST ONE-QUARTER OF SECTION 24, THE NORTHWEST ONE-QUARTER OF
SECTION 25 AND EAST ONE-HALF OF SECTION 25 IN TOWNSHIP 7 SOUTH, RANGE 67 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
COUNTY OF DOUGLAS, STATE OF COLORADO
PROJECT NUMER CD21-0018

SHEET INDEX

T1 (1)	TITLE SHEET
GN1 (2)	GENERAL NOTES
TY1 (3)	GENERAL NOTES AND TYPICAL SECTIONS
SW1-SW7 (4-10)	WATER PLAN AND PROFILE
SW8 (11)	SANITARY SEWER PLAN AND PROFILE
DT1-DT2 (12-13)	DETAILS - SANITARY SEWER
DT3-DT6 (14-17)	DETAILS - WATER
17	TOTAL

PROJECT VARIANCES

NONE

INDEMNIFICATION AND ADHERENCE TO STANDARDS STATEMENTS

THESE PLANS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR CONCEPT ONLY. THE REVIEW DOES NOT IMPLY RESPONSIBILITY BY THE REVIEWING DEPARTMENT, THE TOWN ENGINEER, OR THE TOWN OF CASTLE ROCK FOR ACCURACY AND CORRECTNESS OF THE CALCULATIONS. FURTHERMORE, THE REVIEW DOES NOT IMPLY THAT QUANTITIES OF ITEMS ON THE PLANS ARE THE FINAL QUANTITIES REQUIRED. THE REVIEW SHALL NOT BE CONSTRUED FOR ANY REASON AS ACCEPTANCE OF FINANCIAL RESPONSIBILITY BY THE TOWN FOR ADDITIONAL QUANTITIES OF ITEMS SHOWN THAT MAY BE REQUIRED DURING THE CONSTRUCTION PHASE.

ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE TOWN OF CASTLE ROCK MUNICIPAL CODE, TECHNICAL MANUALS AND/OR OTHER TOWN-APPROVED APPLICABLE STANDARDS.

TOWN APPROVAL BLOCK

TOWN OF CASTLE ROCK APPROVAL PLANS
ARE HEREBY APPROVED FOR ONE YEAR FROM THE DATE OF DEVELOPMENT SERVICES APPROVAL
APPROVED BY:  **DEVELOPMENT SERVICES APPROVED**
by Dena Paulin
on 12/13/2021

Approved CD21-0018 Construction
Documents.pdf
Record Document on File

DEVELOPMENT SERVICES DATE

PROFESSIONAL ENGINEER CERTIFICATION

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.

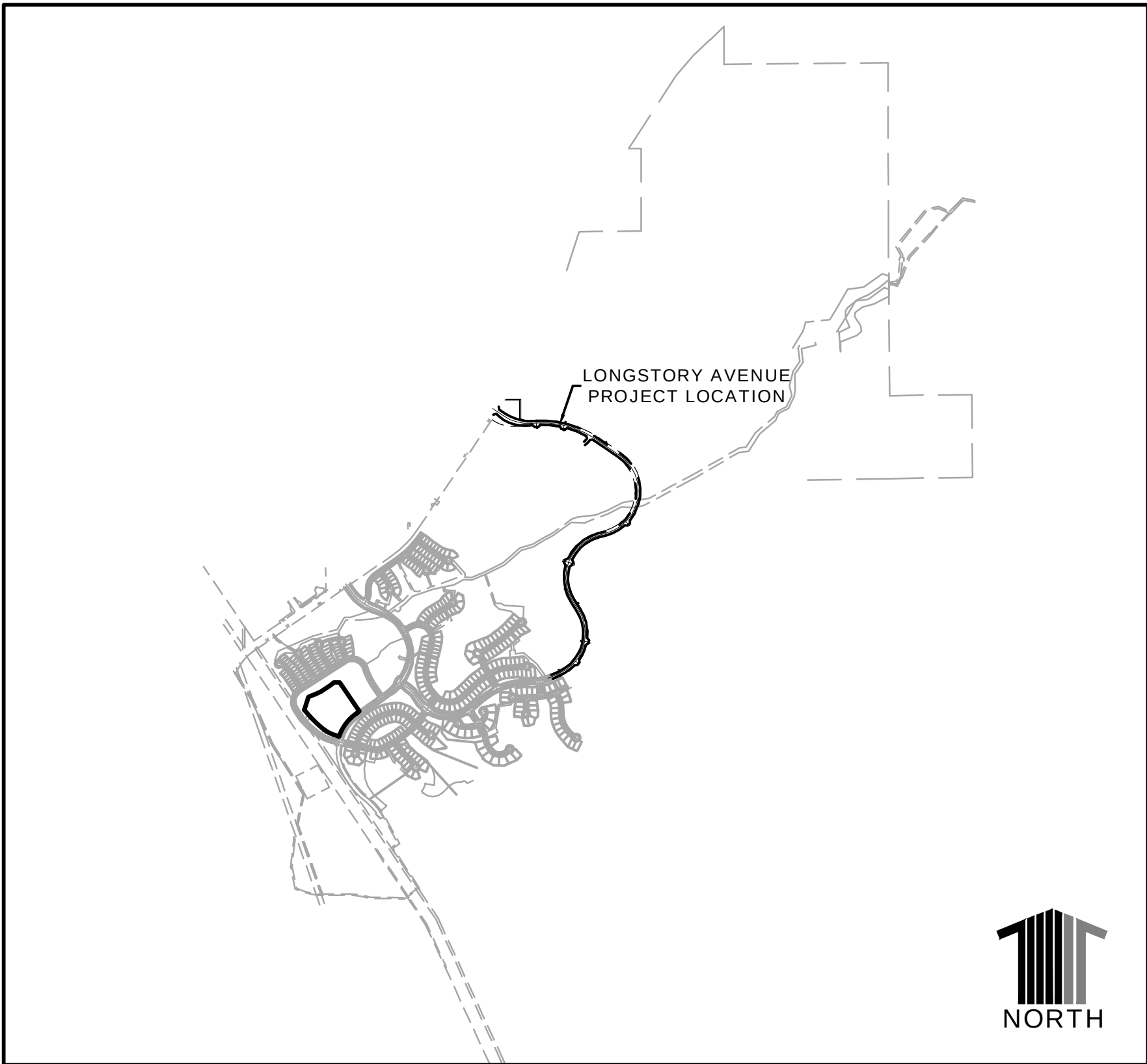


BRIAN K. MOSS
REGISTERED PROFESSIONAL ENGINEER
STATE OF COLORADO NO. 37702
DATE


ASSISTANT DIRECTOR OF DEVELOPMENT REVIEW
12/15/2021
DATE
THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR UTILITIES ONLY.
ENGINEERING DIVISION ACCEPTANCE BLOCK

LEGEND

ROW/PROPERTY LINE	---
CENTERLINE	---
PROPERTY BOUNDARY	---
EASEMENT	---
PROP. WATER MAIN	W-W
PROP. WATER VALVE	⋈
PROP. FIRE HYDRANT	←
PROP. SANITARY SEWER MAIN	→⊙→
PROP. STORM DRAIN	→⊙→
PROP. STORM DRAIN INLET	⊞
SANITARY SEWER MANHOLE NUMBER	16
STORM DRAINAGE MANHOLE NUMBER	MH-5
EX. GAS MAIN	G-G
EX. WATER MAIN	W-W
EX. WATER VALVE	⋈
EX. FIRE HYDRANT	←
EX. SANITARY SEWERS	→⊙→
EX. STORM DRAIN	→⊙→
EX. STORM DRAIN INLET	⊞
EX. POWER POLE	⊙
EX. UNDERGROUND ELECTRIC	E-E
EX. UNDERGROUND TELEPHONE	T-T
EX. FENCE	X-X



VICINITY MAP

SCALE: 1"=2000'

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

BASIS OF BEARINGS:

EAST LINE OF THE SOUTHWEST ONE-QUARTER OF THE SOUTHWEST ONE-QUARTER OF SAID SECTION 20, MONUMENTED ON THE NORTH END BY A FOUND 3-1/4" ALUMINUM CAP STAMPED "PLS 131155" AND ON THE SOUTH END BY A FOUND 2-1/2" ALUMINUM CAP STAMPED "PLS 23515" "2003", ASSUMED TO BEAR SOUTH 00°30'17" EAST 1,324.72 FEET.

OWNER/DEVELOPER:

HT CANYONS SOUTH DEVELOPMENT LP
1144 15TH STREET, SUITE 2600
DENVER, CO 80202
(720) 932-0522
CONTACT: RICHARD CROSS

SURVEYOR:

AZTEC CONSULTANTS, INC
300 EAST MINERAL AVENUE, SUITE 1
LITTLETON, CO 80122
(303) 713-1898
CONTACT: DANIEL DAVIS

TOWN OF CASTLE ROCK

100 NORTH WILLCOX STREET
CASTLE ROCK, CO 80104
(720) 733-2202
CONTACT: KEITH JOHNSTON

SOILS ENGINEER:

CTL/THOMPSON
1971 WEST 12th AVENUE
DENVER, CO 80204
(303) 825-0777
CONTACT: DAVID GLATER

ENGINEER:

CALIBRE ENGINEERING, INC.
9090 SOUTH RIDGELINE BOULEVARD, SUITE 105
HIGHLANDS RANCH, CO 80129
(303) 730-0434
CONTACT: BRIAN MOSS



1-800-922-1987

Utility Notification
Center of Colorado

Administrative Office 303-232-1991
16361 Table Mountain Parkway
Golden, Co. 80403

CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG,
GRADE OR EXCAVATE FOR THE MARKING OF
UNDERGROUND MEMBER UTILITIES.

CALIBRE ENGINEERING, INC. ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS (HORIZONTAL AND VERTICAL). THE EXISTING UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE LOCATIONS OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES.

Hines

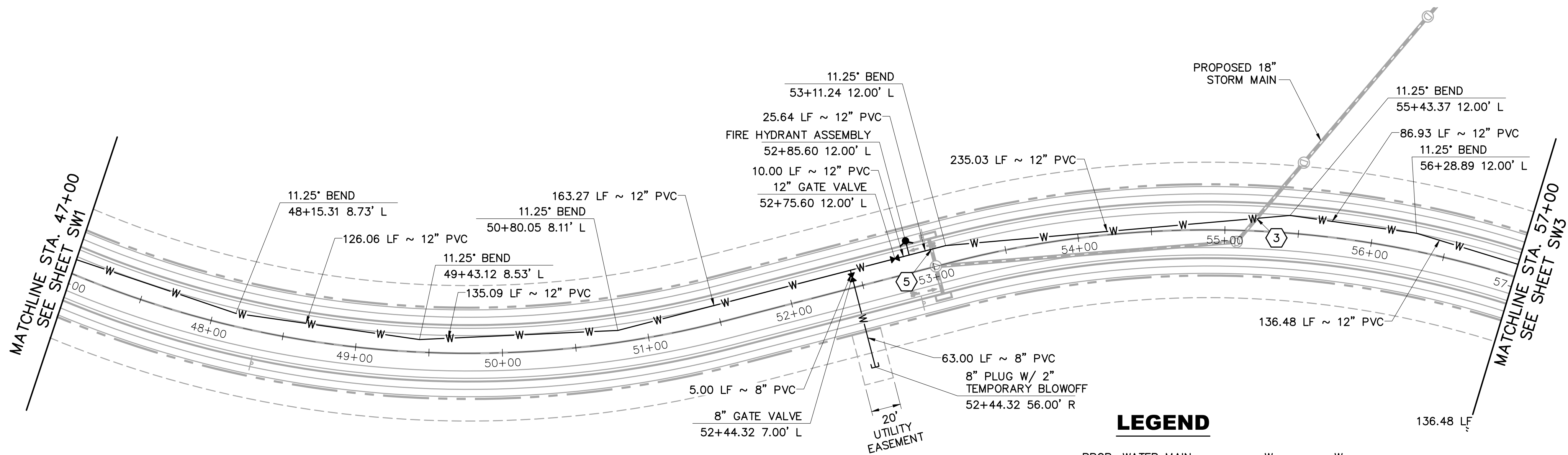
Drawing Name 38T1.dwg			
Job Number HINES CS3			
Prepared For HINES	Designer KWS	Drafter JAH	Checked BKM

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9090 South Ridgeline Boulevard, Suite 105
Highlands Ranch, CO 80129 (303) 730-0434
www.calibre-engineering.com
Construction Management Civil Engineering Surveying

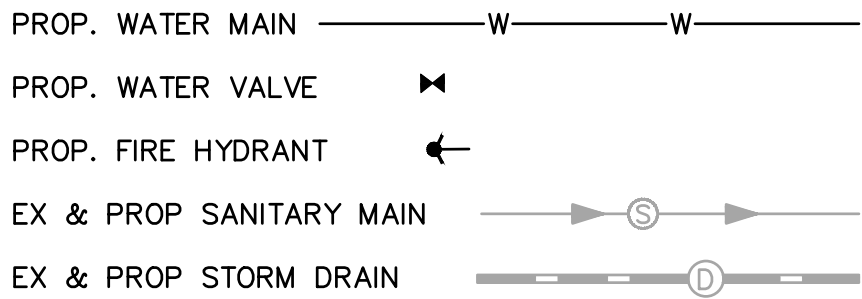
CANYONS SOUTH - LONGSTORY
SANITARY SEWER AND WATER PLANS
TITLE SHEET

Sheet T1	1 of 17
Date DECEMBER 1, 2021	

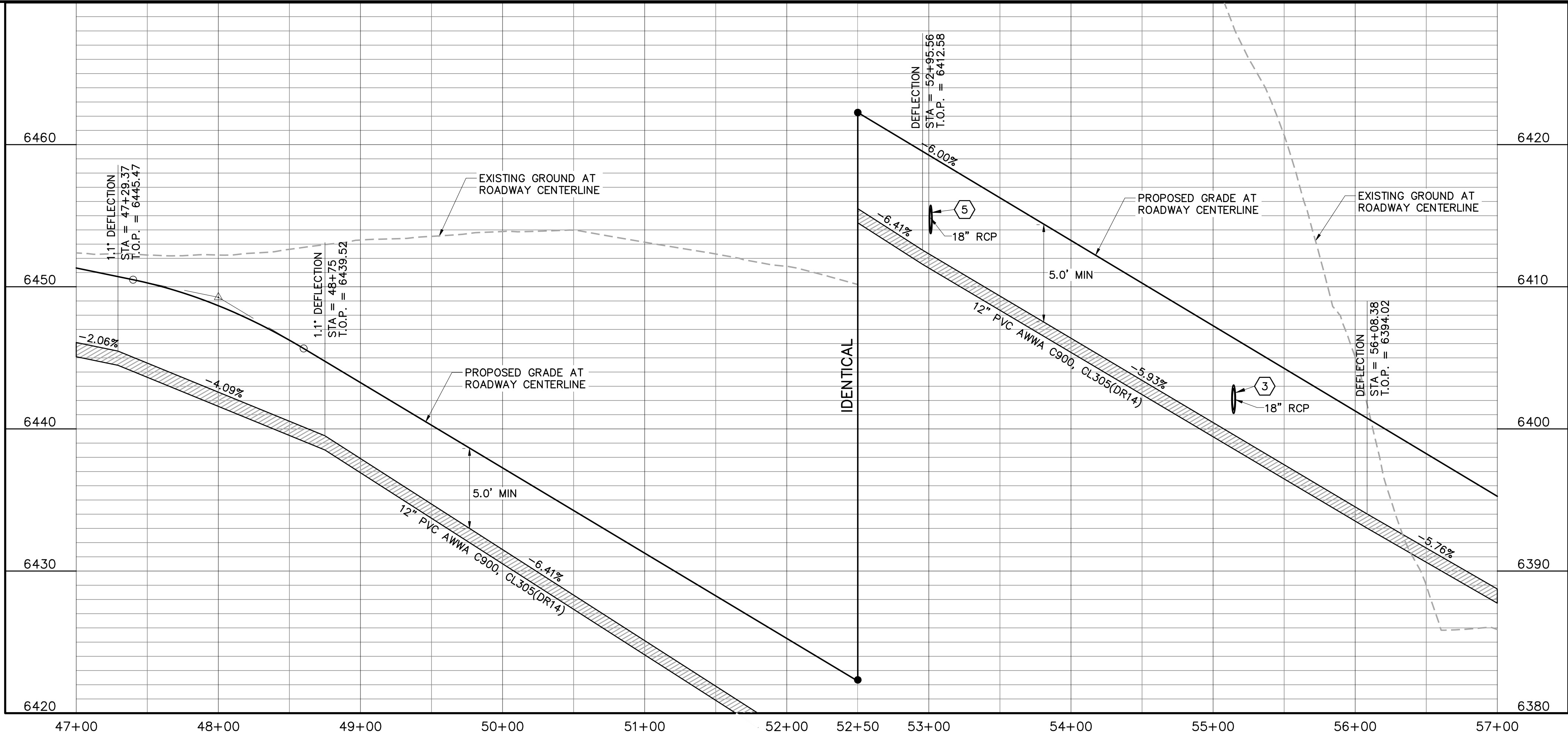


UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
3	18" RCP	BOP=6400.98	OVER	8" PVC WAT	TOP=6399.48	1.50'
5	18" RCP	BOP=6413.86	OVER	12" PVC WAT	TOP=6412.36	1.50'

LEGEND



LONGSTORY AVENUE



KEYMAP CONSTRUCTION NOTES:

- ALL WATER MAINS CONSTRUCTION WITHIN THE CANYONS SOUTH SITE WILL CONFORM TO TOWN OF CASTLE ROCK DEVELOPMENT SERVICES DEPARTMENT.
- THE CANYONS SOUTH SITE IS WITHIN THE RED PRESSURE ZONE IN ITS ENTIRETY.
- REFERENCE CANYONS SOUTH FILING NO. 1A PROPOSED ROADWAY AND STORM DRAINAGE PLANS FOR ROADWAY AND STORM SEWER INFORMATION. REFERENCE CANYONS SOUTH FILING NO. 1A SANITARY SEWER OUTFALL PLANS FOR SANITARY SEWER OUTFALL INFORMATION.
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- CONTRACTOR SHALL PROVIDE A MINIMUM SEVENTY TWO (72) HOURS' NOTICE TO THE ON-SITE TCR CONSTRUCTION INSPECTOR, (720) 733-2200, PRIOR TO MAKING ANY CONNECTIONS OR TIE-INS TO EXISTING WATER SYSTEM PROVIDED THAT THE UTILITY TIE-IN DOES NOT DISRUPT SERVICE TO EXISTING CR WATER CUSTOMERS. IF THE TIE-IN WILL DISRUPT UTILITY SERVICE, THEN CONTRACTOR SHALL PROVIDE A MINIMUM OF THREE (3) WEEKS' NOTICE TO THE TCR CONSTRUCTION INSPECTOR TO ALLOW TIME FOR CR WATER TO PROVIDE WRITTEN NOTIFICATION TO EXISTING CUSTOMERS AFFECTED BY THE TIE-IN. ALL TOWN UTILITY TIE-INS MUST BE APPROVED BY CR WATER PRIOR TO COMMENCING WORK.
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- ALL MANHOLES LOCATED OUTSIDE OF PAVED ROW SHALL BE CONSTRUCTED WITH A LOCKING-TYPE COVER WITH THE MANHOLE RING BOLTED TO THE MANHOLE CONE.

1 INDICATES UTILITY CROSSING NUMBER
(SEE CROSSING TABLE LEFT COLUMN)

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68



1-800-922-1987
Utility Notification
Center of Colorado

TOWN APPROVAL BLOCK

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

APPROVED BY:



Approved CD21-0018 Construction
Documents.pdf
Record Document on File

DEVELOPMENT SERVICES DATE

PATH: J:\HINES CS\CADD\CIVIL\38 LONGSTORY SANITARY AND WATER\38SW1-SW4.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 12/1/2021 11:21 AM
XREFS:

DATE	REVISION	DESCRIPTION

Hines

Drawing Name 38SW1-SW4.dwg	0 25 50 100
Job Number HINES CS3	1 inch = 50 ft. Horizontal 1 inch = 5 ft. Vertical
Prepared For HINES	Designer KWS
	Drafter JAH
	Checked BKM

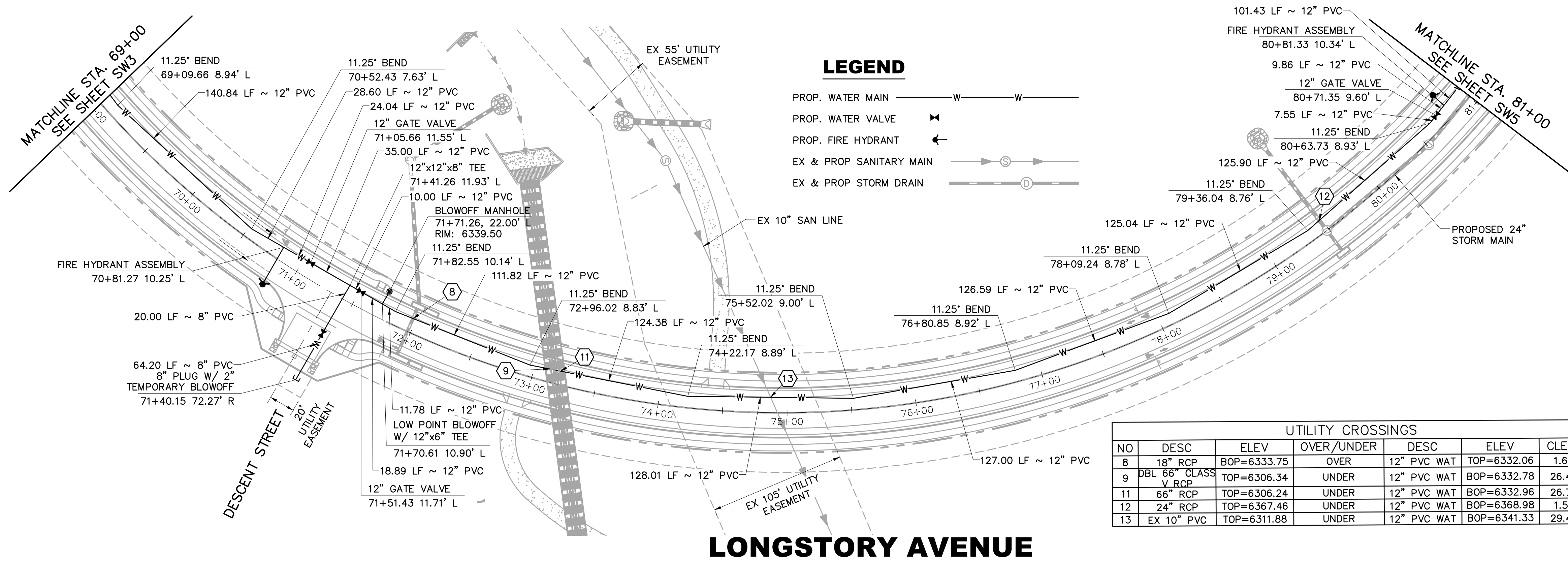


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www.calibre-engineering.com
Construction Management Civil Engineering Surveying

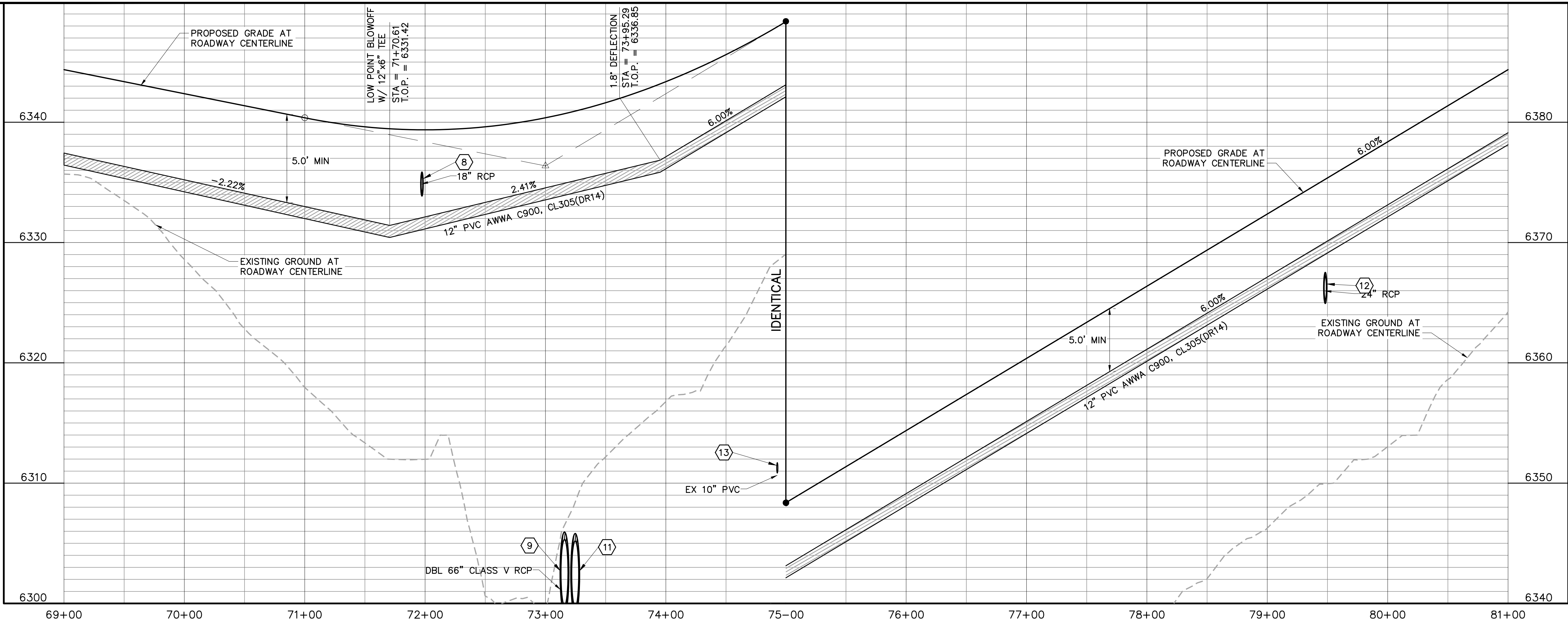
CANYONS SOUTH - LONGSTORY SANITARY SEWER AND WATER PLANS WATER PLAN AND PROFILE

PATH: J:\HINES\CS\CADD\CIVIL\38 LONGSTORY SANITARY AND WATER\38SW1-SW4.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 12/1/2021 11:22 AM
XREFS:



UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
8	18" RCP	BOP=6333.75	OVER	12" PVC WAT	TOP=6332.06	1.69'
9	DBL 66" CLASS V RCP	TOP=6306.34	UNDER	12" PVC WAT	BOP=6332.78	26.44'
11	66" RCP	TOP=6306.24	UNDER	12" PVC WAT	BOP=6332.96	26.72'
12	24" RCP	TOP=6367.46	UNDER	12" PVC WAT	BOP=6368.98	1.53'
13	EX 10" PVC	TOP=6311.88	UNDER	12" PVC WAT	BOP=6341.33	29.45'

LONGSTORY AVENUE



- KEYMAP**
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- 1 INDICATES UTILITY CROSSING NUMBER (SEE CROSSING TABLE LEFT COLUMN)
- PROJECT BENCHMARK:**
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68
- 811** UNCC CALL BEFORE YOU DIG
811 OR 1-800-922-1987
Utility Notification Center of Colorado
- TOWN APPROVAL BLOCK**
TOWN OF CASTLE ROCK APPROVAL PLANS ARE HEREBY APPROVED FOR ONE YEAR FROM DATE OF DEVELOPMENT SERVICES APPROVAL
- APPROVED BY: 
- DEVELOPMENT SERVICES DATE

Hines

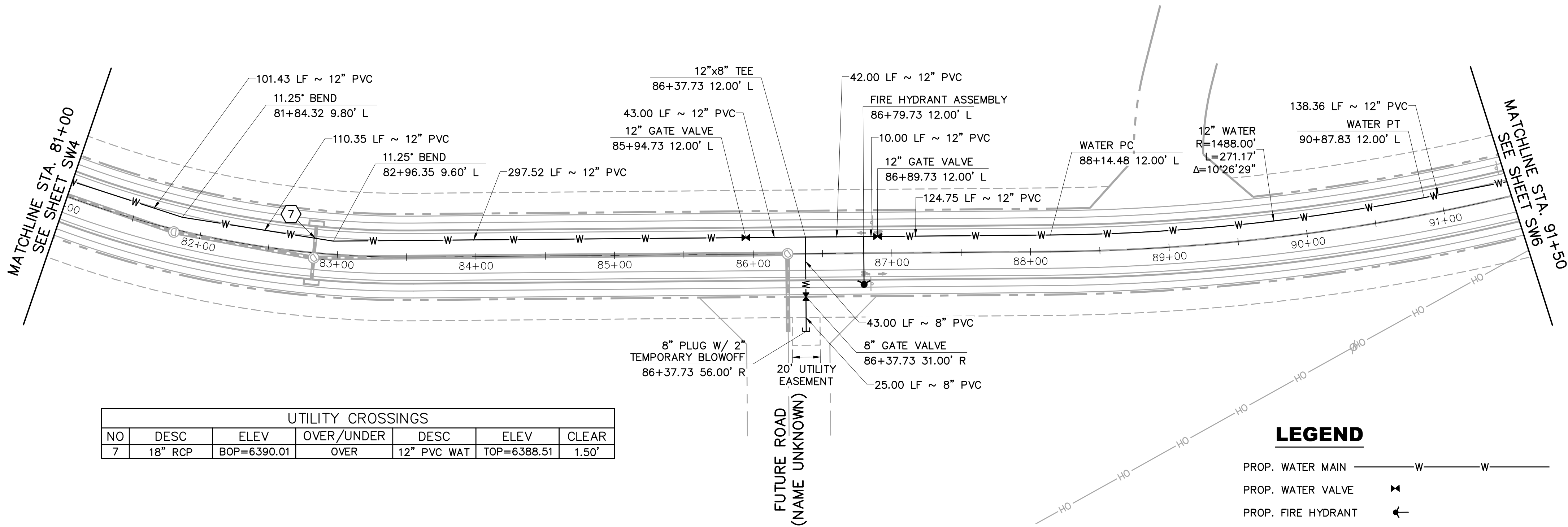
Drawing Name
38SW1-SW4.dwg
Job Number
HINES CS3
Prepared For
HINES
Designer
KWS
Drafter
JAH
Checked
BKM



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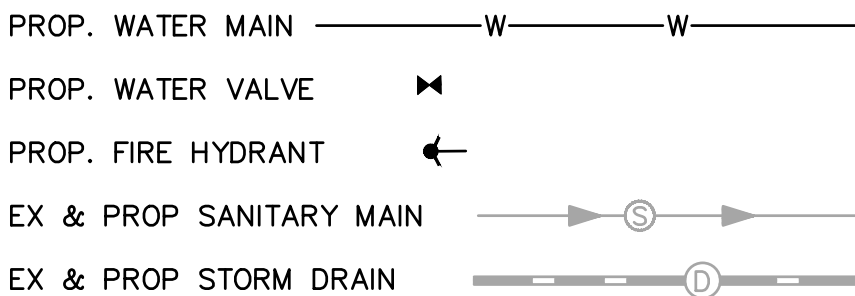
CANYONS SOUTH - LONGSTORY
SANITARY SEWER AND WATER PLANS
WATER PLAN AND PROFILE

Sheet
SW4
of
17
Date
DECEMBER 1, 2021

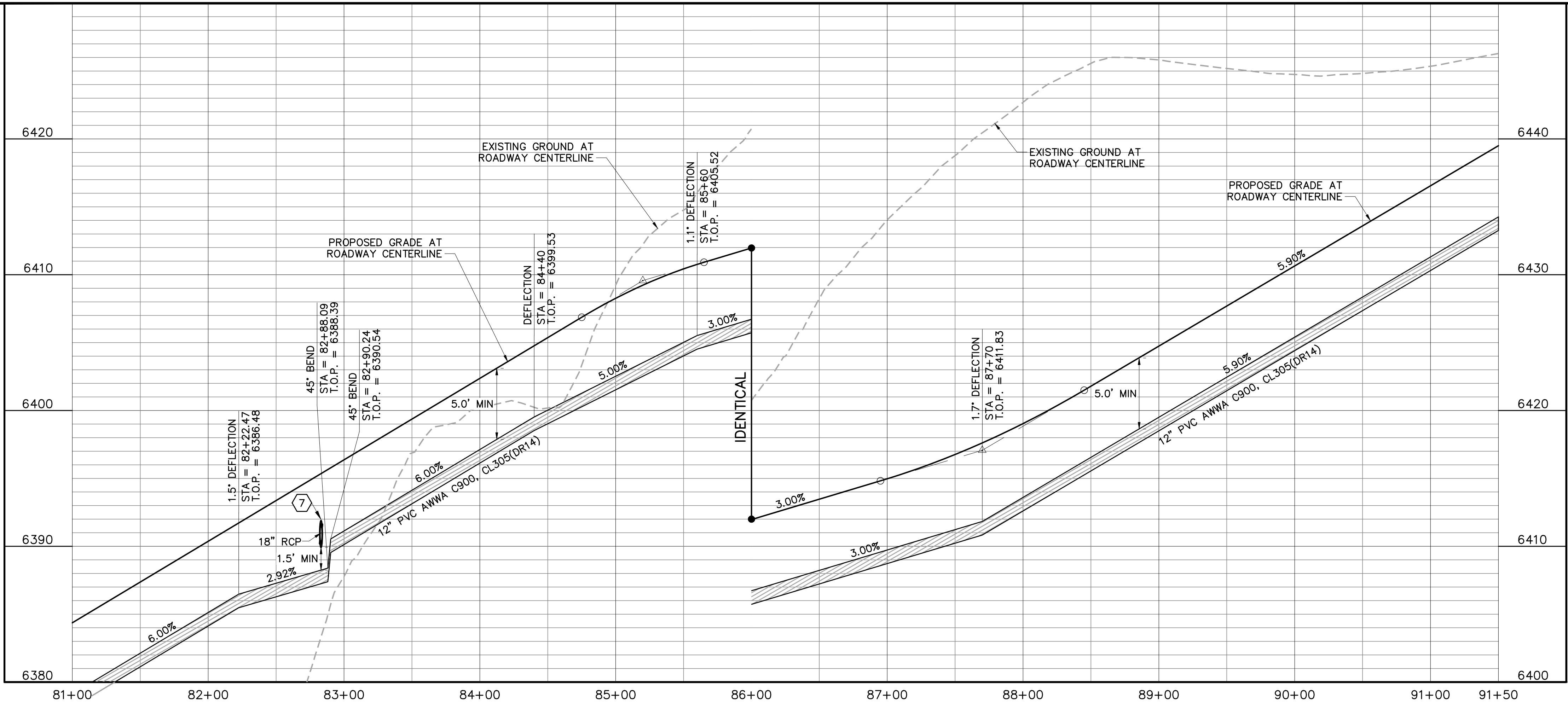
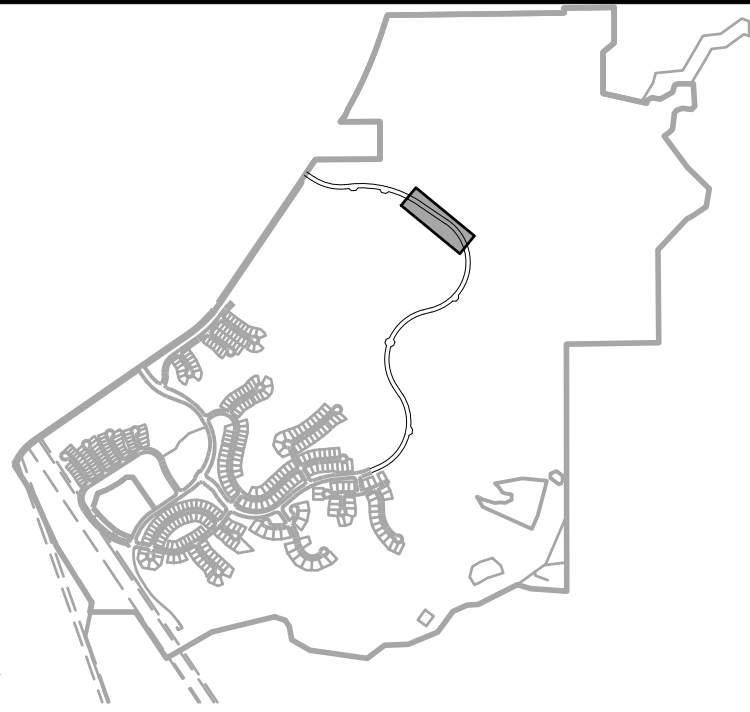


UTILITY CROSSINGS					
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV
7	18" RCP	BOP=6390.01	OVER	12" PVC WAT	TOP=6388.51

LEGEND



LONGSTORY AVENUE



KEYMAP

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- 1 INDICATES UTILITY CROSSING NUMBER (SEE CROSSING TABLE LEFT COLUMN)

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68



1-800-922-1987
Utility Notification
Center of Colorado

TOWN APPROVAL BLOCK

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

APPROVED BY:



DEVELOPMENT SERVICES DATE

DATE	REVISION	DESCRIPTION

Hines

Drawing Name	38SW5-SW7.dwg
Job Number	HINES CS3
Prepared For	HINES

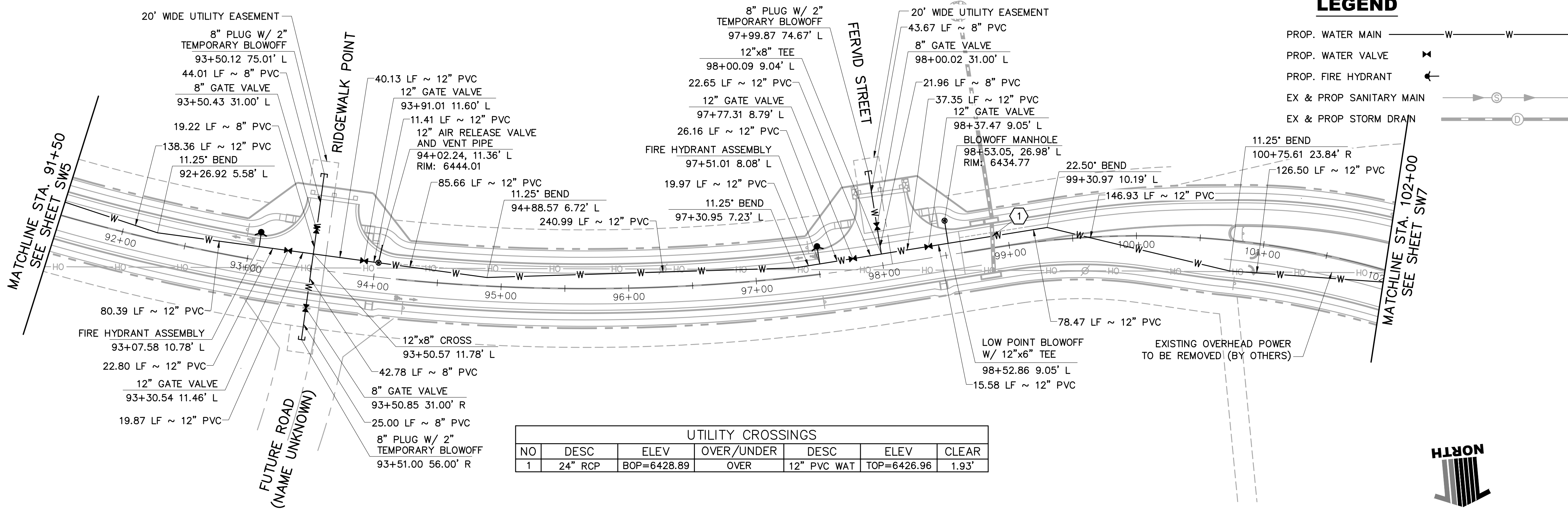
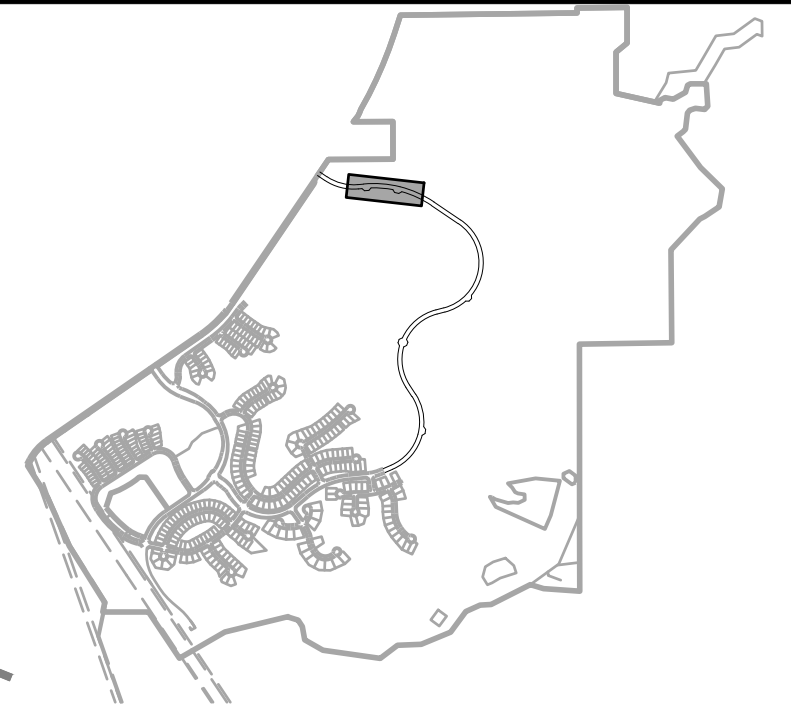
1 inch = 50 ft. Horizontal 1 inch = 5 ft. Vertical	Designer	Drafter	Checked
	KWS	JAH	BKM



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Construction Management Civil Engineering Surveying

CANYONS SOUTH - LONGSTORY
SANITARY SEWER AND WATER PLANS
WATER PLAN AND PROFILE

PATH: J:\HINES\CS\ADD\CVIL\38 LONGSTORY SANITARY AND WATER\38SW5-SW7.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 12/1/2021 11:22 AM
XREFS:



KEYMAP
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PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68



TOWN APPROVAL BLOCK

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

APPROVED BY: **APPROVED**
by Dana Paulin on 12/13/2021

DEVELOPMENT SERVICES DATE

Hines

Drawing Name
38SW5-SW7.dwg
Job Number
HINES CS3
Prepared For
HINES
Designer
KWS
Drafter
JAH
Checked
BKM

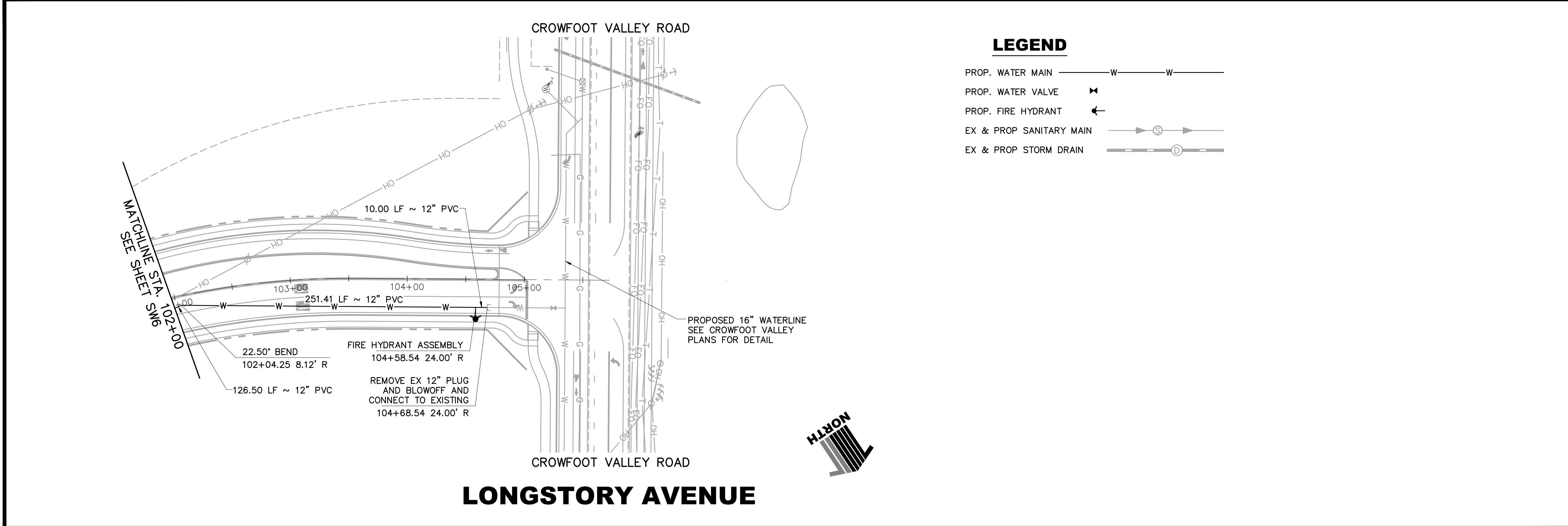


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Construction Management Civil Engineering Surveying

CANYONS SOUTH - LONGSTORY
SANITARY SEWER AND WATER PLANS
WATER PLAN AND PROFILE

Sheet
SW6
of
17
Date
DECEMBER 1, 2021

PATH: J:\HINES CS\CADD\CIVIL\38 LONGSTORY SANITARY AND WATER\38SW5-SW7.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 12/1/2021 11:22 AM
XREFS:



KEYMAP

CONSTRUCTION NOTES:

- ALL WATER MAINS CONSTRUCTION WITHIN THE CANYONS SOUTH SITE WILL CONFORM TO TOWN OF CASTLE ROCK DEVELOPMENT SERVICES DEPARTMENT.
- THE CANYONS SOUTH SITE IS WITHIN THE RED PRESSURE ZONE IN ITS ENTIRETY.
- REFERENCE CANYONS SOUTH FILING NO. 1A PROPOSED ROADWAY AND STORM DRAINAGE PLANS FOR ROADWAY AND STORM SEWER INFORMATION. REFERENCE CANYONS SOUTH FILING NO. 1A SANITARY SEWER OUTFALL PLANS FOR SANITARY SEWER OUTFALL INFORMATION.
- IN ALL LOCATIONS WHERE STORM SEWER CROSSES WATER, ABOVE OR BELOW, EACH STORM SEWER JOINT WITHIN THE TRENCH WIDTH OF THE CROSSING SHALL BE ENCASED IN A 6" THICK CONCRETE COLLAR EXTENDING 6" BEYOND BOTH SIDES OF THE JOINT. MANHOLE RIMS SHALL BE SET 8"-12" ABOVE THE GRADE AND ALL MANHOLE RIMS TO BE SET OUTSIDE THE MAINTENANCE PATH.
- ALL MAINTENANCE ACCESS ROADS SHALL NOT EXCEED 4% CROSS SLOPE OR 10% LONGITUDINAL SLOPE AND SHALL BE A MINIMUM 12' PER TOWN OF CASTLE ROCK CRITERIA.
- CONTRACTOR SHALL PROVIDE A MINIMUM SEVENTY TWO (72) HOURS' NOTICE TO THE ON-SITE TCR CONSTRUCTION INSPECTOR, (720) 733-2200, PRIOR TO MAKING ANY CONNECTIONS OR TIE-INS TO EXISTING WATER SYSTEM PROVIDED THAT THE UTILITY TIE-IN DOES NOT DISRUPT SERVICE TO EXISTING CR WATER CUSTOMERS. IF THE TIE-IN WILL DISRUPT UTILITY SERVICE, THEN CONTRACTOR SHALL PROVIDE A MINIMUM OF THREE (3) WEEKS' NOTICE TO THE TCR CONSTRUCTION INSPECTOR TO ALLOW TIME FOR CR WATER TO PROVIDE WRITTEN NOTIFICATION TO EXISTING CUSTOMERS AFFECTED BY THE TIE-IN. ALL TOWN UTILITY TIE-INS MUST BE APPROVED BY CR WATER PRIOR TO COMMENCING WORK.
- CONTRACTOR SHALL NOTIFY CASTLE ROCK WATER OF ANY WORK THAT REQUIRES SHUTDOWN OR INTERRUPTION OF SERVICE OF EXISTING WATER MAINS THREE WEEKS PRIOR TO THE PROPOSED SHUTDOWN OR INTERRUPTION UNLESS OTHERWISE APPROVED BY CASTLE ROCK WATER.
- WHERE WATER MAINS ARE CONSTRUCTED IN FILL AREAS, ALL FILL MATERIALS SHALL BE PLACED AND COMPACTED TO FINAL GRADE PRIOR TO THE INSTALLATION OF THE WATER MAIN AND APPURTENANCES. ALL FILL MATERIAL SHALL MEET THE TOWN'S STANDARDS AND BE APPROVED BY CASTLE ROCK WATER. WATER MAINS WITHIN FILL AREAS SHALL HAVE RESTRAINED JOINTS IN ACCORDANCE WITH STANDARD DETAIL W-18.
- ALL MANHOLES LOCATED OUTSIDE OF PAVED ROW SHALL BE CONSTRUCTED WITH A LOCKING-TYPE COVER WITH THE MANHOLE RING BOLTED TO THE MANHOLE CONE.

1 INDICATES UTILITY CROSSING NUMBER (SEE CROSSING TABLE LEFT COLUMN)

PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

811 UNCC CALL BEFORE YOU DIG
811 OR 1-800-922-1987
Utility Notification Center of Colorado

TOWN APPROVAL BLOCK

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

APPROVED BY:  **APPROVED**
by Dana Paulin on 12/13/2021

Approved CD21-0018 Construction documents per Record Document on File

DEVELOPMENT SERVICES DATE

DATE	REVISION	DESCRIPTION



Drawing Name 38SW5-SW7.dwg
Job Number HINES CS3
Prepared For HINES

0 25 50 100
1 inch = 50 ft. Horizontal 1 inch = 5 ft. Vertical
Designer KWS
Drafter JAH
Checked BKM



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9090 South Ridgeline Boulevard, Suite 105
Highlands Ranch, CO 80129 (303) 730-0434
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Construction Management Civil Engineering Surveying

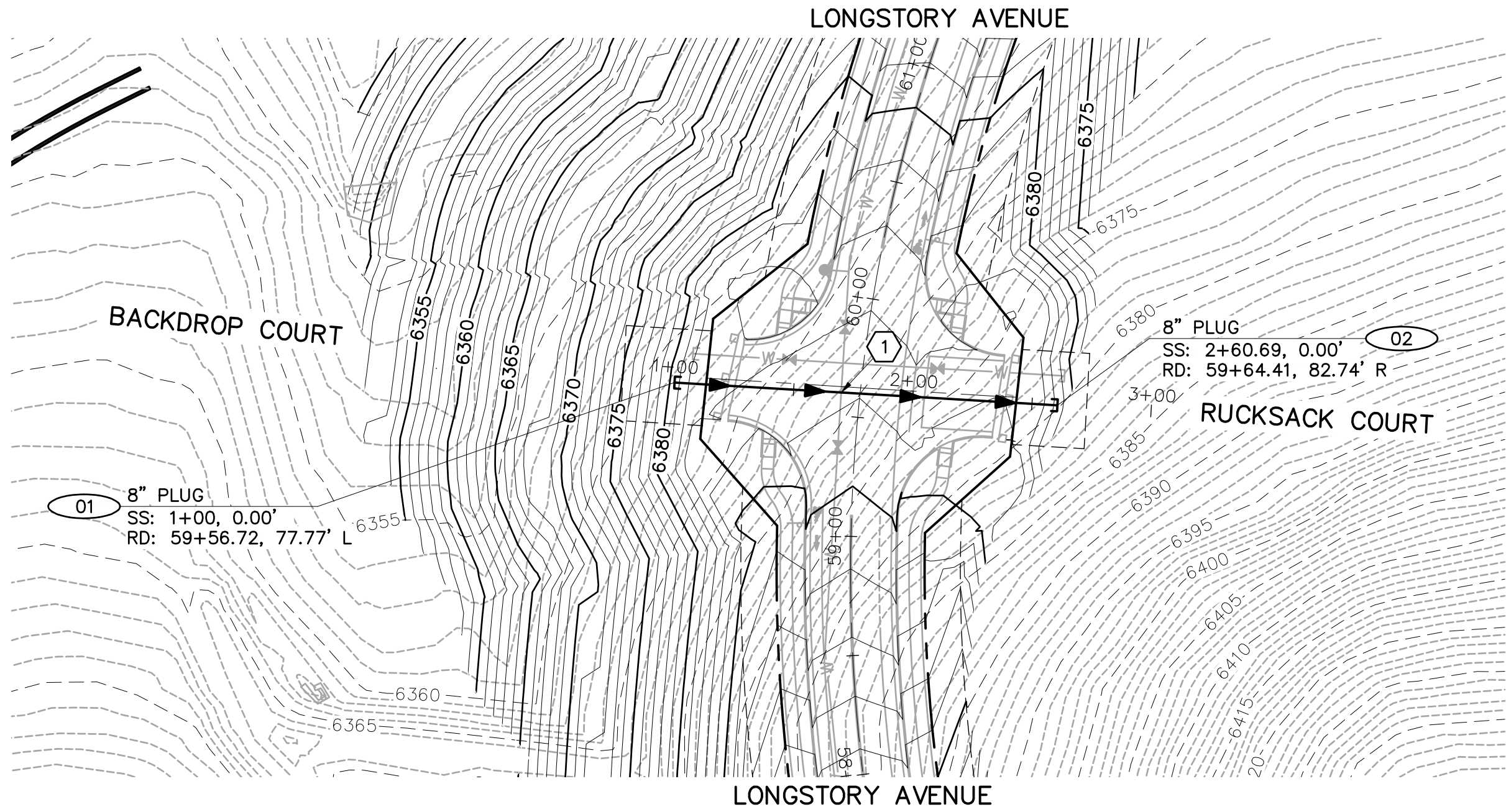
CANYONS SOUTH - LONGSTORY

SANITARY SEWER AND WATER PLANS

WATER PLAN AND PROFILE

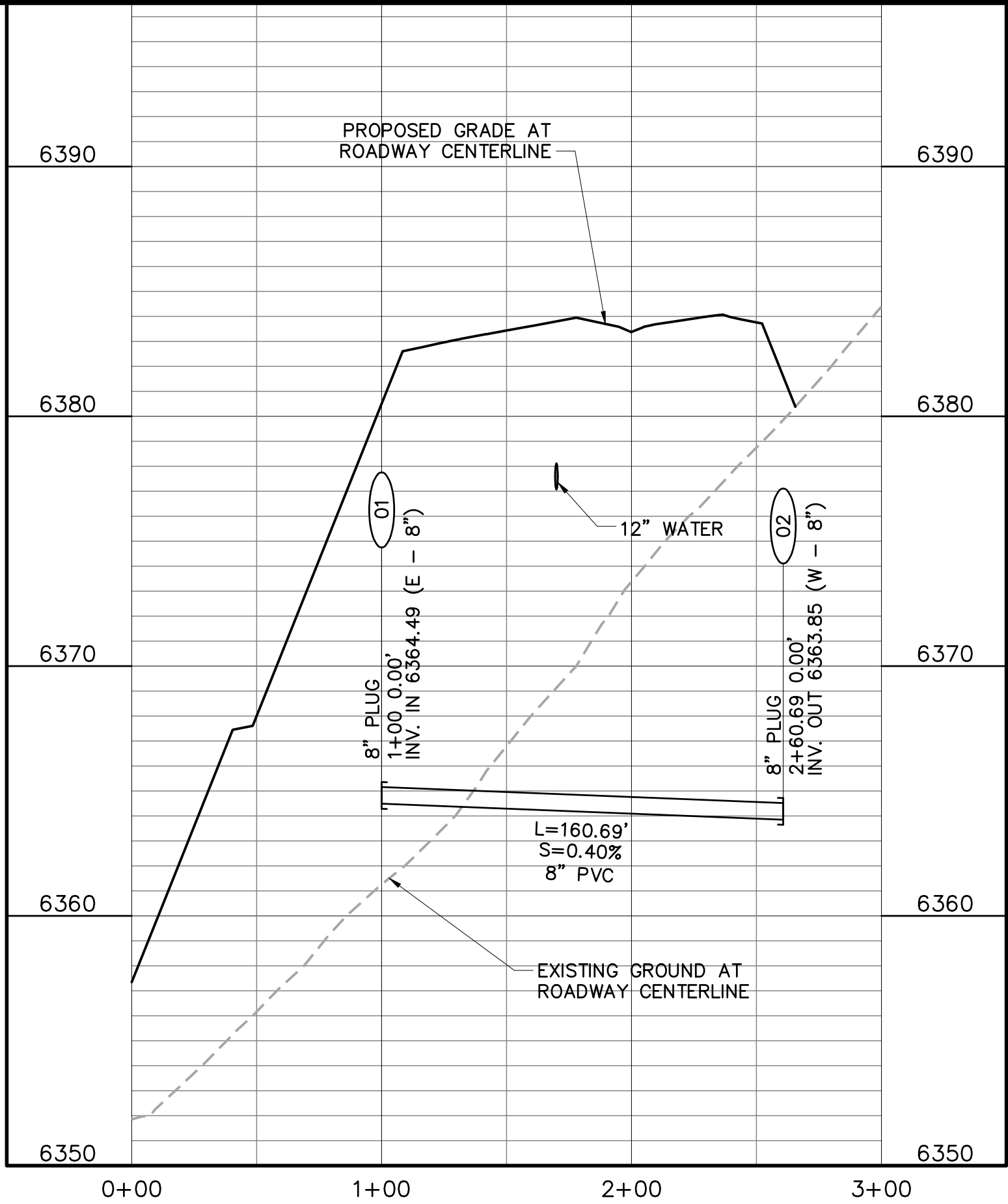
Sheet SW7	10 of 17
Date DECEMBER 1, 2021	

PATH: J:\HINES CS\CADD\CIVIL\38 LONGSTORY SANITARY AND WATER\38SW8.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 12/1/2021 11:23 AM
XREFS:



UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
1	8" PVC	TOP=6364.90	UNDER	12" PVC WAT	BOP=6377.06	12.16'

LONGSTORY AVENUE



KEYMAP
CONSTRUCTION NOTES:

- ALL SANITARY SEWER CONSTRUCTION IS SUBJECT TO THE TOWN OF CASTLE ROCK WASTEWATER COLLECTION DESIGN CRITERIA MANUAL, WELL AS THE SANITARY SEWER CONSTRUCTION NOTES LISTED HEREIN.
- ALL SANITARY SEWER PIPELINES SHALL BE PVC, SDR-35, IN ACCORDANCE WITH ASTM D-3034, BELL AND SPIGOT WITH ELASTOMERIC SEAL.
- ALL SANITARY SEWER PIPELINES SHALL HAVE A MINIMUM COVER OF 5 FEET AND MAXIMUM COVER OF 20 FEET.
- ALL SANITARY SEWER PIPELINES SHALL BE BEDDED IN ACCORDANCE WITH TCR STANDARD DETAIL SS-8.
- ALL MANHOLE RIM ELEVATIONS GIVEN ON THESE PLANS ARE CONSIDERED APPROXIMATE. THE CONTRACTOR SHALL SET THE FINAL RIM ELEVATION BASED ON THE COMPLETE FINISH SURFACE AND PER TCR STANDARD DETAIL SS-3.
- ALL SEWER LINES SHALL HAVE A MINIMUM HORIZONTAL SEPARATION OF 10 FEET EDGE-TO-EDGE FROM ALL WATER LINES. WHERE LINES CROSS, THERE SHALL BE A MINIMUM OF 18" CLEAR VERTICAL SEPARATION.
- ALL SANITARY SEWER LINES MUST BE TESTED IN ACCORDANCE WITH SECTION 450.6 OF THE TOWN OF CASTLE ROCK CONSTRUCTION METHODOLOGY AND MATERIALS MANUAL IN THE PRESENCE OF A TCR CONSTRUCTION INSPECTOR.
- ALL SANITARY SEWER LINE TRENCHES SHALL BE SLOPED OR BRACED AND SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKERS AND THE PROTECTION OF OTHER UTILITIES, IN COMPLIANCE WITH ALL APPLICABLE STATE AND FEDERAL REQUIREMENTS. ALL EXCAVATION OPERATION SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL MANHOLES SHALL BE PLACED ON A MINIMUM OF 1' OF 3/4" WASH ROCK. IF ADDITIONAL SUBGRADE IS DISTURBED, EXCAVATION SHALL BE BACKFILLED WITH 3/4" WASH ROCK OR OTHER APPROVED STRUCTURAL SOIL COMPACTED TO 95% OF ASTM D698 UNLESS OTHERWISE INSTRUCTED BY THE INSPECTOR.

1 INDICATES UTILITY CROSSING NUMBER
(SEE CROSSING TABLE LEFT COLUMN)

PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

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1-800-922-1987
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Center of Colorado

TOWN APPROVAL BLOCK

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

APPROVED BY:  **APPROVED**
by Dana Paulin
on 12/13/2021
Approved CO21-0018 Construction
Documents.pdf
DEVELOPMENT SERVICES DATE

Hines

Drawing Name 38SW8.dwg	0 25 50 100 1 inch = 50 ft. Horizontal 1 inch = 5 ft. Vertical		
Job Number HINES CS3	Designer KWS	Drafter JAH	Checked BKM
Prepared For HINES			



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CANYONS SOUTH - LONGSTORY
SANITARY SEWER AND WATER PLANS
SANITARY SEWER PLAN AND PROFILE

Sheet
SW8
of
17
Date
DECEMBER 1, 2021

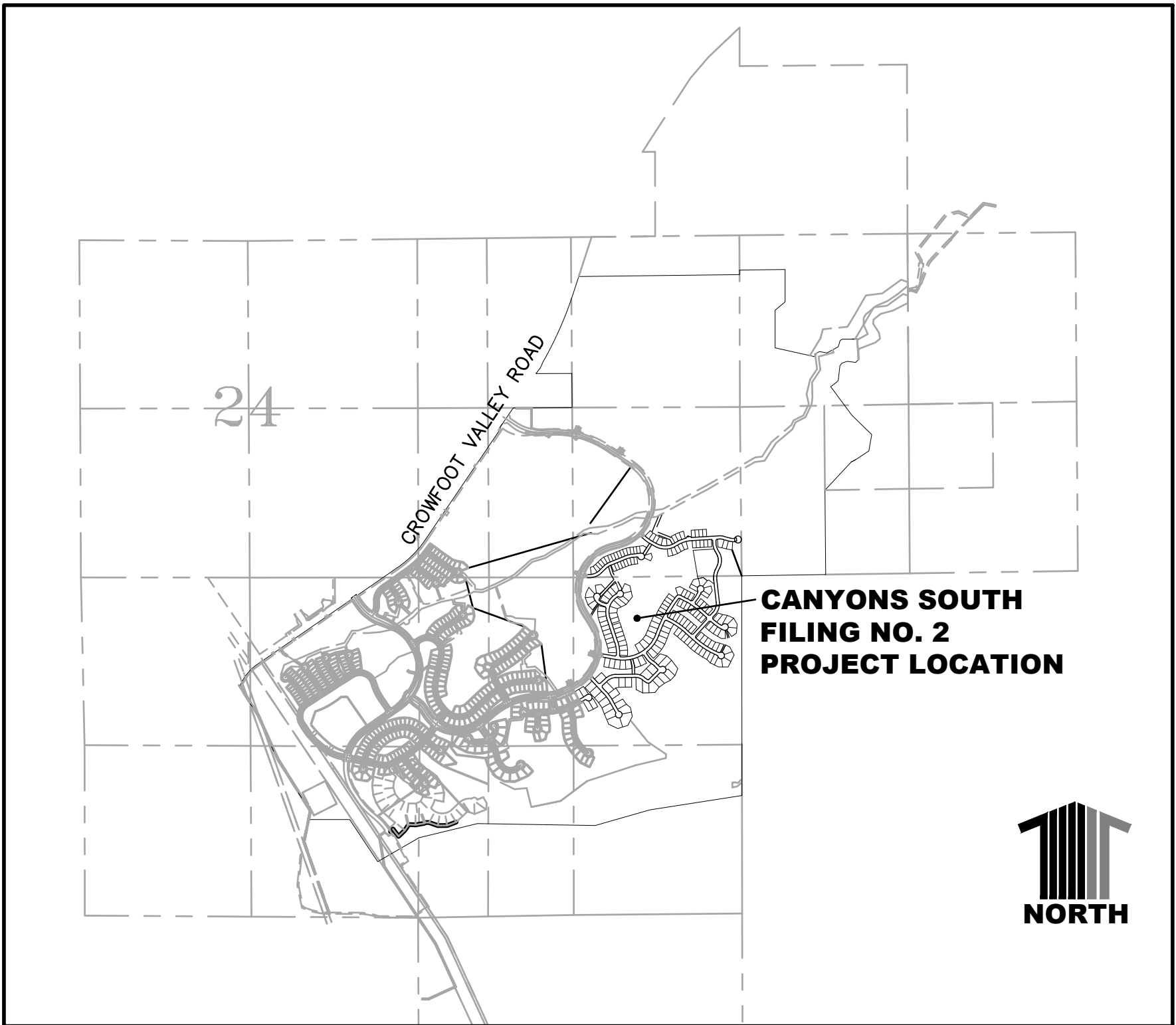
CANYONS SOUTH FILING NO. 2
PROPOSED SANITARY SEWER AND WATER PLANS
SITUATED IN PORTIONS OF SECTION 19 AND SECTION 30 IN TOWNSHIP 7 SOUTH,
RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN,
COUNTY OF DOUGLAS, STATE OF COLORADO
PROJECT NO. CD21-0023

SHEET INDEX

T1 (1)	TITLE SHEET
GN1 (2)	GENERAL NOTES
TY1 (3)	TYPICAL SECTIONS AND FIRE & TRACER WIRE NOTES
OU1-OU6 (4-9)	OVERALL UTILITY PLAN
SW1-SW20 (10-29)	SANITARY AND WATER PLAN AND PROFILE
DT1-DT2 (30-31)	DETAILS - SANITARY SEWER
DT3-DT6 (32-35)	DETAILS - WATER
35	TOTAL

LEGEND

ROW/PROPERTY LINE	---
CENTERLINE	---
PROPERTY BOUNDARY	---
EASEMENT	---
PROP. WATER MAIN	W-W
PROP. WATER VALVE	⋈
PROP. FIRE HYDRANT	←
PROP. SANITARY SEWER MAIN	→⊙→
PROP. STORM DRAIN	→⊙→
PROP. STORM DRAIN INLET	□
SANITARY SEWER MANHOLE NUMBER	16
STORM DRAINAGE MANHOLE NUMBER	MH-5
EX. GAS MAIN	G-G
EX. WATER MAIN	W-W
EX. WATER VALVE	⋈
EX. FIRE HYDRANT	←
EX. SANITARY SEWERS	→⊙→
EX. STORM DRAIN	→⊙→
EX. STORM DRAIN INLET	□
EX. POWER POLE	⊙
EX. UNDERGROUND ELECTRIC	E-E
EX. UNDERGROUND TELEPHONE	T-T
EX. FENCE	X-X



VICINITY MAP

SCALE: 1"=2000'

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

BASIS OF BEARINGS:

EAST LINE OF THE SOUTHWEST ONE-QUARTER OF THE SOUTHWEST ONE-QUARTER OF SAID SECTION 20, MONUMENTED ON THE NORTH END BY A FOUND 3-1/4" ALUMINUM CAP STAMPED "PLS 131155" AND ON THE SOUTH END BY A FOUND 2-1/2" ALUMINUM CAP STAMPED "PLS 23515" "2003", ASSUMED TO BEAR SOUTH 00°30'17" EAST 1,324.72 FEET.

OWNER/DEVELOPER:

1125 17TH STREET, SUITE 700
DENVER, CO 80202
(720) 932-0522
CONTACT: RICHARD CROSS

TOWN OF CASTLE ROCK

100 NORTH WILLCOX STREET
CASTLE ROCK, CO 80104
(720) 733-2202
CONTACT: KEITH JOHNSTON

ENGINEER:

CALIBRE ENGINEERING, INC.
9090 SOUTH RIDGELINE BLVD., SUITE 105
HIGHLANDS RANCH, CO 80129
(303) 730-0434
CONTACT: BRIAN MOSS

SURVEYOR:

AZTEC CONSULTANTS, INC
300 EAST MINERAL AVENUE, SUITE 1
LITTLETON, CO 80122
(303) 713-1898
CONTACT: DANIEL DAVIS

SOILS ENGINEER:

CTL/THOMPSON
1971 WEST 12th AVENUE
DENVER, CO 80204
(303) 825-0777
CONTACT: DAVID GLATER

PROJECT VARIANCES

NUMBER: TCV21-0099
APPROVAL DATE:

THE PROJECT VARIANCE FOR TCV21-0099 INCLUDES A WATER MAIN LENGTH EXCEEDING TOWN OF CASTLE ROCK CRITERIA IN THE PROPOSED ROCKHOP POINT. PROPER MEASURE WILL BE TAKEN FOR ACCESSIBILITY AND MAINTENANCE WHILE FOLLOWING TOWN OF CASTLE ROCK CRITERIA FOR EXTENDED LINES IN CUL-DE-SACS.

INDEMNIFICATION AND ADHERENCE TO STANDARDS STATEMENTS

THESE PLANS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR CONCEPT ONLY. THE REVIEW DOES NOT IMPLY RESPONSIBILITY BY THE REVIEWING DEPARTMENT, THE TOWN ENGINEER, OR THE TOWN OF CASTLE ROCK FOR ACCURACY AND CORRECTNESS OF THE CALCULATIONS. FURTHERMORE, THE REVIEW DOES NOT IMPLY THAT QUANTITIES OF ITEMS ON THE PLANS ARE THE FINAL QUANTITIES REQUIRED. THE REVIEW SHALL NOT BE CONSTRUED FOR ANY REASON AS ACCEPTANCE OF FINANCIAL RESPONSIBILITY BY THE TOWN FOR ADDITIONAL QUANTITIES OF ITEMS SHOWN THAT MAY BE REQUIRED DURING THE CONSTRUCTION PHASE.

ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE TOWN OF CASTLE ROCK MUNICIPAL CODE, TECHNICAL MANUALS AND/OR OTHER TOWN-APPROVED APPLICABLE STANDARDS.

TOWN APPROVAL BLOCK

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

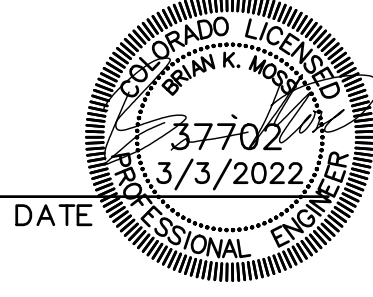
APPROVED BY:

DEVELOPMENT SERVICES DATE

PROFESSIONAL ENGINEER CERTIFICATION

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.

BRIAN K. MOSS
REGISTERED PROFESSIONAL ENGINEER
STATE OF COLORADO NO. 37702



FCO #	DATE	PURPOSE/DESCRIPTION

ASSISTANT DIRECTOR OF DEVELOPMENT REVIEW

DATE

THESE CONSTRUCTION DRAWINGS HAVE BEEN
REVIEWED BY DOUGLAS COUNTY FOR
UTILITIES ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK



1-800-922-1987

Utility Notification
Center of Colorado

Administrative Office 303-232-1991
16361 Table Mountain Parkway
Golden, Co. 80403

CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG,
GRADE OR EXCAVATE FOR THE MARKING OF
UNDERGROUND MEMBER UTILITIES.

CALIBRE ENGINEERING, INC. ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS (HORIZONTAL AND VERTICAL). THE EXISTING UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE LOCATIONS OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES.

Hines

Drawing Name 33T1.dwg			
Job Number HINES CS3			
Prepared For HINES	Designer CAP	Drafter JAH	Checked BKM

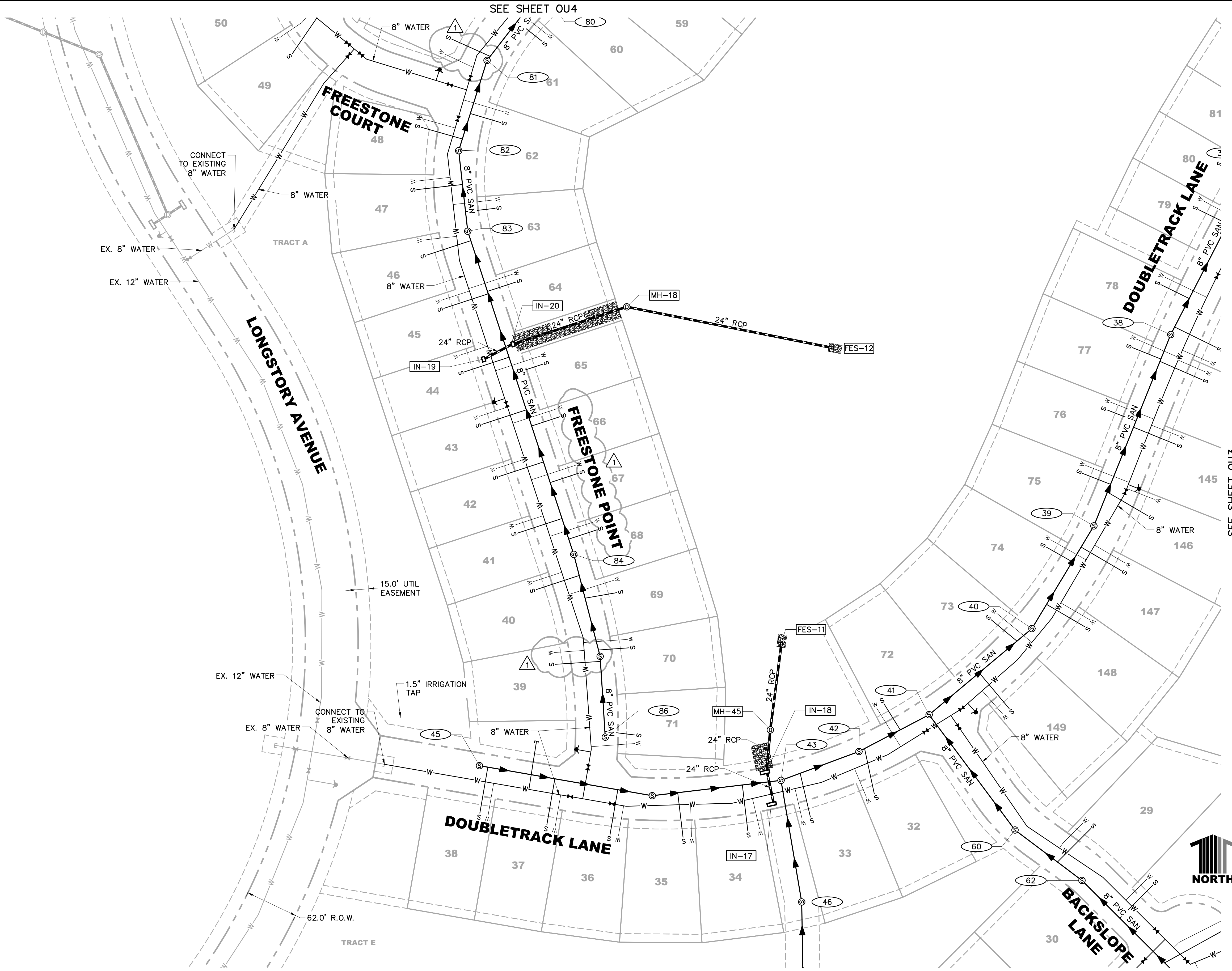
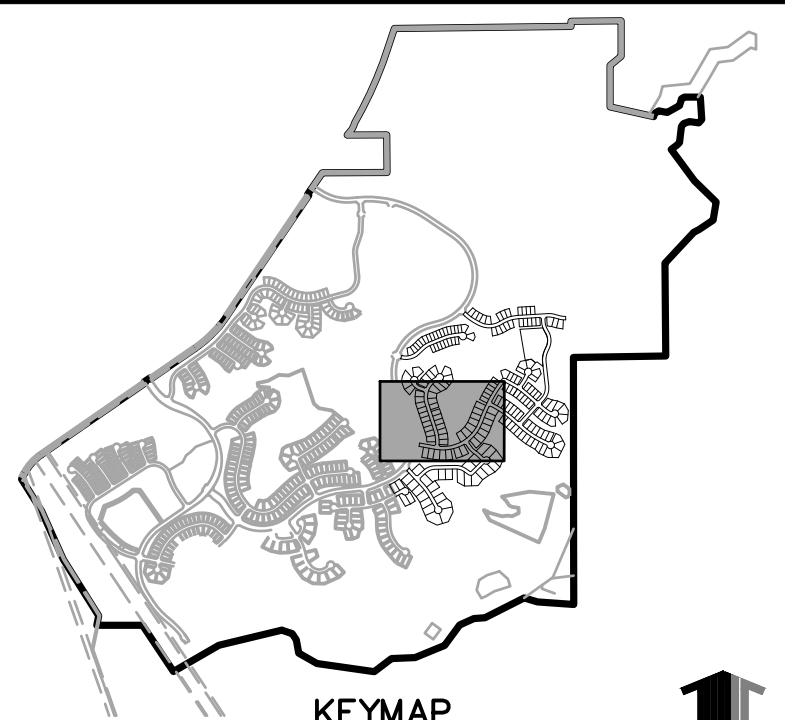
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CANYONS SOUTH FILING NO. 2
SANITARY SEWER AND WATER PLANS
TITLE SHEET

Sheet T1	1 of 35
Date JANUARY 20, 2022	

PATH: J:\HINES CS\CADD\CIVIL\32 F2 ROADWAY AND STORM DRAINAGE\32OU1-OU6.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 4/19/2022 11:09 AM
XREFS:



1. ALL WATER MAINS CONSTRUCTION WITHIN THE CANYONS SOUTH SITE WILL CONFORM TO TOWN OF CASTLE ROCK DEVELOPMENT SERVICES DEPARTMENT.
2. ALL DIMENSIONS ARE TO FLOWLINE, EXCEPT PROFILES, WHICH ARE CENTERLINE DIMENSIONS, UNLESS OTHERWISE NOTED.
3. CONTRACTOR SHALL PROVIDE A MINIMUM SEVENTY TWO (72) HOURS' NOTICE TO THE ON-SITE TCR CONSTRUCTION INSPECTOR, (720) 733-2200, PRIOR TO MAKING ANY CONNECTIONS OR TIE-INS TO EXISTING WATER SYSTEM PROVIDED THAT THE UTILITY TIE-IN DOES NOT DISRUPT SERVICE TO EXISTING CR WATER CUSTOMERS. IF THE TIE-IN WILL DISRUPT UTILITY SERVICE, THEN CONTRACTOR SHALL PROVIDE A MINIMUM OF THREE (3) WEEKS' NOTICE TO THE TCR CONSTRUCTION INSPECTOR TO ALLOW TIME FOR CR WATER TO PROVIDE WRITTEN NOTIFICATION TO EXISTING CUSTOMERS AFFECTED BY THE TIE-IN. ALL TOWN UTILITY TIE-INS MUST BE APPROVED BY CR WATER PRIOR TO COMMENCING WORK.
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LEGEND	
	PROPOSED STORM DRAIN MANHOLE
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLET
	EXISTING STORM DRAIN MANHOLE
	EXISTING STORM DRAIN
	EXISTING STORM DRAIN INLET
	PROPOSED SANITARY SEWER MAIN
	PROPOSED SANITARY SEWER MANHOLE
	EXISTING SANITARY SEWER MAIN
	EXISTING SANITARY SEWER MANHOLE
	PROPOSED WATERMAIN
	PROPOSED FIRE HYDRANT
	PROPOSED GATE VALVE
	EXISTING WATERMAIN
	EXISTING FIRE HYDRANT
	EXISTING GATE VALVE

PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68



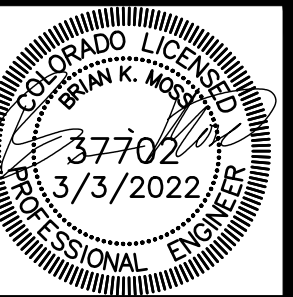
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TOWN APPROVAL BLOCK
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DATE OF DEVELOPMENT SERVICES APPROVAL
APPROVED BY: _____
DEVELOPMENT SERVICES _____ DATE _____

DATE	REVISION DESCRIPTION
04/13/2022	W/S SERVICE CHANGES AND STREET NAME CHANGE



Drawing Name 32OU1-OU6.dwg	0 30 60 120 1 inch = 120 ft. Horizontal
Job Number HINES CS3	
Prepared For HINES	Designer RLS Drafter JAH Checked BKM

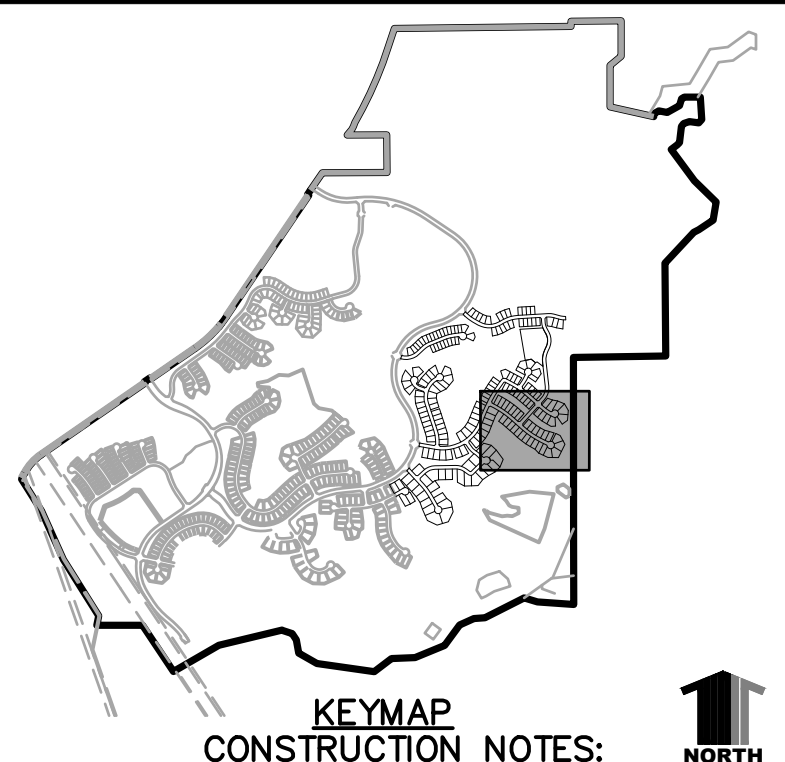




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CANYONS SOUTH FILING NO. 2
SANITARY SEWER AND WATER PLANS
OVERALL UTILITY PLAN

PATH: J:\HINES\CS\CADD\CIVIL\32 F2 ROADWAY AND STORM DRAINAGE\32OU1-OU6.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 4/19/2022 11:09 AM
XREFS:



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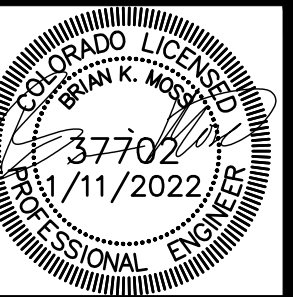
APPROVED BY: _____

DEVELOPMENT SERVICES _____ DATE _____

DATE	REVISION	DESCRIPTION



Drawing Name 32OU1-OU6.dwg	0 30 60 120 1 inch = 120 ft. Horizontal	DESIGNER RLS	DRAFTER JAH	CHECKED BKM
Job Number HINES CS3				
Prepared For HINES				



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www.calibre-engineering.com
Construction Management Civil Engineering Surveying

CANYONS SOUTH FILING NO. 2
PROPOSED ROADWAY AND STORM DRAINAGE PLANS
OVERALL UTILITY PLAN

Sheet OU3 Date JANUARY 20, 2022	6 of 35
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PATH: J:\HINES CS\CADD\CIVIL\32 F2 ROADWAY AND STORM DRAINAGE\32OU1-OU6.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 4/19/2022 11:09 AM
XREFS:



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LEGEND

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	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLET
	EXISTING STORM DRAIN MANHOLE
	EXISTING STORM DRAIN
	EXISTING STORM DRAIN INLET
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	PROPOSED SANITARY SEWER MANHOLE
	EXISTING SANITARY SEWER MAIN
	EXISTING SANITARY SEWER MANHOLE
	PROPOSED WATERMAIN
	PROPOSED FIRE HYDRANT
	PROPOSED GATE VALVE
	EXISTING WATERMAIN
	EXISTING FIRE HYDRANT
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APPROVED BY: _____

DEVELOPMENT SERVICES _____ DATE _____

PATH: J:\HINES\CS\CADD\CIVIL\32 F2 ROADWAY AND STORM DRAINAGE\32OU1-OU6.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 4/19/2022 11:09 AM
XREFS:



KEYMAP

CONSTRUCTION NOTES:

- ALL STORM DRAIN CONSTRUCTION WITHIN THE CANYONS SOUTH SITE WILL CONFORM TO DOUGLAS COUNTY STANDARDS AND SPECIFICATIONS.
- ALL DIMENSIONS ARE TO FLOWLINE, EXCEPT PROFILES, WHICH ARE CENTERLINE DIMENSIONS, UNLESS OTHERWISE NOTED.
- SEE SHEET TY1 FOR TYPICAL CONDUIT TRENCH SECTION.

LEGEND

	PROPOSED STORM DRAIN MANHOLE
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLET
	EXISTING STORM DRAIN MANHOLE
	EXISTING STORM DRAIN
	EXISTING STORM DRAIN INLET
	PROPOSED SANITARY SEWER MAIN
	EXISTING SANITARY SEWER MAIN
	EXISTING SANITARY SEWER MANHOLE
	PROPOSED WATERMAIN
	PROPOSED FIRE HYDRANT
	PROPOSED GATE VALVE
	EXISTING WATERMAIN
	EXISTING FIRE HYDRANT
	EXISTING GATE VALVE
	PROPOSED DRAINAGE SWALE
	PROPOSED CONDUIT
	PROPOSED LIGHTPOLE

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

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Utility Notification
Center of Colorado

ASSISTANT DIRECTOR OF DEVELOPMENT REVIEW

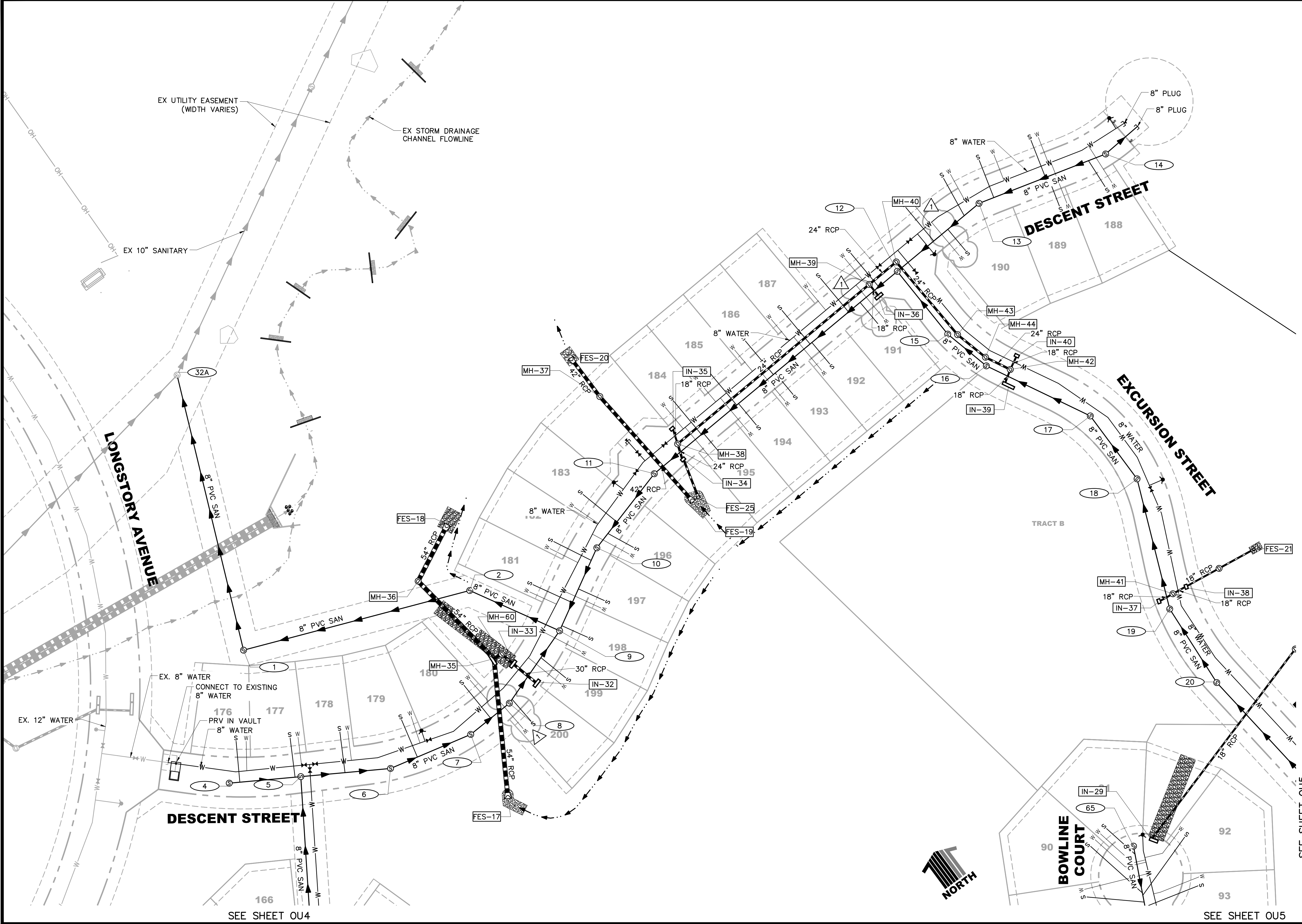
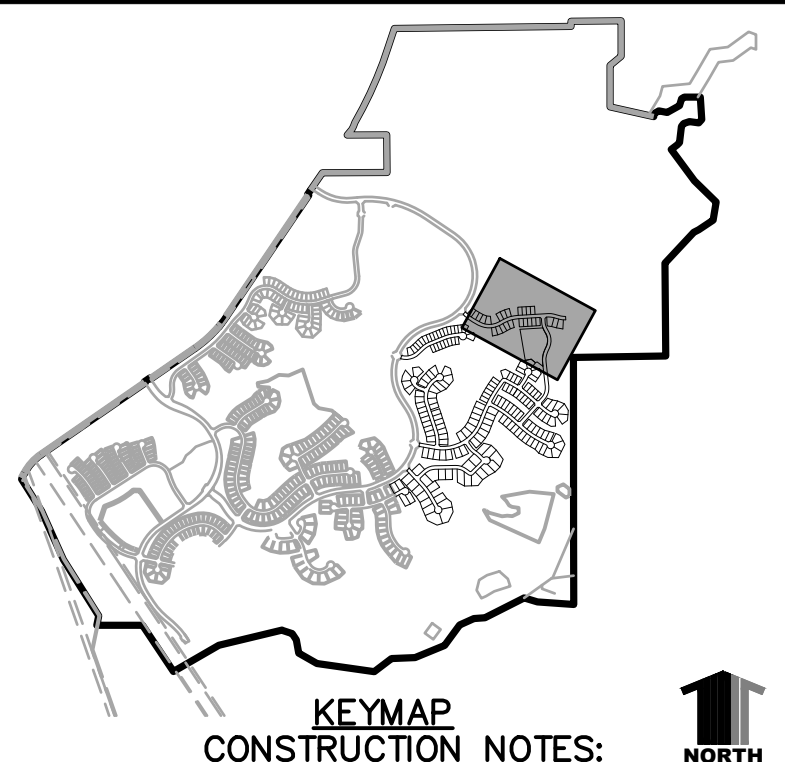
DATE

THESE CONSTRUCTION PLANS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE, AND GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK

Drawing Name 32OU1-OU6.dwg		0 30 60 120 1 inch = 120 ft. Horizontal			Calibre Calibre Engineering, Inc. 9090 South Ridgeline Boulevard, Suite 105 Highlands Ranch, CO 80129 (303) 730-0434 www.calibre-engineering.com Construction Management Civil Engineering Surveying	CANYONS SOUTH FILING NO. 2 PROPOSED ROADWAY AND STORM DRAINAGE PLANS OVERALL UTILITY PLAN	Sheet OU5 Date JANUARY 20, 2022	8 of 35
Job Number HINES CS3		Designer RLS						
Prepared For HINES								
DATE 04/13/2022		W/S SERVICE CHANGES AND STREET NAME CHANGE						
REVISION DESCRIPTION								

PATH: J:\HINES\CS\CADD\CIVIL\32 F2 ROADWAY AND STORM DRAINAGE\32OU1-OU6.DWG
PLOT BY: KYLER SANFORD PLOT DATE: 4/19/2022 11:09 AM
XREFS:



- KEYMAP CONSTRUCTION NOTES:**
1. ALL WATER MAINS CONSTRUCTION WITHIN THE CANYONS SOUTH SITE WILL CONFORM TO TOWN OF CASTLE ROCK DEVELOPMENT SERVICES DEPARTMENT.
 2. ALL DIMENSIONS ARE TO FLOWLINE, EXCEPT PROFILES, WHICH ARE CENTERLINE DIMENSIONS, UNLESS OTHERWISE NOTED.
 3. CONTRACTOR SHALL PROVIDE A MINIMUM SEVENTY TWO (72) HOURS' NOTICE TO THE ON-SITE TCR CONSTRUCTION INSPECTOR, (720) 733-2200, PRIOR TO MAKING ANY CONNECTIONS OR TIE-INS TO EXISTING WATER SYSTEM PROVIDED THAT THE UTILITY TIE-IN DOES NOT DISRUPT SERVICE TO EXISTING CR WATER CUSTOMERS. IF THE TIE-IN WILL DISRUPT UTILITY SERVICE, THEN CONTRACTOR SHALL PROVIDE A MINIMUM OF THREE (3) WEEKS' NOTICE TO THE TCR CONSTRUCTION INSPECTOR TO ALLOW TIME FOR CR WATER TO PROVIDE WRITTEN NOTIFICATION TO EXISTING CUSTOMERS AFFECTED BY THE TIE-IN. ALL TOWN UTILITY TIE-INS MUST BE APPROVED BY CR WATER PRIOR TO COMMENCING WORK.
 4. CONTRACTOR SHALL NOTIFY CASTLE ROCK WATER OF ANY WORK THAT REQUIRES SHUTDOWN OR INTERRUPTION OF SERVICE OF EXISTING WATER MAINS THREE WEEKS PRIOR TO THE PROPOSED SHUTDOWN OR INTERRUPTION UNLESS OTHERWISE APPROVED BY CASTLE ROCK WATER.

- LEGEND**
- PROPOSED STORM DRAIN MANHOLE
 - PROPOSED STORM DRAIN
 - PROPOSED STORM DRAIN INLET
 - EXISTING STORM DRAIN MANHOLE
 - EXISTING STORM DRAIN
 - EXISTING STORM DRAIN INLET
 - PROPOSED SANITARY SEWER MAIN
 - PROPOSED SANITARY SEWER MANHOLE
 - EXISTING SANITARY SEWER MAIN
 - EXISTING SANITARY SEWER MANHOLE
 - PROPOSED WATERMAIN
 - PROPOSED FIRE HYDRANT
 - PROPOSED GATE VALVE
 - EXISTING WATERMAIN
 - EXISTING FIRE HYDRANT
 - EXISTING GATE VALVE

PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

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

DATE	REVISION DESCRIPTION
04/13/2022	W/S SERVICE CHANGES AND STREET NAME CHANGE



Drawing Name 32OU1-OU6.dwg	Designer RLS	Drafter JAH	Checked BKM
Job Number HINES CS3			
Prepared For HINES			

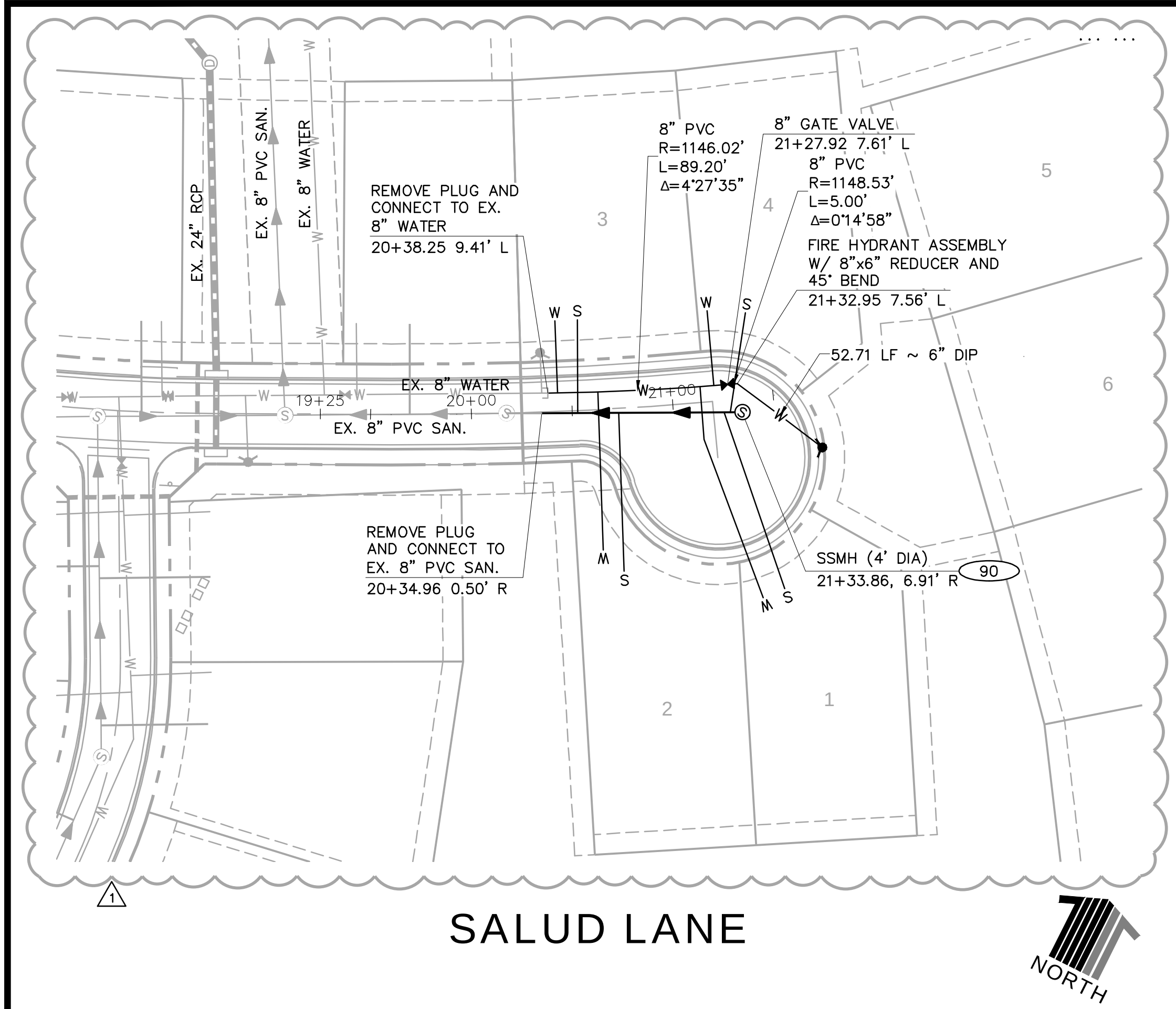
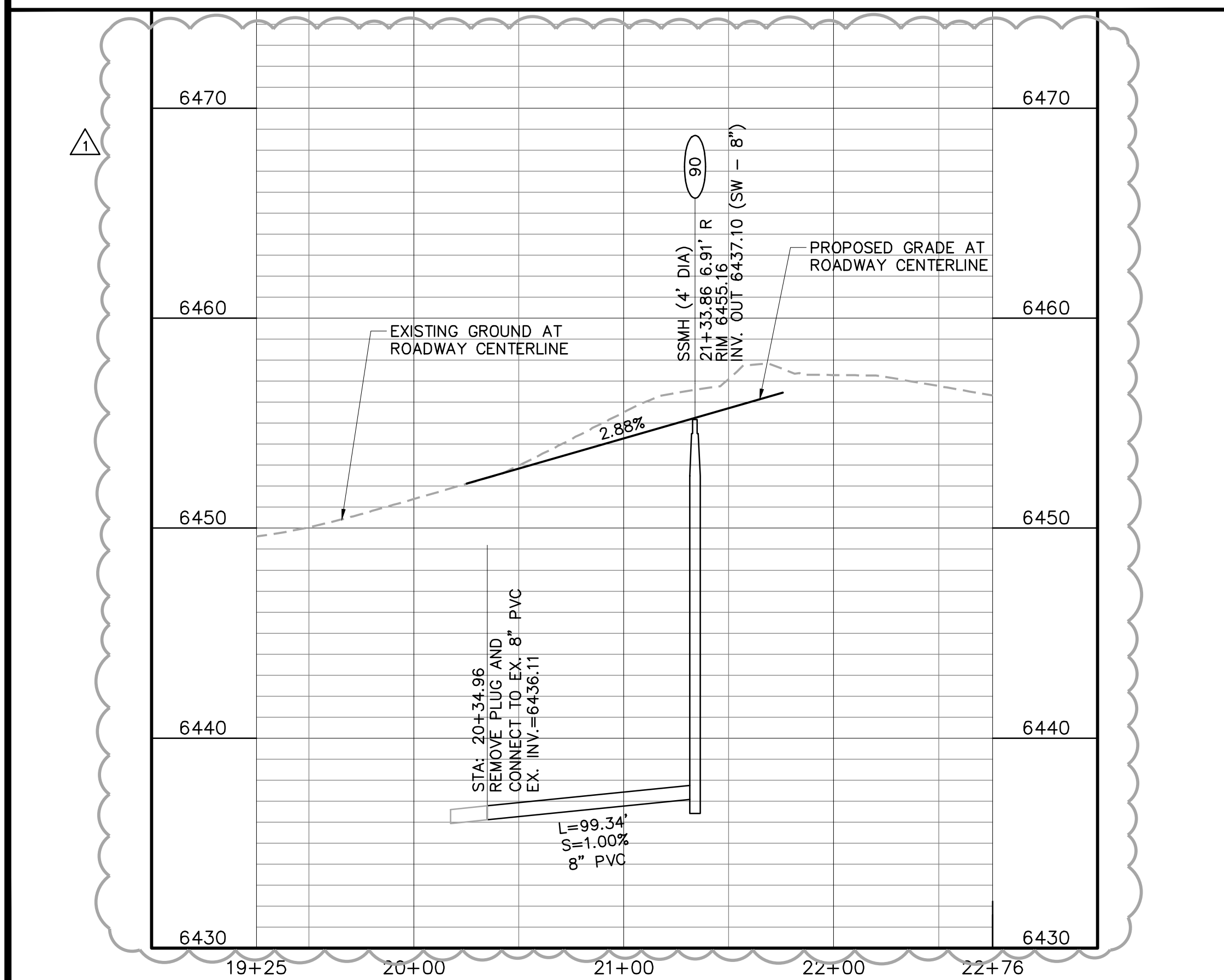


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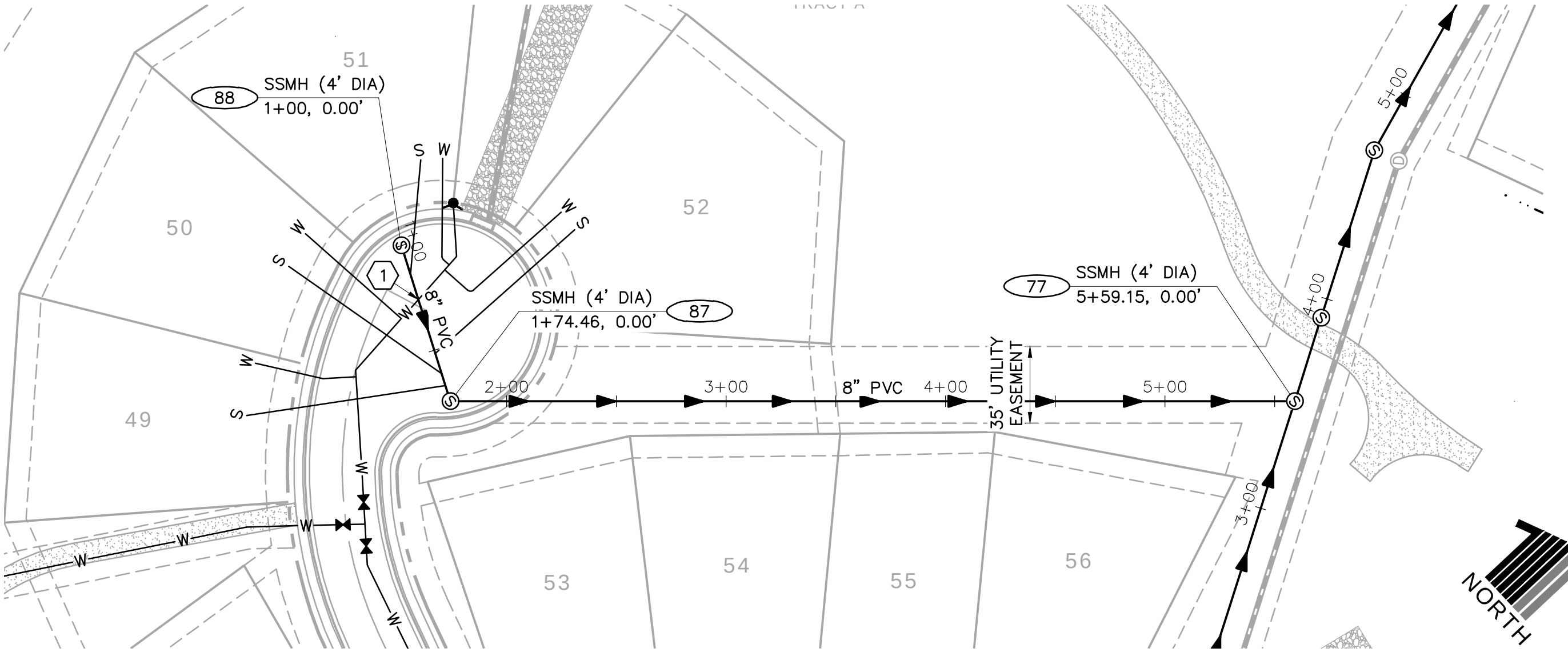
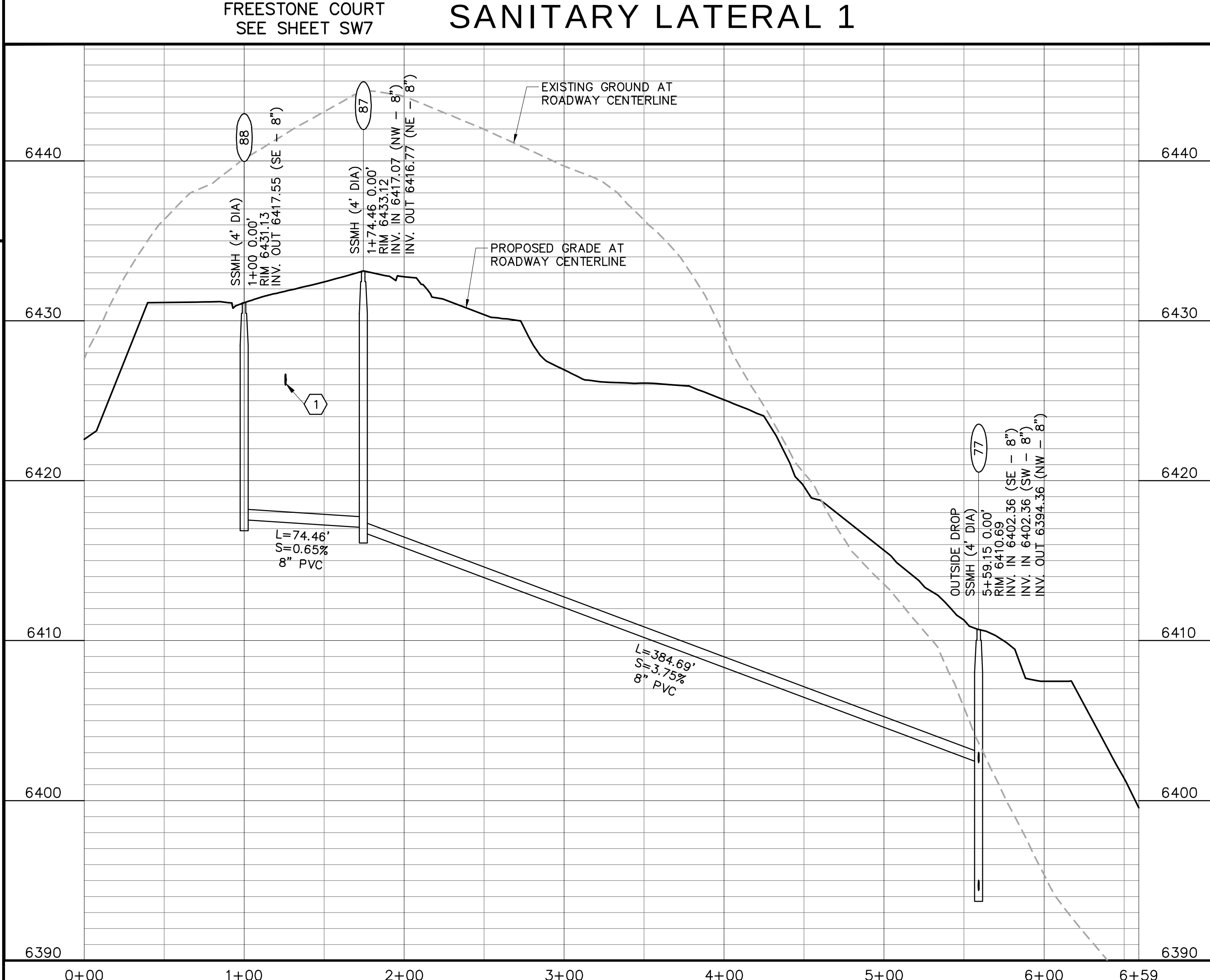
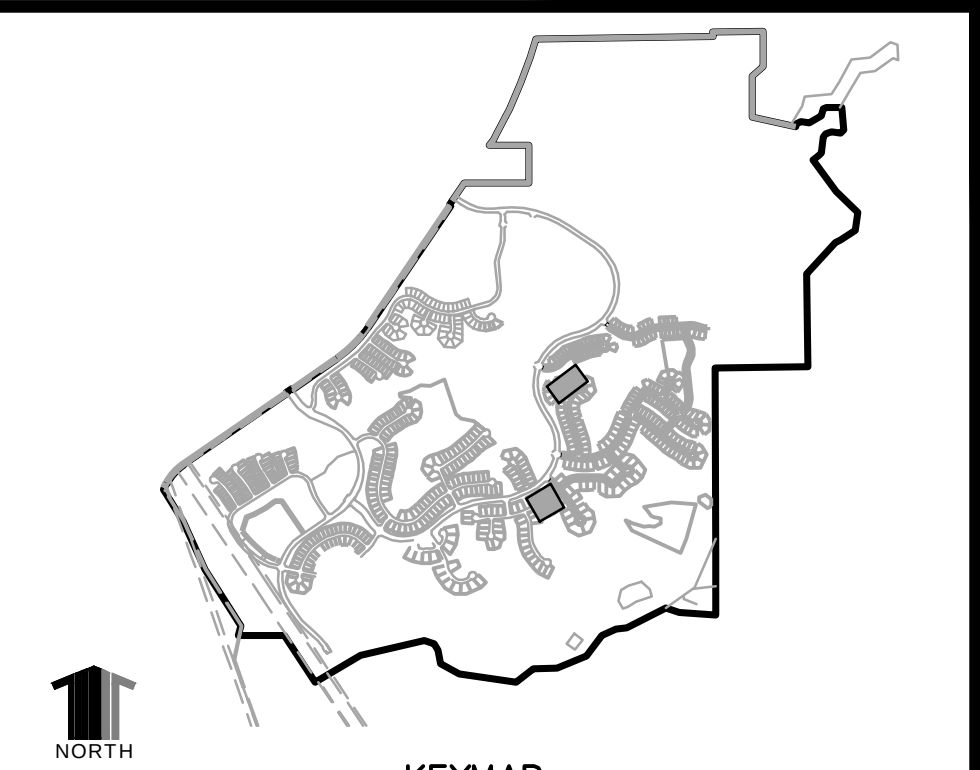
CANYONS SOUTH FILING NO. 2
SANITARY SEWER AND WATER PLANS
OVERALL UTILITY PLAN

Sheet OU6 Date JANUARY 20, 2022	9 of 35
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PATH: J:\HINES\CS\CADD\CIVIL\33 F2 SANITARY AND WATER\33SW1-SW3.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 4/14/2022 2:13 PM
XREFS:



UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
1	8" PVC	TOP=6418.07	UNDER	8" PVC WAT	BOP=6425.97	7.90'



- KEYMAP**
- CONSTRUCTION NOTES:**
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 - ALL SANITARY SEWER PIPELINES SHALL HAVE A MINIMUM COVER OF 5 FEET AND MAXIMUM COVER OF 20 FEET.
 - ALL SANITARY SEWER PIPELINES SHALL BE BEDDED IN ACCORDANCE WITH TCR STANDARD DETAIL SS-8.
 - ALL MANHOLE RIM ELEVATIONS GIVEN ON THESE PLANS ARE CONSIDERED APPROXIMATE. THE CONTRACTOR SHALL SET THE FINAL RIM ELEVATION BASED ON THE COMPLETE FINISH SURFACE AND PER TCR STANDARD DETAIL SS-3.
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① INDICATES UTILITY CROSSING NUMBER
(SEE CROSSING TABLE LEFT COLUMN)

PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

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Utility Notification
Center of Colorado

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

DEVELOPMENT SERVICES DATE

DATE	REVISION DESCRIPTION
04/13/2022	1 SALUD LANE CHANGE

Hines

Drawing Name
33SW1-SW3.dwg
Job Number
HINES CS3
Prepared For
HINES

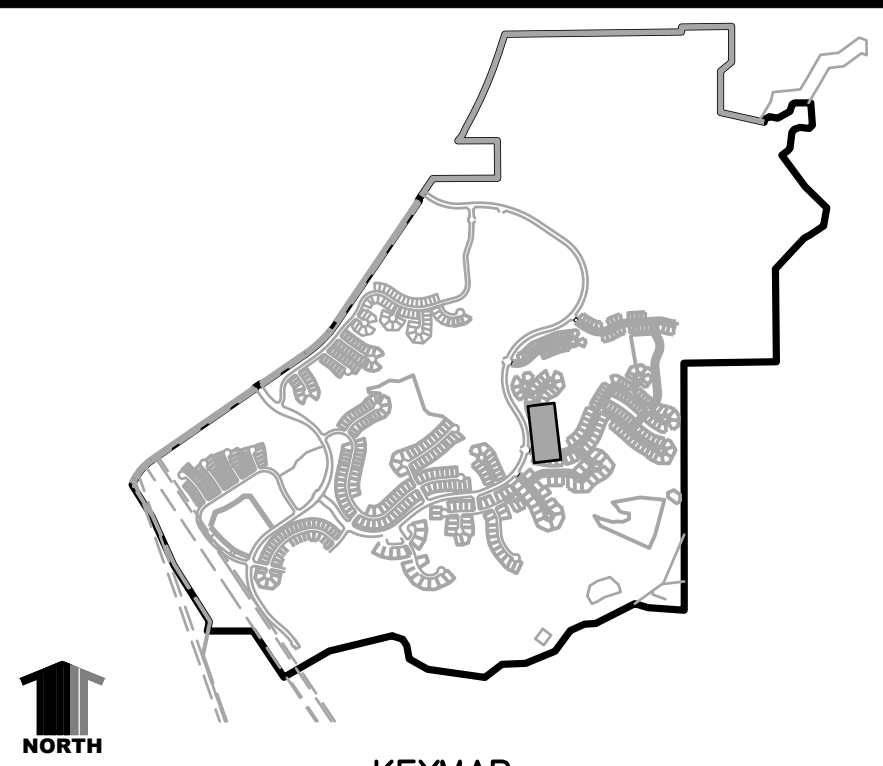
0 25 50 100
1 inch = 50 ft. Horizontal
1 inch = 5 ft. Vertical



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CANYONS SOUTH FILING NO. 2
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

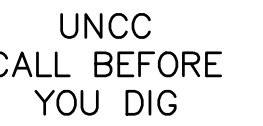
Sheet
SW1
of
35
Date
JANUARY 20, 2022



NORTH

- 1 INDICATES UTILITY CROSSING NUMBER
(SEE CROSSING TABLE LEFT COLUMN)

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68



Utility Notification
Center of Colorado

APPROVED BY:

Sheet
SW2
11
of
35

Date JANUARY 20 2022

J:\HINES CSICADD\CIVIL\33 F2 SANITARY AND WATER\33SW1-SW3.DWG
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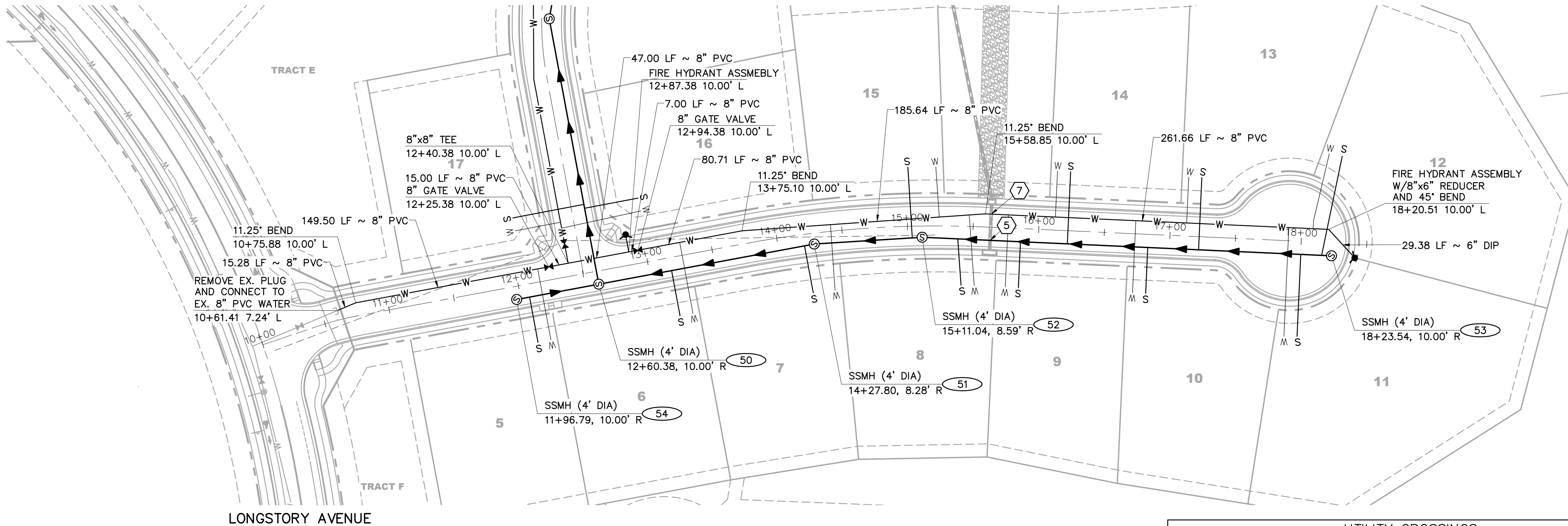
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Job Number	HINES CS3
Prepared For	HINES



CANYONS SOUTH FILING NO. 2
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

LONGSTORY AVENUE

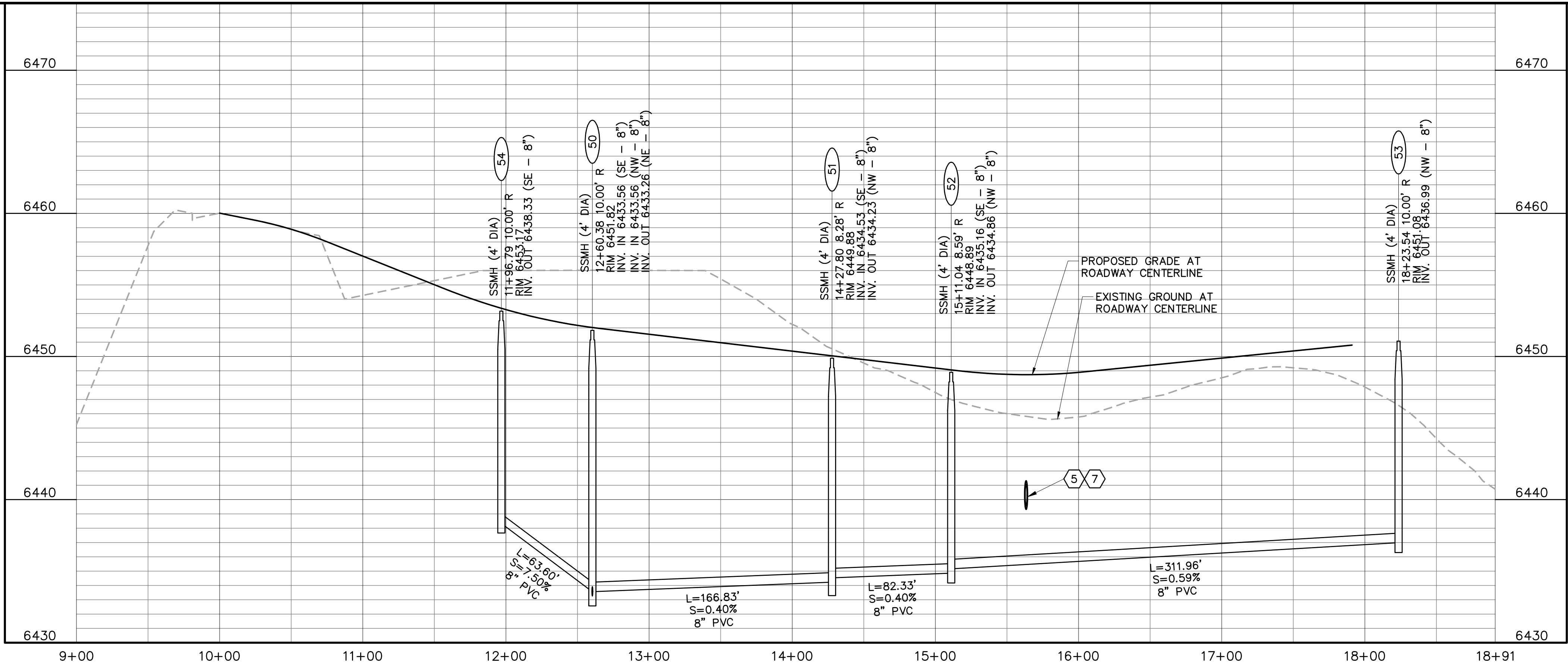
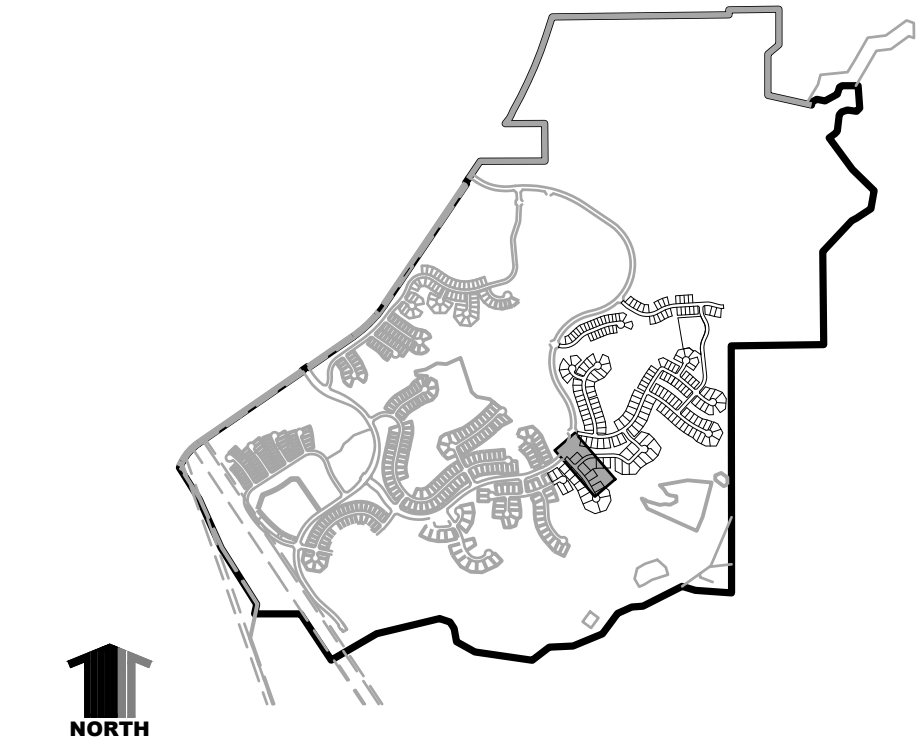
BACKSLOPE LANE
SEE SHEET SW5



LONGSTORY AVENUE

ROCKHOP POINT

UTILITY CROSSINGS					
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV
5	8" PVC	TOP=6436.15	UNDER	18" RCP	BOP=6439.59
7	18" RCP	TOP=6441.03	UNDER	8" PVC WAT	BOP=6442.81



CONSTRUCTION NOTES:

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INDICATES UTILITY CROSSING NUMBER
(SEE CROSSING TABLE LEFT COLUMN)

PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

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TOWN APPROVAL BLOCK

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

APPROVED BY:

DEVELOPMENT SERVICES DATE

PATH: J:\HINES\CS\ADDCIVIL\33 F2 SANITARY AND WATER\33SW4.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 4/13/2022 4:44 PM
XREFS:

DATE	REVISION DESCRIPTION



Drawing Name 33SW4.dwg
Job Number HINES CS3
Prepared For HINES

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1 inch = 50 ft. Horizontal 1 inch = 5 ft. Vertical
Designer KWS
Drafter JAH
Checked BKM

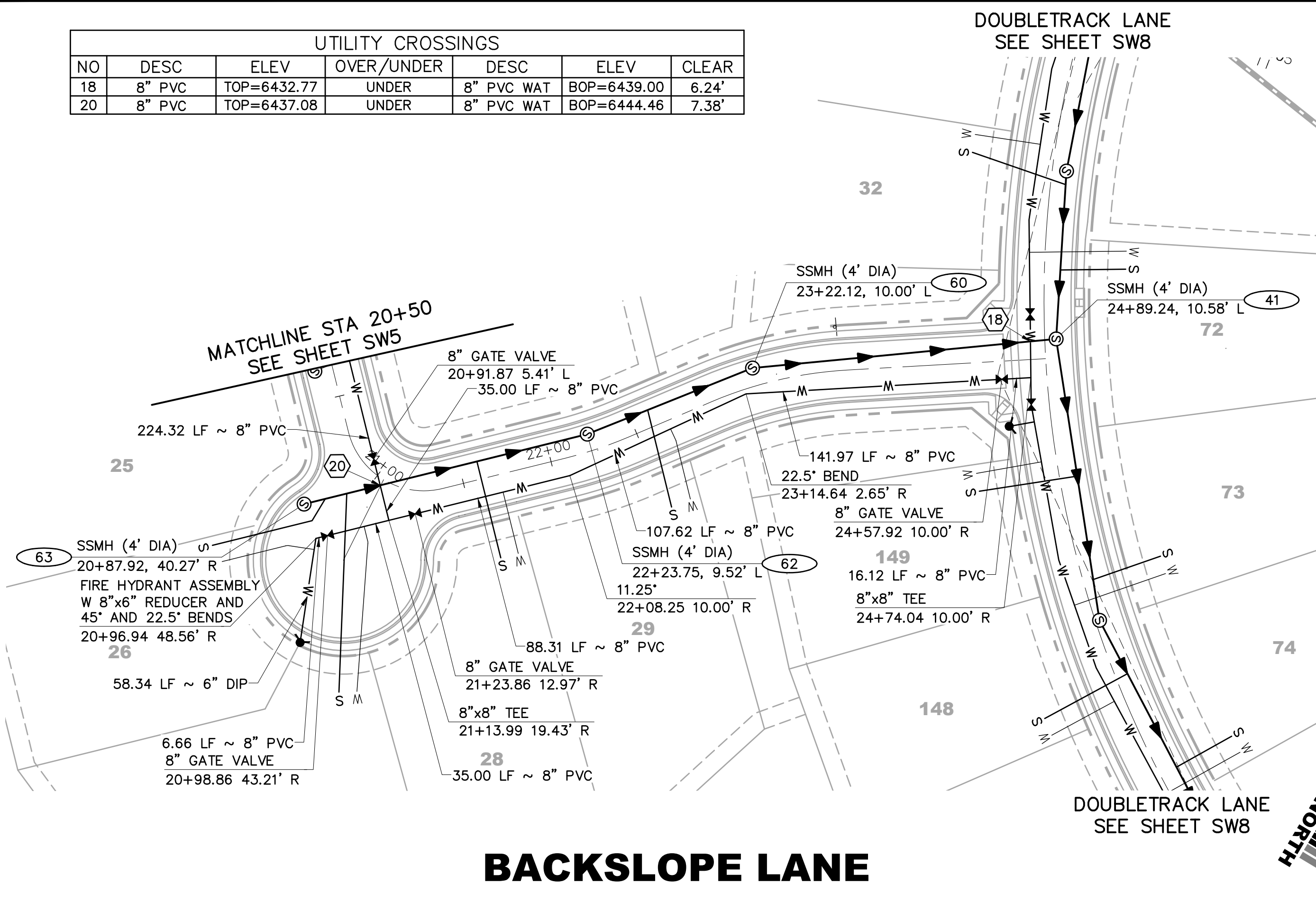


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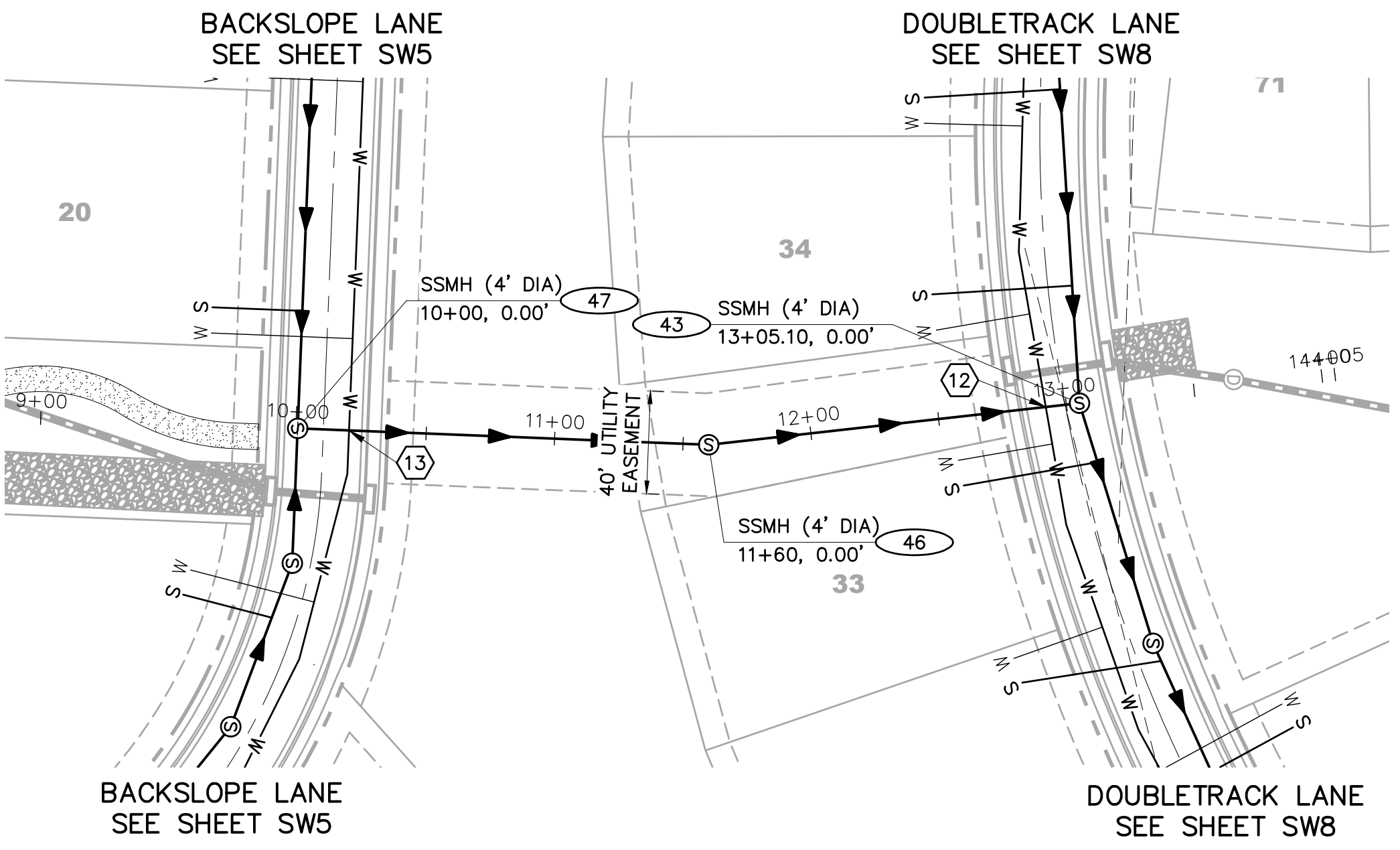
CANYONS SOUTH FILING NO. 2
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

Sheet SW4	13 of 35
Date JANUARY 20, 2022	

UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
18	8" PVC	TOP=6432.77	UNDER	8" PVC WAT	BOP=6439.00	6.24'
20	8" PVC	TOP=6437.08	UNDER	8" PVC WAT	BOP=6444.46	7.38'

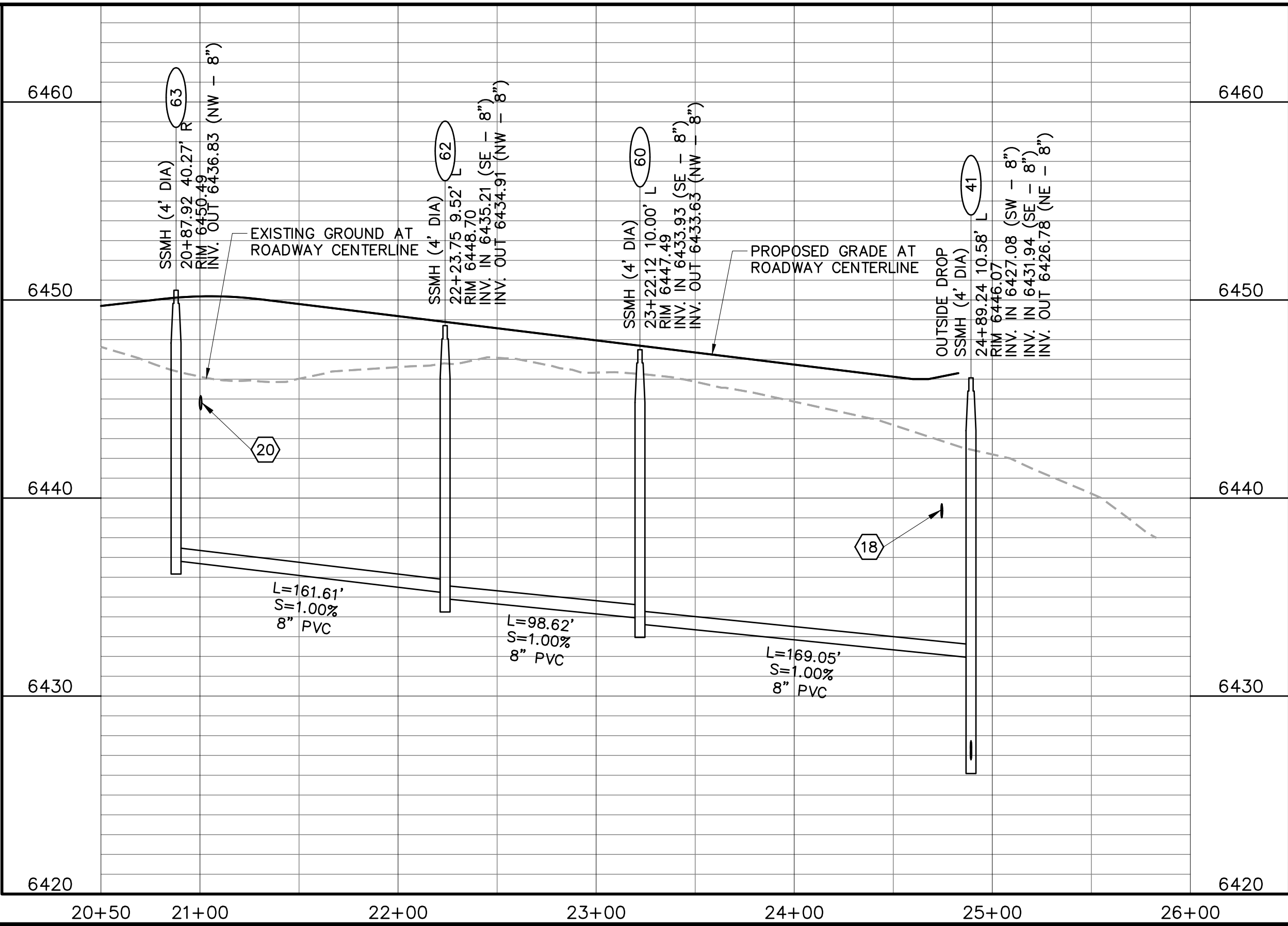
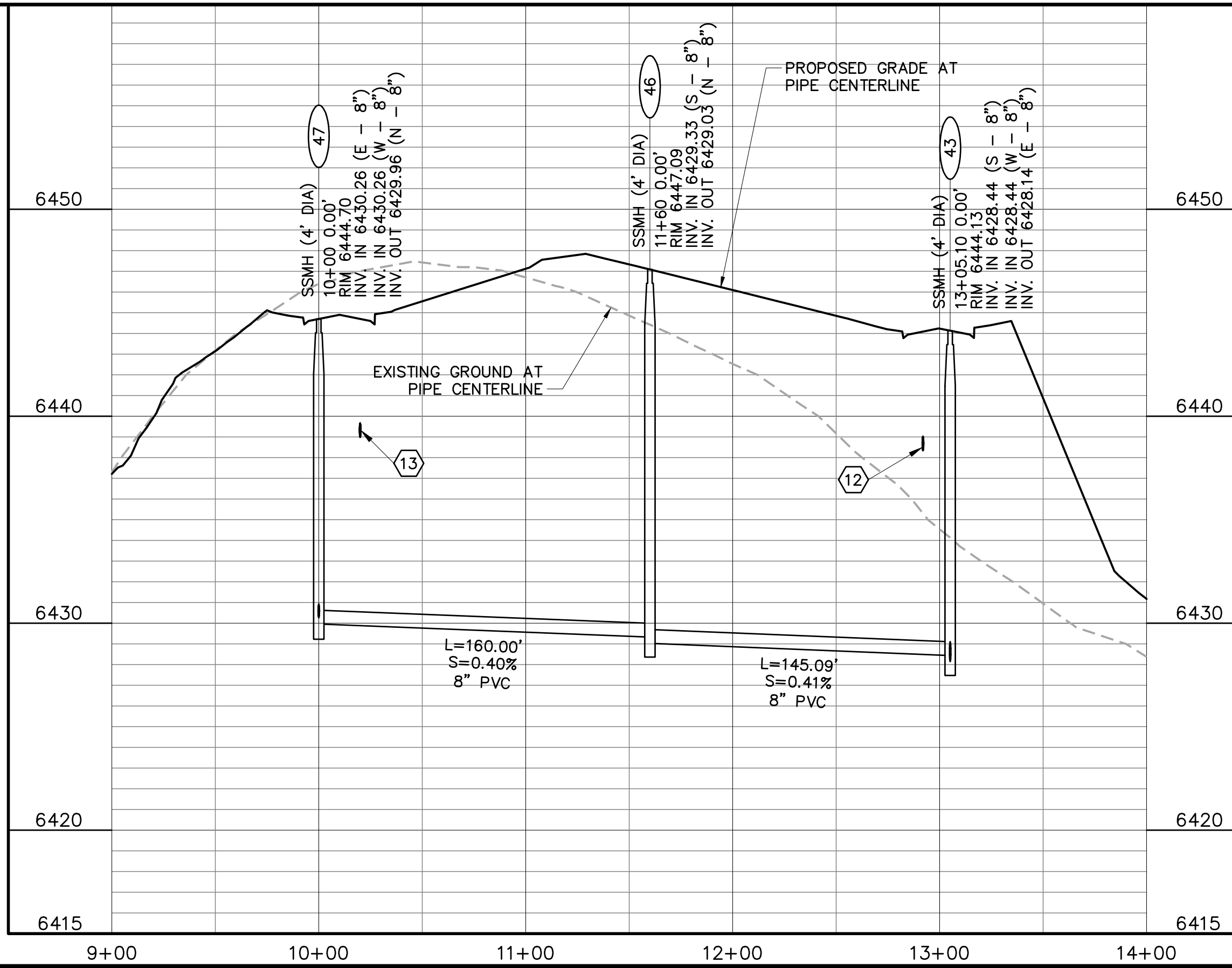
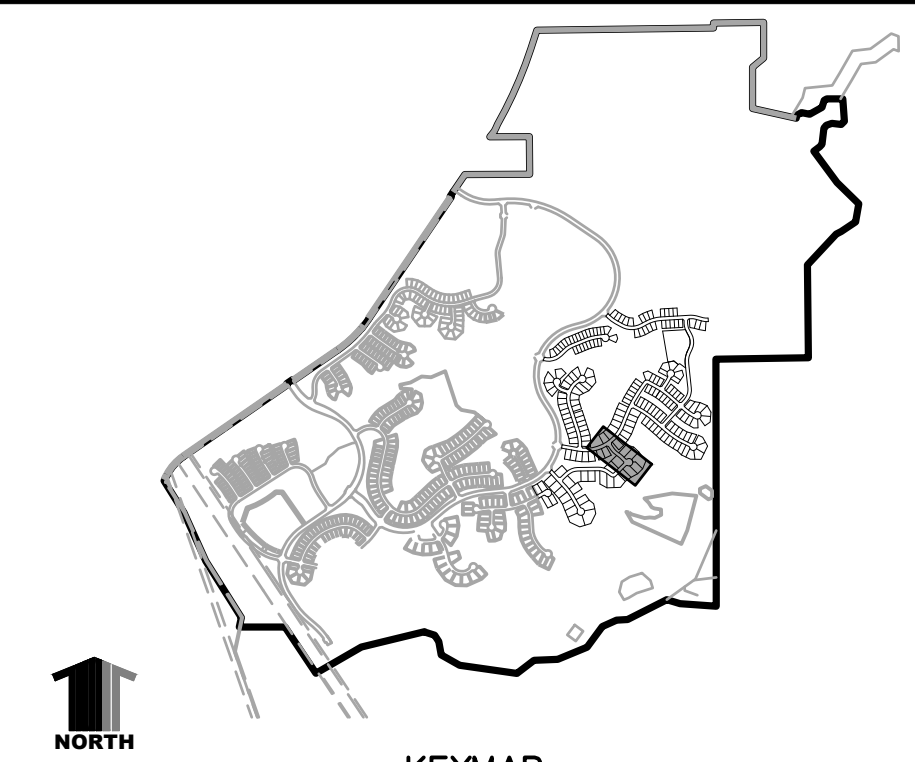


BACKSLOPE LANE



SANITARY LATERAL 3

UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
12	8" PVC	TOP=6429.18	UNDER	8" PVC WAT	BOP=6438.33	9.15'
13	8" PVC	TOP=6430.57	UNDER	8" PVC WAT	BOP=6438.98	8.41'



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INDICATES UTILITY CROSSING NUMBER (SEE CROSSING TABLE LEFT COLUMN)

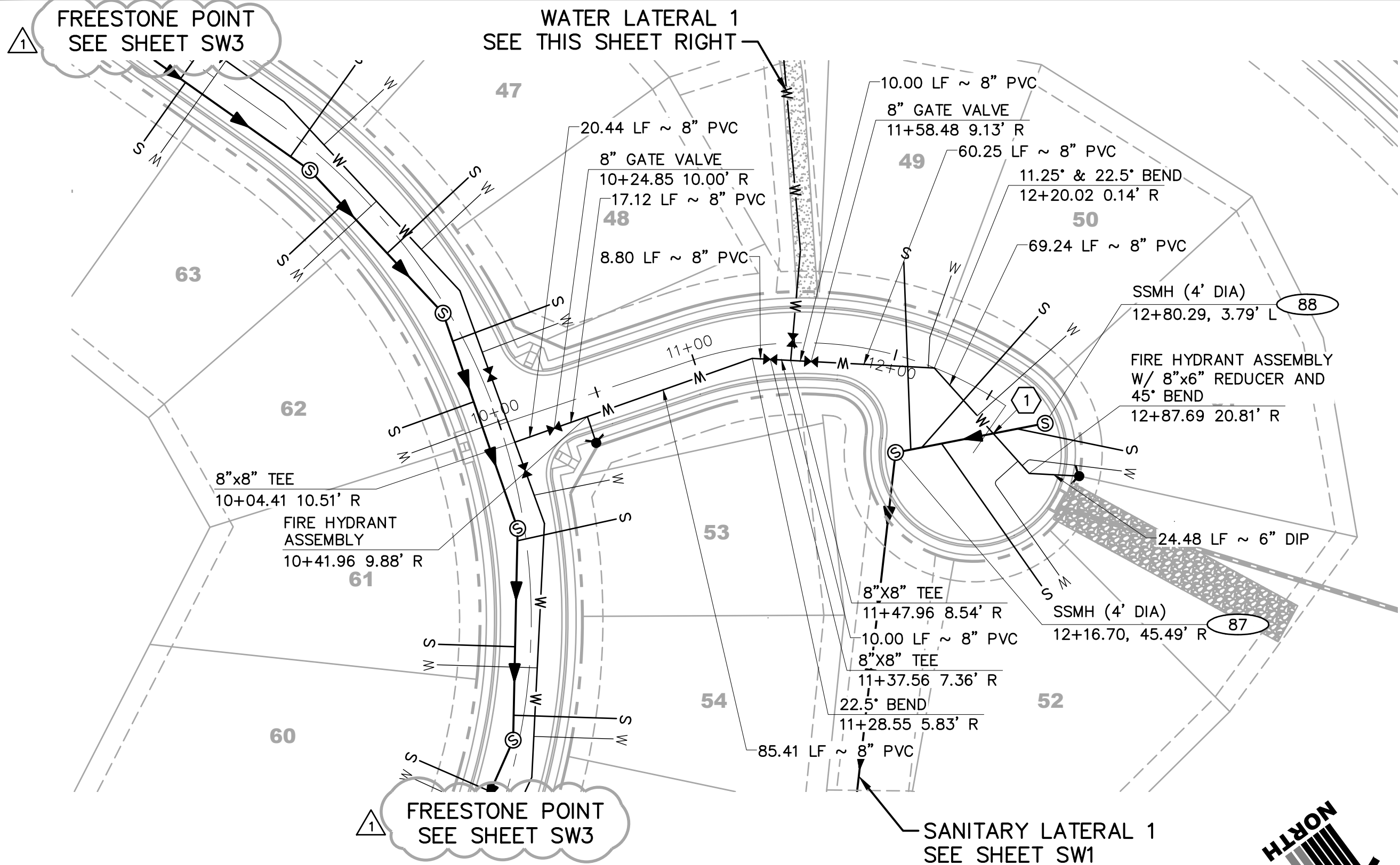
PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

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TOWN APPROVAL BLOCK
TOWN OF CASTLE ROCK APPROVAL PLANS
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DATE OF DEVELOPMENT SERVICES APPROVAL

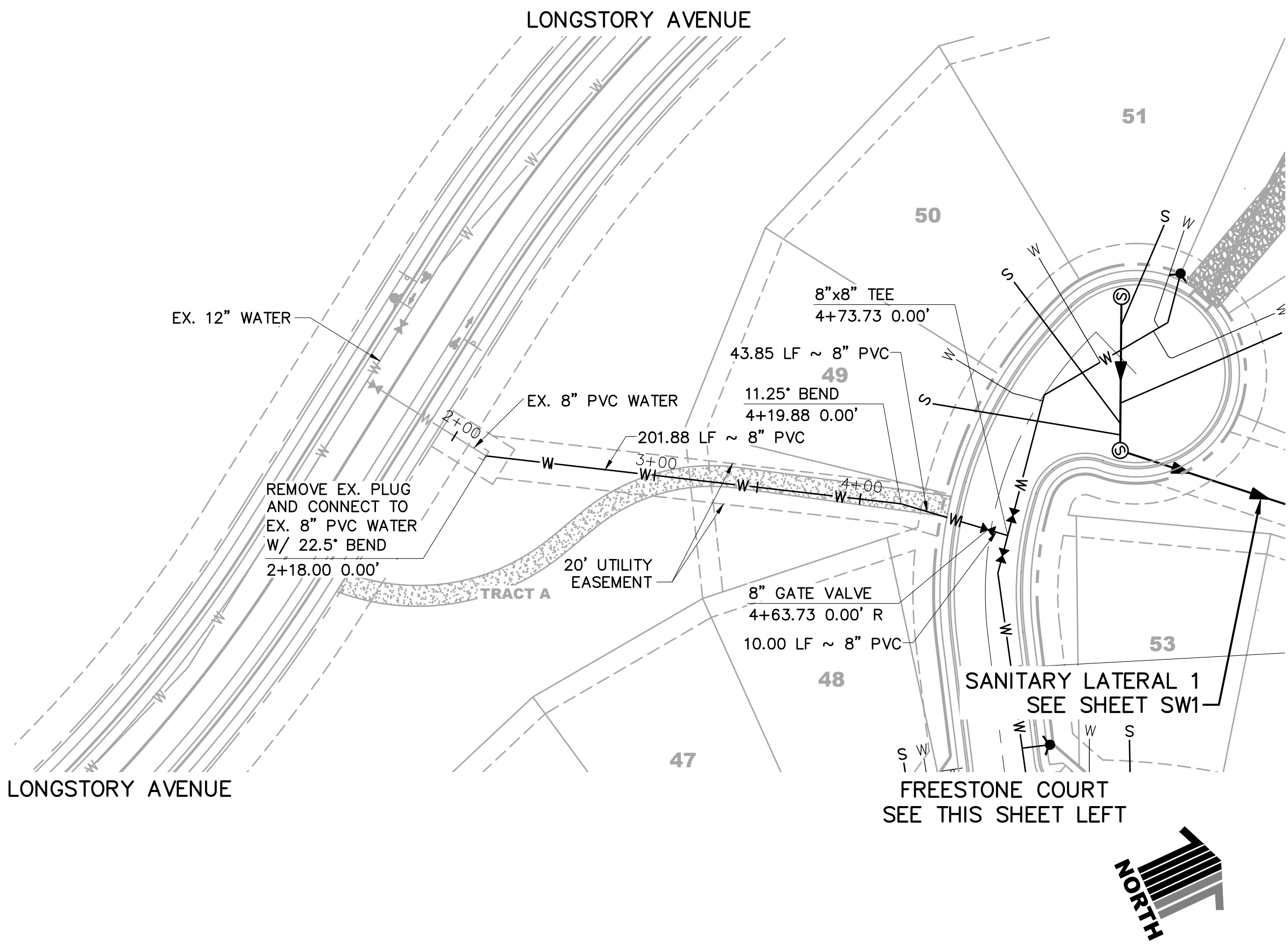
APPROVED BY: _____

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PLOTTED BY: KYLER SANFORD PLOT DATE: 4/13/2022 4:45 PM
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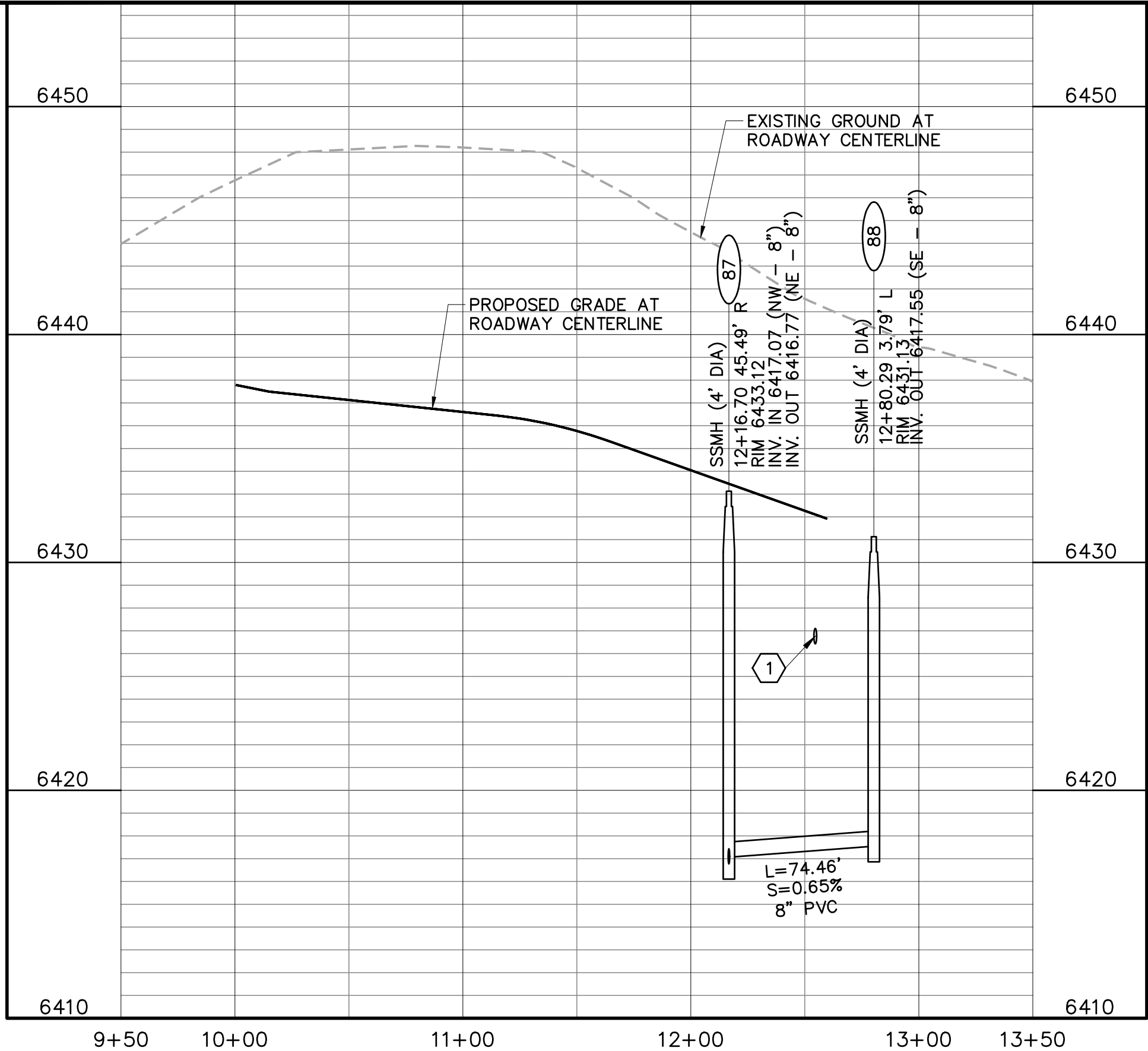
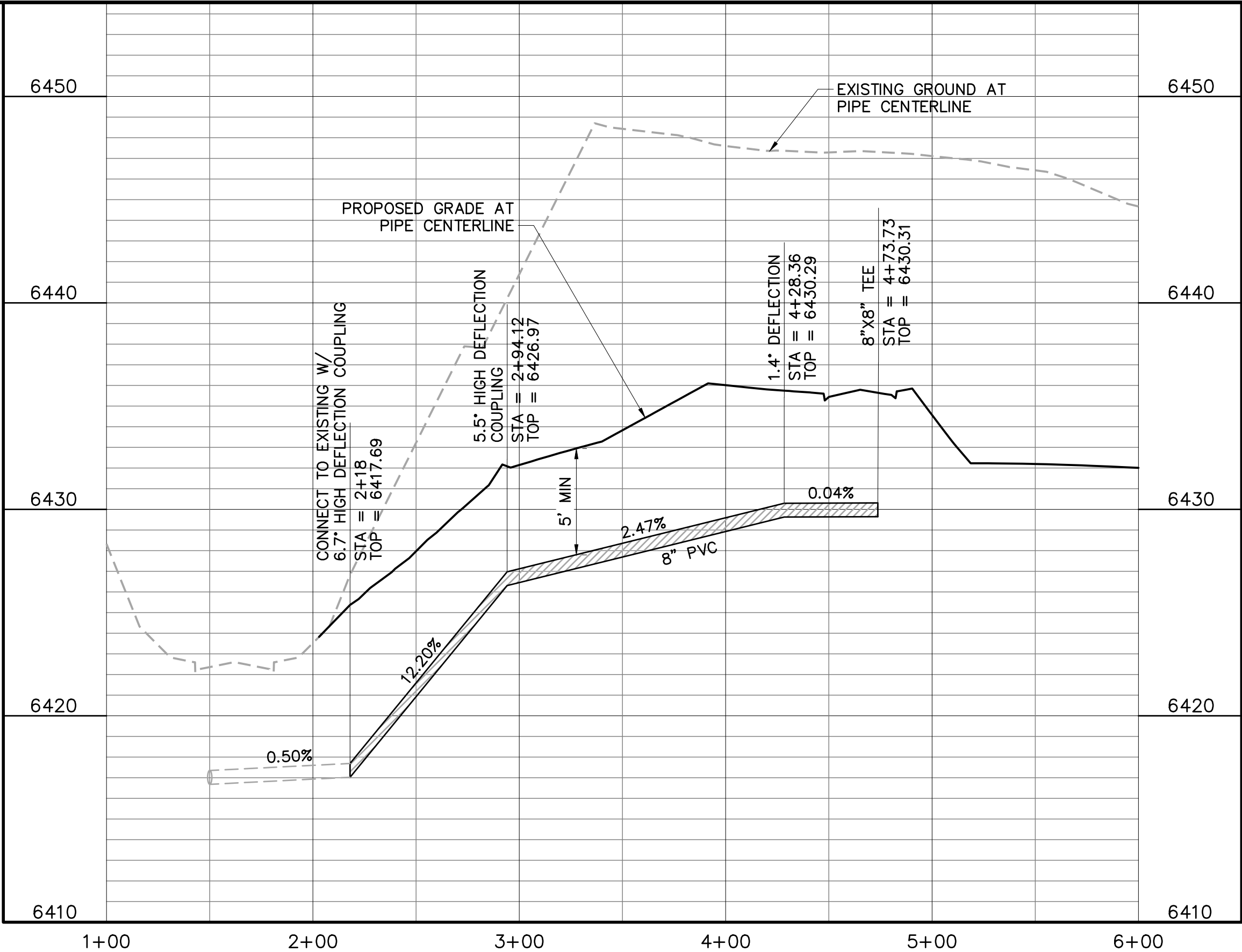
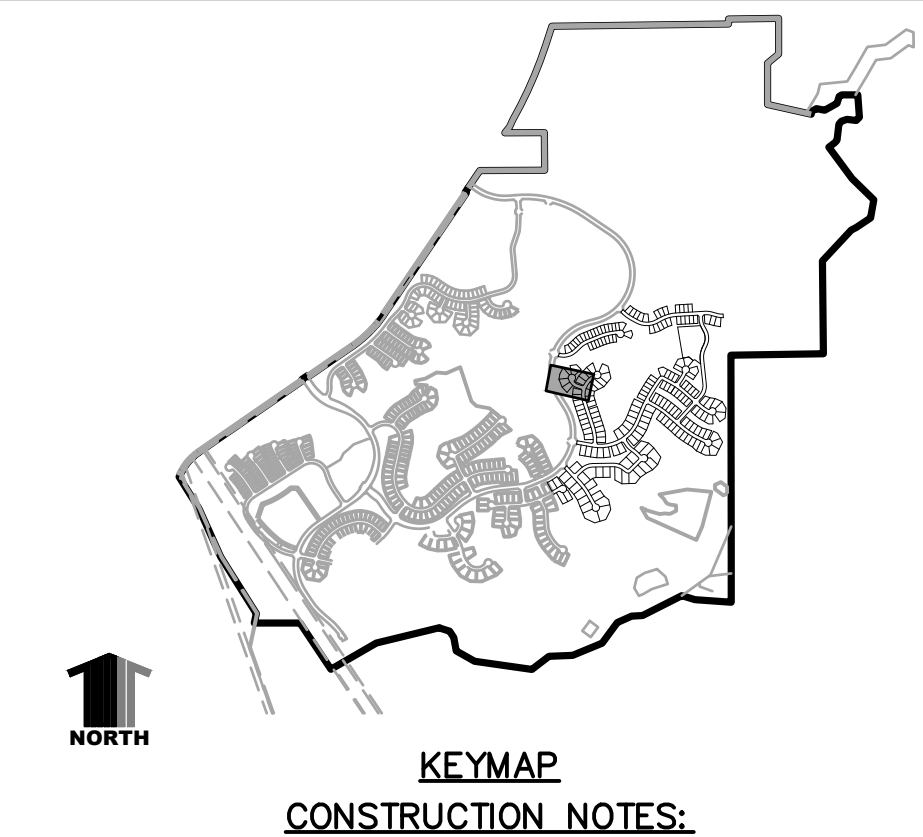


UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
1	8" PVC	TOP=6418.07	UNDER	8" PVC WAT	BOP=6425.97	7.90'

FREESTONE COURT



WATER LATERAL 1



- CONSTRUCTION NOTES:**
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DOUGLAS COUNTY BENCHMARK TT17A
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APPROVED BY:

DEVELOPMENT SERVICES DATE

PATH: J:\HINES\CS\CADD\CIVIL\33 F2 SANITARY AND WATER\33SW7.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 4/13/2022 4:46 PM
XREFS:

DATE	REVISION DESCRIPTION
04/13/2022	STREET NAME CHANGE

Hines

Drawing Name 33SW7.dwg	Job Number HINES CS3	Prepared For HINES
Designer KWS	Drafter JAH	Checked BKM

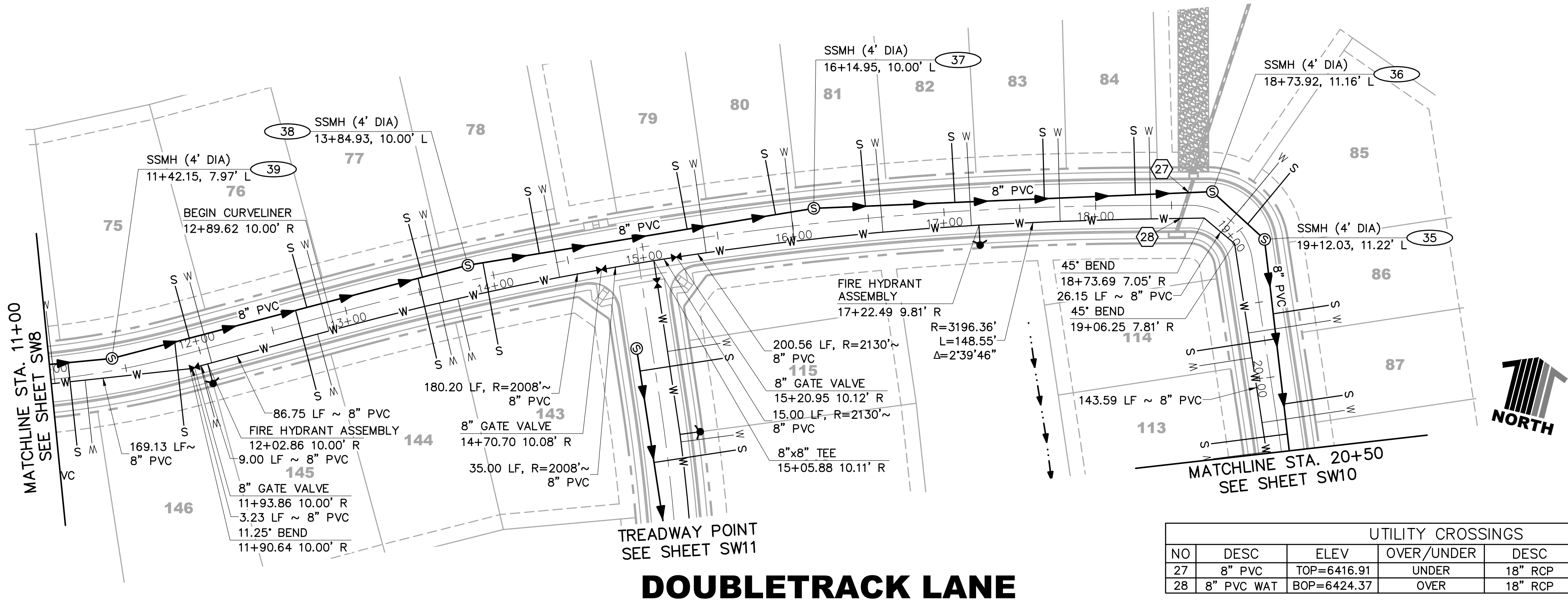
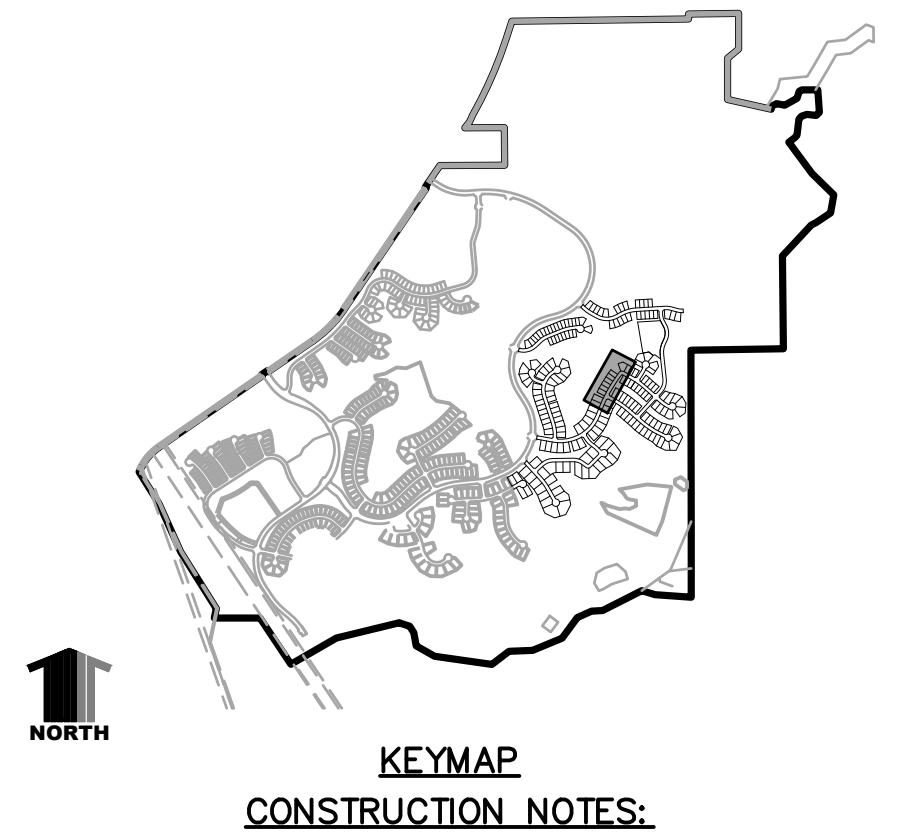


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CANYONS SOUTH FILING NO. 2
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

Sheet SW7	16 of 35
Date JANUARY 20, 2022	

PATH: J:\HINES CS\CADD\CIVIL\33 F2 SANITARY AND WATER\33SW8-SW10.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 4/13/2022 4:47 PM
XREFS:



- ALL SANITARY SEWER CONSTRUCTION IS SUBJECT TO THE TOWN OF CASTLE ROCK WASTEWATER COLLECTION DESIGN CRITERIA MANUAL, WELL AS THE SANITARY SEWER CONSTRUCTION NOTES LISTED HEREIN.
- ALL SANITARY SEWER PIPELINES SHALL BE PVC, SDR-35, IN ACCORDANCE WITH ASTM D-3034, BELL AND SPIGOT WITH ELASTOMERIC SEAL.
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- ALL MANHOLES SHALL BE PLACED ON A MINIMUM OF 1' OF 3/4" WASH ROCK. IF ADDITIONAL SUBGRADE IS DISTURBED, EXCAVATION SHALL BE BACKFILLED WITH 3/4" WASH ROCK OR OTHER APPROVED STRUCTURAL SOIL COMPACTED TO 95% OF ASTM D698 UNLESS OTHERWISE INSTRUCTED BY THE INSPECTOR.

① INDICATES UTILITY CROSSING NUMBER
(SEE CROSSING TABLE LEFT COLUMN)

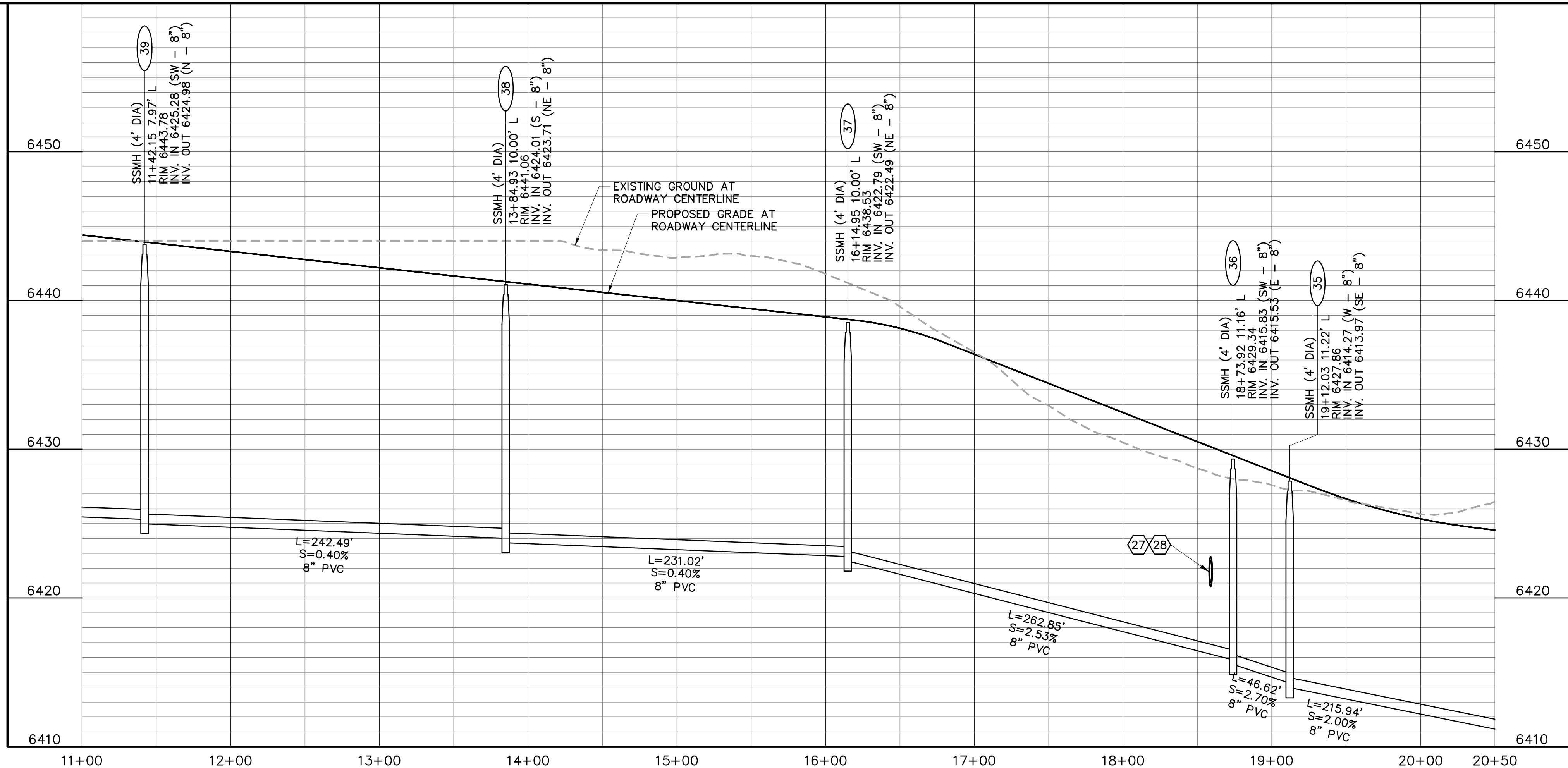
PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

811 UNCC
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Utility Notification
Center of Colorado

TOWN APPROVAL BLOCK

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

DEVELOPMENT SERVICES DATE



Hines

Drawing Name
33SW8-SW10.dwg
Job Number
HINES CS3
Prepared For
HINES
Designer
KWS
Drafter
JAH
Checked
BKM

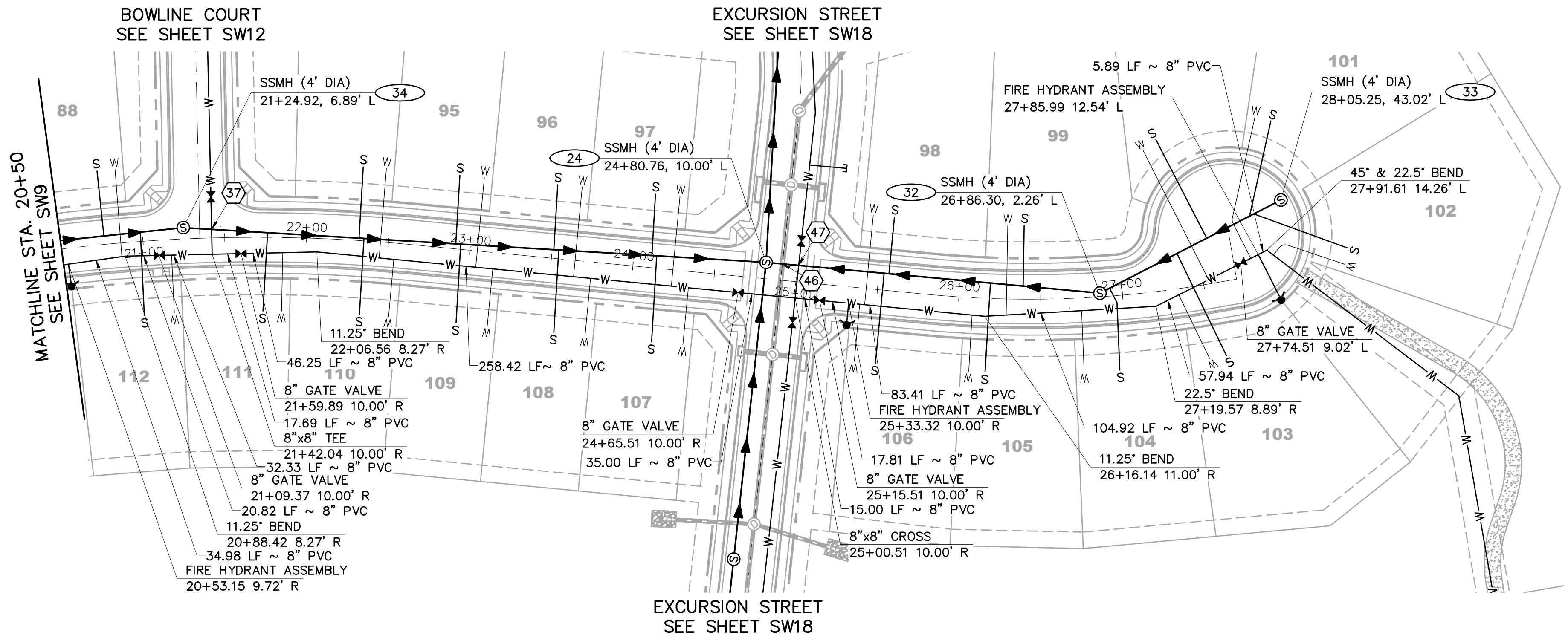
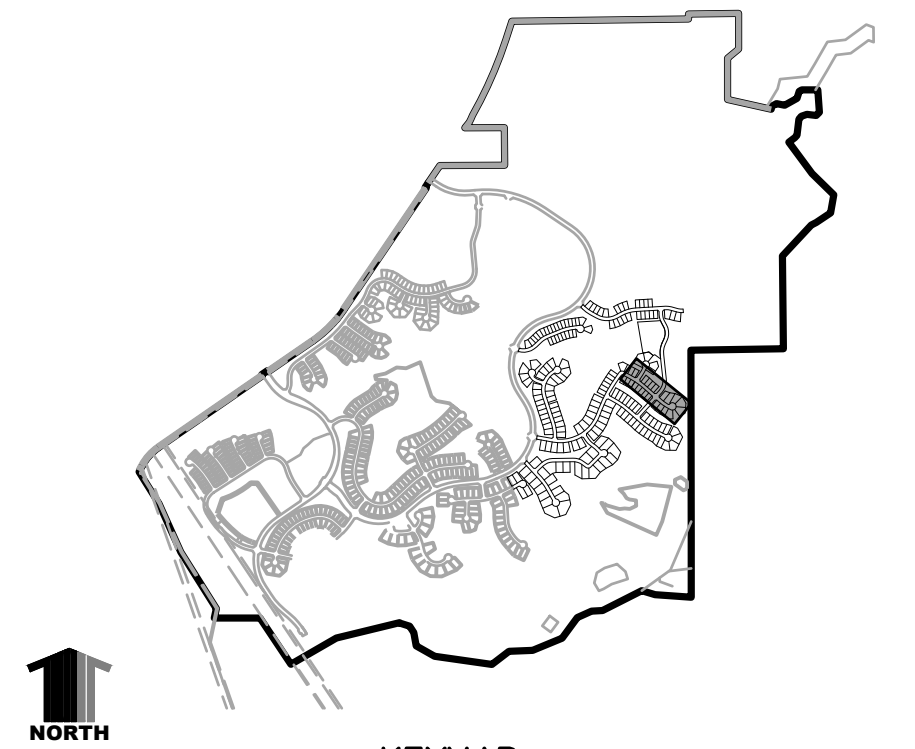
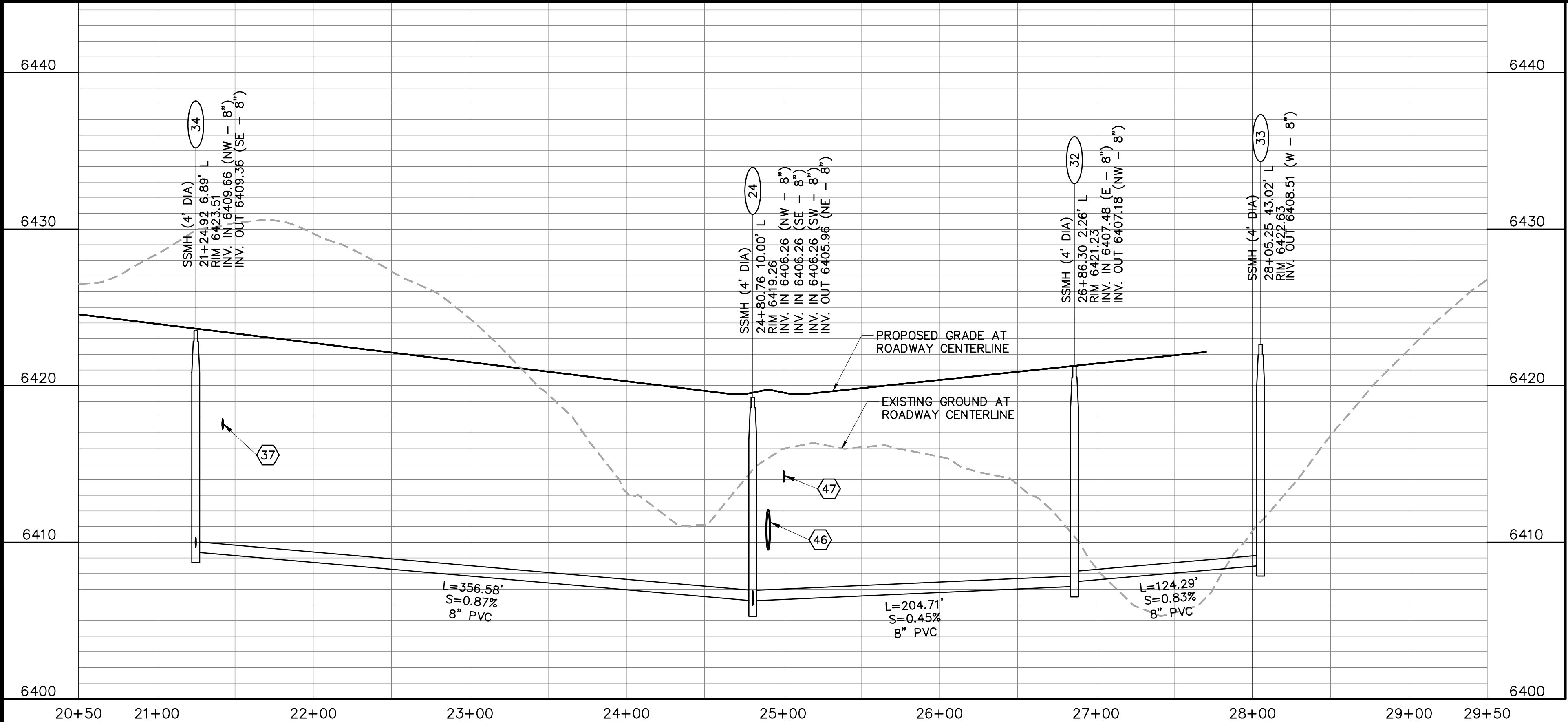


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CANYONS SOUTH FILING NO. 2
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

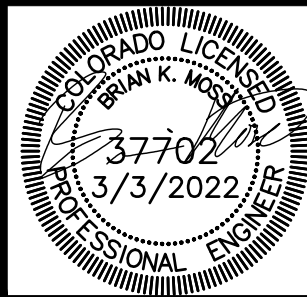
Sheet
SW9
of
35
Date
JANUARY 20, 2022

PATH: J:\HINES\CS\CADD\CIVIL\33 F2 SANITARY AND WATER\33SW8-SW10.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 4/13/2022 4:47 PM
XREFS:



Hines

Drawing Name	33SW8-SW10.dwg
Job Number	HINES CS3
Prepared For	HINES
Designer	KWS
Drafter	JAH
Checked	BKM

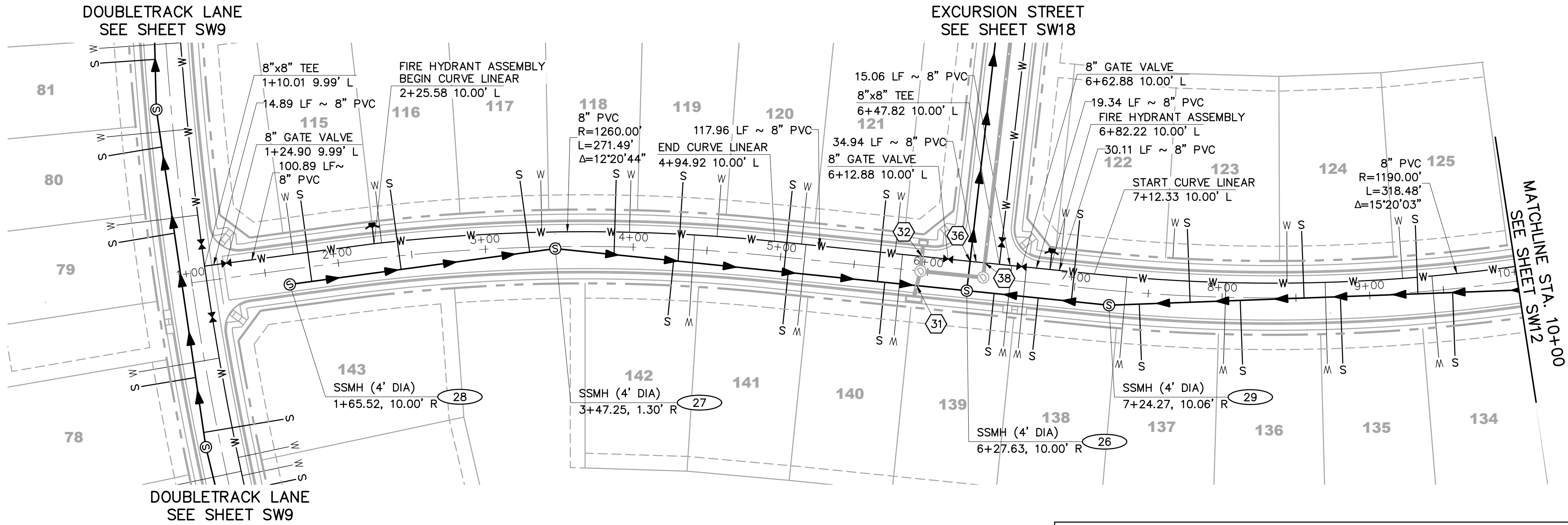


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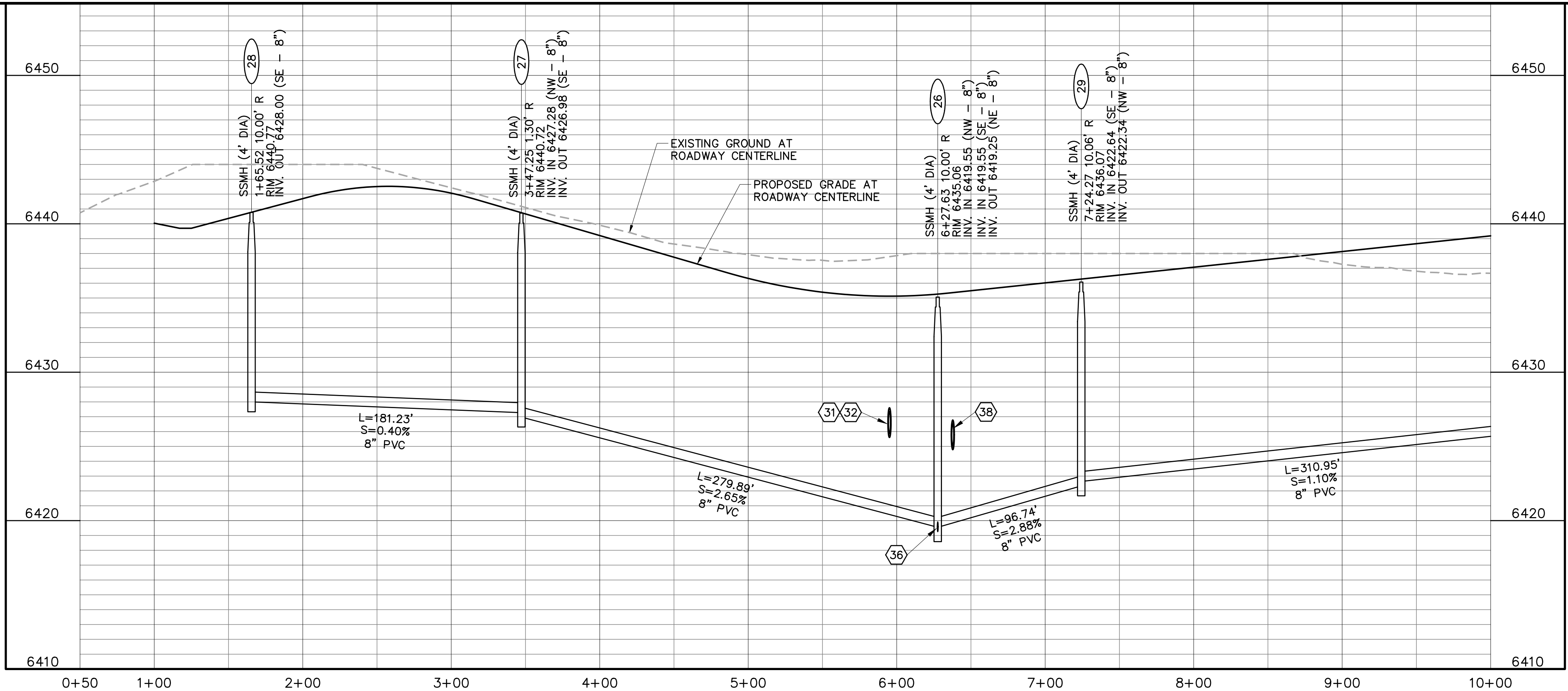
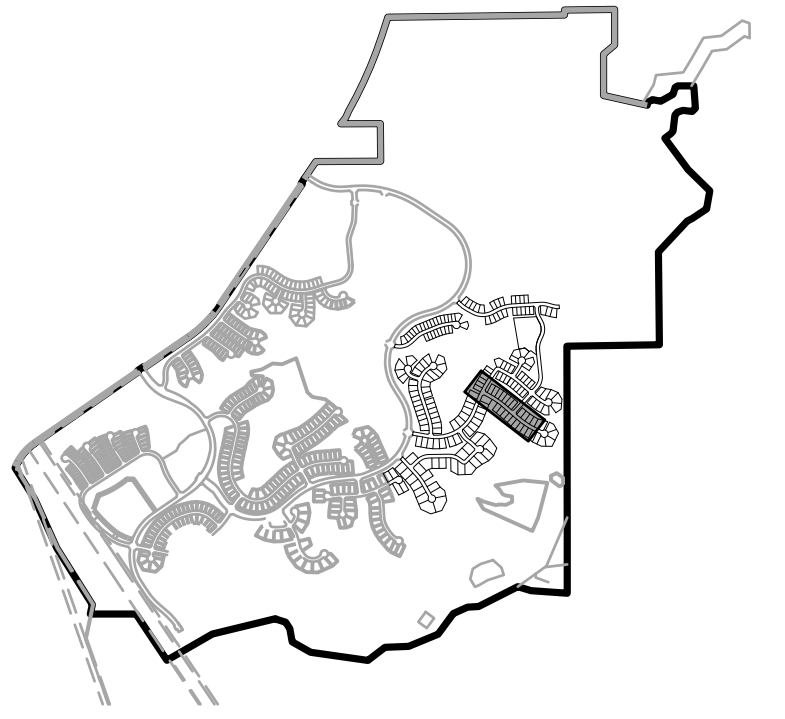
CANYONS SOUTH FILING NO. 2
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

Sheet
SW10
19 of 35
Date
JANUARY 20, 2022



TREADWAY POINT

UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
31	8" PVC	TOP=6421.14	UNDER	18" RCP	BOP=6425.71	4.57'
32	18" RCP	TOP=6427.71	UNDER	8" PVC WAT	BOP=6429.21	1.50'
36	8" PVC	TOP=6419.63	UNDER	8" PVC WAT	BOP=6429.21	9.57'
38	18" RCP	TOP=6426.58	UNDER	8" PVC WAT	BOP=6429.21	2.62'



KEYMAP CONSTRUCTION NOTES:

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PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

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TOWN APPROVAL BLOCK

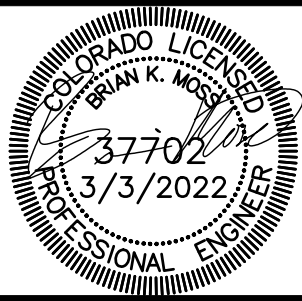
TOWN OF CASTLE ROCK APPROVAL PLANS
ARE HEREBY APPROVED FOR ONE YEAR FROM
DATE OF DEVELOPMENT SERVICES APPROVAL
APPROVED BY:

DEVELOPMENT SERVICES DATE

DATE	REVISION DESCRIPTION

Hines

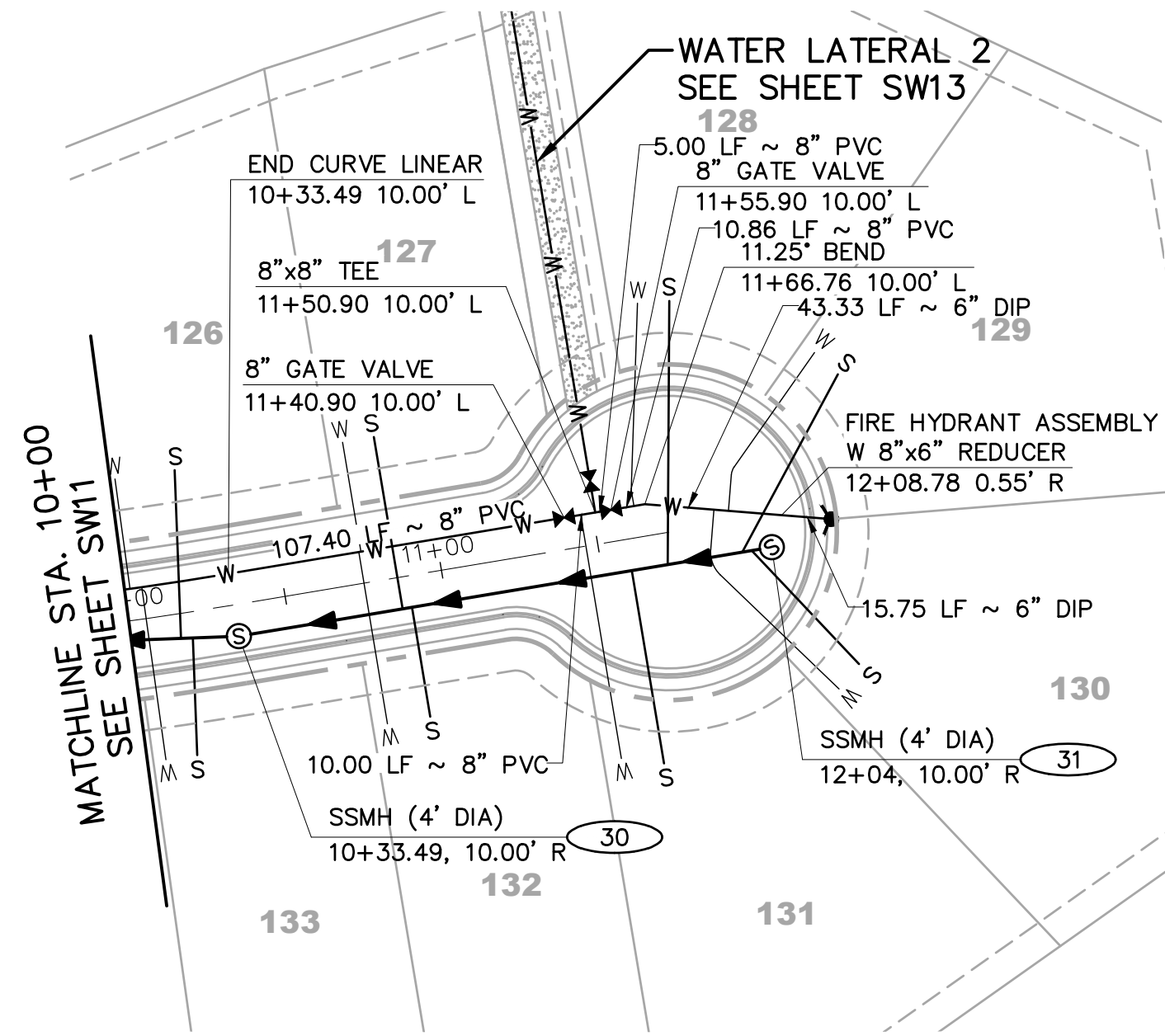
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Designer KWS	Drafter JAH	Checked BKM



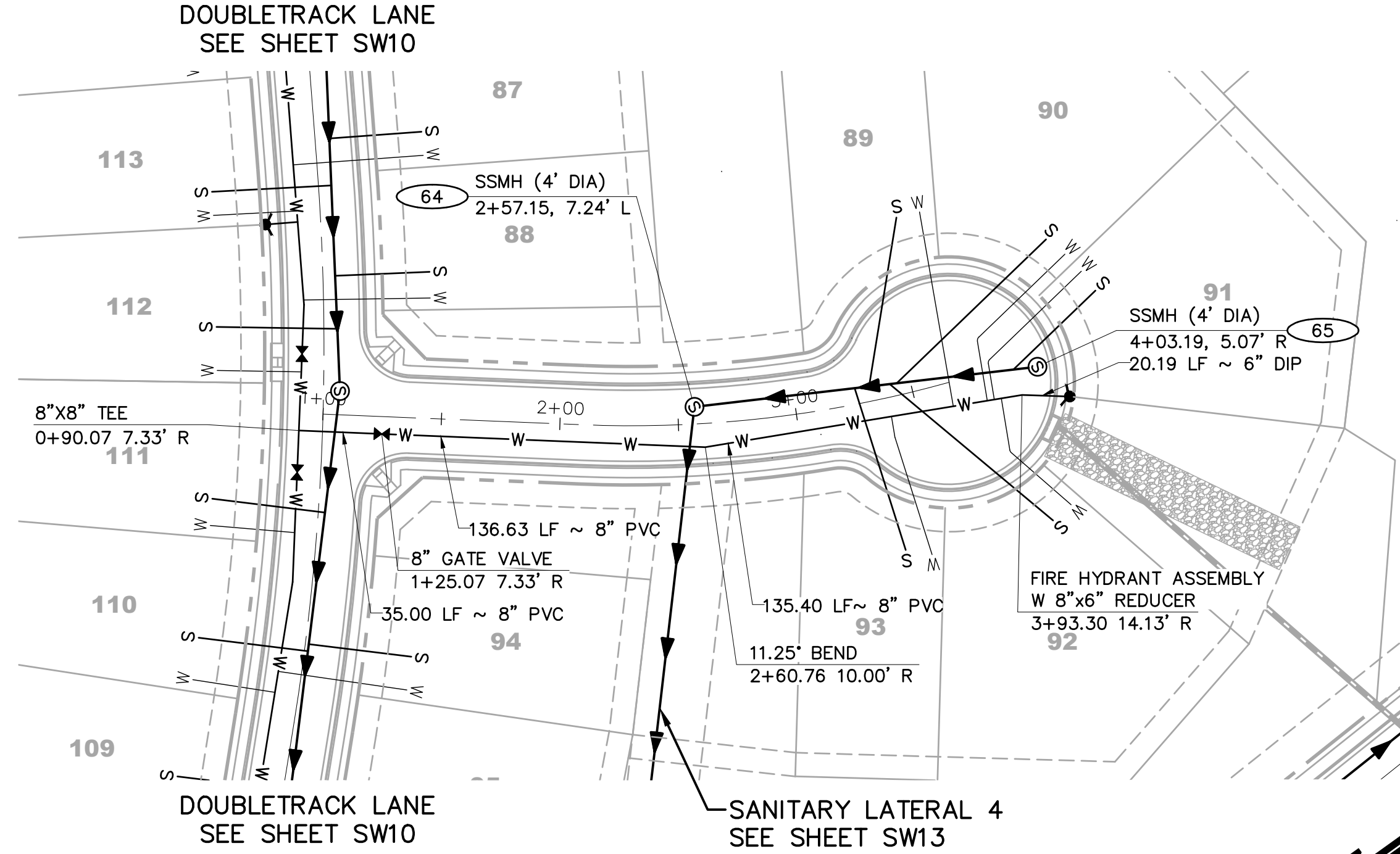
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CANYONS SOUTH FILING NO. 2
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

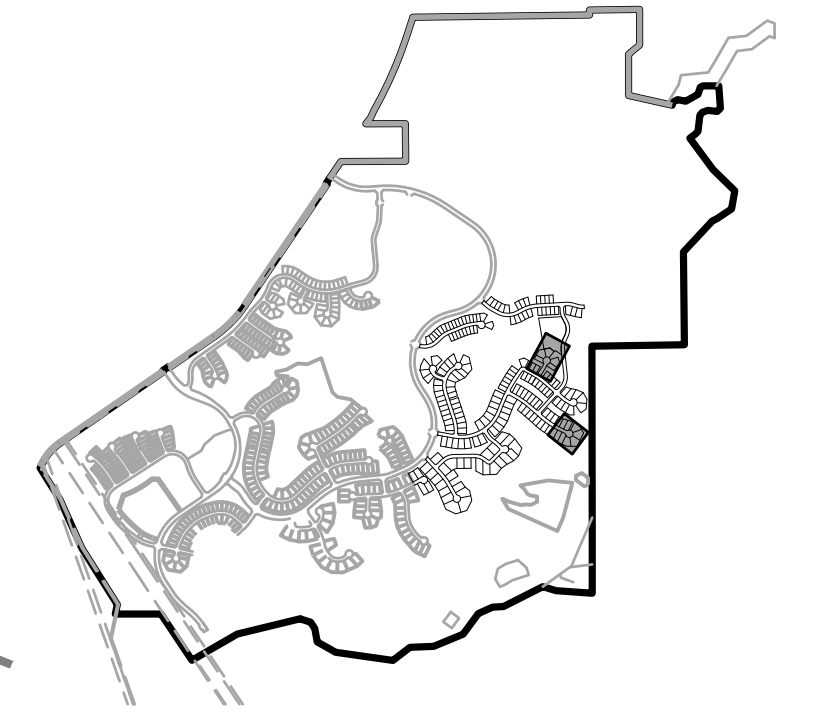
Sheet SW11	20 of 35
Date JANUARY 20, 2022	



TREADWAY POINT



BOWLINE COURT



KEYMAP
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PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68



1-800-922-1987

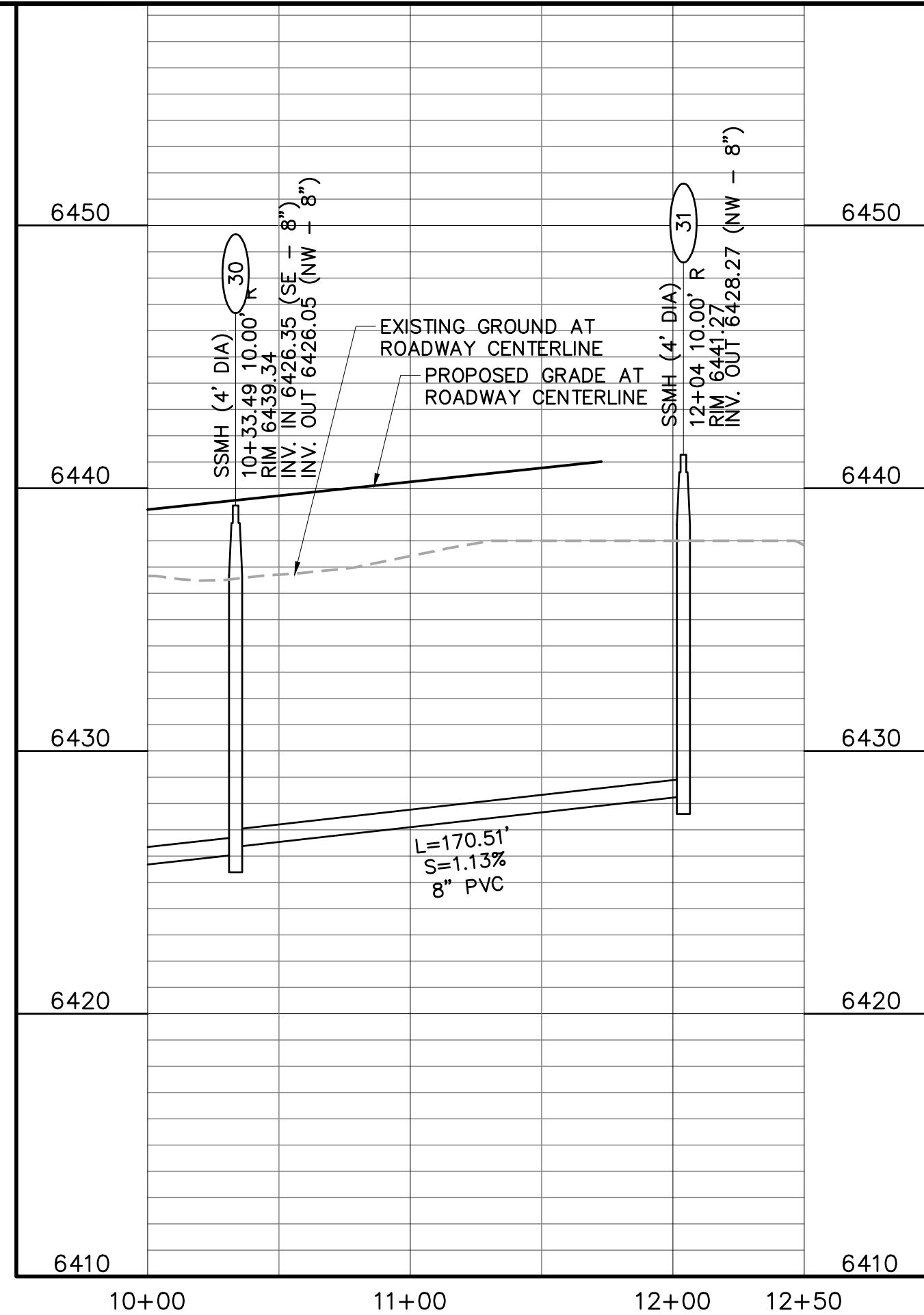
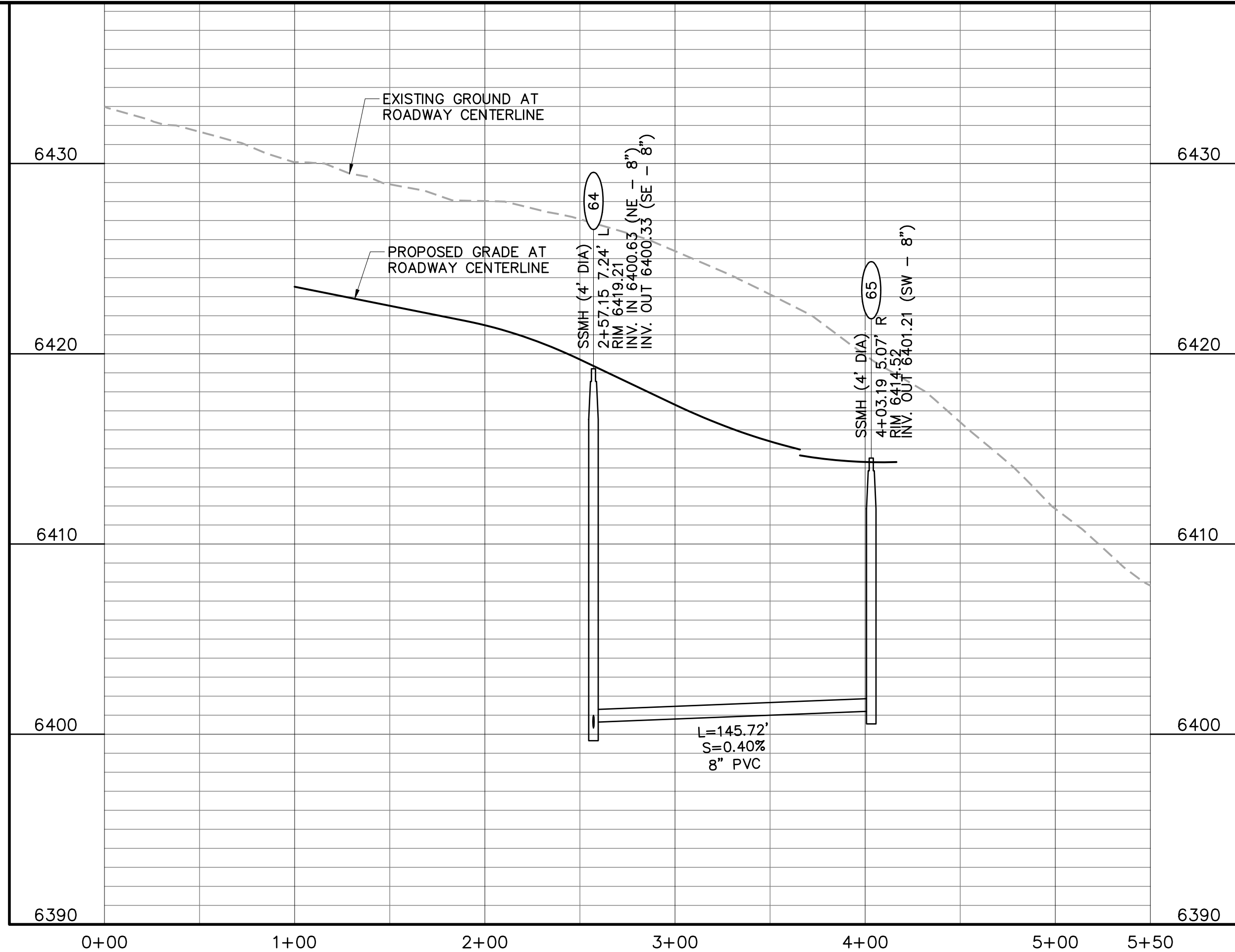
Utility Notification
Center of Colorado

TOWN APPROVAL BLOCK

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

APPROVED BY:

DEVELOPMENT SERVICES DATE



DATE	REVISION	DESCRIPTION

Hines

Drawing Name 33SW11-SW12.dwg	0 25 50 100 1 inch = 50 ft. Horizontal 1 inch = 5 ft. Vertical
Job Number HINES CS3	Designer KWS
Prepared For HINES	Drafter JAH
	Checked BKM

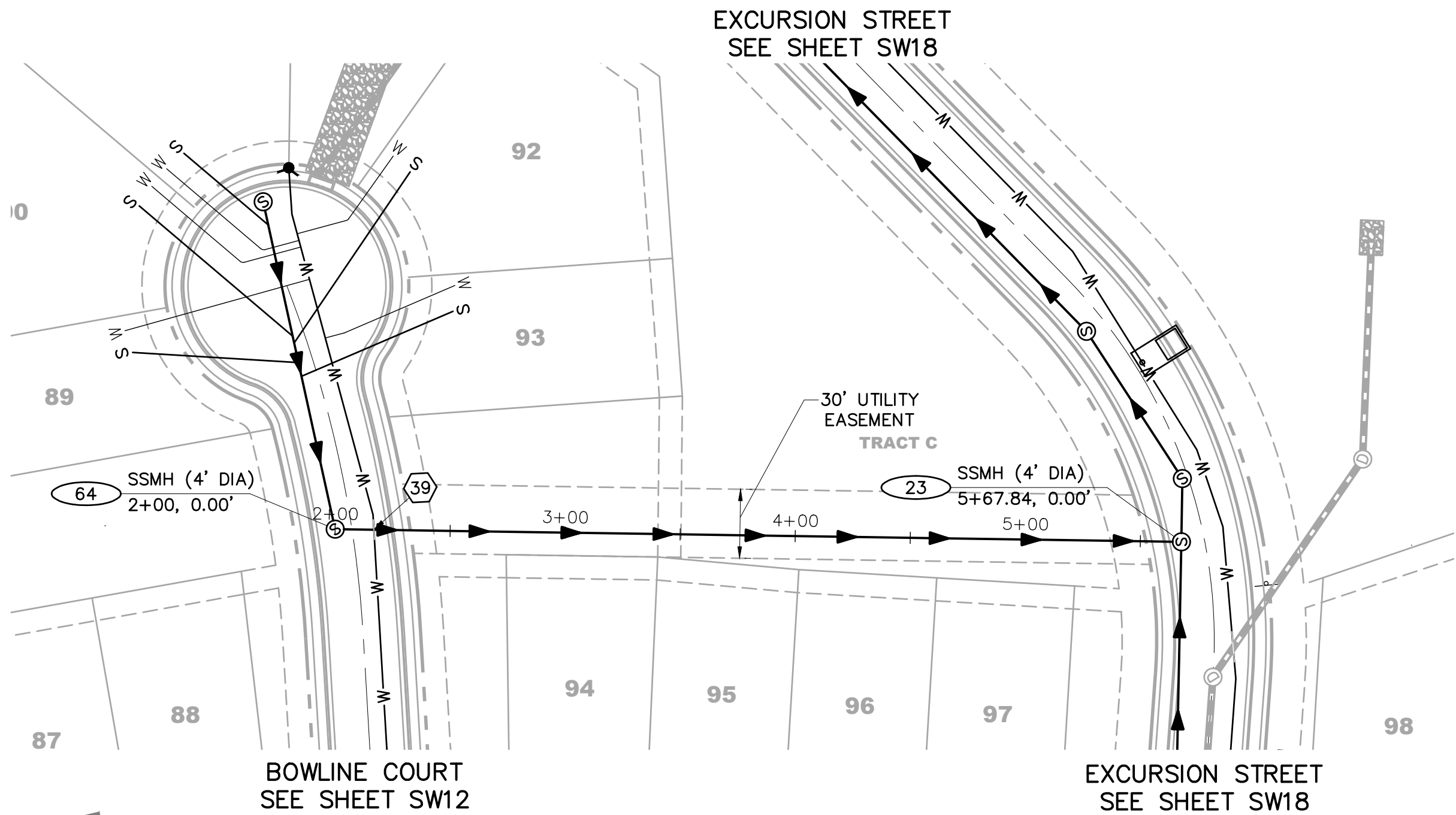


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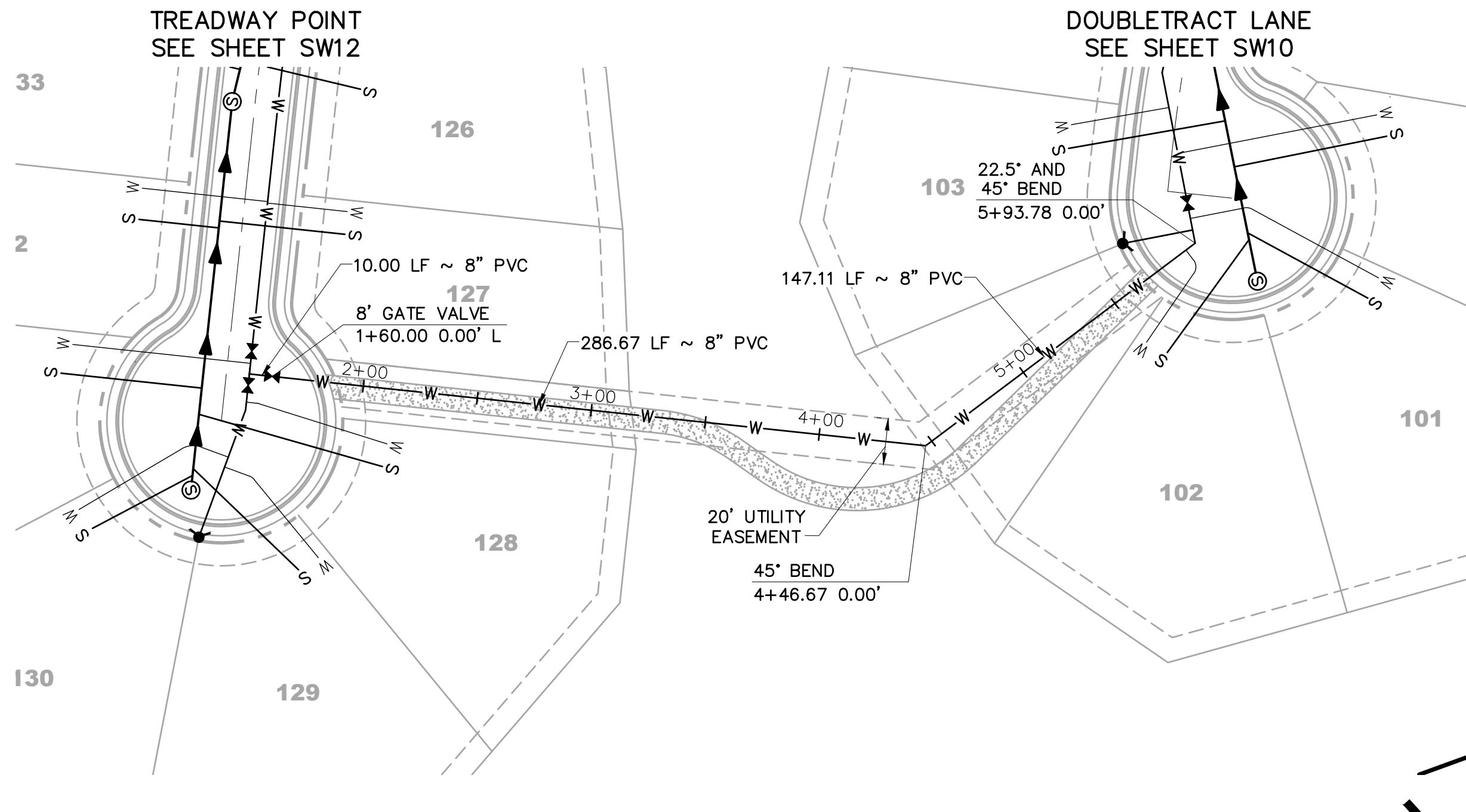
CANYONS SOUTH FILING NO. 2
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

Sheet SW12	21 of 35
Date JANUARY 20, 2022	

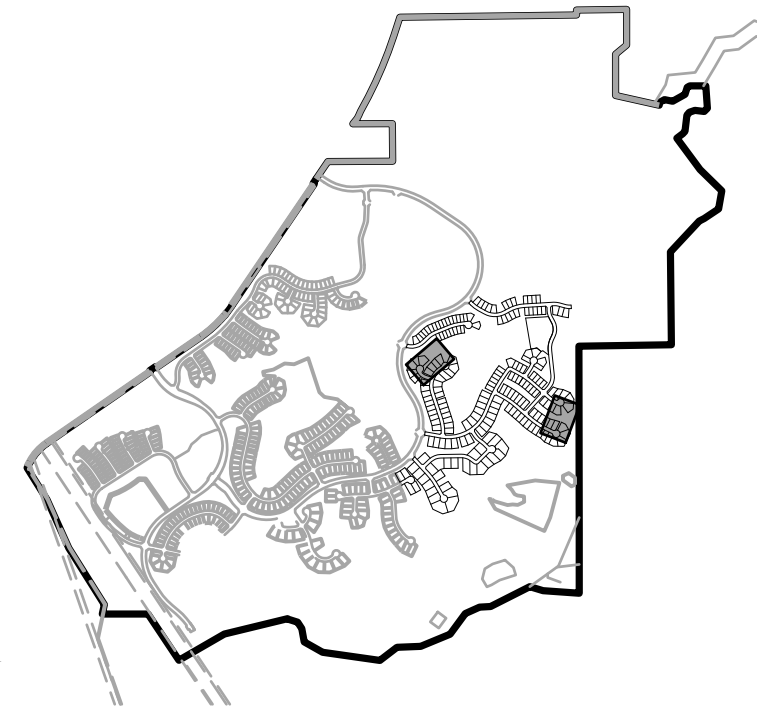
UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
39	8" PVC	TOP=6400.95	UNDER	8" PVC WAT	BOP=6413.28	12.34'



SANITARY LATERAL 4



WATER LATERAL 2



KEYMAP
CONSTRUCTION NOTES:

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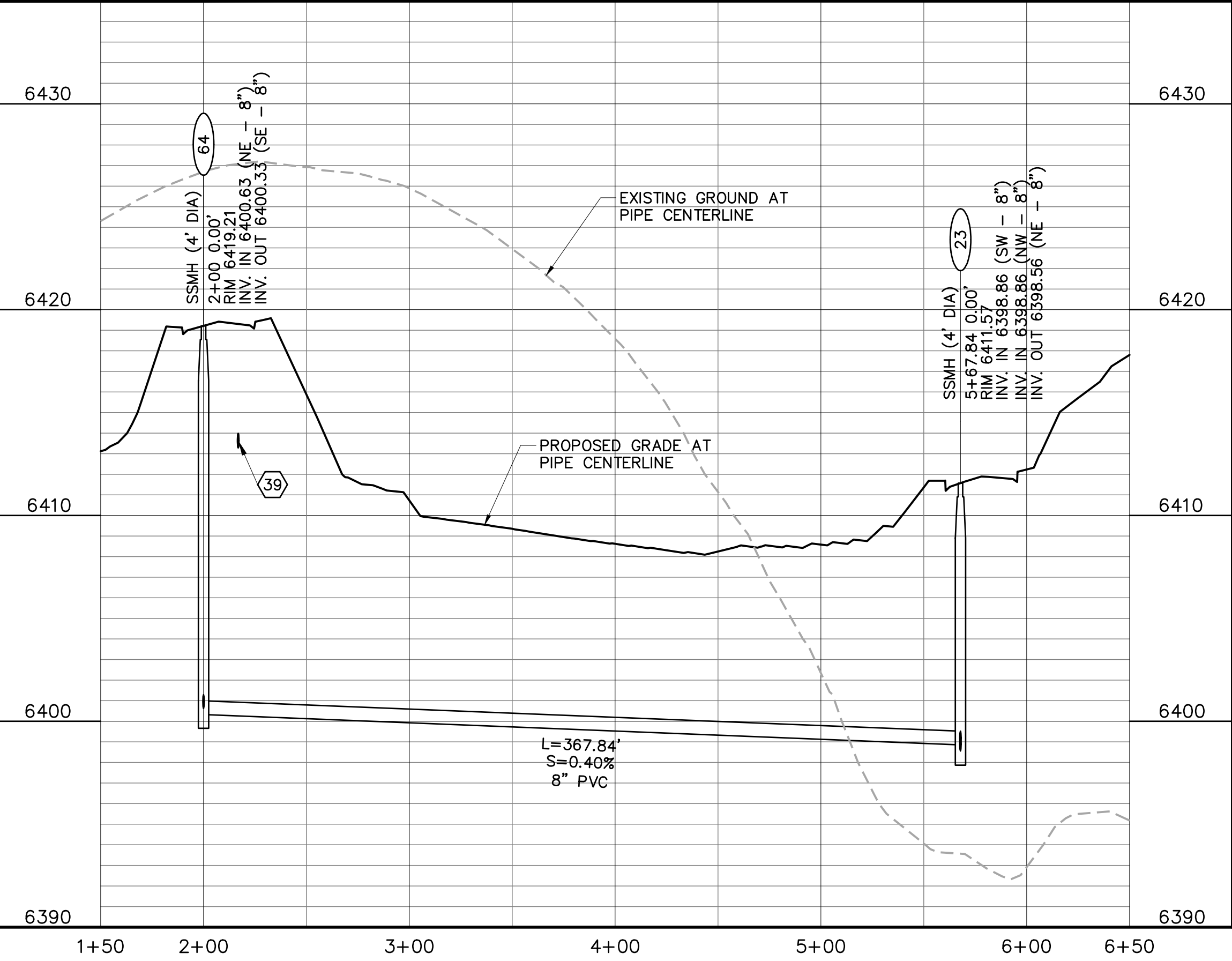
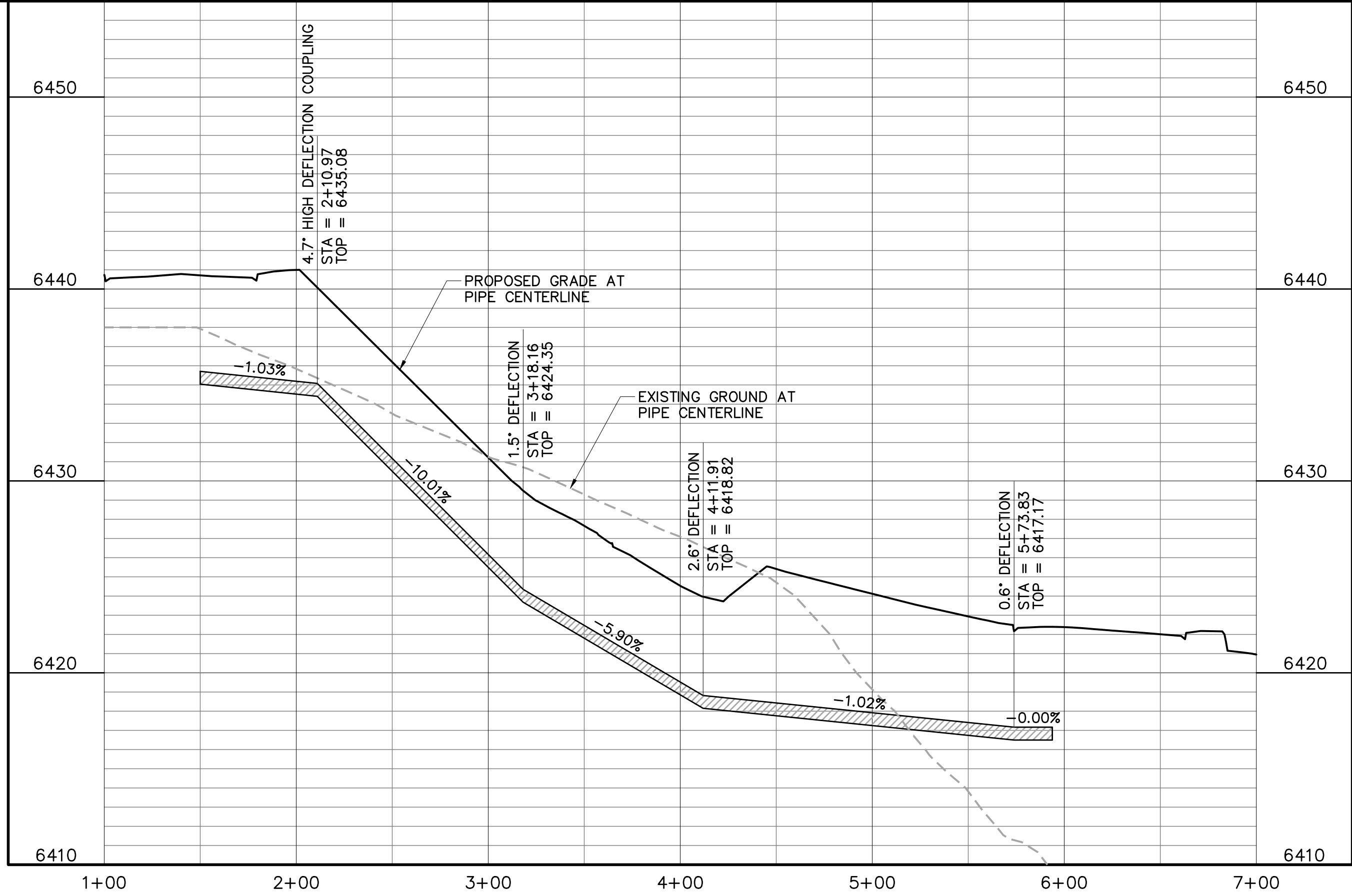
PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

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TOWN APPROVAL BLOCK

TOWN OF CASTLE ROCK APPROVAL PLANS
ARE HEREBY APPROVED FOR ONE YEAR FROM
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APPROVED BY:

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PATH: J:\HINES\CS\CADD\CIVIL\33 F2 SANITARY AND WATER\33SW13.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 4/13/2022 4:48 PM
XREFS:

DATE	REVISION	DESCRIPTION

Drawing Name
33SW13.dwg

Job Number
HINES CS3

Prepared For
HINES

0 25 50 100

1 inch = 50 ft. Horizontal
1 inch = 5 ft. Vertical

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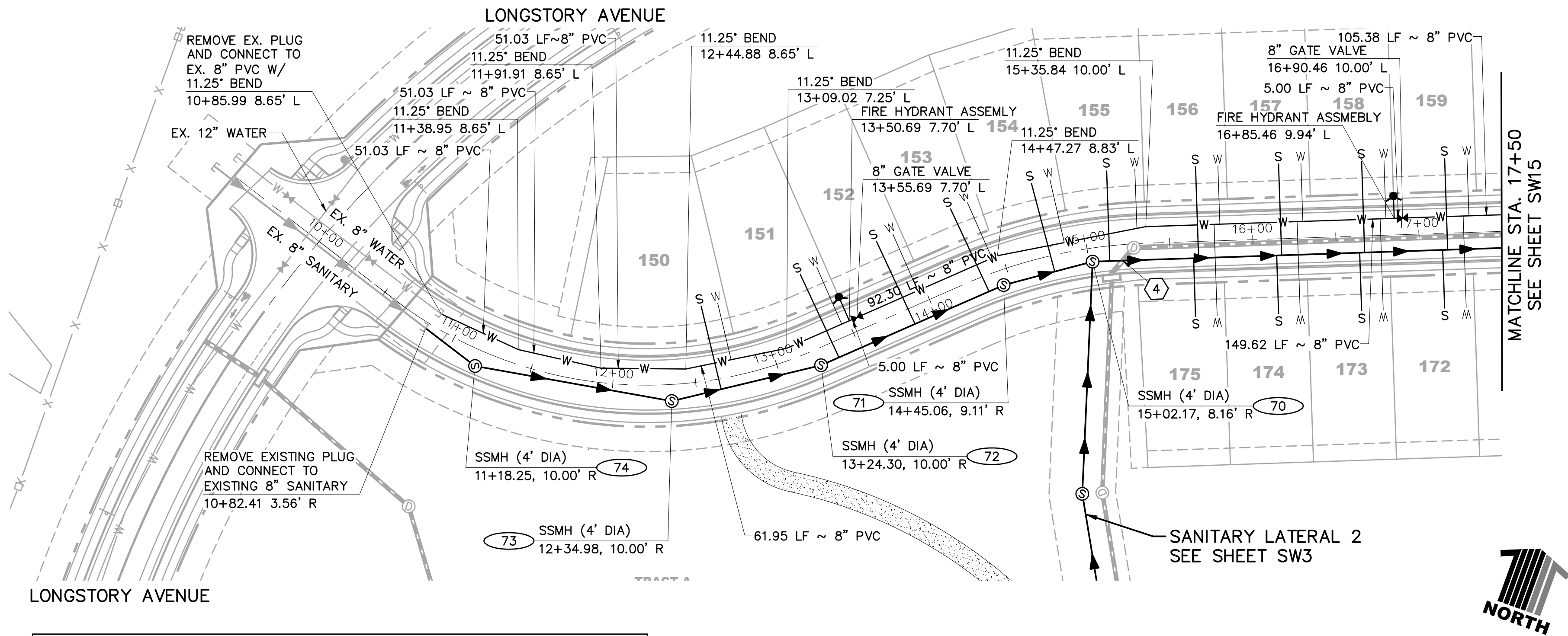
SANITARY SEWER AND WATER PLANS

SANITARY AND WATER PLAN AND PROFILE

Sheet
SW13
of
35

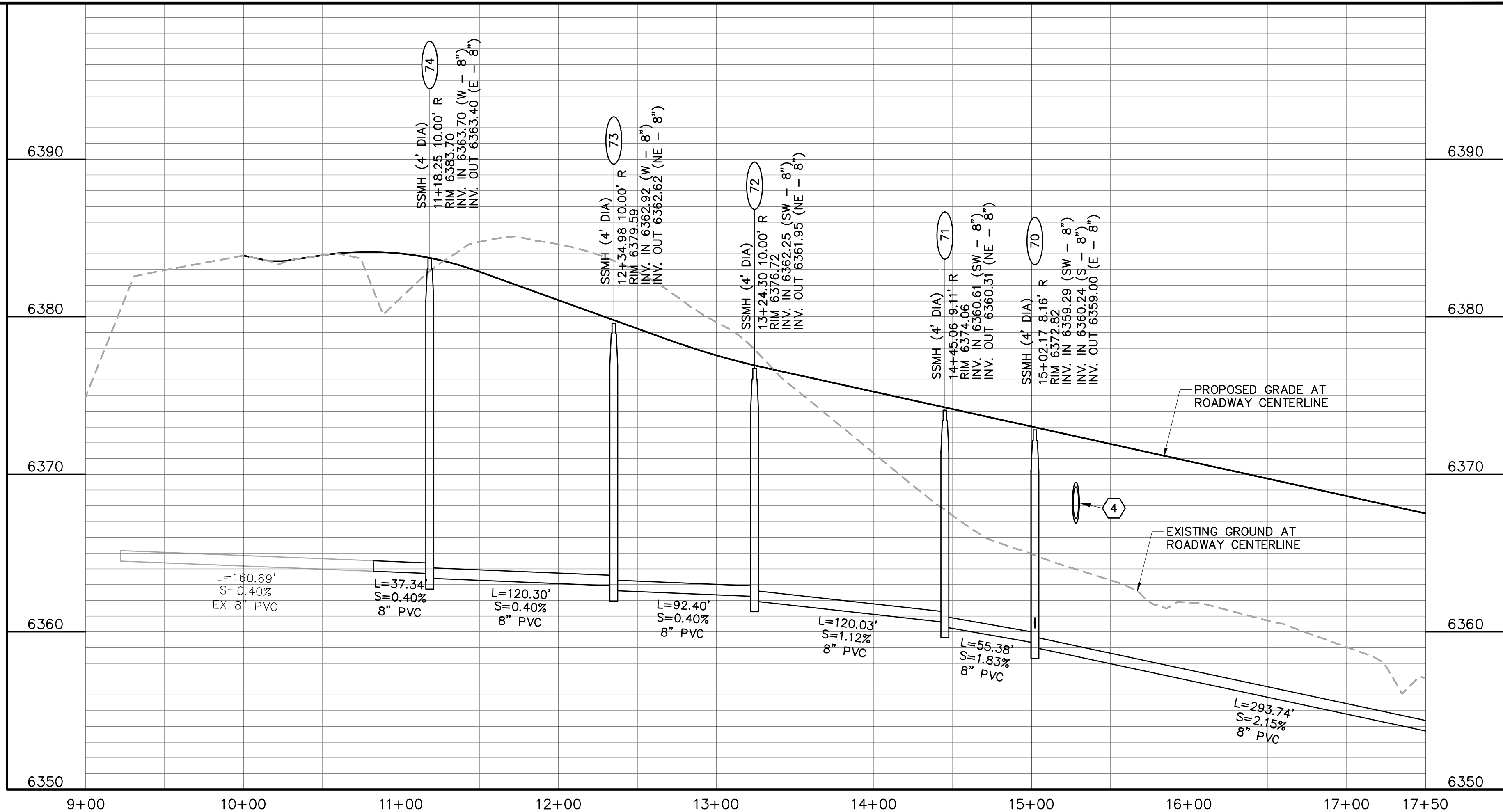
Date
JANUARY 20, 2022

PATH: J:\HINES CS\CADD\CIVIL\33 F2 SANITARY AND WATER\33SW14-SW15.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 4/13/2022 4:49 PM
XREFS:



UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
4	8" PVC	TOP=6359.30	UNDER	24" RCP	BOP=6367.00	7.71'

RUCKSACK COURT



① INDICATES UTILITY CROSSING NUMBER
(SEE CROSSING TABLE LEFT COLUMN)

PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

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APPROVED BY:

DEVELOPMENT SERVICES DATE

Hines

Drawing Name
33SW14-SW15.dwg
Job Number
HINES CS3
Prepared For
HINES

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1 inch = 50 ft. Horizontal
1 inch = 5 ft. Vertical

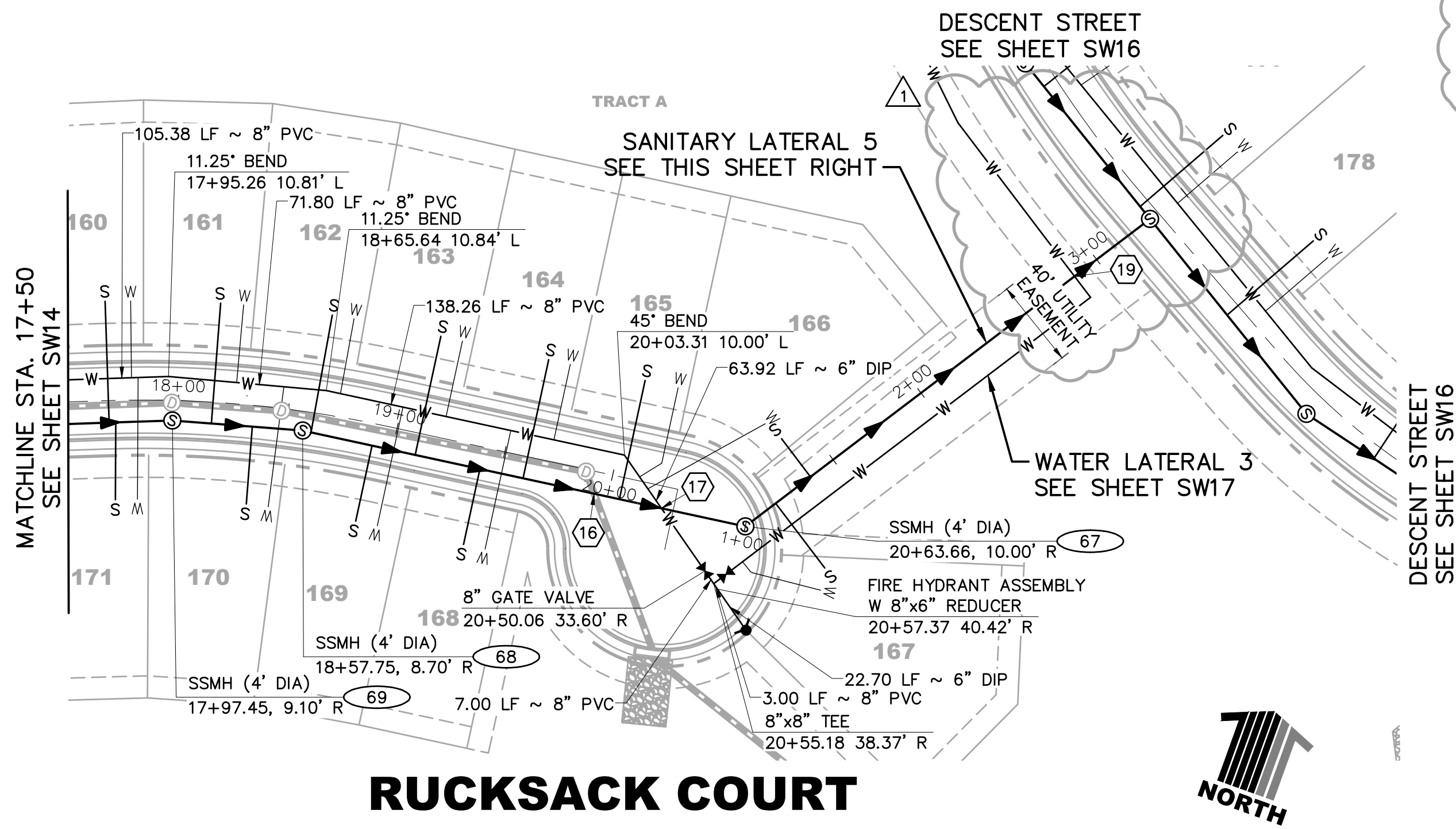
Designer
KWS
Drafter
ETG
Checked
BKM



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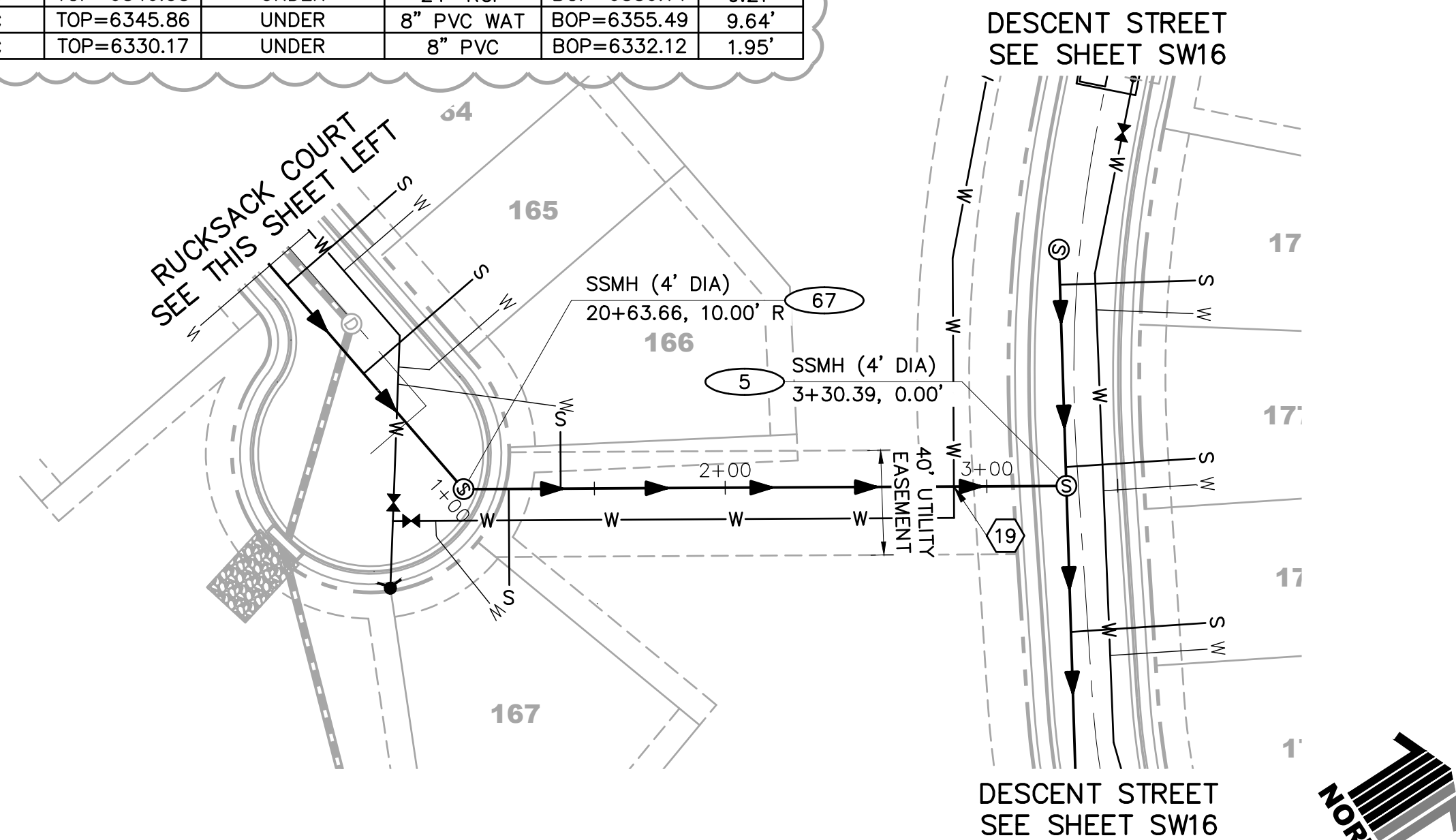
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Sheet
SW14
of
35
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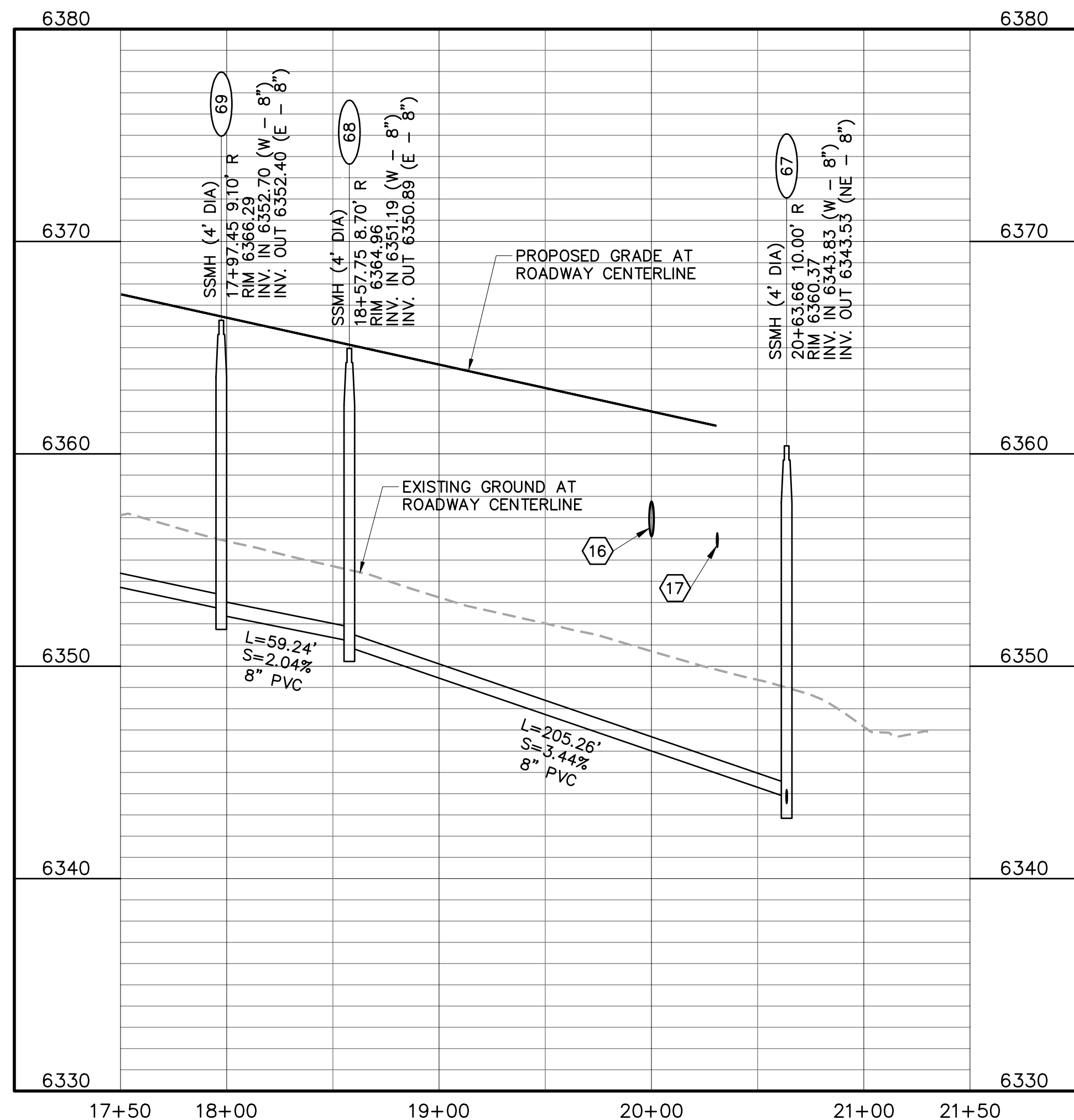
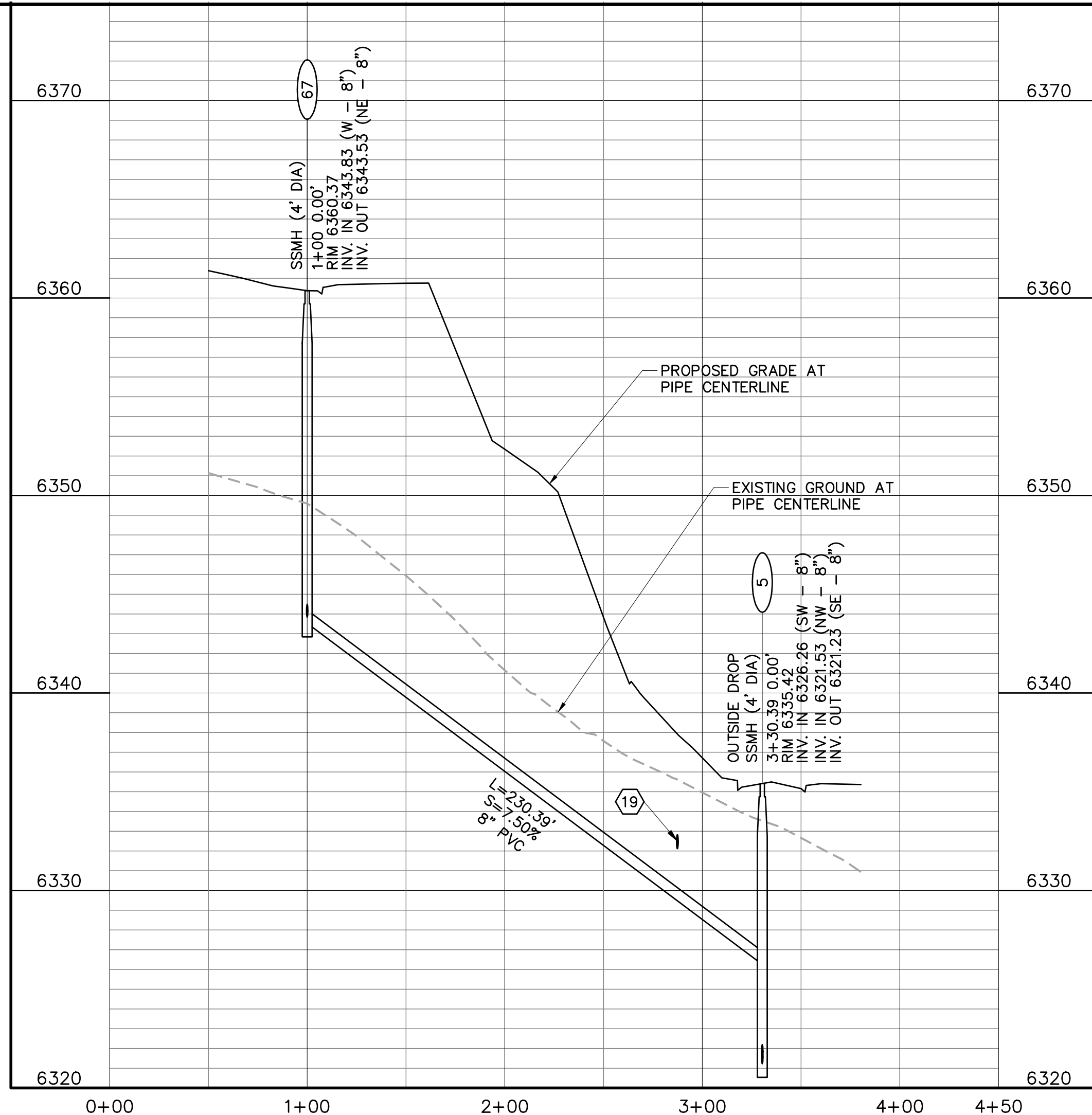
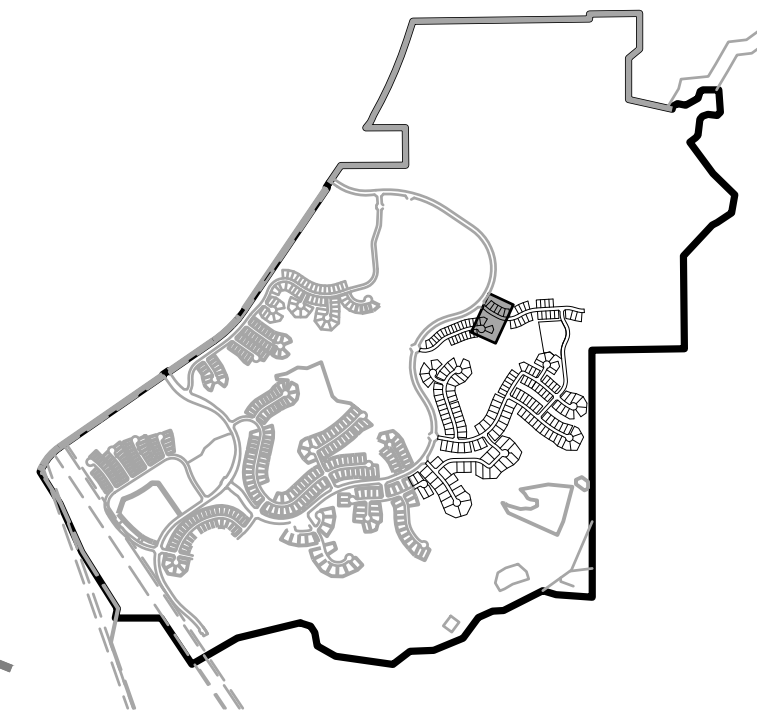


RUCKSACK COURT

UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
16	8" PVC	TOP=6346.93	UNDER	24" RCP	BOP=6356.14	9.21'
17	8" PVC	TOP=6345.86	UNDER	8" PVC WAT	BOP=6355.49	9.64'
19	8" PVC	TOP=6330.17	UNDER	8" PVC	BOP=6332.12	1.95'



SANITARY LATERAL 5



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(NAVD88 DATUM) ELEVATION=6483.68



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Utility Notification
Center of Colorado

TOWN APPROVAL BLOCK

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

APPROVED BY:

DEVELOPMENT SERVICES DATE

PATH: J:\HINES\CS\CADD\CIVIL\33 F2 SANITARY AND WATER\33SW14-SW15.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 4/21/2022 11:10 AM
XREFS:

DATE	REVISION DESCRIPTION
4/21/2022	WATERLINE RE-ALIGNMENT

Hines

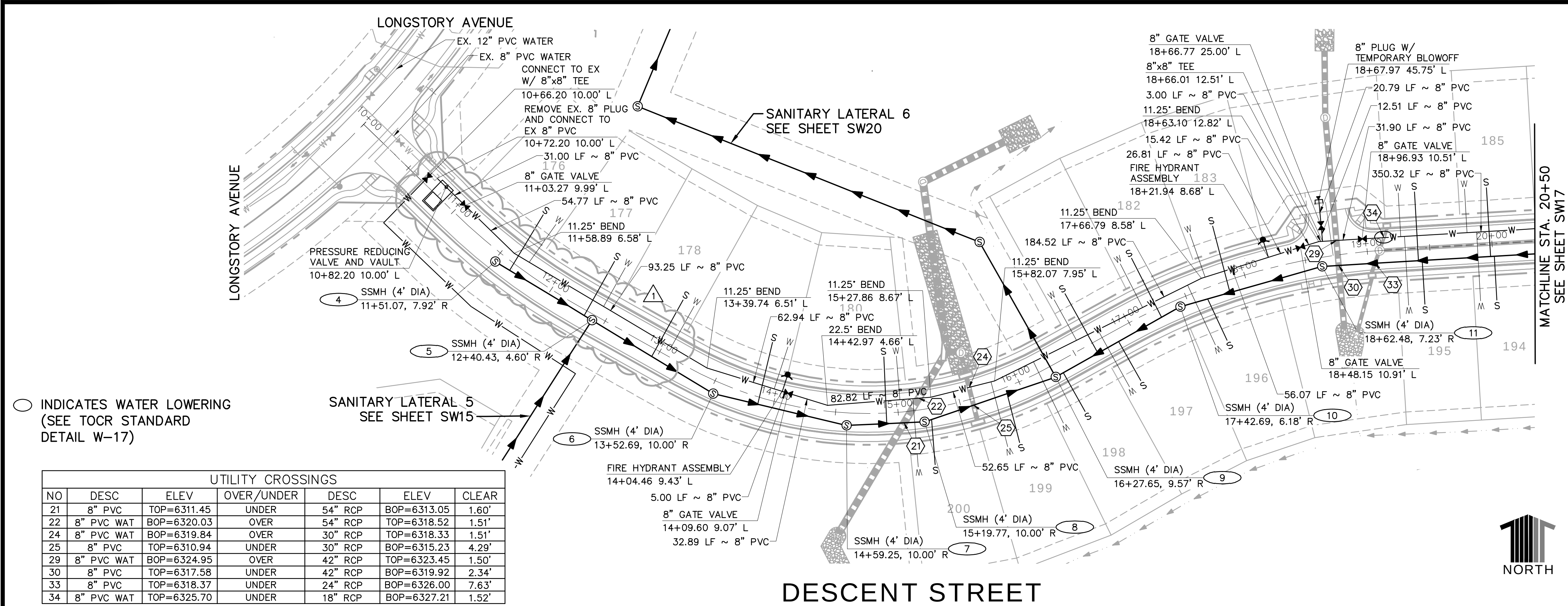
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Job Number HINES CS3	Designer KWS
Prepared For HINES	Drafter JAH
	Checked BKM

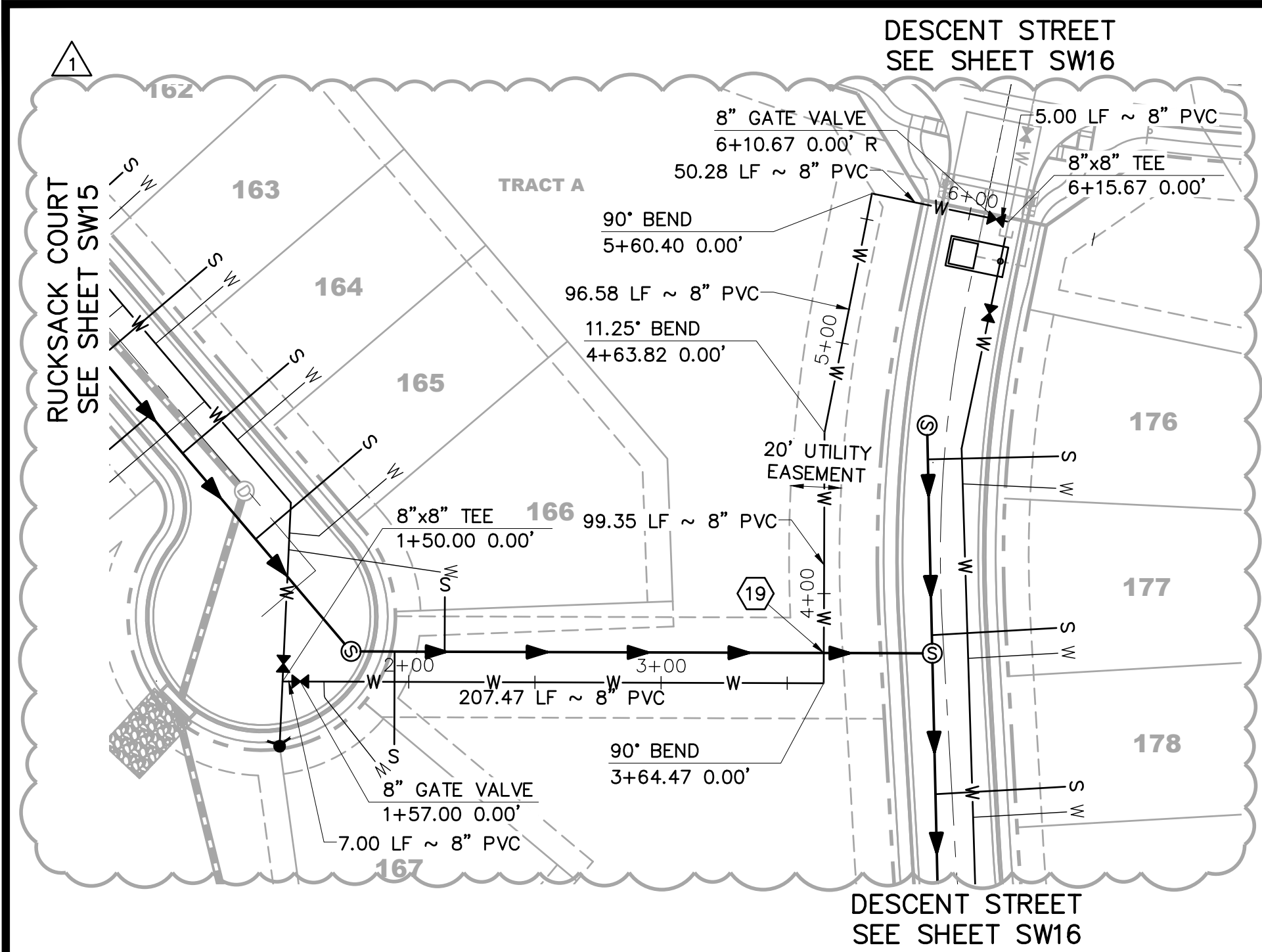


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Construction Management Civil Engineering Surveying

CANYONS SOUTH FILING NO. 2
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

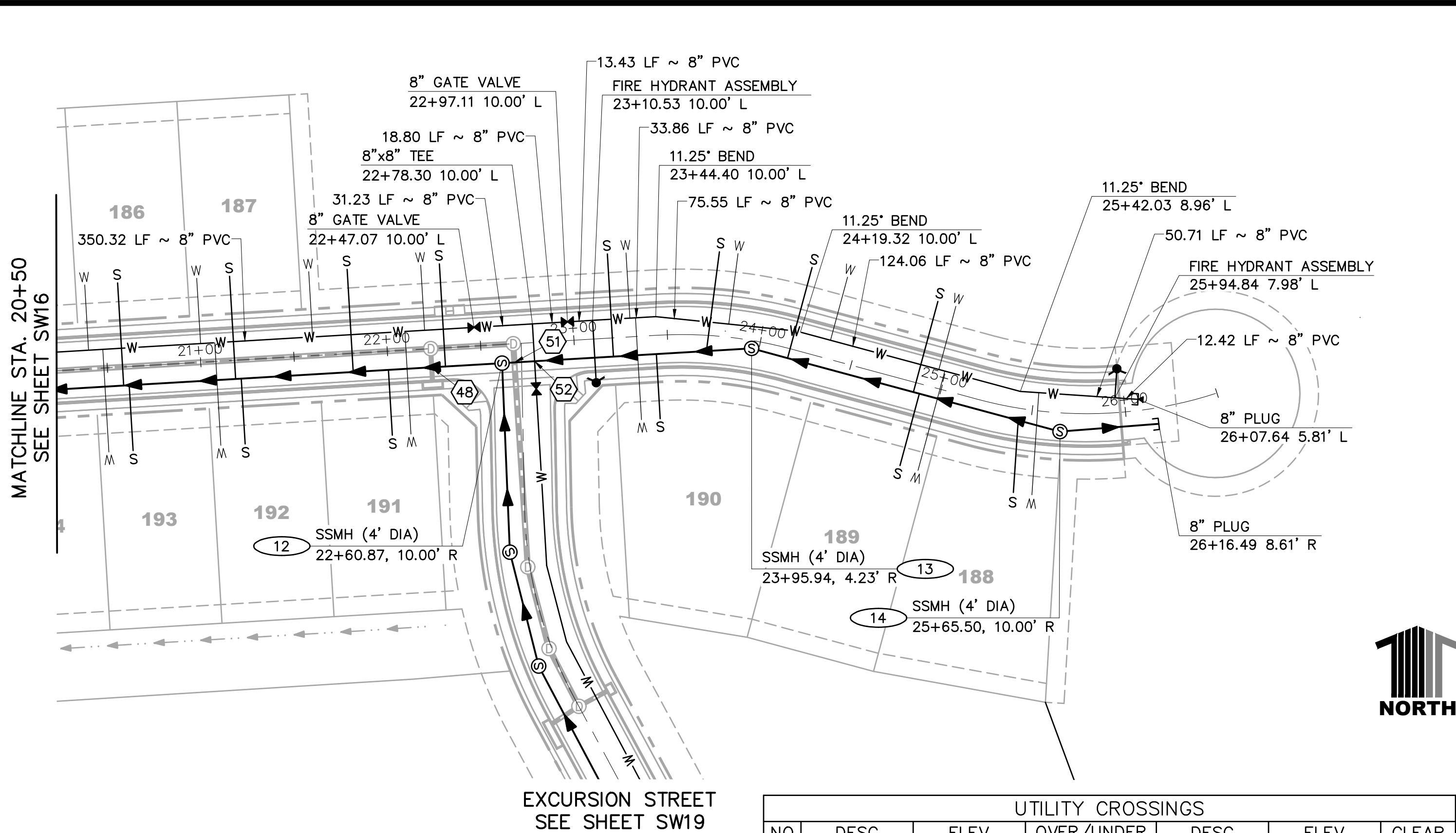
Sheet SW15	24 of 35
Date JANUARY 20, 2022	





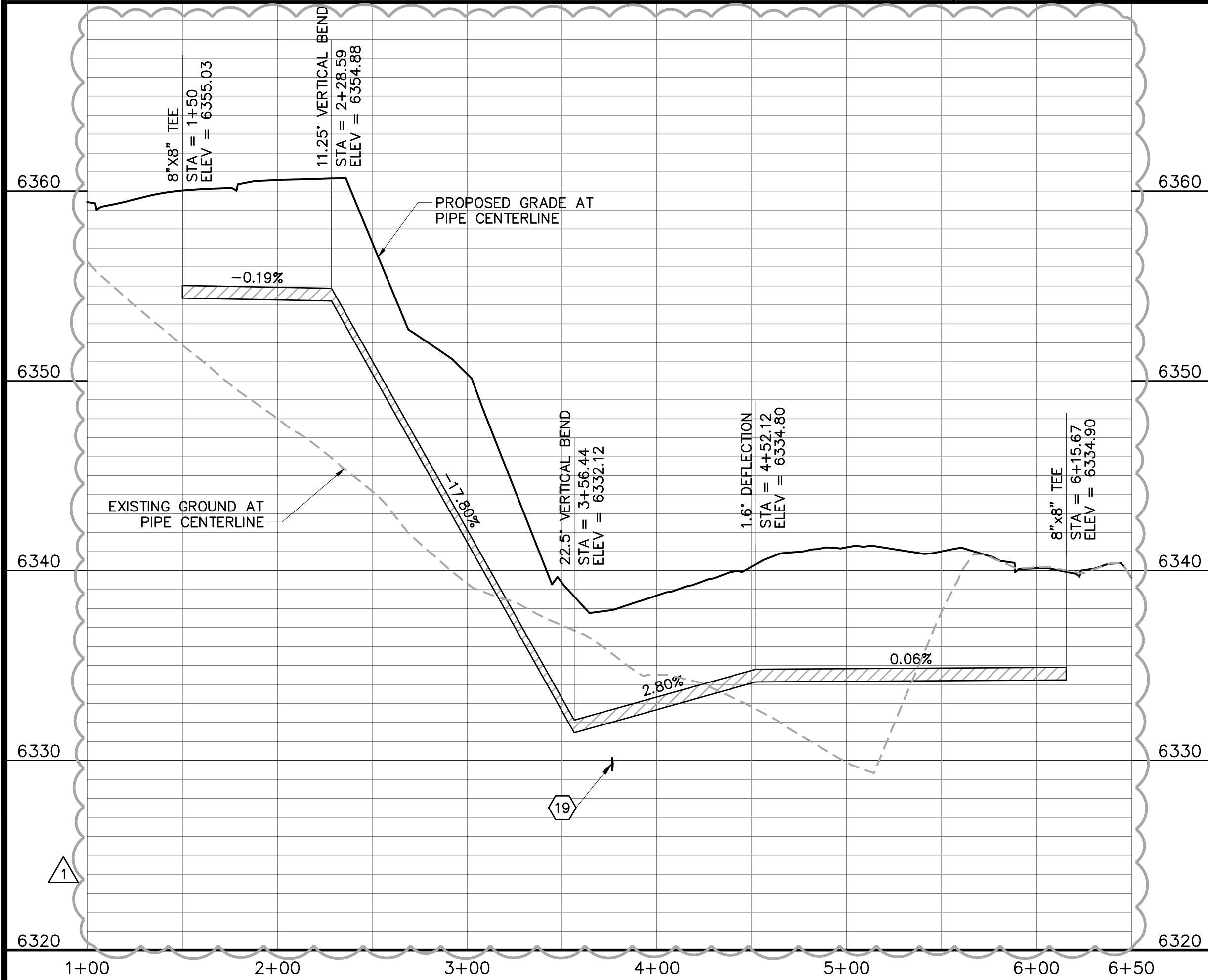
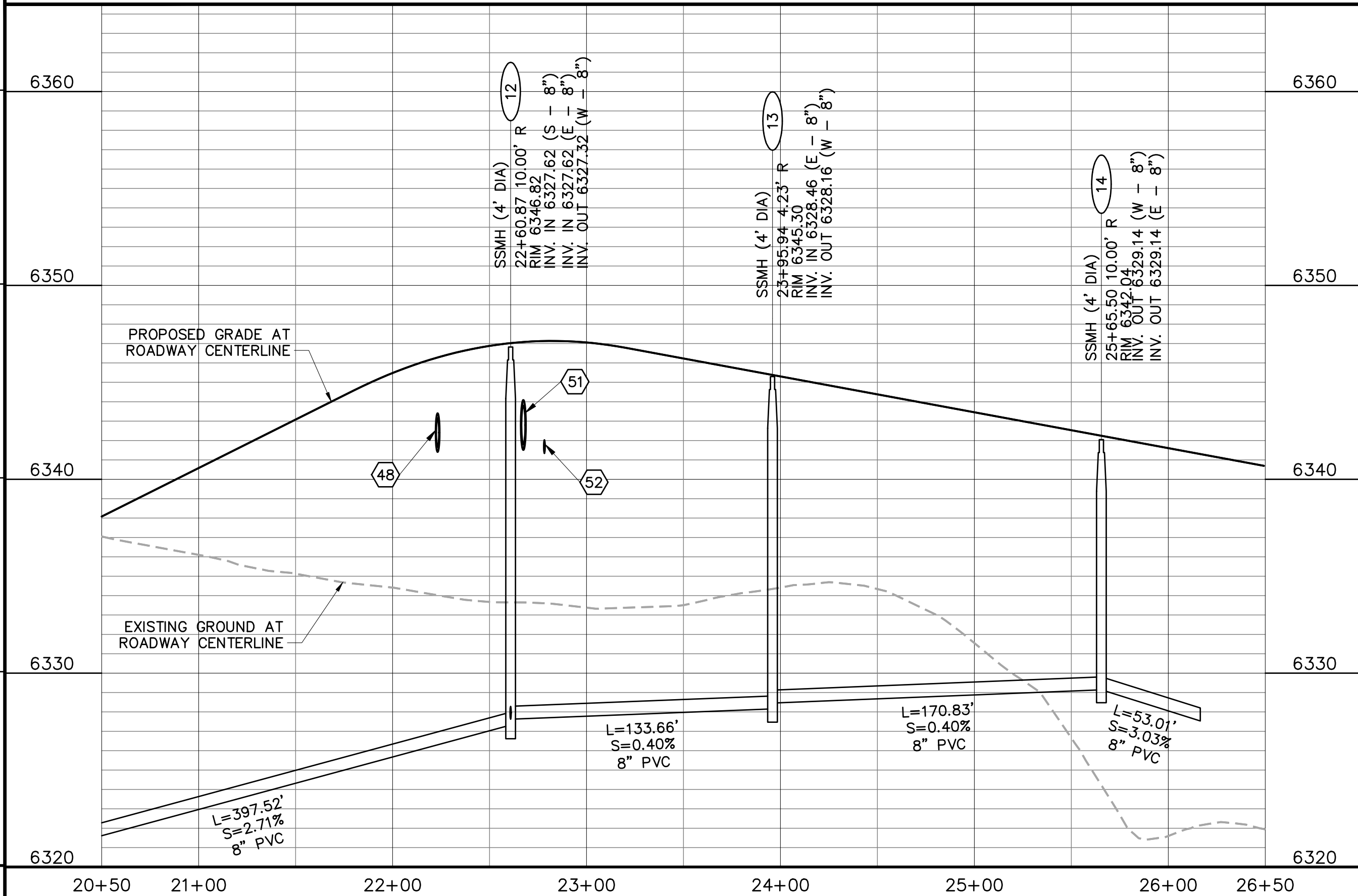
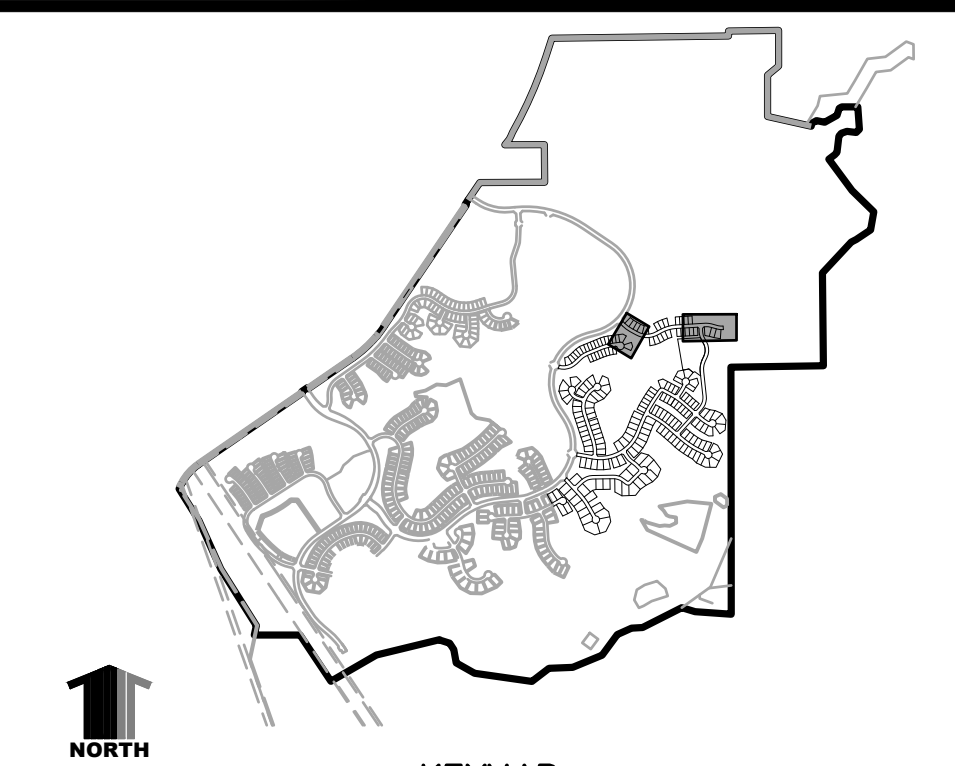
UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
19	8" PVC	TOP=6330.17	UNDER	8" PVC	BOP=6332.12	1.95'

WATER LATERAL 3



UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
48	8" PVC	TOP=6326.99	UNDER	18" RCP	BOP=6341.65	14.66'
51	8" PVC	TOP=6328.34	UNDER	24" RCP	BOP=6341.75	13.41'
52	8" PVC	TOP=6328.38	UNDER	8" PVC WAT	BOP=6341.19	12.81'

DESCENT STREET



KEYMAP

CONSTRUCTION NOTES:

- ALL SANITARY SEWER CONSTRUCTION IS SUBJECT TO THE TOWN OF CASTLE ROCK WASTEWATER COLLECTION DESIGN CRITERIA MANUAL, WELL AS THE SANITARY SEWER CONSTRUCTION NOTES LISTED HEREIN.
- ALL SANITARY SEWER PIPELINES SHALL BE PVC, SDR-35, IN ACCORDANCE WITH ASTM D-3034, BELL AND SPIGOT WITH ELASTOMERIC SEAL.
- ALL SANITARY SEWER PIPELINES SHALL HAVE A MINIMUM COVER OF 5 FEET AND MAXIMUM COVER OF 20 FEET.
- ALL SANITARY SEWER PIPELINES SHALL BE BEDDED IN ACCORDANCE WITH TCR STANDARD DETAIL SS-8.
- ALL MANHOLE RIM ELEVATIONS GIVEN ON THESE PLANS ARE CONSIDERED APPROXIMATE. THE CONTRACTOR SHALL SET THE FINAL RIM ELEVATION BASED ON THE COMPLETE FINISH SURFACE AND PER TCR STANDARD DETAIL SS-3.
- ALL SEWER LINES SHALL HAVE A MINIMUM HORIZONTAL SEPARATION OF 10 FEET EDGE-TO-EDGE FROM ALL WATER LINES. WHERE LINES CROSS, THERE SHALL BE A MINIMUM OF 18" CLEAR VERTICAL SEPARATION.
- ALL SANITARY SEWER LINES MUST BE TESTED IN ACCORDANCE WITH SECTION 450.6 OF THE TOWN OF CASTLE ROCK CONSTRUCTION METHODOLOGY AND MATERIALS MANUAL IN THE PRESENCE OF A TCR CONSTRUCTION INSPECTOR.
- ALL SANITARY SEWER LINE TRENCHES SHALL BE SLOPED OR BRACED AND SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKERS AND THE PROTECTION OF OTHER UTILITIES, IN COMPLIANCE WITH ALL APPLICABLE STATE AND FEDERAL REQUIREMENTS. ALL EXCAVATION OPERATION SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL MANHOLES SHALL BE PLACED ON A MINIMUM OF 1' OF 3/4" WASH ROCK. IF ADDITIONAL SUBGRADE IS DISTURBED, EXCAVATION SHALL BE BACKFILLED WITH 3/4" WASH ROCK OR OTHER APPROVED STRUCTURAL SOIL COMPACTED TO 95% OF ASTM D698 UNLESS OTHERWISE INSTRUCTED BY THE INSPECTOR.

- ① INDICATES UTILITY CROSSING NUMBER (SEE CROSSING TABLE LEFT COLUMN)

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68



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YOU DIG

811
OR

1-800-922-1987

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Center of Colorado

TOWN APPROVAL BLOCK

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

APPROVED BY:

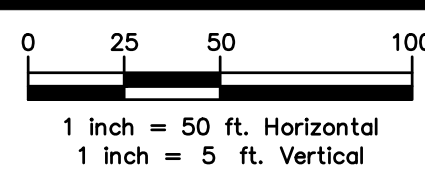
DEVELOPMENT SERVICES DATE

PATH: J:\HINES\CS\CADD\CIVIL\33 F2 SANITARY AND WATER\33SW16-SW17.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 4/21/2022 11:10 AM
XREFS:

DATE	REVISION DESCRIPTION
4/21/2022	WATERLINE RE-ALIGNMENT

Hines

Drawing Name 33SW16-SW17.dwg	Job Number HINES CS3	Prepared For HINES
Designer KWS	Drafter JAH	Checked BKM



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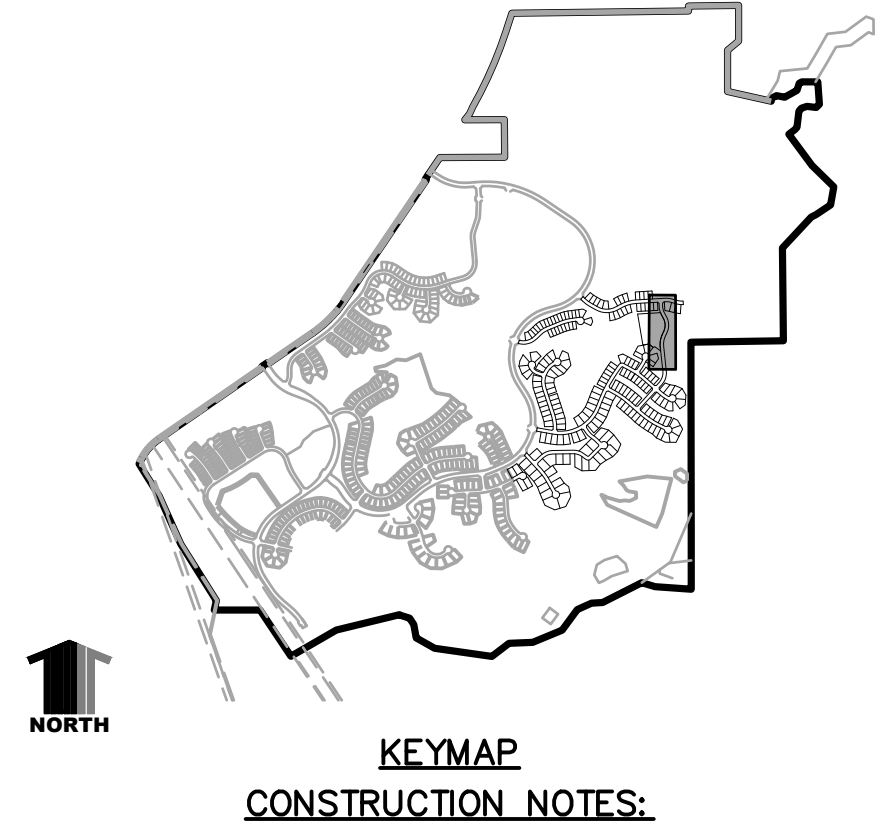
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CANYONS SOUTH FILING NO. 2

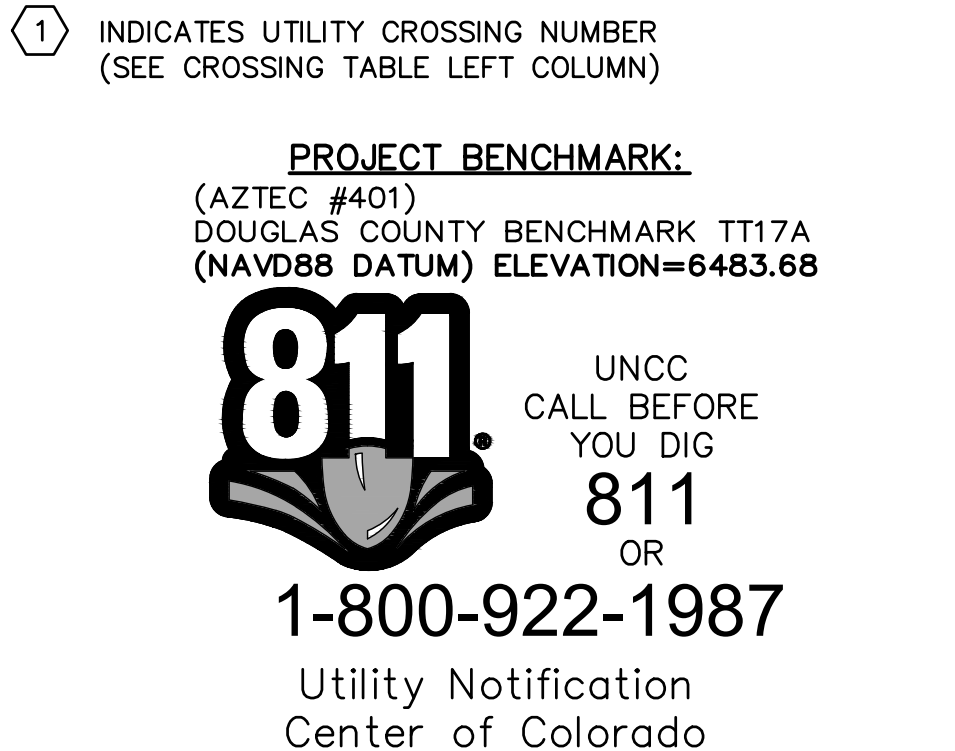
SANITARY SEWER AND WATER PLANS

SANITARY AND WATER PLAN AND PROFILE

Sheet SW17	26 of 35
Date JANUARY 20, 2022	



1. ALL SANITARY SEWER CONSTRUCTION IS SUBJECT TO THE TOWN OF CASTLE ROCK WASTEWATER COLLECTION DESIGN CRITERIA MANUAL, WELL AS THE SANITARY SEWER CONSTRUCTION NOTES LISTED HEREIN.
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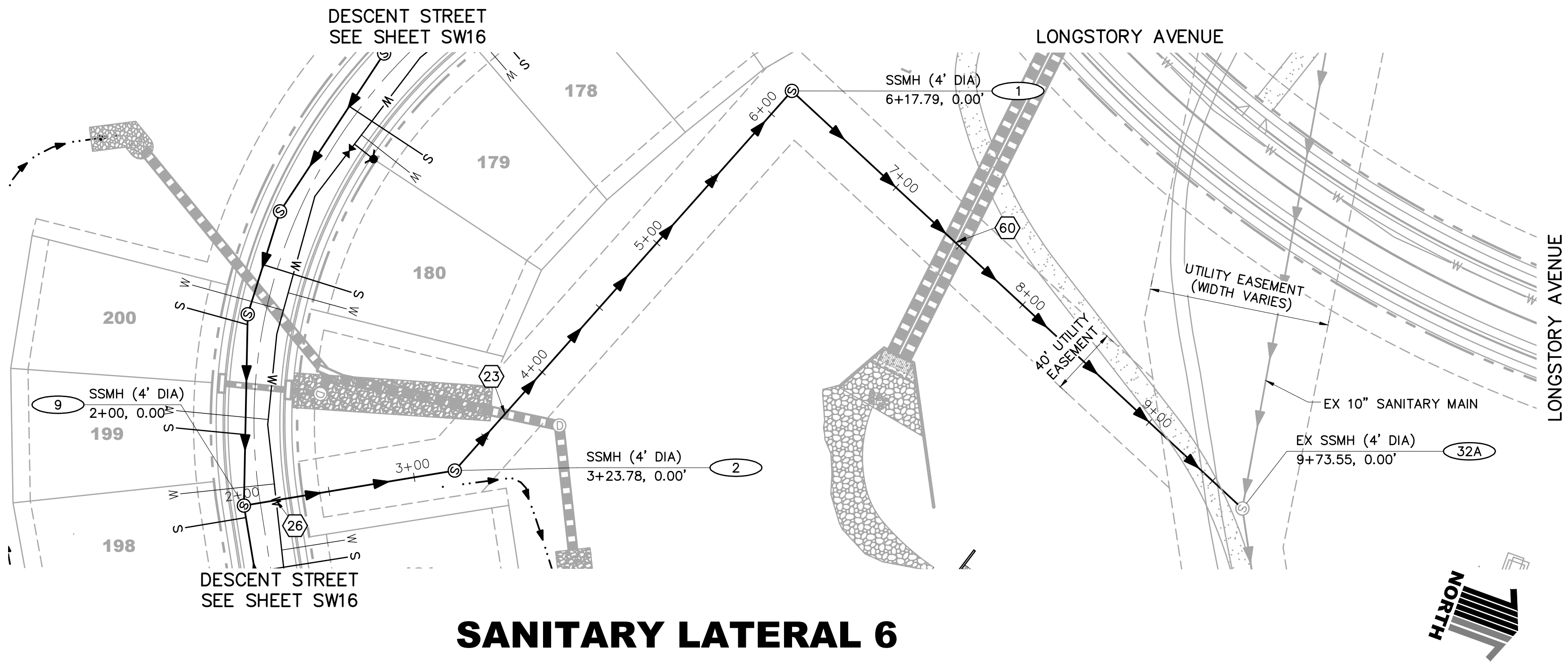
TOWN APPROVAL BLOCK

TOWN OF CASTLE ROCK APPROVAL PLANS
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DATE OF DEVELOPMENT SERVICES APPROVAL

APPROVED BY: _____

DEVELOPMENT SERVICES	DATE

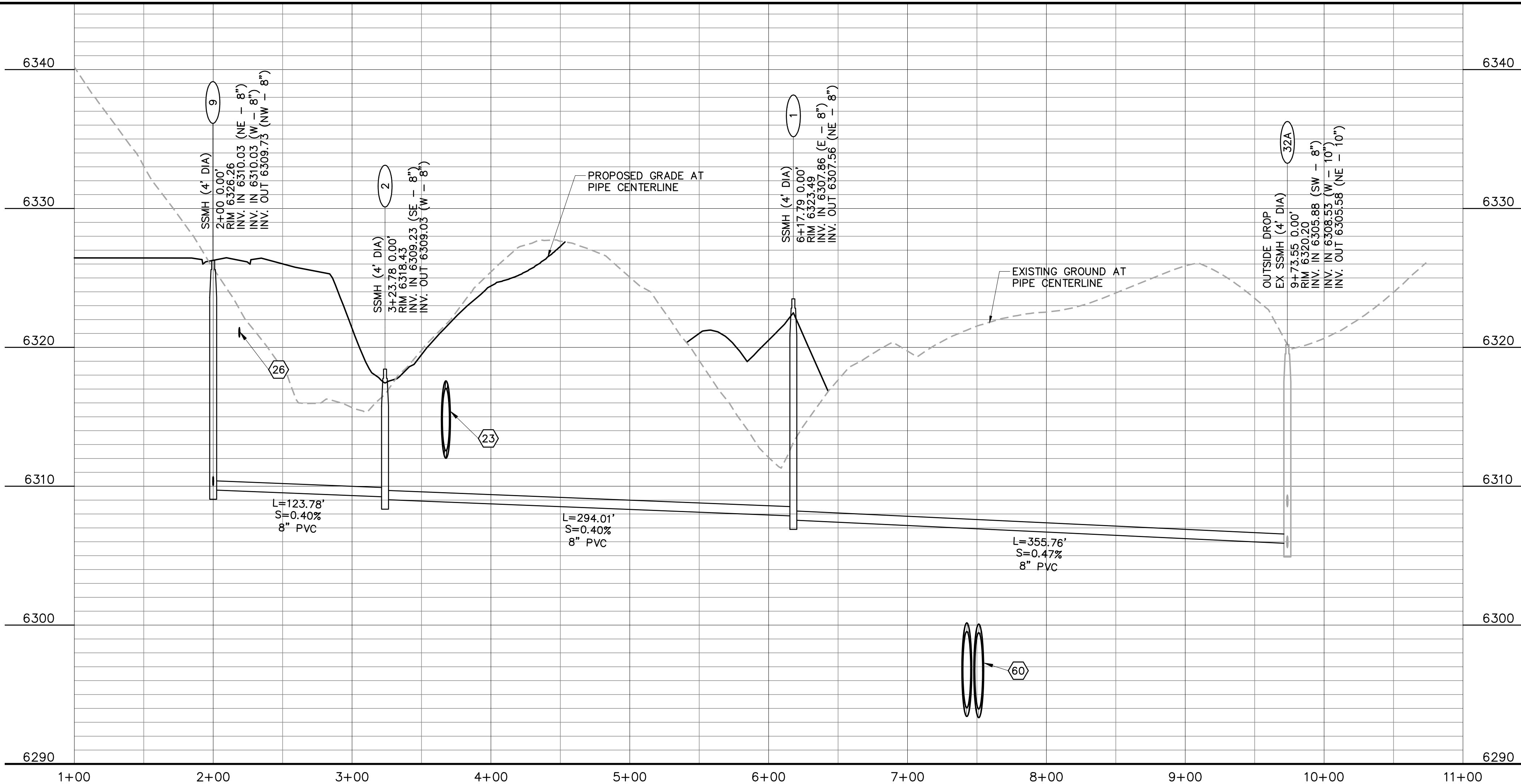
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PLOTTED BY: KYLER SANFORD PLOT DATE: 4/13/2022 4:52 PM
XREFS:



SANITARY LATERAL 6



UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
60	8" PVC	BOP=6306.95	OVER	DBL 66" RCP	TOP=6300.17	6.78'
23	8" PVC	TOP=6309.54	UNDER	54" RCP	BOP=6312.01	2.46'
26	8" PVC	TOP=6310.34	UNDER	8" PVC WAT	BOP=6320.73	10.39'



KEYMAP CONSTRUCTION NOTES:

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① INDICATES UTILITY CROSSING NUMBER
(SEE CROSSING TABLE LEFT COLUMN)

PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

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Center of Colorado

TOWN APPROVAL BLOCK

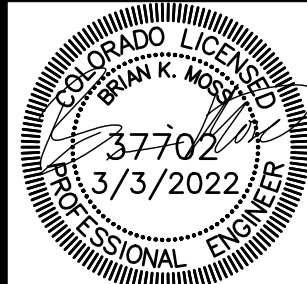
TOWN OF CASTLE ROCK APPROVAL PLANS
ARE HEREBY APPROVED FOR ONE YEAR FROM
DATE OF DEVELOPMENT SERVICES APPROVAL

APPROVED BY:

DEVELOPMENT SERVICES DATE

Hines

Drawing Name 33SW18-SW20.dwg	0 25 50 100 1 inch = 50 ft. Horizontal 1 inch = 5 ft. Vertical		
Job Number HINES CS3	Designer KWS	Drafter JAH	Checked BKM
Prepared For HINES			



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CANYONS SOUTH FILING NO. 2
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

Sheet
SW20
of
35
Date
JANUARY 20, 2022

CANYONS SOUTH FILING NO. 3
PROPOSED SANITARY SEWER AND WATER PLANS
SITUATED IN PORTIONS OF SECTION 19 AND SECTION 30 IN TOWNSHIP 7 SOUTH,
RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN,
COUNTY OF DOUGLAS, STATE OF COLORADO
PROJECT NUMER CD22-0015

SHEET INDEX

T1 (1)	TITLE SHEET
GN1 (2)	GENERAL NOTES
TY1 (3)	GENERAL NOTES AND TYPICAL SECTIONS
OU1–OU3 (4–6)	OVERALL UTILITY PLAN
SW1–SW10 (7–16)	SANITARY AND WATER PLAN AND PROFILE
DT1–DT2 (17–18)	DETAILS – SANITARY SEWER
DT3–DT6 (19–22)	DETAILS – WATER
22	TOTAL SHEETS

PROJECT VARIANCES

NONE

INDEMNIFICATION AND ADHERENCE TO STANDARDS STATEMENTS

THESE PLANS HAVE BEEN REVIEWED BY THE TOWN OF CASTLE ROCK FOR CONCEPT ONLY. THE REVIEW DOES NOT IMPLY RESPONSIBILITY BY THE REVIEWING DEPARTMENT, THE TOWN ENGINEER, OR THE TOWN OF CASTLE ROCK FOR ACCURACY AND CORRECTNESS OF THE CALCULATIONS. FURTHERMORE, THE REVIEW DOES NOT IMPLY THAT QUANTITIES OF ITEMS ON THE PLANS ARE THE FINAL QUANTITIES REQUIRED. THE REVIEW SHALL NOT BE CONSTRUED FOR ANY REASON AS ACCEPTANCE OF FINANCIAL RESPONSIBILITY BY THE TOWN FOR ADDITIONAL QUANTITIES OF ITEMS SHOWN THAT MAY BE REQUIRED DURING THE CONSTRUCTION PHASE.

ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE TOWN OF CASTLE ROCK MUNICIPAL CODE, TECHNICAL MANUALS AND/OR OTHER TOWN–APPROVED APPLICABLE STANDARDS.

TOWN APPROVAL BLOCK

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

APPROVED BY:

DEVELOPMENT SERVICES DATE

PROFESSIONAL ENGINEER CERTIFICATION

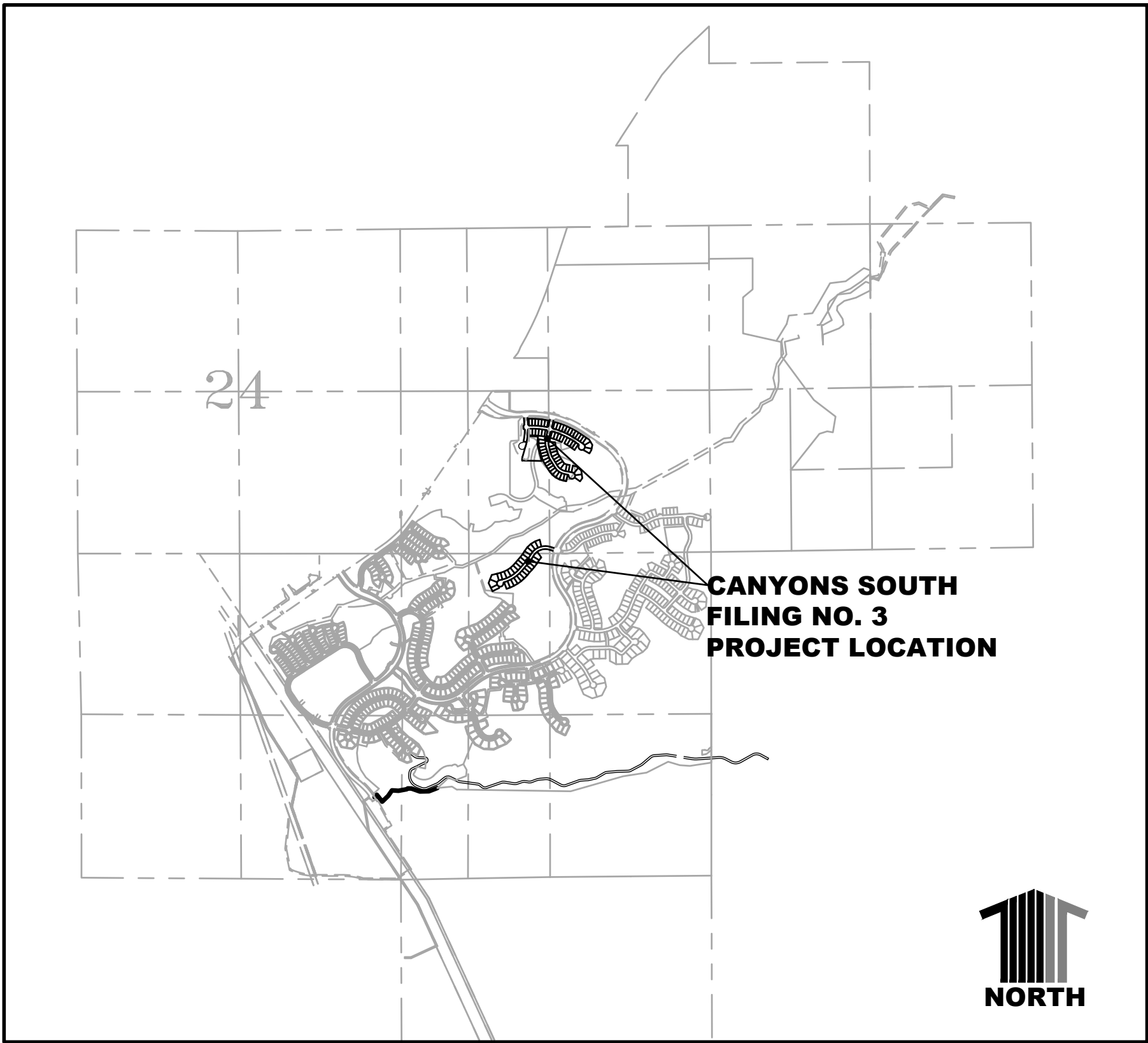
I HEREBY AFFIRM THAT THESE FINAL CONSTRUCTION PLANS WERE PREPARED UNDER MY DIRECT SUPERVISION, IN ACCORDANCE WITH ALL APPLICABLE TOWN OF CASTLE ROCK AND STATE OF COLORADO STANDARDS AND STATUES, RESPECTIVELY, AND THAT I AM FULLY RESPONSIBLE FOR ALL DESIGN AND REVISIONS RELATIVE TO SAID PLANS.



BRIAN K. MOSS DATE
REGISTERED PROFESSIONAL ENGINEER
STATE OF COLORADO NO. 37702

LEGEND

ROW/PROPERTY LINE	---
CENTERLINE	---
PROPERTY BOUNDARY	---
EASEMENT	---
PROP. WATER MAIN	—W—W—
PROP. WATER VALVE	⋈
PROP. FIRE HYDRANT	←
PROP. SANITARY SEWER MAIN	→⊙→
PROP. STORM DRAIN	—D—
PROP. STORM DRAIN INLET	□
SANITARY SEWER MANHOLE NUMBER	16
STORM DRAINAGE MANHOLE NUMBER	MH-5
EX. GAS MAIN	—G—G—G—
EX. WATER MAIN	—W—W—W—
EX. WATER VALVE	⋈
EX. FIRE HYDRANT	←
EX. SANITARY SEWERS	→⊙→
EX. STORM DRAIN	—D—
EX. STORM DRAIN INLET	□
EX. POWER POLE	—O—
EX. UNDERGROUND ELECTRIC	—E—E—E—
EX. UNDERGROUND TELEPHONE	—T—T—T—
EX. FENCE	—X—X—X—



VICINITY MAP

SCALE: 1"=2000'

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A

(NAVD88 DATUM) ELEVATION=6483.68

BASIS OF BEARINGS:

EAST LINE OF THE SOUTHWEST ONE–QUARTER OF THE SOUTHWEST ONE–QUARTER OF SAID SECTION 20, MONUMENTED ON THE NORTH END BY A FOUND 3–1/4" ALUMINUM CAP STAMPED "PLS 131155" AND ON THE SOUTH END BY A FOUND 2–1/2" ALUMINUM CAP STAMPED "PLS 23515" "2003", ASSUMED TO BEAR SOUTH 00°30'17" EAST 1,324.72 FEET.

OWNER/DEVELOPER:

HT CANYONS SOUTH DEVELOPMENT LP
1144 15TH STREET, SUITE 2600
DENVER, CO 80202
(720) 932–0522
CONTACT: RICHARD CROSS

SURVEYOR:

AZTEC CONSULTANTS, INC
300 EAST MINERAL AVENUE, SUITE 1
LITTLETON, CO 80122
(303) 713–1898
CONTACT: DANIEL DAVIS

TOWN OF CASTLE ROCK

100 NORTH WILCOX STREET
CASTLE ROCK, CO 80104
(720) 733–2202
CONTACT: KEITH JOHNSTON

SOILS ENGINEER:

CTL/THOMPSON
1971 WEST 12th AVENUE
DENVER, CO 80204
(303) 825–0777
CONTACT: DAVID GLATER

ENGINEER:

CALIBRE ENGINEERING, INC.
9090 SOUTH RIDGELINE BOULEVARD, SUITE 105
HIGHLANDS RANCH, CO 80129
(303) 730–0434
CONTACT: BRIAN MOSS



1-800-922-1987

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Center of Colorado

Administrative Office 303–232–1991
16361 Table Mountain Parkway
Golden, Co. 80403

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UNDERGROUND MEMBER UTILITIES.

CALIBRE ENGINEERING, INC. ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS (HORIZONTAL AND VERTICAL). THE EXISTING UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE LOCATIONS OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES.

Hines

Drawing Name 53T1.dwg			
Job Number HINES CS3			
Prepared For HINES	Designer KWS	Drafter JAH	Checked BKM

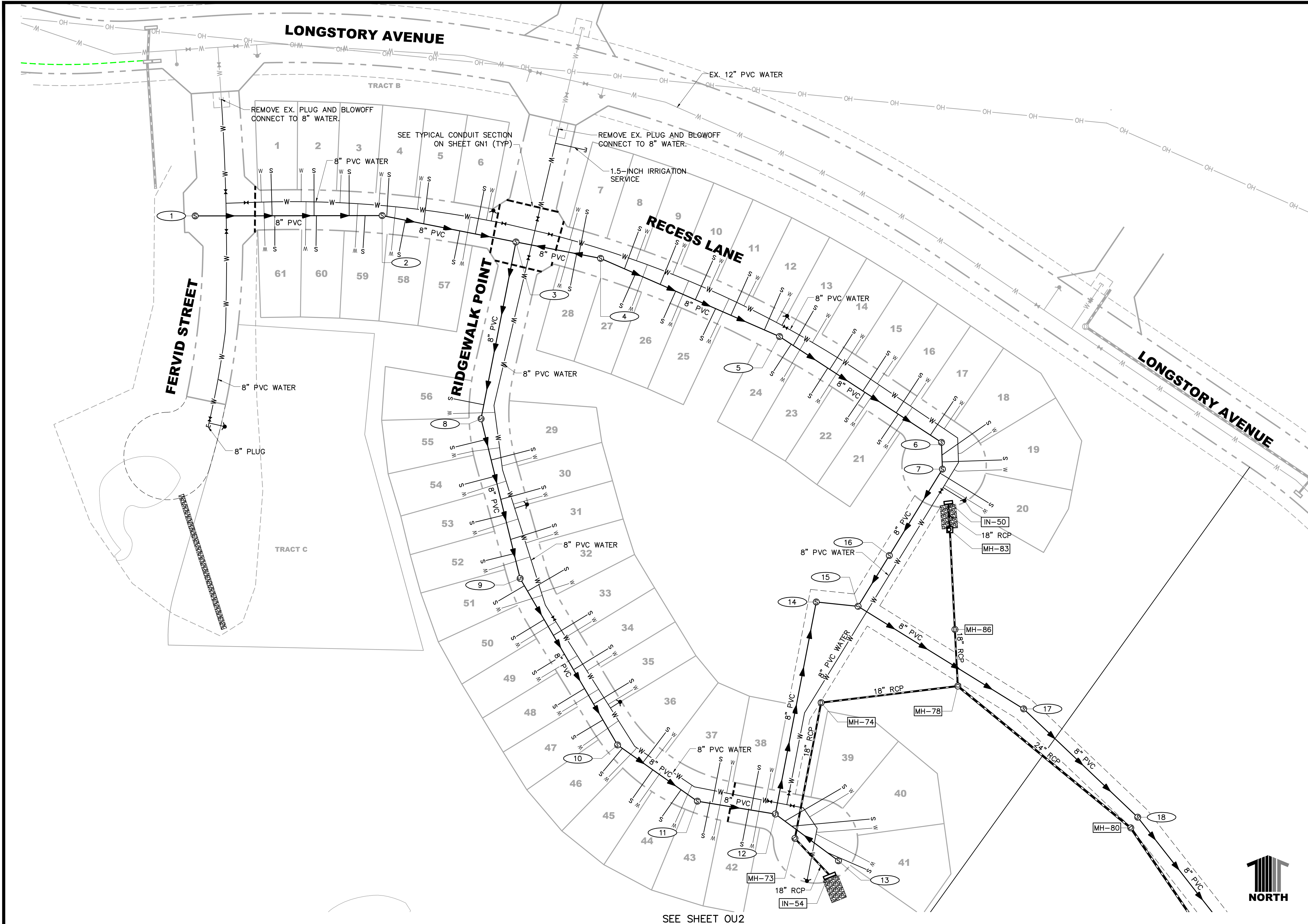
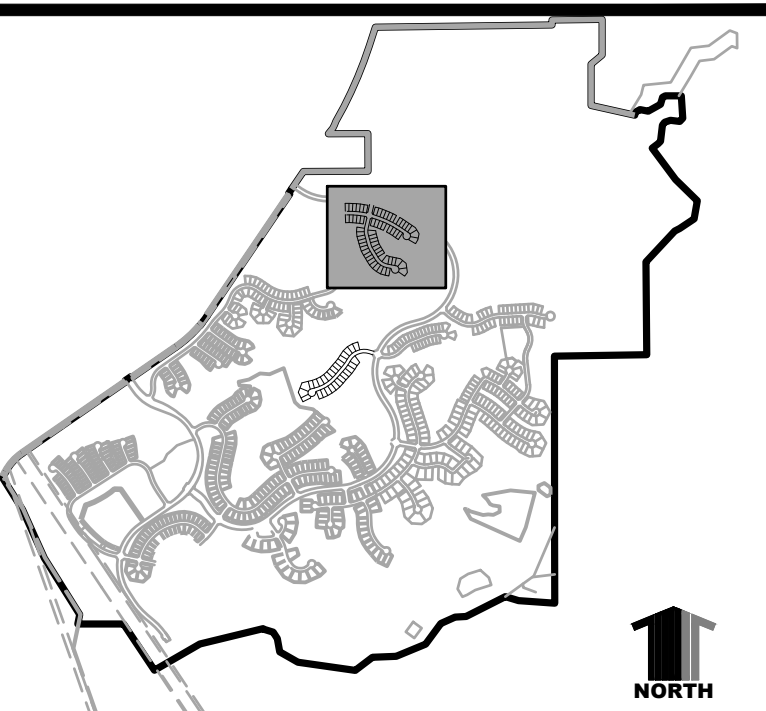
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CANYONS SOUTH FILING NO. 3
SANITARY SEWER AND WATER PLANS
TITLE SHEET

Sheet T1	1 of 22
Date MAY 10, 2022	

PATH: J:\HINES\CS\CADD\CIVIL\F3 ROADWAY AND STORM DRAINAGE\52OU1.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 5/10/2022 9:16 AM
XREFS:



- KEYMAP**
- CONSTRUCTION NOTES:**
1. ALL STORM DRAIN CONSTRUCTION WITHIN THE CANYONS SOUTH SITE WILL CONFORM TO DOUGLAS COUNTY STANDARDS AND SPECIFICATIONS.
 2. ALL DIMENSIONS ARE TO FLOWLINE, EXCEPT PROFILES, WHICH ARE CENTERLINE DIMENSIONS, UNLESS OTHERWISE NOTED.
 3. SEE SHEET TY1 FOR TYPICAL CONDUIT TRENCH SECTION.

- LEGEND**
- ① PROPOSED STORM DRAIN MANHOLE
 - PROPOSED STORM DRAIN
 - PROPOSED STORM DRAIN INLET
 - ① EXISTING STORM DRAIN MANHOLE
 - EXISTING STORM DRAIN
 - EXISTING STORM DRAIN INLET
 - PROPOSED SANITARY SEWER MAIN
 - PROPOSED SANITARY SEWER MANHOLE
 - EXISTING SANITARY SEWER MAIN
 - EXISTING SANITARY SEWER MANHOLE
 - PROPOSED WATERMAIN
 - PROPOSED FIRE HYDRANT
 - PROPOSED GATE VALVE
 - EXISTING WATERMAIN
 - EXISTING FIRE HYDRANT
 - EXISTING GATE VALVE
 - EXISTING GATE VALVE
 - PROPOSED CONDUIT
 - ★ PROPOSED LIGHTPOLE

PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

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OR
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Center of Colorado

ASSISTANT DIRECTOR OF DEVELOPMENT REVIEW

DATE

THESE CONSTRUCTION PLANS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE, AND GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK

DATE	REVISION	DESCRIPTION



Drawing Name
52OU1.dwg
Job Number
HINES CS3
Prepared For
HINES

0 30 60 120
1 inch = 60 ft. Horizontal

Designer	Drafter	Checked
RLS	JAH	BKM



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CANYONS SOUTH FILING NO. 3
SANITARY SEWER AND WATER PLANS
OVERALL UTILITY PLAN

Sheet
OU1
Date
MAY 10, 2022

PATH: J:\HINES\CS\ADDCIVIL\62 F3 ROADWAY AND STORM DRAINAGE\62OU1.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 5/10/2022 9:16 AM
XREFS:



KEYMAP

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- SEE SHEET TY1 FOR TYPICAL CONDUIT TRENCH SECTION.

LEGEND

①	PROPOSED STORM DRAIN MANHOLE
—	PROPOSED STORM DRAIN
—	PROPOSED STORM DRAIN INLET
①	EXISTING STORM DRAIN MANHOLE
—	EXISTING STORM DRAIN
—	EXISTING STORM DRAIN INLET
—	PROPOSED SANITARY SEWER MAIN
—	EXISTING SANITARY SEWER MAIN
—	EXISTING SANITARY SEWER MANHOLE
—	PROPOSED WATERMAIN
—	PROPOSED FIRE HYDRANT
—	PROPOSED GATE VALVE
—	EXISTING WATERMAIN
—	EXISTING FIRE HYDRANT
—	EXISTING GATE VALVE
—	EXISTING GATE VALVE
—	PROPOSED CONDUIT
—	PROPOSED LIGHTPOLE

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

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ASSISTANT DIRECTOR OF DEVELOPMENT REVIEW

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ENGINEERING DIVISION ACCEPTANCE BLOCK

DATE	REVISION	DESCRIPTION



Drawing Name 52OU1.dwg
Job Number HINES CS3
Prepared For HINES

0 30 60 120
1 inch = 60 ft. Horizontal
Designer RLS
Drafter JAH
Checked BKM



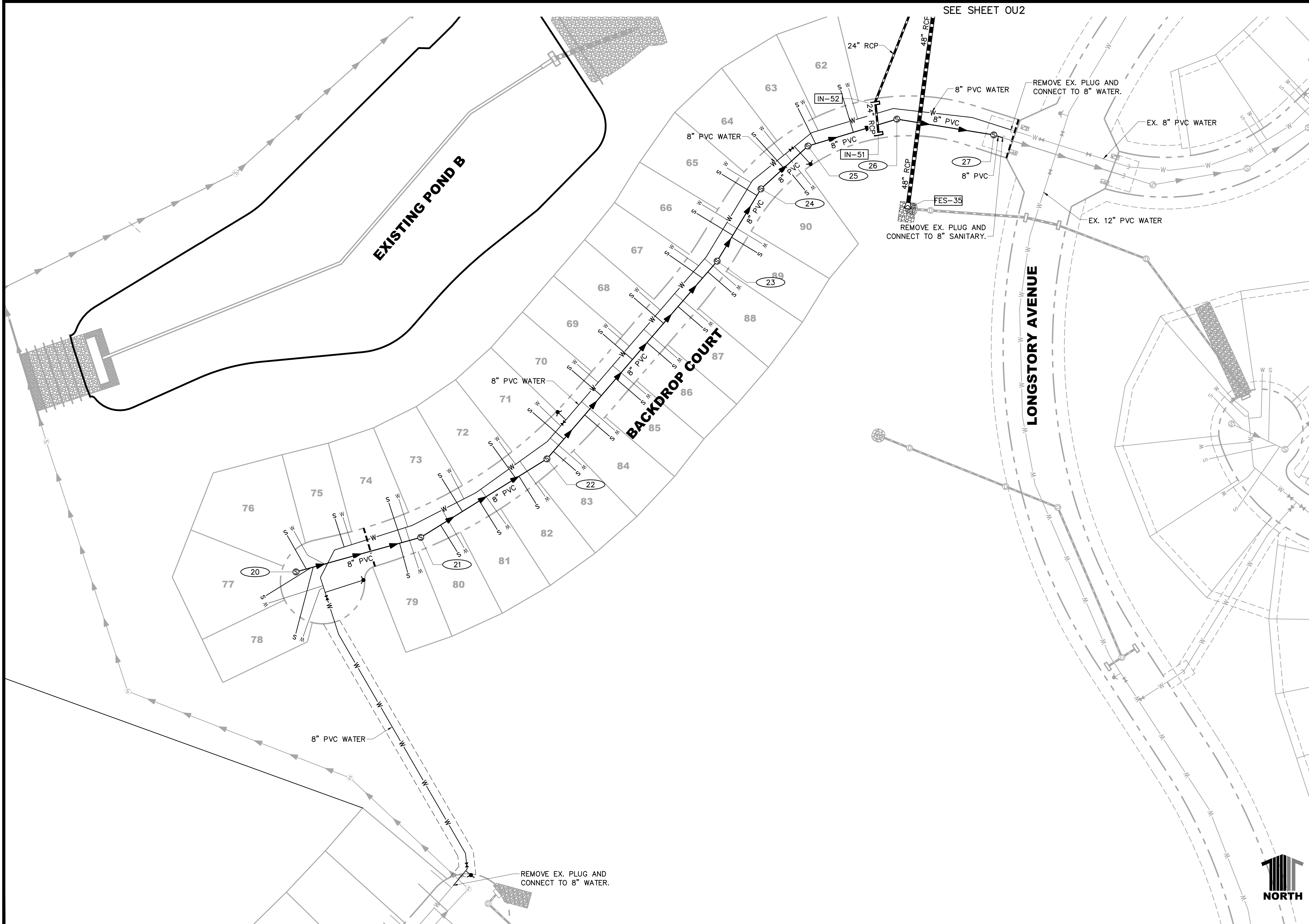
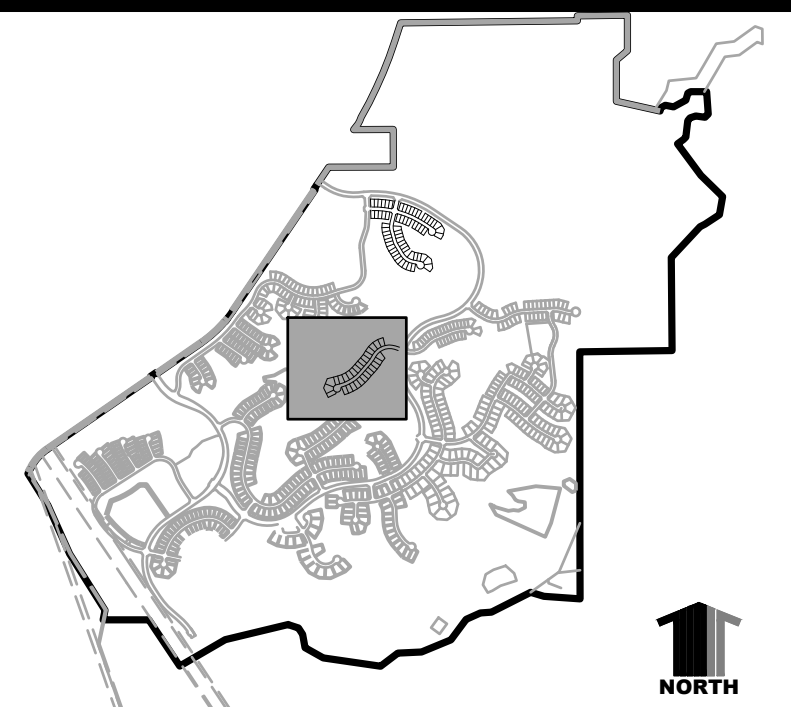
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CANYONS SOUTH FILING NO. 3
SANITARY SEWER AND WATER PLANS
OVERALL UTILITY PLAN

Sheet OU2	5 of 22
Date MAY 10, 2022	

PATH: J:\HINES\CS\CADD\CIVIL\62 F3 ROADWAY AND STORM DRAINAGE\62OU1.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 5/10/2022 9:16 AM
XREFS:



- KEYMAP**
- CONSTRUCTION NOTES:**
1. ALL STORM DRAIN CONSTRUCTION WITHIN THE CANYONS SOUTH SITE WILL CONFORM TO DOUGLAS COUNTY STANDARDS AND SPECIFICATIONS.
 2. ALL DIMENSIONS ARE TO FLOWLINE, EXCEPT PROFILES, WHICH ARE CENTERLINE DIMENSIONS, UNLESS OTHERWISE NOTED.
 3. SEE SHEET TY1 FOR TYPICAL CONDUIT TRENCH SECTION.

- LEGEND**
- ① PROPOSED STORM DRAIN MANHOLE
 - PROPOSED STORM DRAIN
 - PROPOSED STORM DRAIN INLET
 - ① EXISTING STORM DRAIN MANHOLE
 - EXISTING STORM DRAIN
 - EXISTING STORM DRAIN INLET
 - PROPOSED SANITARY SEWER MAIN
 - ① PROPOSED SANITARY SEWER MANHOLE
 - EXISTING SANITARY SEWER MAIN
 - ① EXISTING SANITARY SEWER MANHOLE
 - PROPOSED WATERMAIN
 - PROPOSED FIRE HYDRANT
 - PROPOSED GATE VALVE
 - EXISTING WATERMAIN
 - EXISTING FIRE HYDRANT
 - EXISTING GATE VALVE
 - EXISTING GATE VALVE
 - PROPOSED CONDUIT
 - ☆ PROPOSED LIGHTPOLE

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

811 UNCC
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1-800-922-1987
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Center of Colorado

ASSISTANT DIRECTOR OF DEVELOPMENT REVIEW

DATE

THESE CONSTRUCTION PLANS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE, AND GRADING, EROSION AND SEDIMENT CONTROL IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK

DATE	REVISION DESCRIPTION



Drawing Name
52OU1.dwg

Job Number
HINES CS3

Prepared For
HINES

0 30 60 120
1 inch = 60 ft. Horizontal

Designer	Drafter	Checked
RLS	JAH	BKM



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CANYONS SOUTH FILING NO. 3

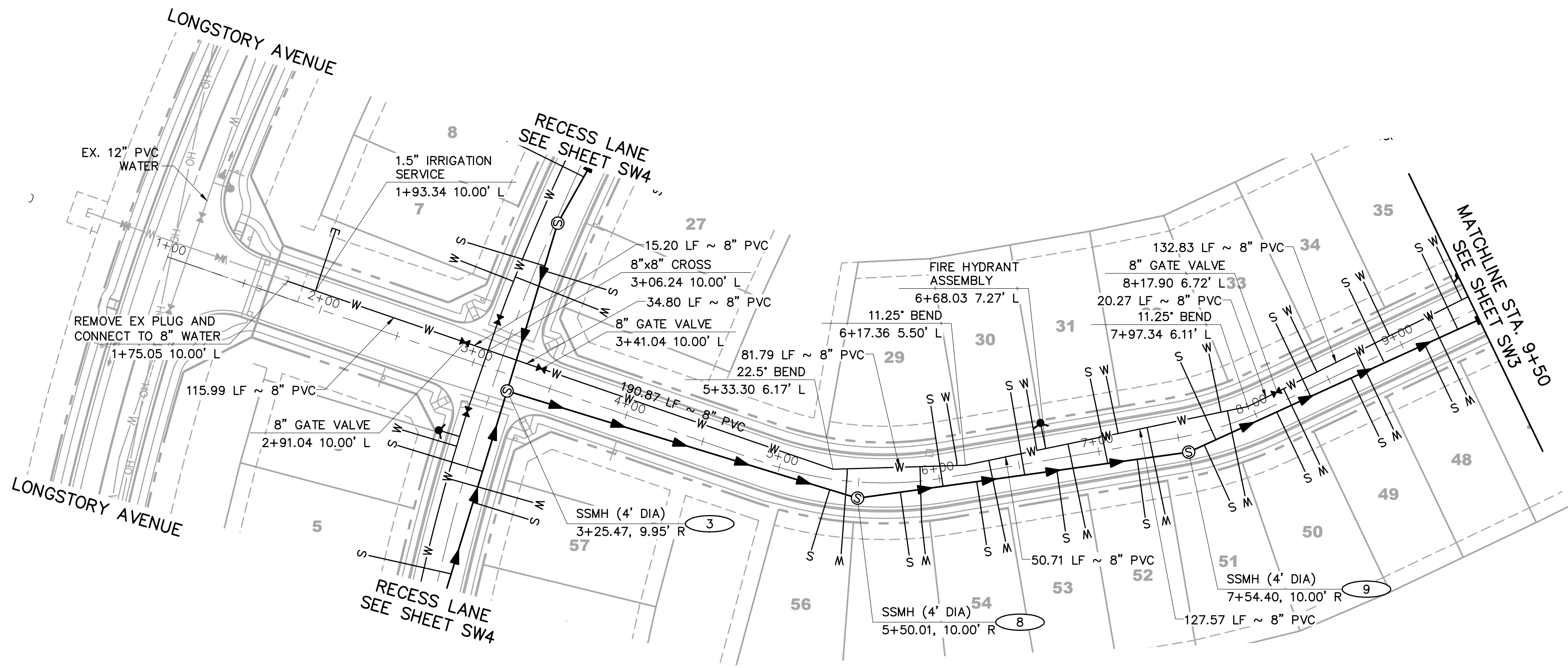
SANITARY SEWER AND WATER PLANS

OVERALL UTILITY PLAN

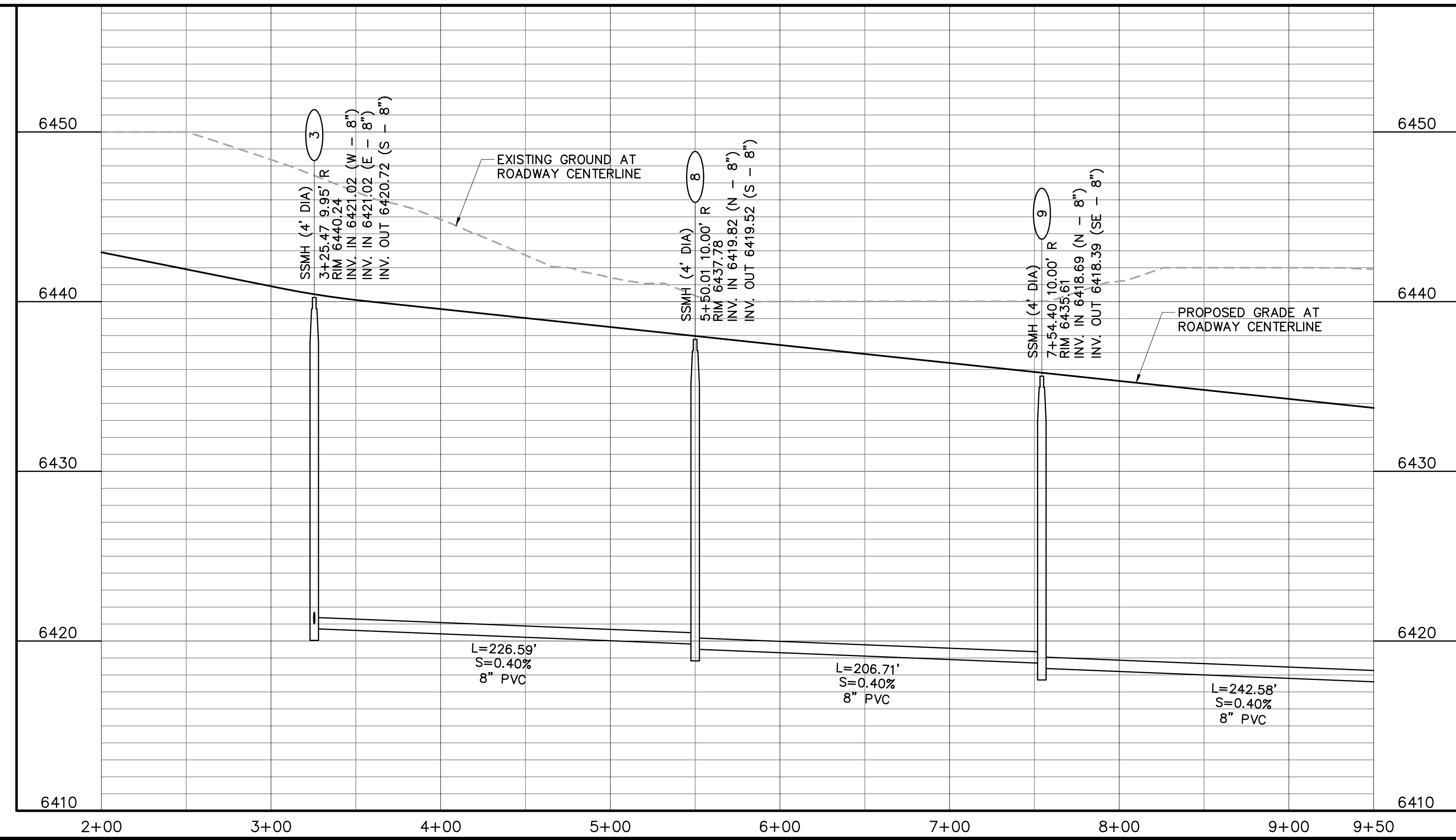
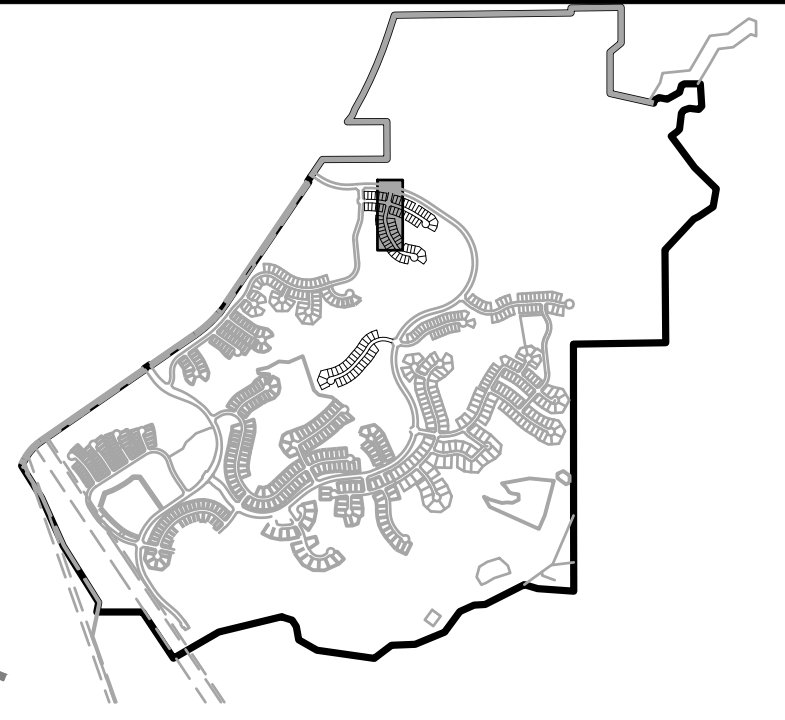
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OU3
Date
MAY 10, 2022

6 of 22

PATH: J:\HINES\CS\CADD\CIVIL\53 F3 SANITARY AND WATER\53SW2-SW3.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 5/10/2022 9:17 AM
XREFS:



RIDGEWALK POINT



CONSTRUCTION NOTES:

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- ⊖ INDICATES WATER LOWERING PER TCR DETAIL W-17 (SEE SHEET DT4)

PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

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Center of Colorado

TOWN APPROVAL BLOCK

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

APPROVED BY:

DEVELOPMENT SERVICES DATE

Hines

Drawing Name
53SW2-SW3.dwg
Job Number
HINES CS3
Prepared For
HINES

0 25 50 100
1 inch = 50 ft. Horizontal
1 inch = 5 ft. Vertical
Designer
KWS
Drafter
JAH
Checked
BKM

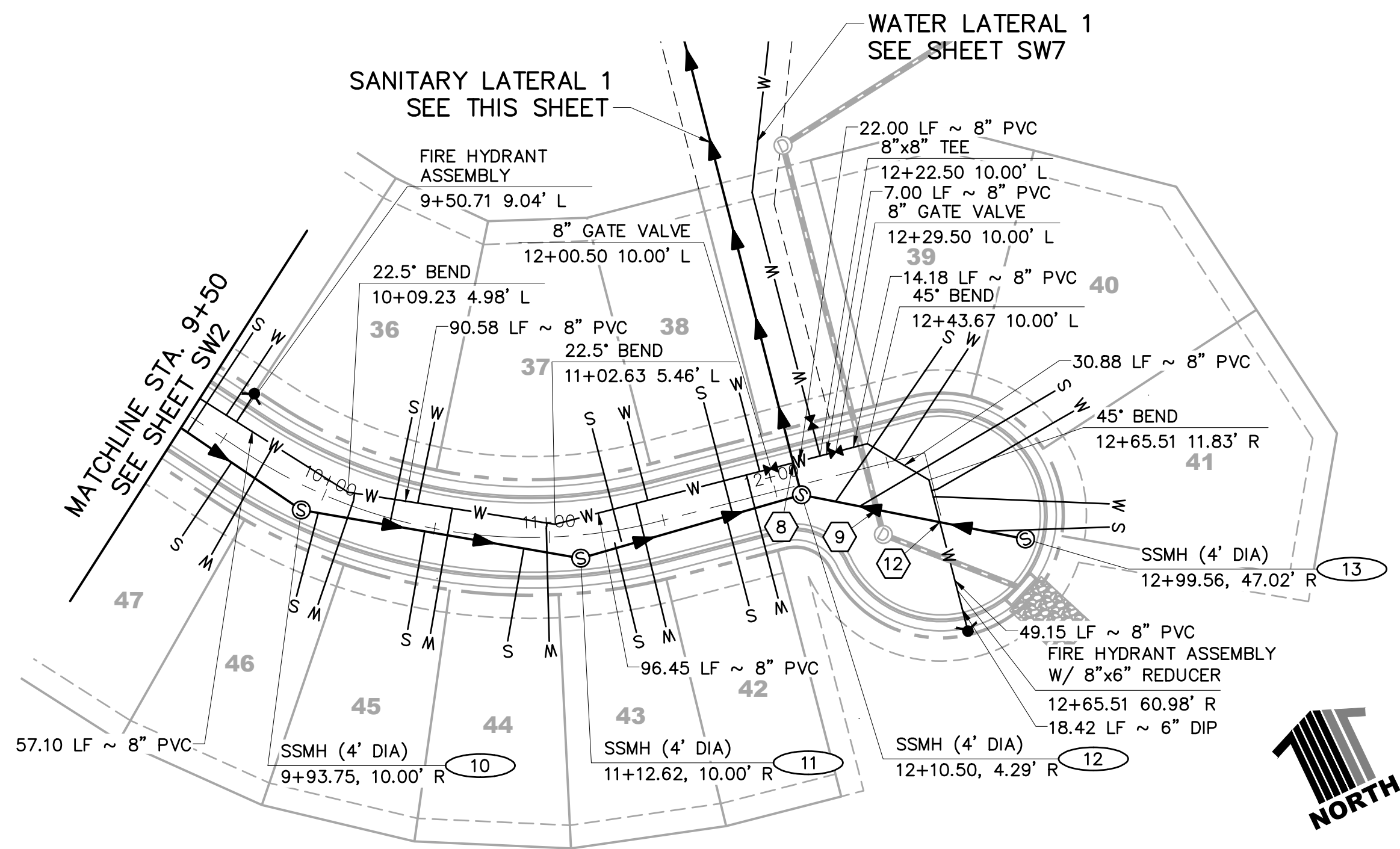


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SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

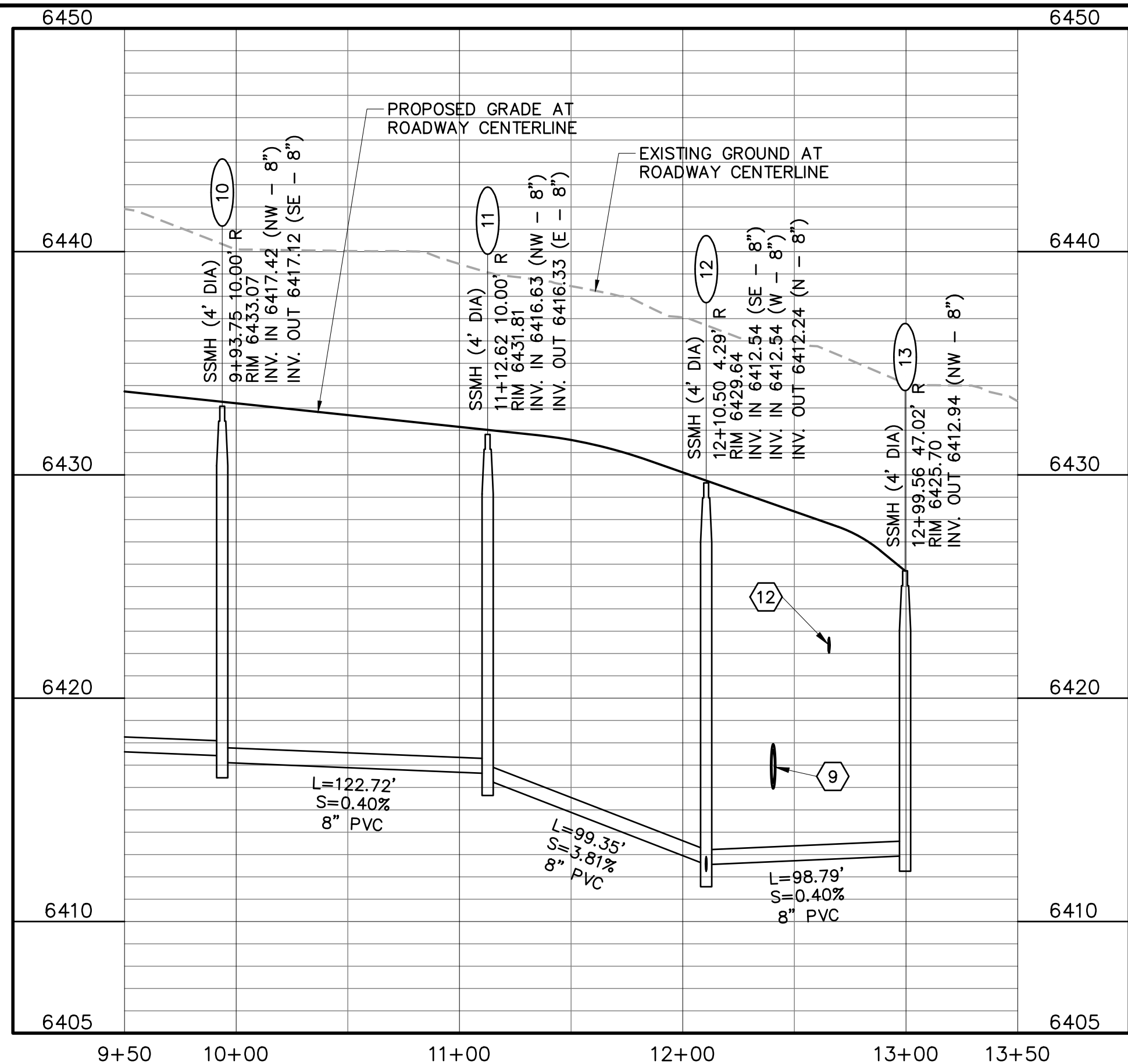
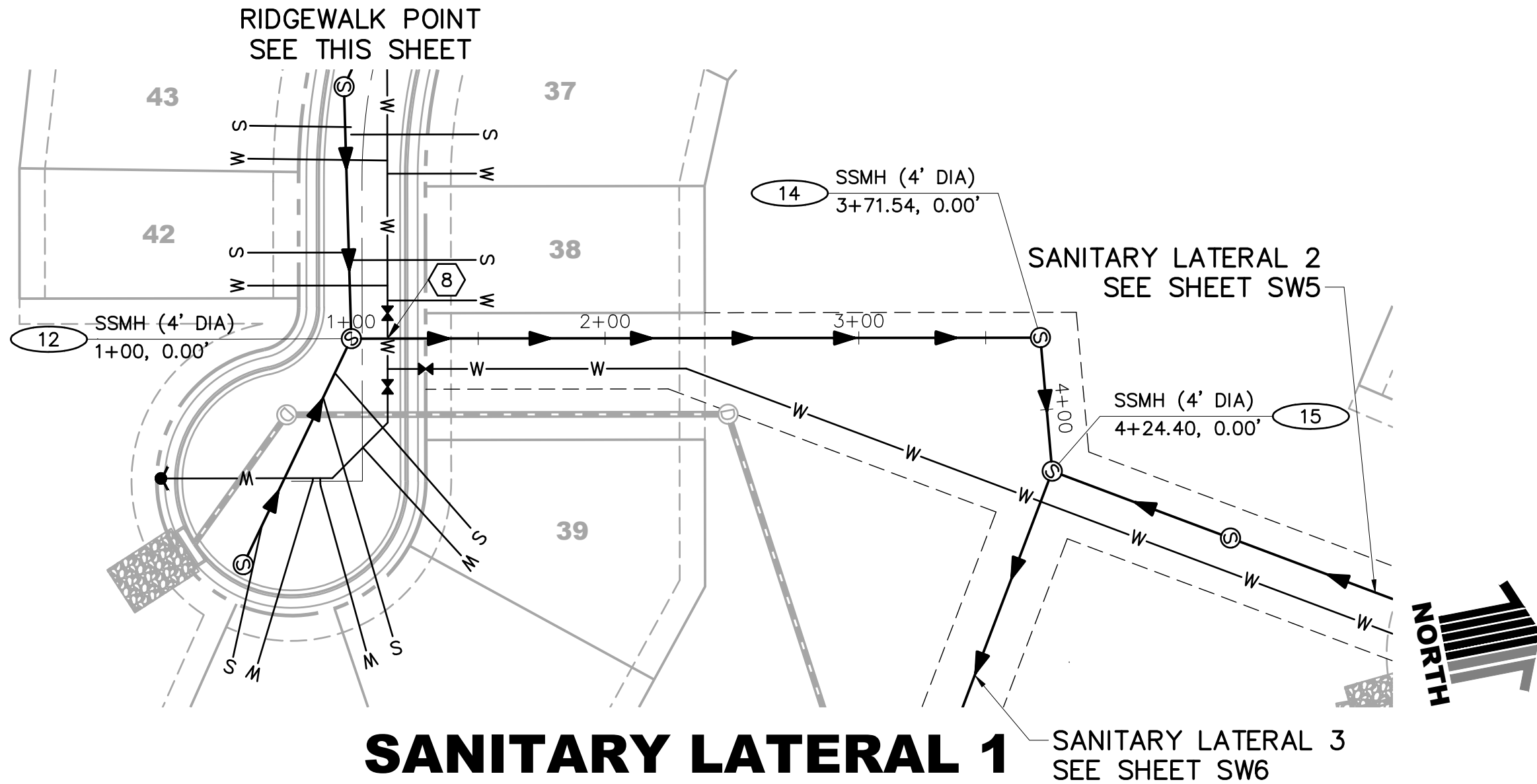
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SW2
of
22
Date
MAY 10, 2022

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PLOTTED BY: KYLER SANFORD PLOT DATE: 5/10/2022 9:17 AM
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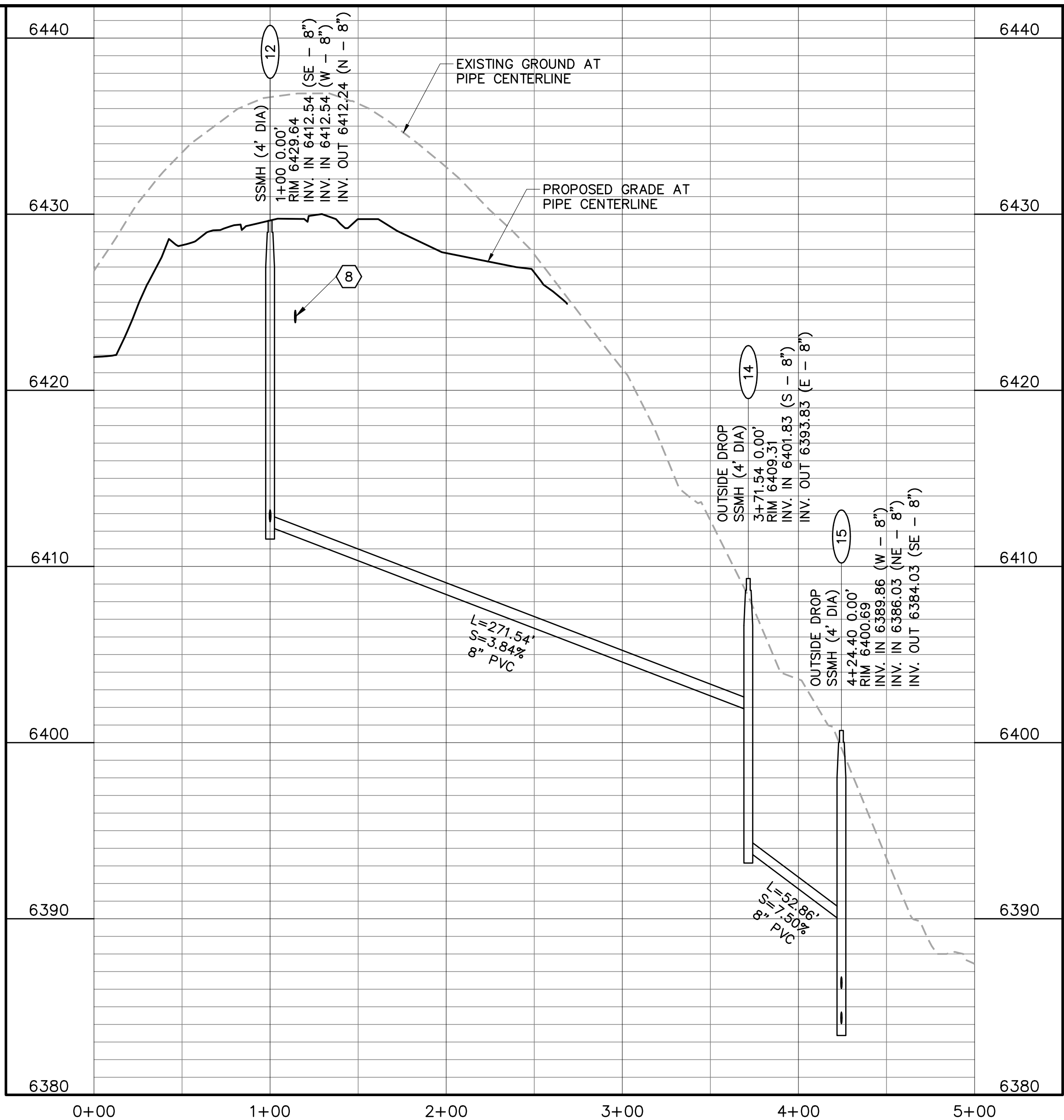
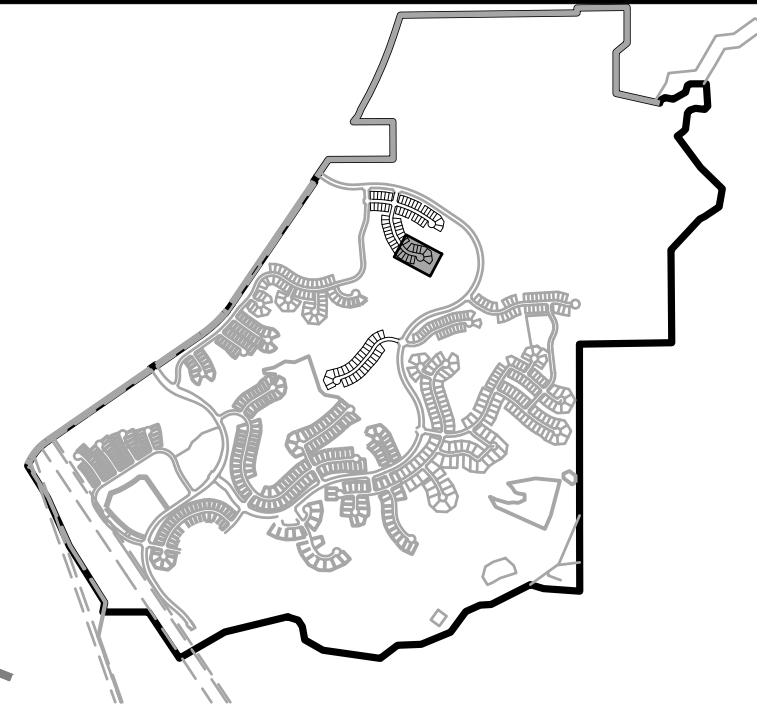
RIDGEWALK POINT

UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
8	8" PVC	TOP=6412.38	UNDER	8" PVC WAT	BOP=6423.84	11.46'
9	8" PVC	TOP=6413.36	UNDER	18" RCP	BOP=6416.36	2.99'
12	8" PVC	TOP=6413.47	UNDER	8" PVC WAT	BOP=6421.12	7.65'



SANITARY LATERAL 1

SANITARY LATERAL 3



KEYMAP

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(SEE CROSSING TABLE LEFT COLUMN)
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DETAIL W-17 (SEE SHEET DT4)

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68



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Utility Notification
Center of Colorado

TOWN APPROVAL BLOCK

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APPROVED BY:

DEVELOPMENT SERVICES DATE

Hines

Drawing Name
53SW2-SW3.dwg

Job Number
HINES CS3

Prepared For
HINES

0 25 50 100
1 inch = 50 ft. Horizontal
1 inch = 5 ft. Vertical

Designer
KWS

Drafter
JAH

Checked
BKM



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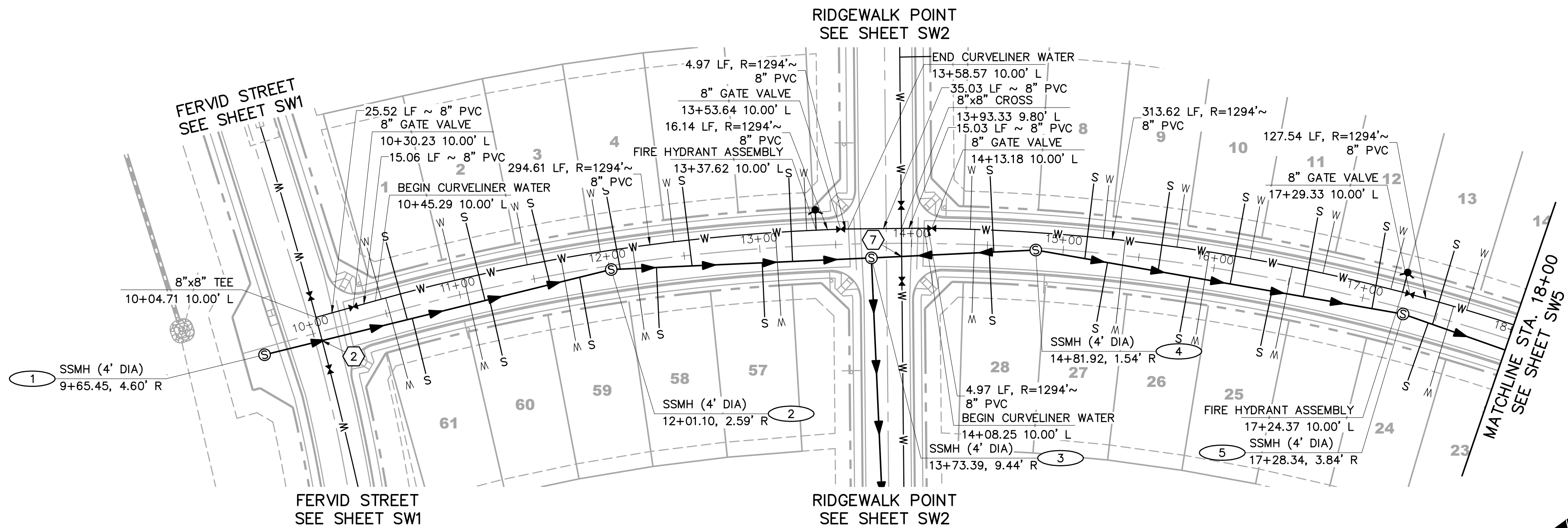
CANYONS SOUTH FILING NO. 3
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

Sheet
SW3

9 of 22

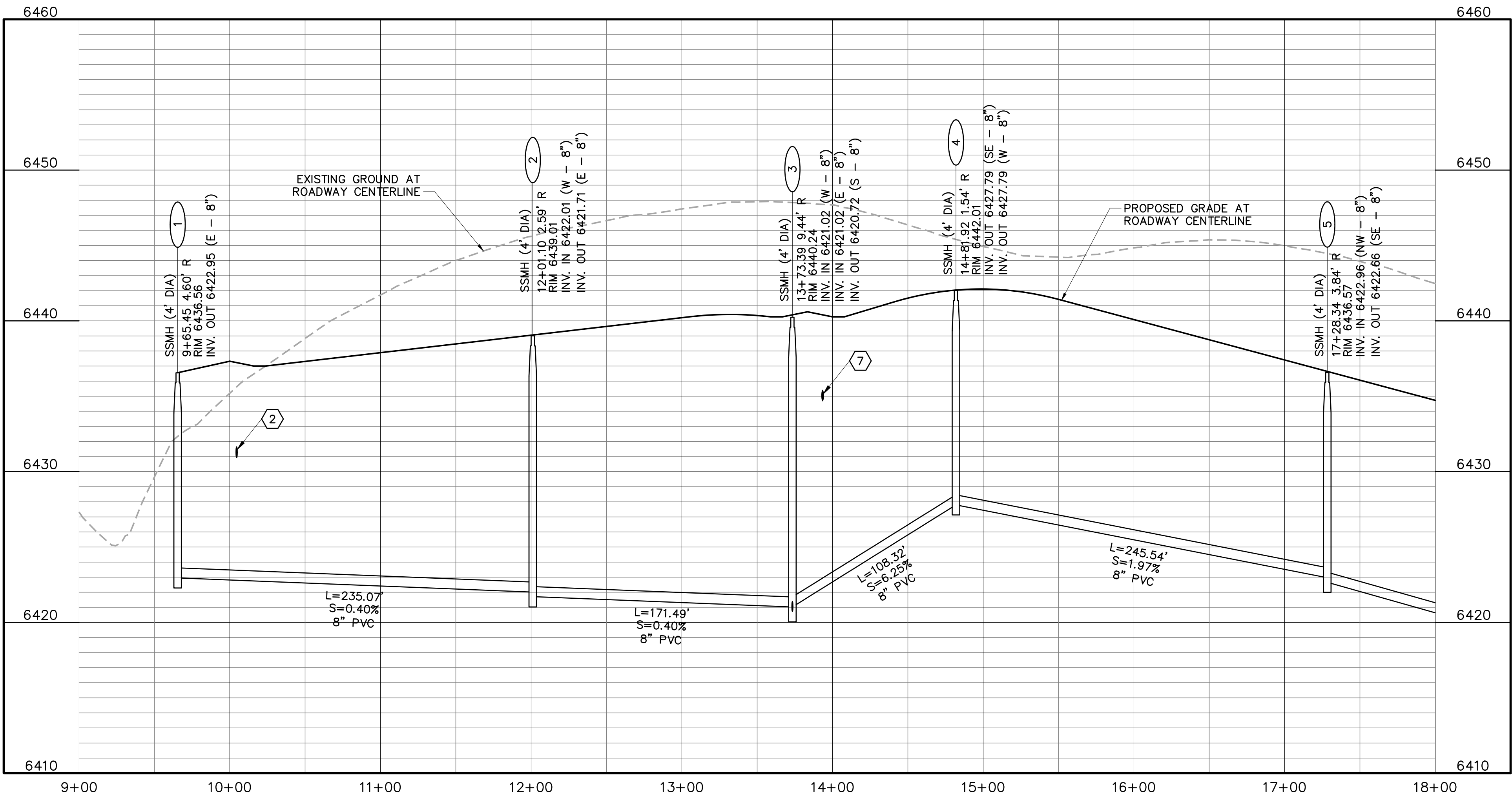
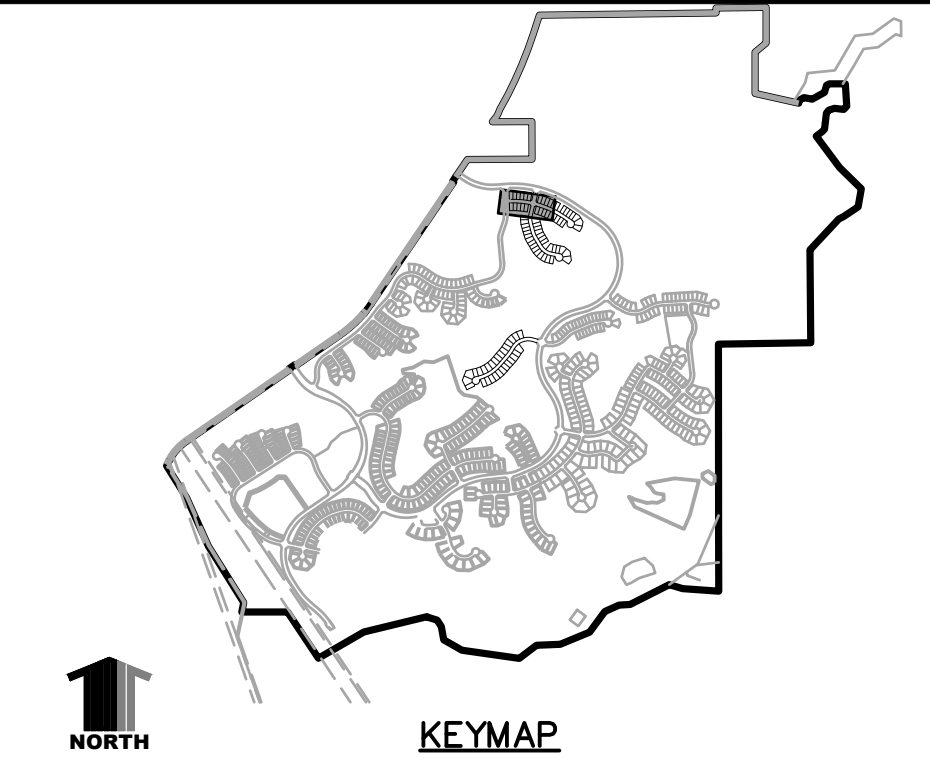
Date
MAY 10, 2022

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PLOTTED BY: KYLER SANFORD PLOT DATE: 5/10/2022 9:18 AM
XREFS:



UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
2	8" PVC	TOP=6423.48	UNDER	8" PVC WAT	BOP=6430.74	7.26'
7	8" PVC	TOP=6422.96	UNDER	8" PVC WAT	BOP=6434.54	11.58'

RECESS LANE



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PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68



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Utility Notification
Center of Colorado

TOWN APPROVAL BLOCK

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

APPROVED BY:

DEVELOPMENT SERVICES DATE

Hines

Drawing Name 53SW4-SW5.dwg		
Job Number HINES CS3		
Prepared For HINES		
Designer KWS	Drafter JAH	Checked BKM

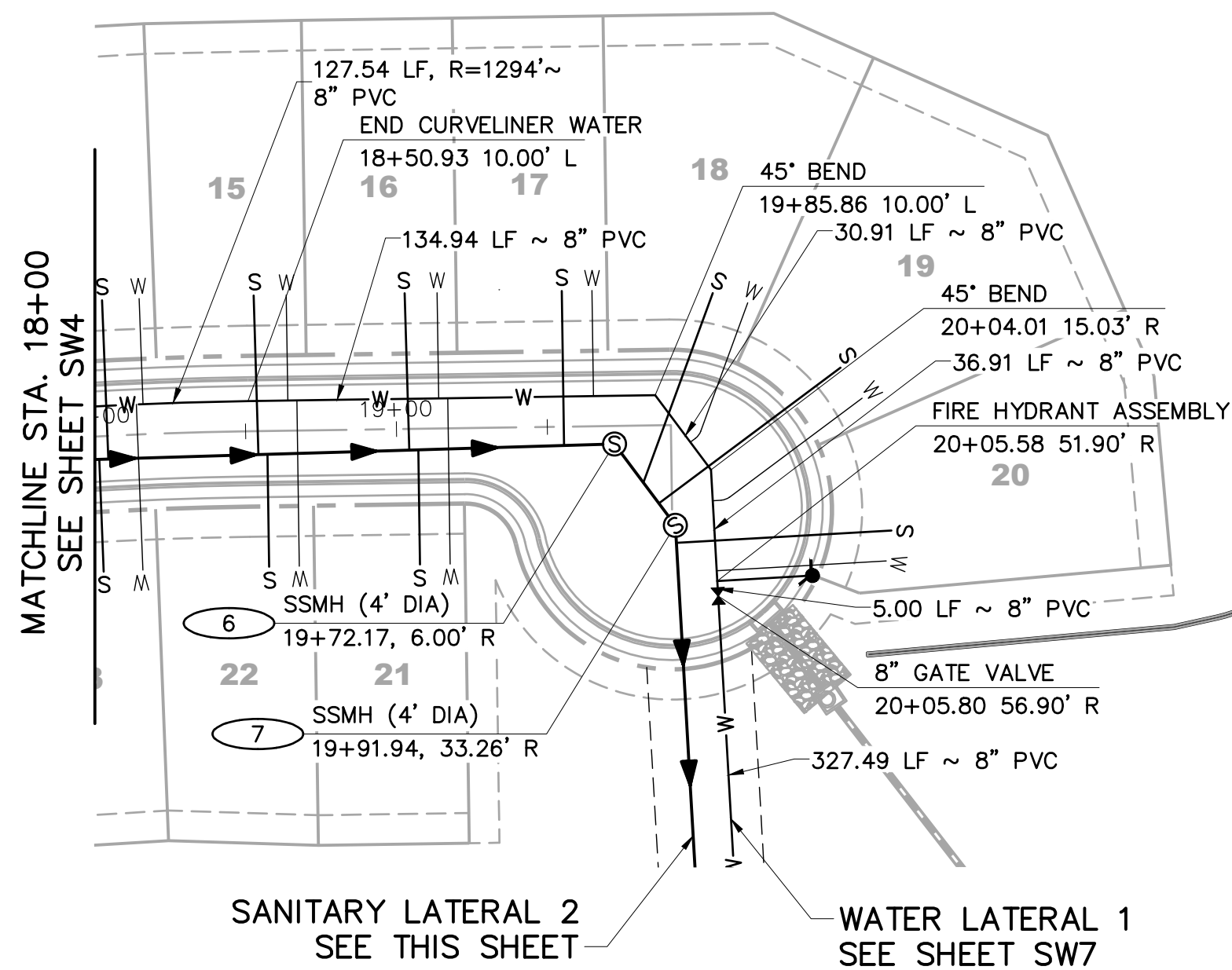


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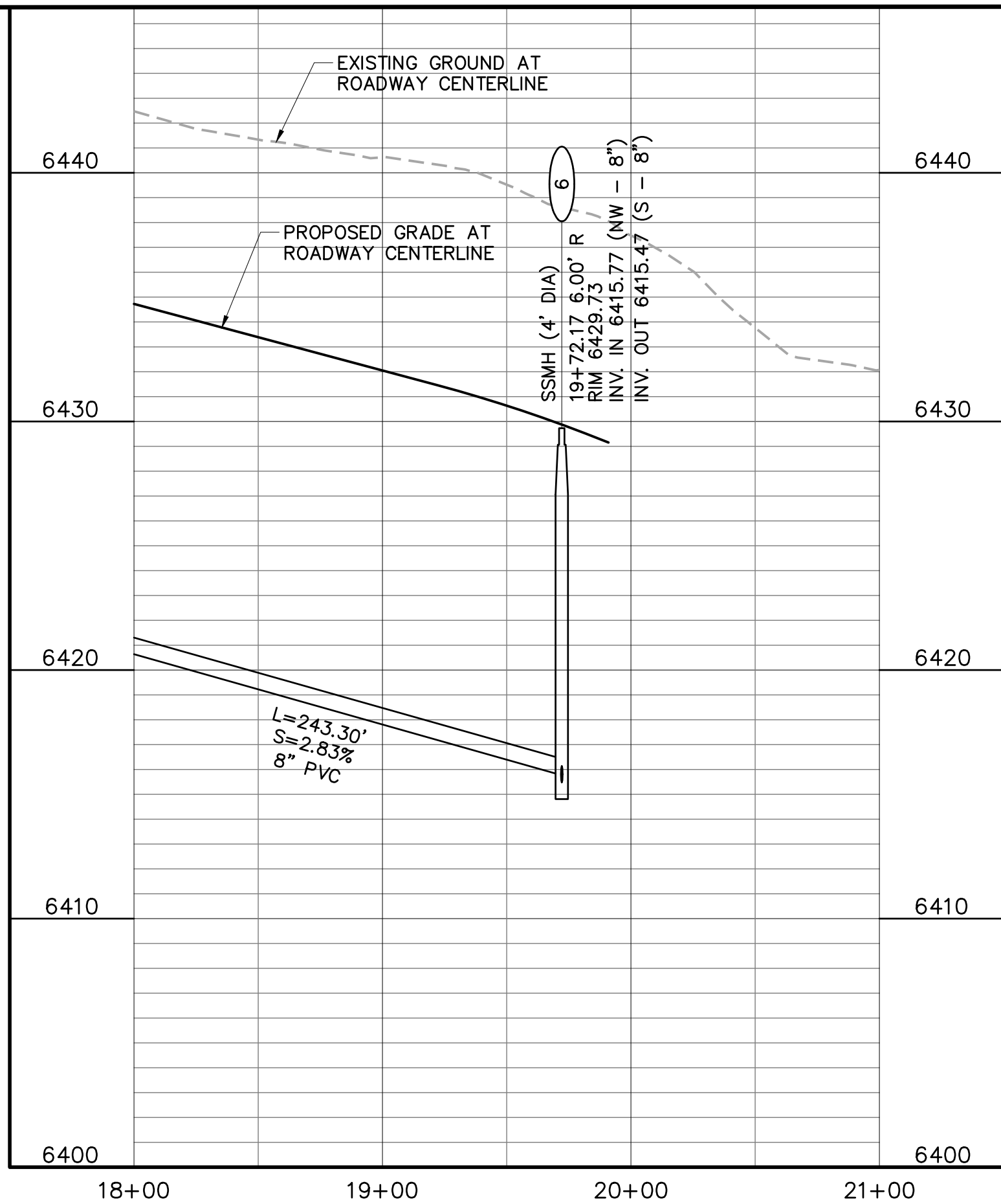
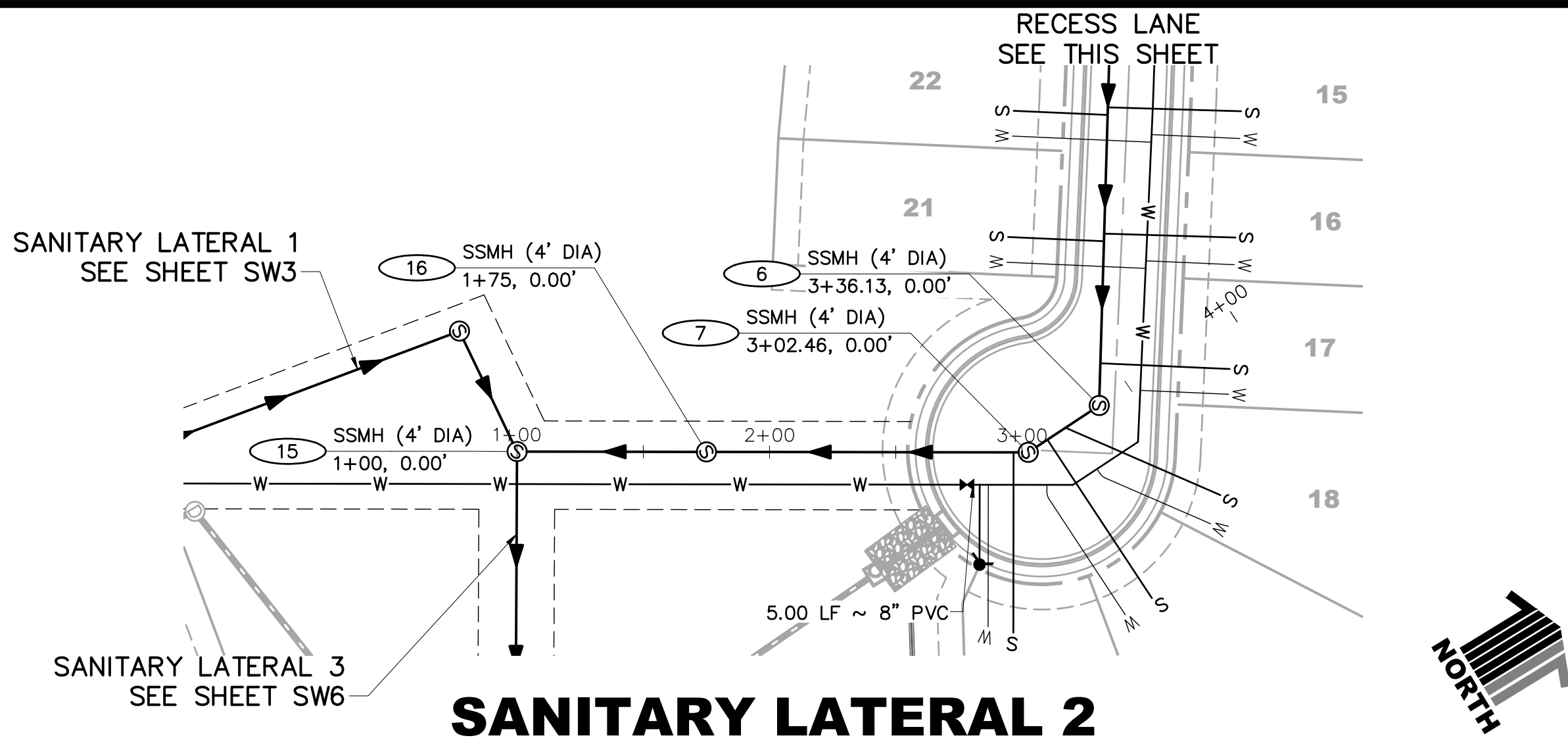
CANYONS SOUTH FILING NO. 3
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

Sheet SW4	10 of 22
Date MAY 10, 2022	

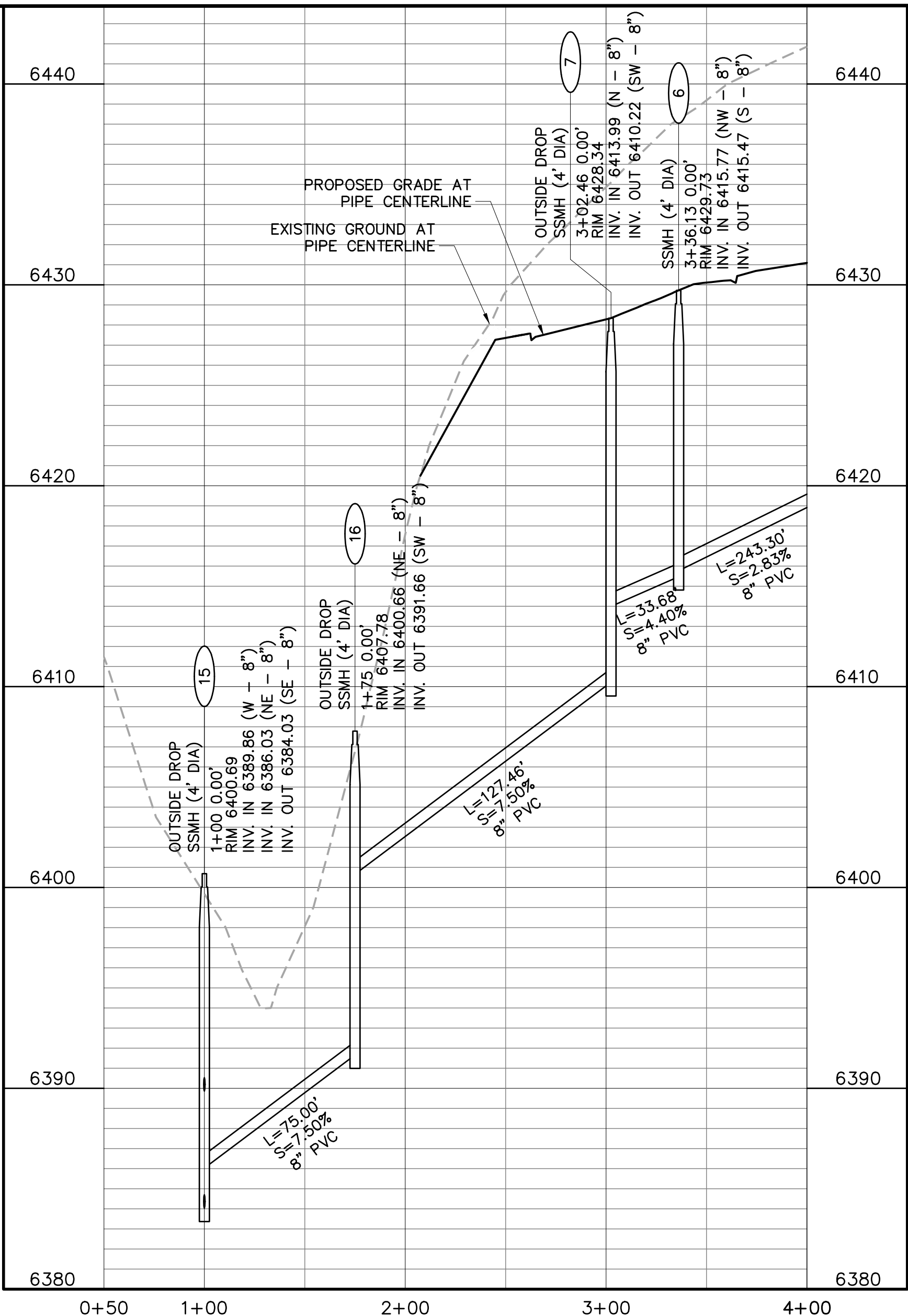
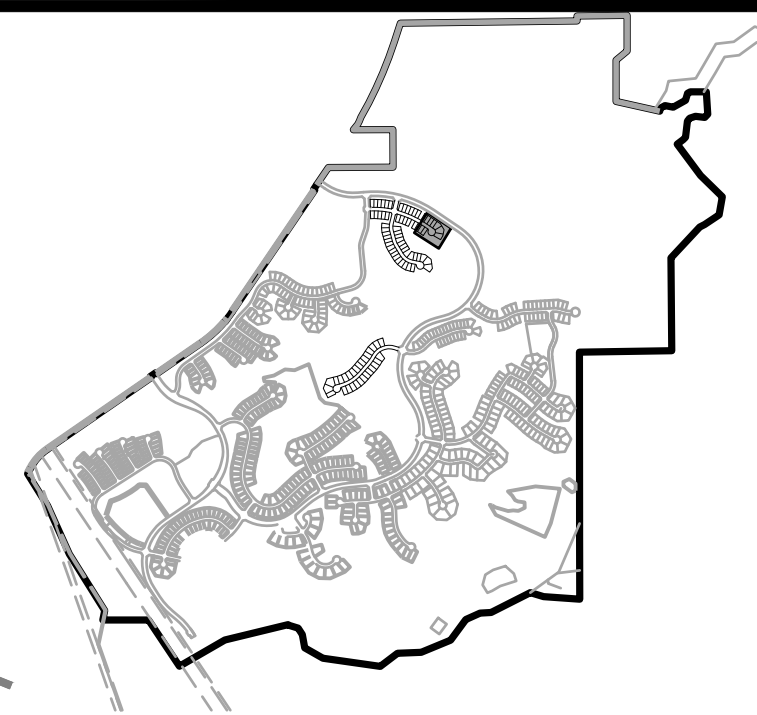
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PLOTTED BY: KYLER SANFORD PLOT DATE: 5/10/2022 9:18 AM
XREFS:



RECESS LANE



SANITARY LATERAL 2



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PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
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Utility Notification
Center of Colorado

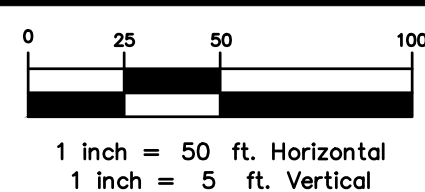
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Hines

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Prepared For
HINES



Designer
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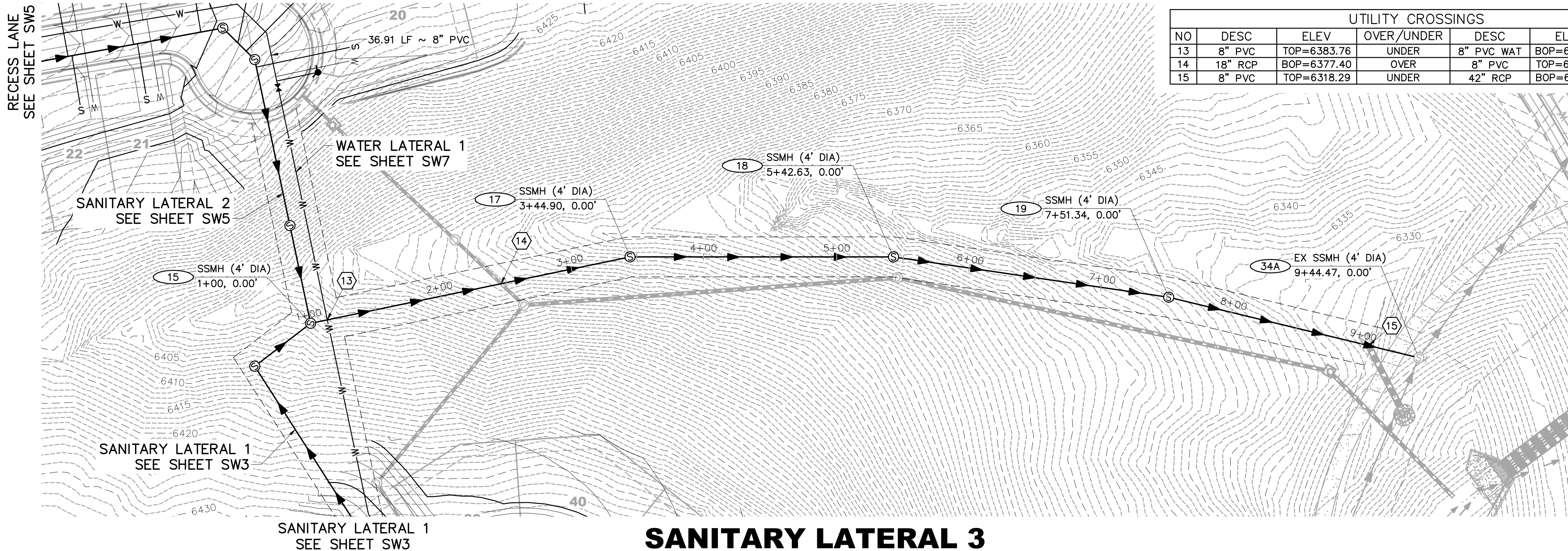
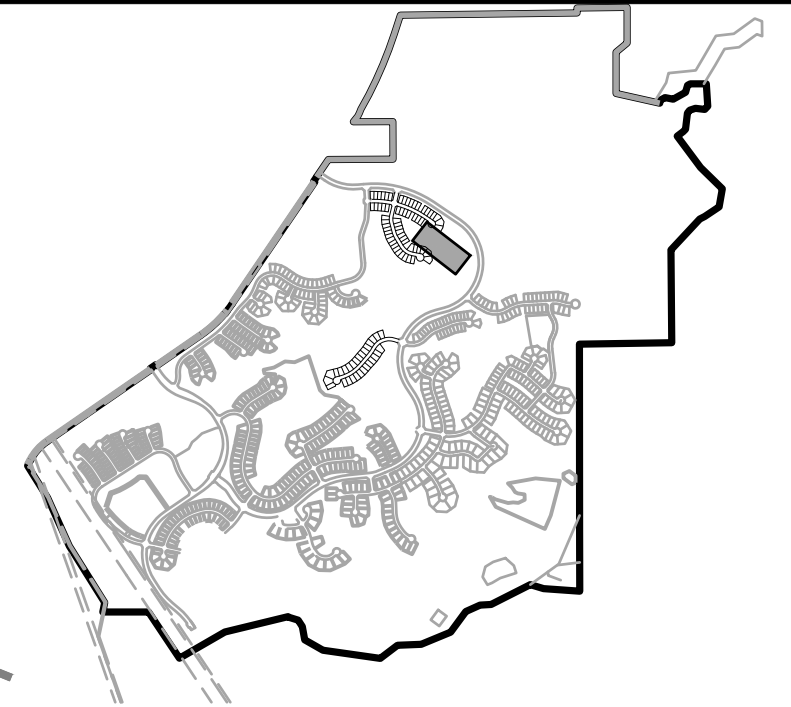


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Sheet
SW5
Date
MAY 10, 2022
11 of 22

PATH: J:\HINES CS\CADD\CIVIL\53 F3 SANITARY AND WATER\53SW6-SW7.DWG
PLOTTED BY: KYLER SANFORD PLOT DATE: 5/10/2022 9:19 AM
XREFS:



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- ALL MANHOLES LOCATED OUTSIDE OF PAVED ROW SHALL BE CONSTRUCTED WITH A LOCKING-TYPE COVER WITH THE MANHOLE RING BOLTED TO THE MANHOLE CONE AND RAISED 8"-12" ABOVE GRADE PER STANDARD DETAIL SS-3.

- 1 INDICATES UTILITY CROSSING NUMBER
(SEE CROSSING TABLE LEFT COLUMN)
- 15 INDICATES WATER LOWERING PER TCR
DETAIL W-17 (SEE SHEET DT4)

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68



1-800-922-1987

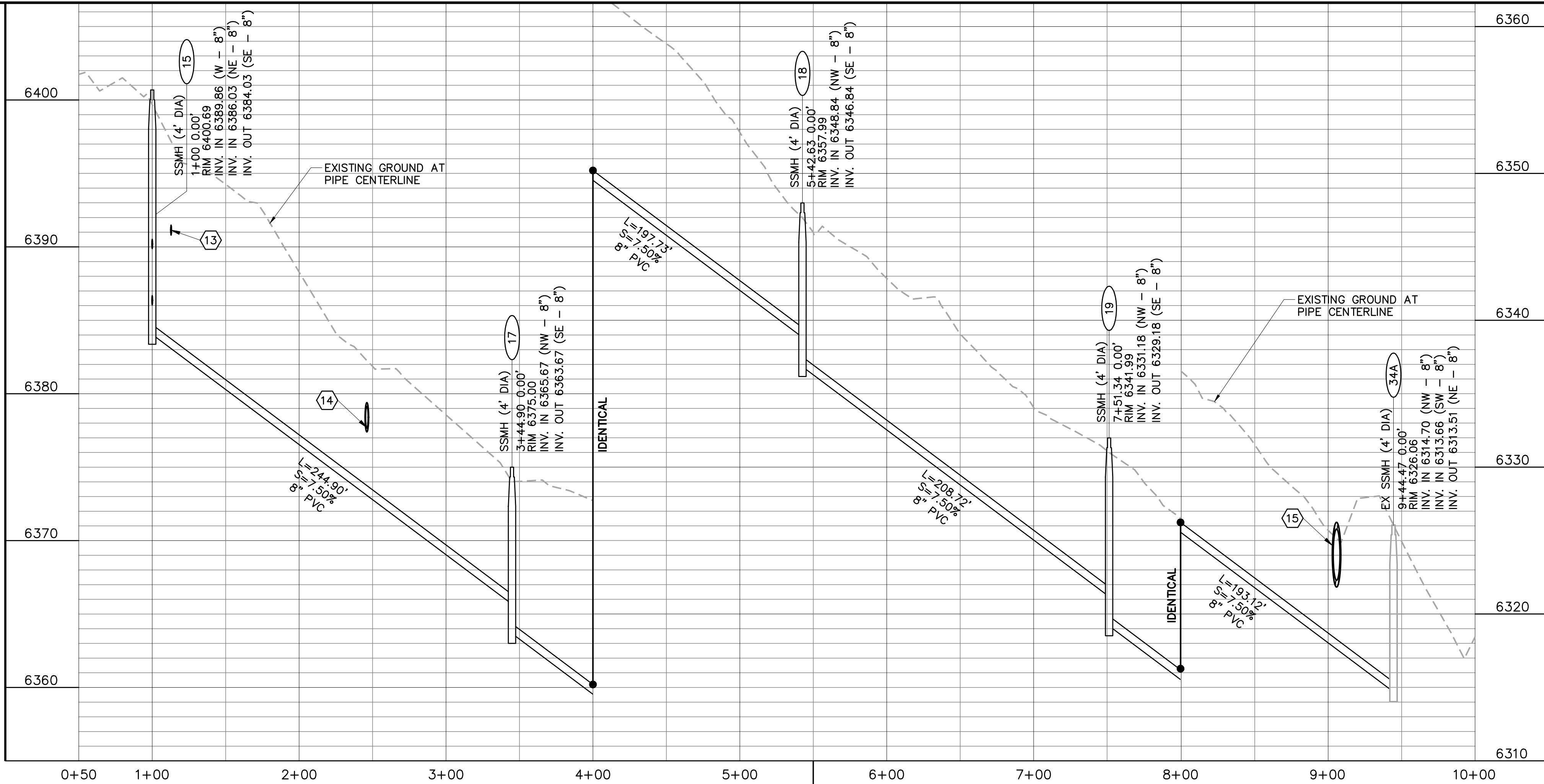
Utility Notification
Center of Colorado

TOWN APPROVAL BLOCK

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

APPROVED BY:

DEVELOPMENT SERVICES DATE



Hines

Drawing Name
53SW6-SW7.dwg
Job Number
HINES CS3
Prepared For
HINES
Designer
KWS
Drafter
JAH
Checked
BKM

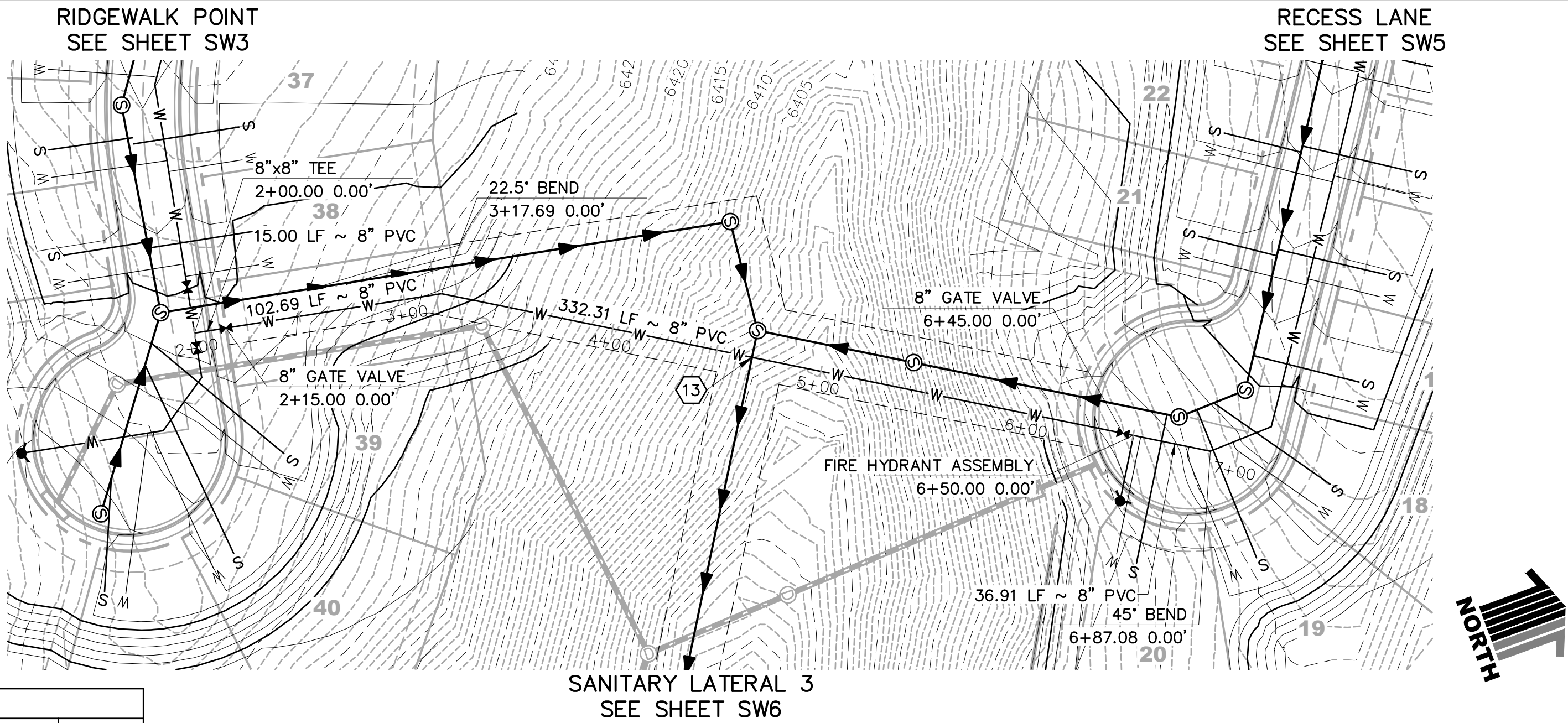


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Construction Management Civil Engineering Surveying

CANYONS SOUTH FILING NO. 3
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

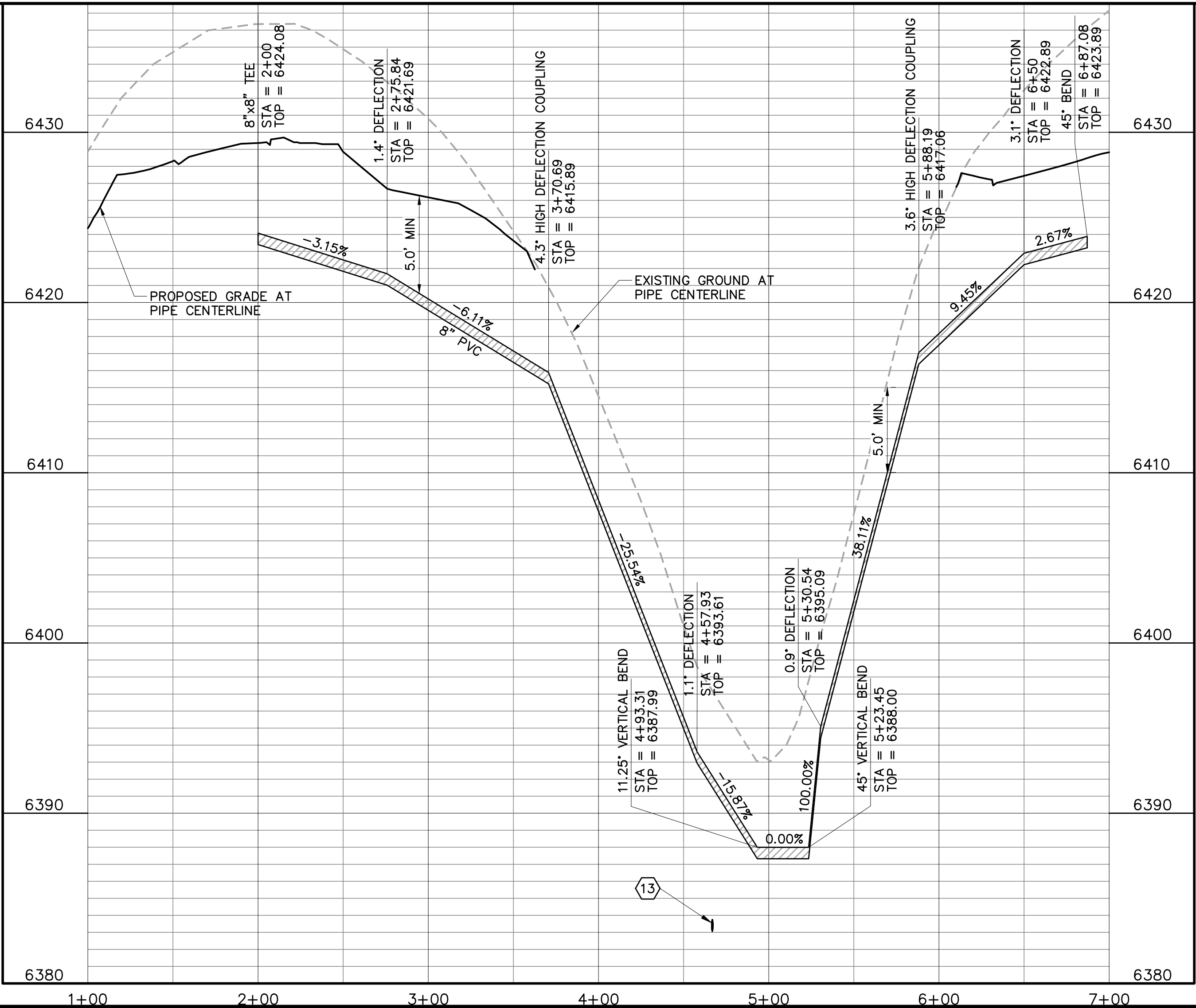
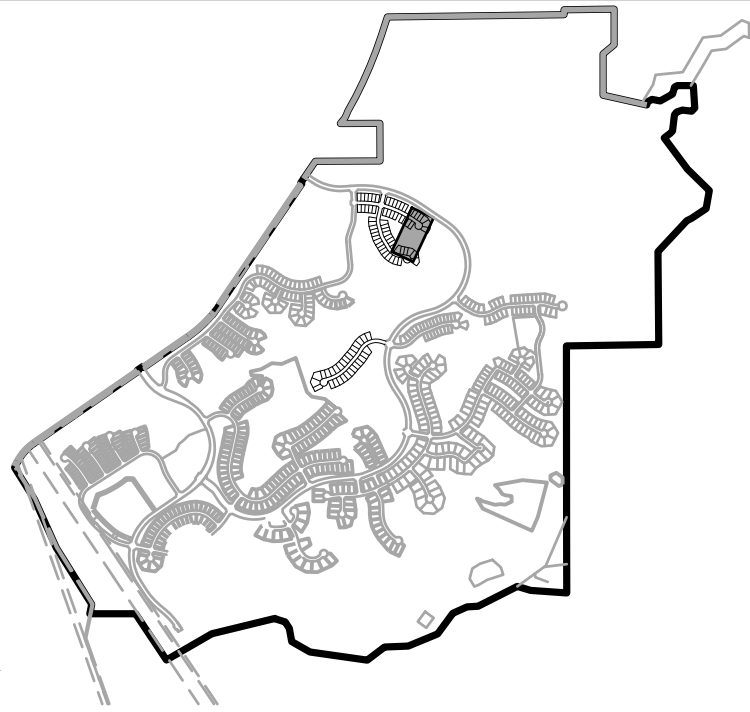
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SW6
Date
MAY 10, 2022

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PLOTTED BY: KYLER SANFORD PLOT DATE: 5/10/2022 9:19 AM
XREFS:



UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
13	8" PVC	TOP=6383.76	UNDER	8" PVC WAT	BOP=6390.79	7.03'

WATER LATERAL 1



CONSTRUCTION NOTES:

- ALL WATER MAINS CONSTRUCTION WITHIN THE CANYONS SOUTH SITE WILL CONFORM TO TOWN OF CASTLE ROCK DEVELOPMENT SERVICES DEPARTMENT.
- THE CANYONS SOUTH SITE IS WITHIN THE RED PRESSURE ZONE IN ITS ENTIRETY.
- REFERENCE CANYONS SOUTH FILING NO. 1A PROPOSED ROADWAY AND STORM DRAINAGE PLANS FOR ROADWAY AND STORM SEWER INFORMATION. REFERENCE CANYONS SOUTH FILING NO. 1A SANITARY SEWER OUTFALL PLANS FOR SANITARY SEWER OUTFALL INFORMATION.
- IN ALL LOCATIONS WHERE STORM SEWER CROSSES WATER, ABOVE OR BELOW, EACH STORM SEWER JOINT WITHIN THE TRENCH WIDTH OF THE CROSSING SHALL BE ENCASED IN A 6" THICK CONCRETE COLLAR EXTENDING 6" BEYOND BOTH SIDES OF THE JOINT. MANHOLE RIMS SHALL BE SET 8"-12" ABOVE THE GRADE AND ALL MANHOLE RIMS TO BE SET OUTSIDE THE MAINTENANCE PATH.
- ALL MAINTENANCE ACCESS ROADS SHALL NOT EXCEED 4% CROSS SLOPE OR 10% LONGITUDINAL SLOPE AND SHALL BE A MINIMUM 12' PER TOWN OF CASTLE ROCK CRITERIA.
- CONTRACTOR SHALL PROVIDE A MINIMUM SEVENTY TWO (72) HOURS' NOTICE TO THE ON-SITE TCR CONSTRUCTION INSPECTOR, (720) 733-2200, PRIOR TO MAKING ANY CONNECTIONS OR TIE-INS TO EXISTING WATER SYSTEM PROVIDED THAT THE UTILITY TIE-IN DOES NOT DISRUPT SERVICE TO EXISTING CR WATER CUSTOMERS. IF THE TIE-IN WILL DISRUPT UTILITY SERVICE, THEN CONTRACTOR SHALL PROVIDE A MINIMUM OF THREE (3) WEEKS' NOTICE TO THE TCR CONSTRUCTION INSPECTOR TO ALLOW TIME FOR CR WATER TO PROVIDE WRITTEN NOTIFICATION TO EXISTING CUSTOMERS AFFECTED BY THE TIE-IN. ALL TOWN UTILITY TIE-INS MUST BE APPROVED BY CR WATER PRIOR TO COMMENCING WORK.
- CONTRACTOR SHALL NOTIFY CASTLE ROCK WATER OF ANY WORK THAT REQUIRES SHUTDOWN OR INTERRUPTION OF SERVICE OF EXISTING WATER MAINS THREE WEEKS PRIOR TO THE PROPOSED SHUTDOWN OR INTERRUPTION UNLESS OTHERWISE APPROVED BY CASTLE ROCK WATER.
- WHERE WATER MAINS ARE CONSTRUCTED IN FILL AREAS, ALL FILL MATERIALS SHALL BE PLACED AND COMPACTED TO FINAL GRADE PRIOR TO THE INSTALLATION OF THE WATER MAIN AND APPURTENANCES. ALL FILL MATERIAL SHALL MEET THE TOWN'S STANDARDS AND BE APPROVED BY CASTLE ROCK WATER. WATER MAINS WITHIN FILL AREAS SHALL HAVE RESTRAINED JOINTS IN ACCORDANCE WITH STANDARD DETAIL W-18.
- ALL MANHOLES LOCATED OUTSIDE OF PAVED ROW SHALL BE CONSTRUCTED WITH A LOCKING-TYPE COVER WITH THE MANHOLE RING BOLTED TO THE MANHOLE CONE.

1 INDICATES UTILITY CROSSING NUMBER
(SEE CROSSING TABLE LEFT COLUMN)

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68



TOWN APPROVAL BLOCK

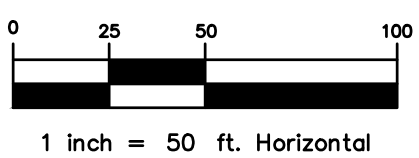
TOWN OF CASTLE ROCK APPROVAL PLANS
ARE HEREBY APPROVED FOR ONE YEAR FROM
DATE OF DEVELOPMENT SERVICES APPROVAL

APPROVED BY:

DEVELOPMENT SERVICES DATE

Hines

Drawing Name	53SW6-SW7.dwg
Job Number	HINES CS3
Prepared For	HINES
Designer	KWS
Drafter	JAH
Checked	BKM

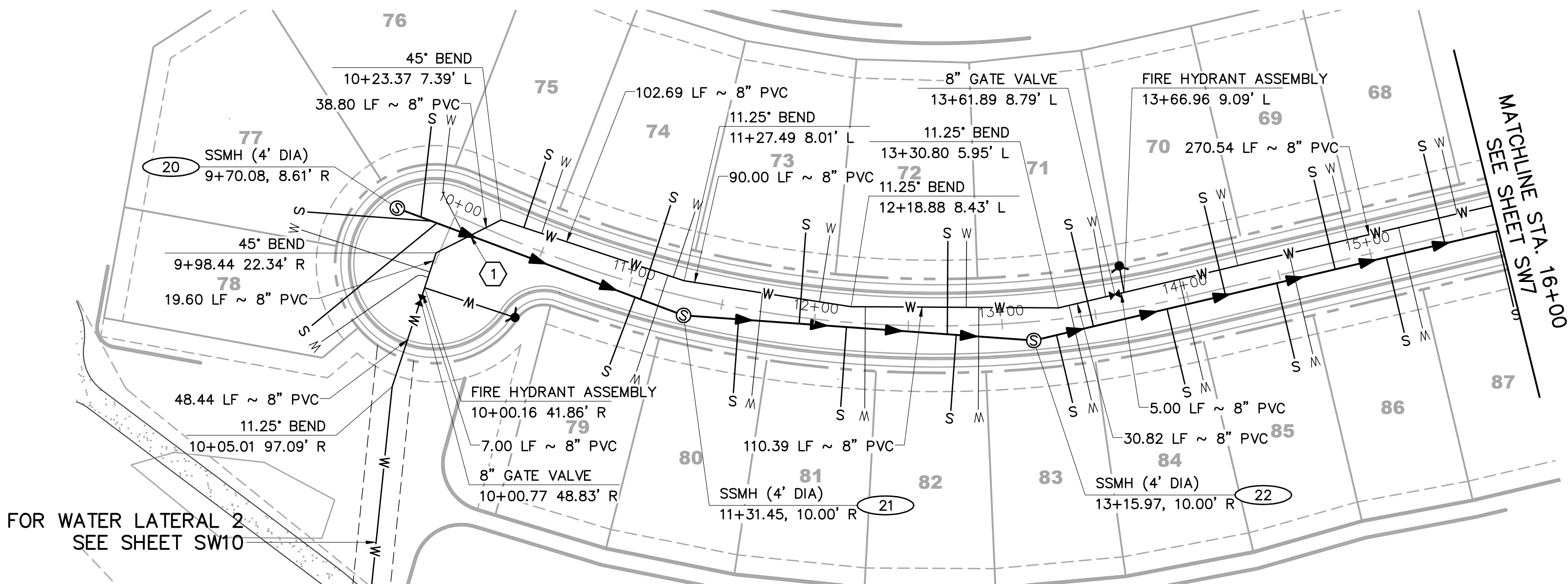


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CANYONS SOUTH FILING NO. 3
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

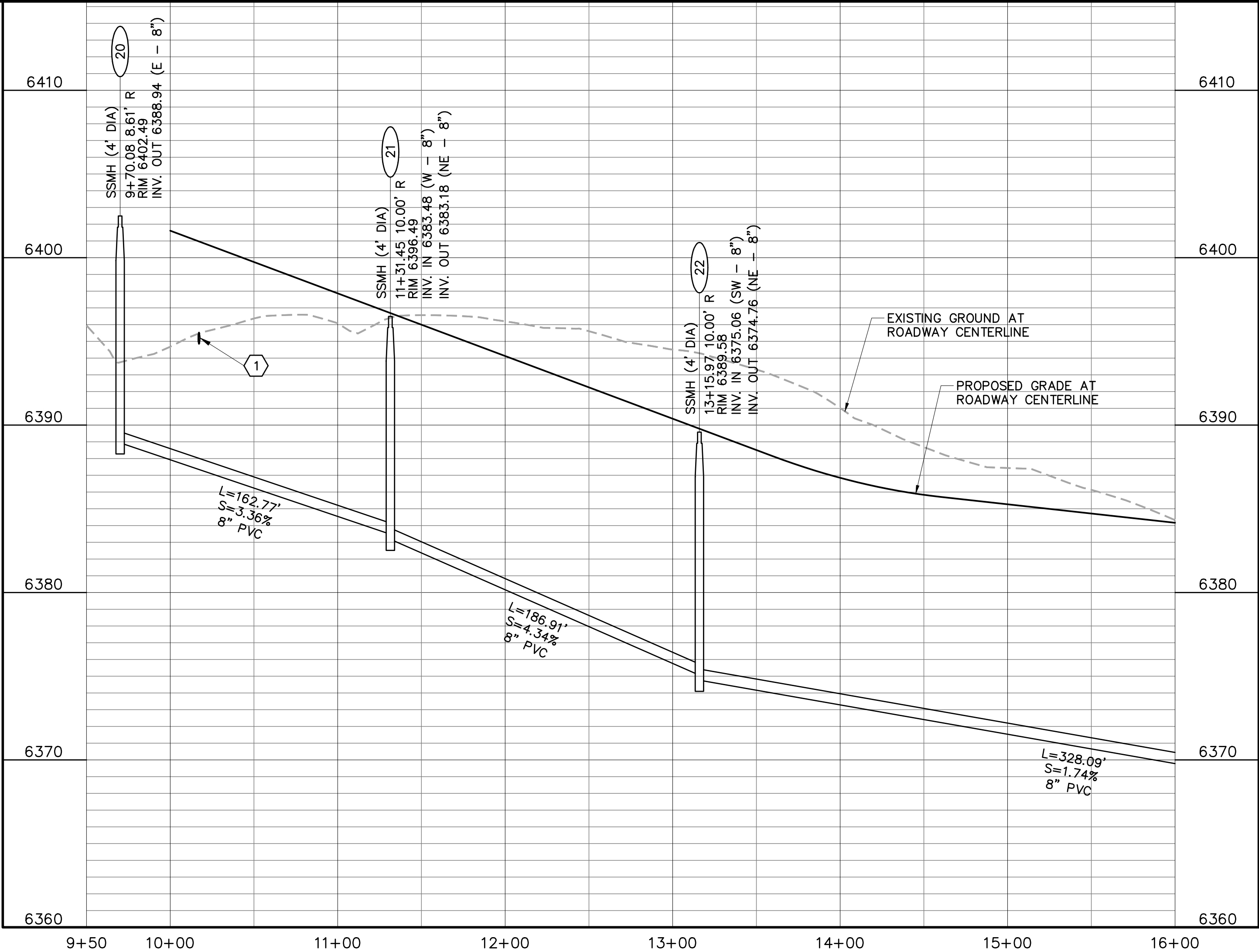
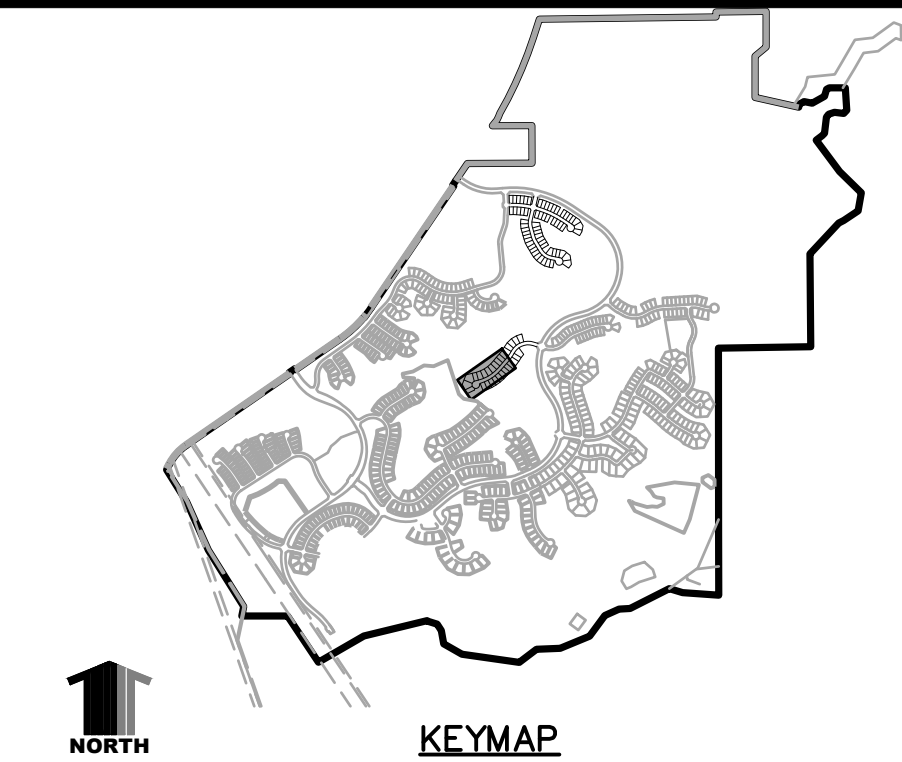
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SW7
of
22
Date
MAY 10, 2022

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PLOTTED BY: KYLER SANFORD PLOT DATE: 5/10/2022 9:19 AM
XREFS:



UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
1	8" PVC	TOP=6388.24	UNDER	8" PVC WAT	BOP=6394.84	6.60'

BACKDROP COURT



CONSTRUCTION NOTES:

- ALL SANITARY SEWER CONSTRUCTION IS SUBJECT TO THE TOWN OF CASTLE ROCK WASTEWATER COLLECTION DESIGN CRITERIA MANUAL, WELL AS THE SANITARY SEWER CONSTRUCTION NOTES LISTED HEREIN.
 - ALL SANITARY SEWER PIPELINES SHALL BE PVC, SDR-35, IN ACCORDANCE WITH ASTM D-3034, BELL AND SPIGOT WITH ELASTOMERIC SEAL.
 - ALL SANITARY SEWER PIPELINES SHALL HAVE A MINIMUM COVER OF 5 FEET AND MAXIMUM COVER OF 20 FEET.
 - ALL SANITARY SEWER PIPELINES SHALL BE BEDDED IN ACCORDANCE WITH TCR STANDARD DETAIL SS-8.
 - ALL MANHOLE RIM ELEVATIONS GIVEN ON THESE PLANS ARE CONSIDERED APPROXIMATE. THE CONTRACTOR SHALL SET THE FINAL RIM ELEVATION BASED ON THE COMPLETE FINISH SURFACE AND PER TCR STANDARD DETAIL SS-3.
 - ALL SEWER LINES SHALL HAVE A MINIMUM HORIZONTAL SEPARATION OF 10 FEET EDGE-TO-EDGE FROM ALL WATER LINES. WHERE LINES CROSS, THERE SHALL BE A MINIMUM OF 18" CLEAR VERTICAL SEPARATION.
 - ALL SANITARY SEWER LINES MUST BE TESTED IN ACCORDANCE WITH SECTION 450.6 OF THE TOWN OF CASTLE ROCK CONSTRUCTION METHODOLOGY AND MATERIALS MANUAL IN THE PRESENCE OF A TCR CONSTRUCTION INSPECTOR.
 - ALL SANITARY SEWER LINE TRENCHES SHALL BE SLOPED OR BRACED AND SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKERS AND THE PROTECTION OF OTHER UTILITIES, IN COMPLIANCE WITH ALL APPLICABLE STATE AND FEDERAL REQUIREMENTS. ALL EXCAVATION OPERATION SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR.
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- ① INDICATES UTILITY CROSSING NUMBER (SEE CROSSING TABLE LEFT COLUMN)
- ⊖ INDICATES WATER LOWERING PER TCR DETAIL W-17 (SEE SHEET DT4)

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68



OR
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Utility Notification
Center of Colorado

TOWN APPROVAL BLOCK

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

APPROVED BY:

DEVELOPMENT SERVICES DATE

Hines

Drawing Name 53SW8-SW9.dwg	0 25 50 100	1 inch = 50 ft. Horizontal 1 inch = 5 ft. Vertical
Job Number HINES CS3	DESIGNER KWS	DRAFTER JAH
Prepared For HINES	CHECKED BKM	

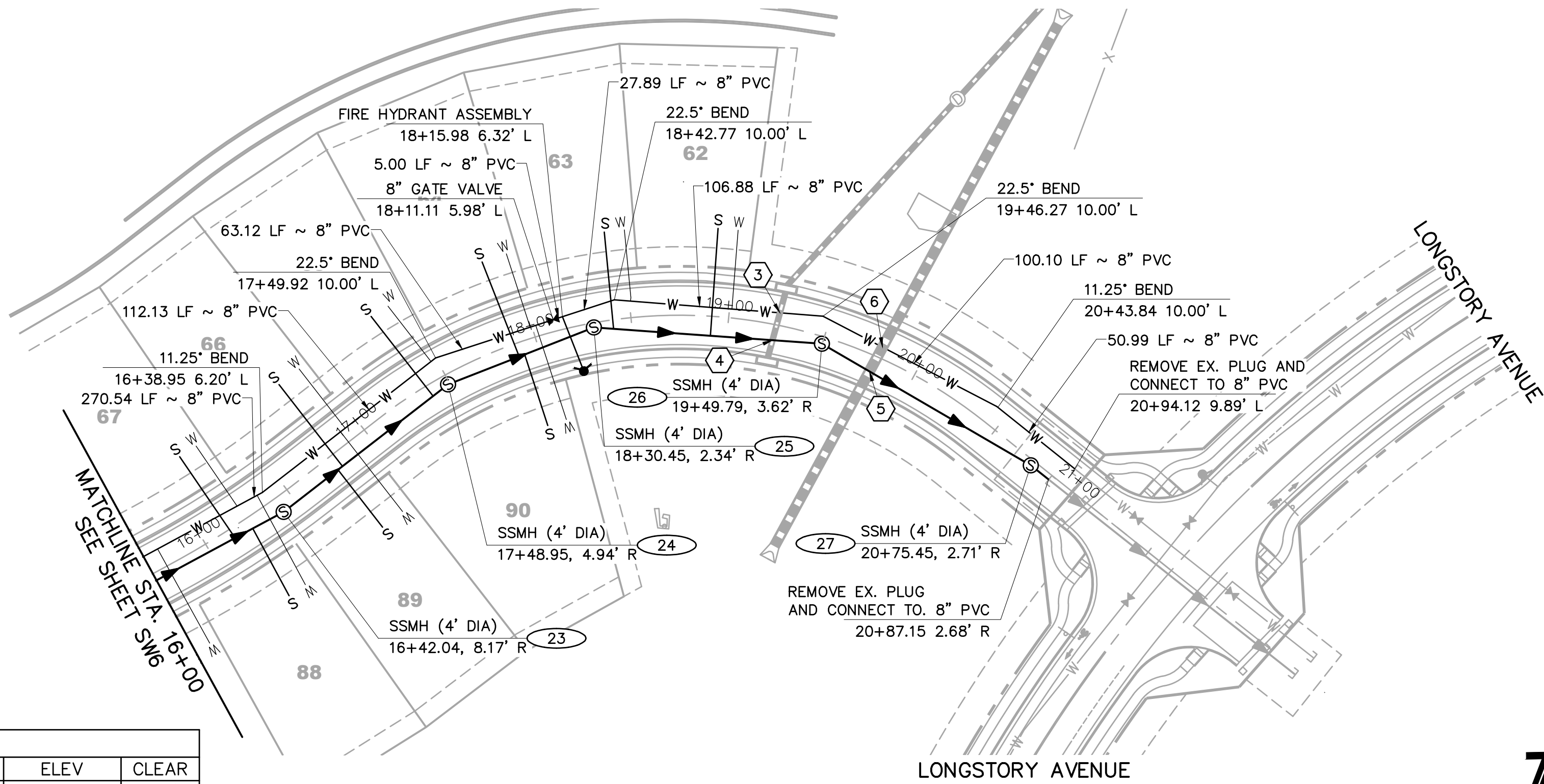


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CANYONS SOUTH FILING NO. 3
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

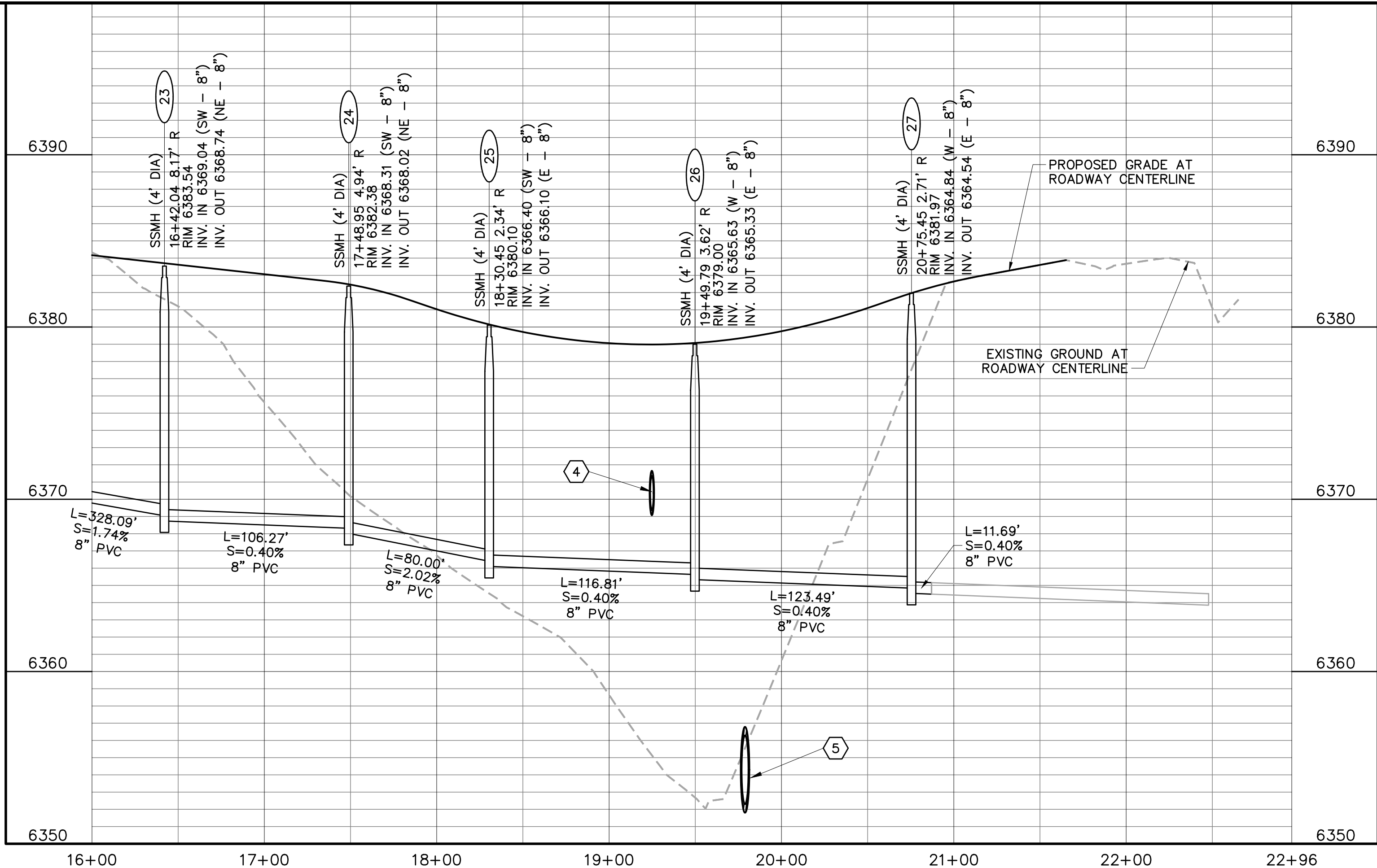
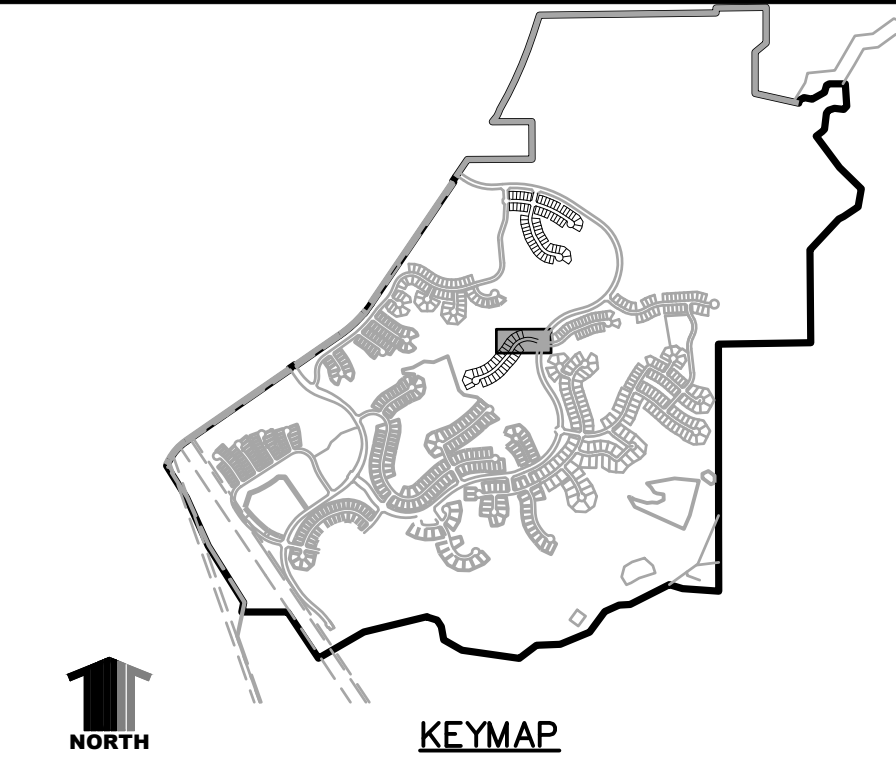
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22
Date
MAY 10, 2022

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PLOTTED BY: KYLER SANFORD PLOT DATE: 5/10/2022 9:20 AM
XREFS:



UTILITY CROSSINGS						
NO	DESC	ELEV	OVER/UNDER	DESC	ELEV	CLEAR
3	24" RCP	TOP=6371.59	UNDER	8" PVC WAT	BOP=6373.09	1.50'
4	24" RCP	BOP=6369.15	OVER	8" PVC	TOP=6366.42	2.73'
5	48" RCP	TOP=6357.24	UNDER	8" PVC	BOP=6365.20	7.96'
6	48" RCP	TOP=6356.50	UNDER	8" PVC WAT	BOP=6373.39	16.89'

BACKDROP COURT



CONSTRUCTION NOTES:

- ALL SANITARY SEWER CONSTRUCTION IS SUBJECT TO THE TOWN OF CASTLE ROCK WASTEWATER COLLECTION DESIGN CRITERIA MANUAL, WELL AS THE SANITARY SEWER CONSTRUCTION NOTES LISTED HEREIN.
 - ALL SANITARY SEWER PIPELINES SHALL BE PVC, SDR-35, IN ACCORDANCE WITH ASTM D-3034, BELL AND SPIGOT WITH ELASTOMERIC SEAL.
 - ALL SANITARY SEWER PIPELINES SHALL HAVE A MINIMUM COVER OF 5 FEET AND MAXIMUM COVER OF 20 FEET.
 - ALL SANITARY SEWER PIPELINES SHALL BE BEDDED IN ACCORDANCE WITH TCR STANDARD DETAIL SS-8.
 - ALL MANHOLE RIM ELEVATIONS GIVEN ON THESE PLANS ARE CONSIDERED APPROXIMATE. THE CONTRACTOR SHALL SET THE FINAL RIM ELEVATION BASED ON THE COMPLETE FINISH SURFACE AND PER TCR STANDARD DETAIL SS-3.
 - ALL SEWER LINES SHALL HAVE A MINIMUM HORIZONTAL SEPARATION OF 10 FEET EDGE-TO-EDGE FROM ALL WATER LINES. WHERE LINES CROSS, THERE SHALL BE A MINIMUM OF 18" CLEAR VERTICAL SEPARATION.
 - ALL SANITARY SEWER LINES MUST BE TESTED IN ACCORDANCE WITH SECTION 450.6 OF THE TOWN OF CASTLE ROCK CONSTRUCTION METHODOLOGY AND MATERIALS MANUAL IN THE PRESENCE OF A TCR CONSTRUCTION INSPECTOR.
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 - ALL MANHOLES LOCATED OUTSIDE OF PAVED ROW SHALL BE CONSTRUCTED WITH A LOCKING-TYPE COVER WITH THE MANHOLE RING BOLTED TO THE MANHOLE CONE AND RAISED 8"-12" ABOVE GRADE PER STANDARD DETAIL SS-3.
- 1 INDICATES UTILITY CROSSING NUMBER (SEE CROSSING TABLE LEFT COLUMN)
- INDICATES WATER LOWERING PER TOCR DETAIL W-17 (SEE SHEET DT4)

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68



UNCC
CALL BEFORE
YOU DIG

811
OR
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Utility Notification
Center of Colorado

TOWN APPROVAL BLOCK

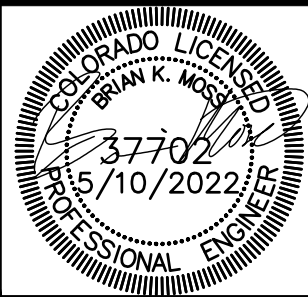
TOWN OF CASTLE ROCK APPROVAL PLANS
ARE HEREBY APPROVED FOR ONE YEAR FROM
DATE OF DEVELOPMENT SERVICES APPROVAL

APPROVED BY:

DEVELOPMENT SERVICES DATE

Hines

Drawing Name 53SW8-SW9.dwg	0 25 50 100	1 inch = 50 ft. Horizontal 1 inch = 5 ft. Vertical	37702 5/10/2022	Calibre	CANYONS SOUTH FILING NO. 3 SANITARY SEWER AND WATER PLANS SANITARY AND WATER PLAN AND PROFILE	Sheet SW9 Date MAY 10, 2022
Job Number HINES CS3	1 inch = 50 ft. Horizontal 1 inch = 5 ft. Vertical	1 inch = 50 ft. Horizontal 1 inch = 5 ft. Vertical	37702 5/10/2022	Calibre Engineering, Inc. 9090 South Ridgeline Boulevard, Suite 105 Highlands Ranch, CO 80129 (303) 730-0434 www.calibre-engineering.com Construction Management Civil Engineering Surveying	CANYONS SOUTH FILING NO. 3 SANITARY SEWER AND WATER PLANS SANITARY AND WATER PLAN AND PROFILE	15 of 22
Prepared For HINES	Designer KWS	Drafter JAH	Checked BKM			

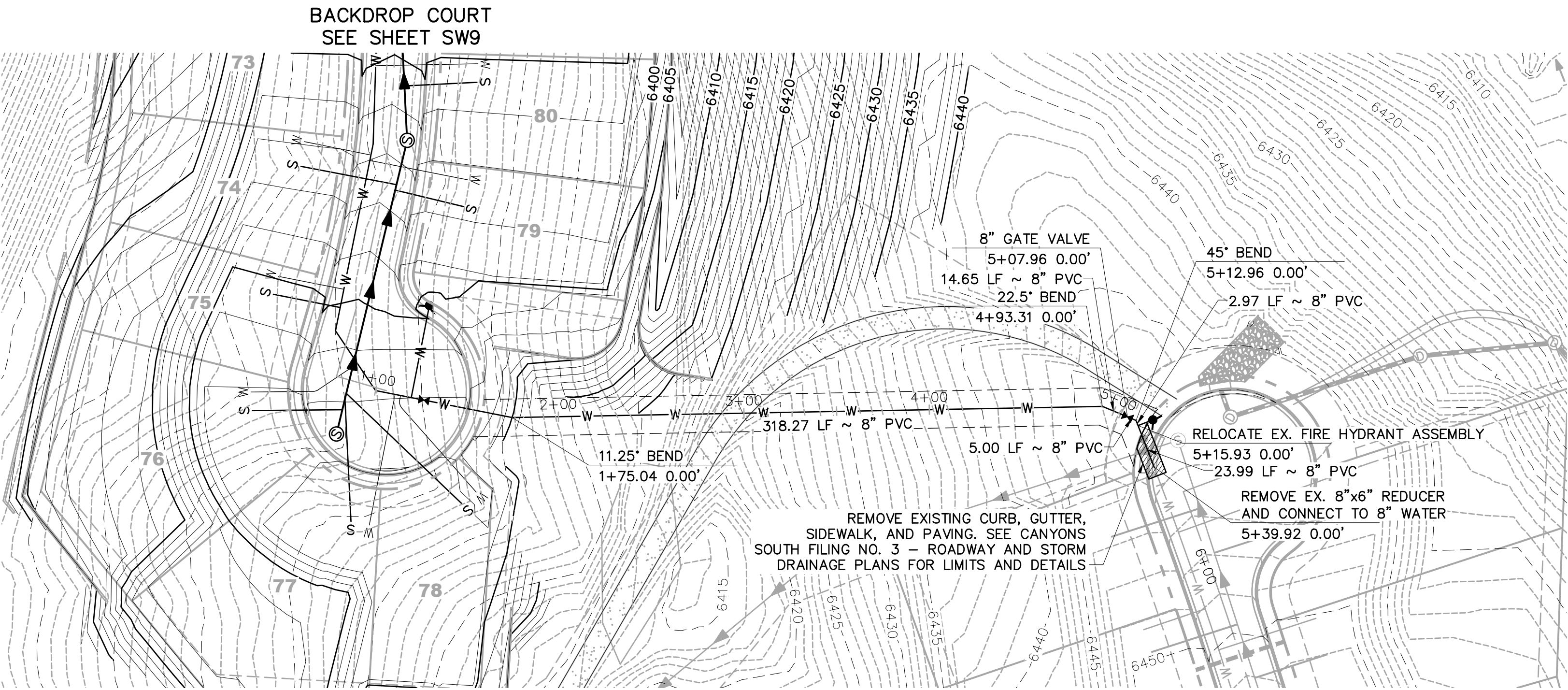


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CANYONS SOUTH FILING NO. 3
SANITARY SEWER AND WATER PLANS
SANITARY AND WATER PLAN AND PROFILE

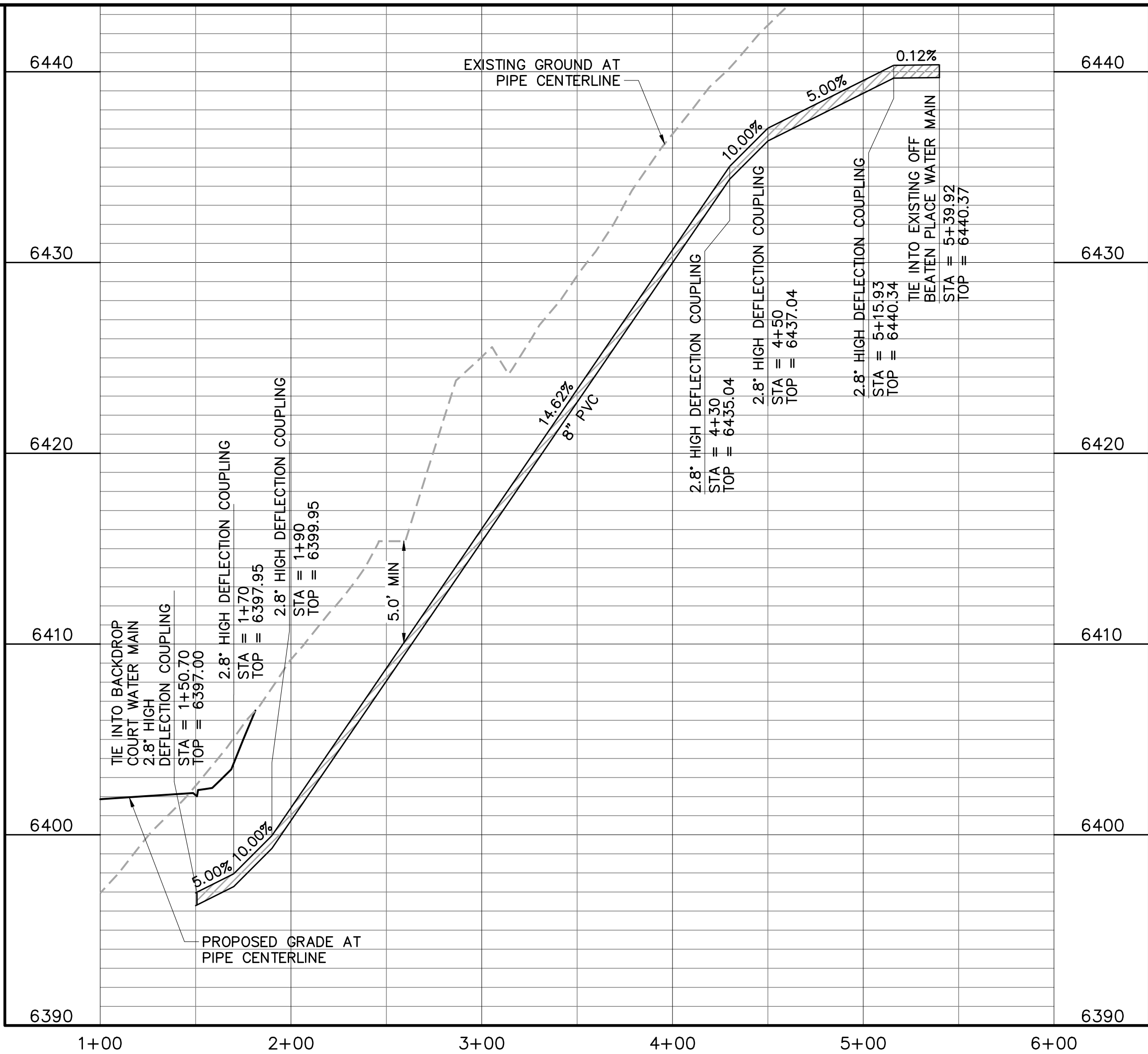
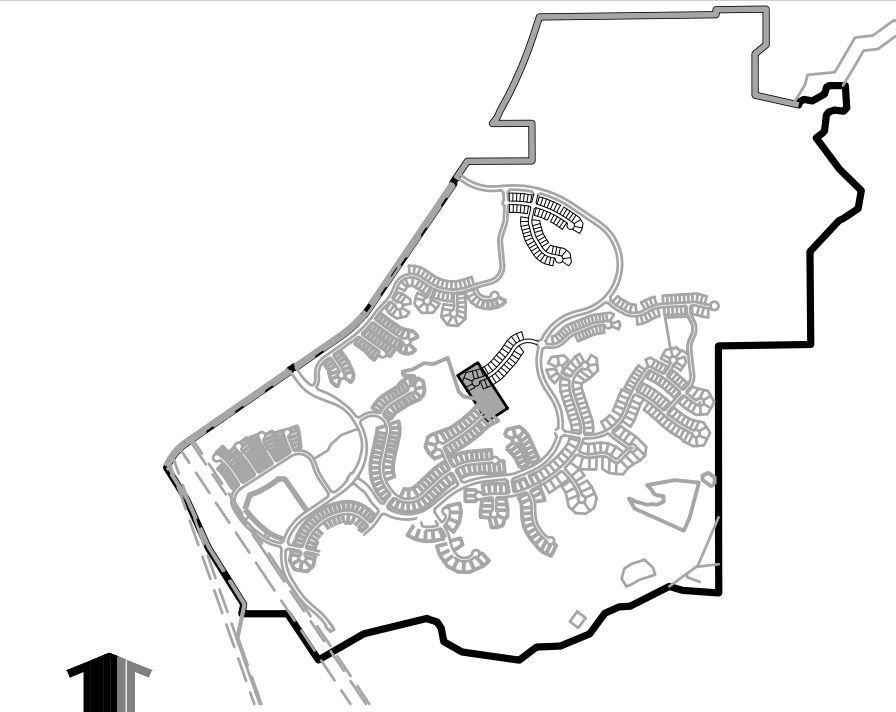
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SW9
Date
MAY 10, 2022

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PLOTTED BY: KYLER SANFORD PLOT DATE: 5/10/2022 9:20 AM
XREFS:



WATER LATERAL 2

OFFBEATEN PLACE
CANYONS SOUTH (FILING NO. 1A)



KEYMAP

CONSTRUCTION NOTES:

- ALL WATER MAINS CONSTRUCTION WITHIN THE CANYONS SOUTH SITE WILL CONFORM TO TOWN OF CASTLE ROCK DEVELOPMENT SERVICES DEPARTMENT.
- THE CANYONS SOUTH SITE IS WITHIN THE RED PRESSURE ZONE IN ITS ENTIRETY.
- REFERENCE CANYONS SOUTH FILING NO. 1A PROPOSED ROADWAY AND STORM DRAINAGE PLANS FOR ROADWAY AND STORM SEWER INFORMATION. REFERENCE CANYONS SOUTH FILING NO. 1A SANITARY SEWER OUTFALL PLANS FOR SANITARY SEWER OUTFALL INFORMATION.
- IN ALL LOCATIONS WHERE STORM SEWER CROSSES WATER, ABOVE OR BELOW, EACH STORM SEWER JOINT WITHIN THE TRENCH WIDTH OF THE CROSSING SHALL BE ENCASED IN A 6" THICK CONCRETE COLLAR EXTENDING 6" BEYOND BOTH SIDES OF THE JOINT. MANHOLE RIMS SHALL BE SET 8"-12" ABOVE THE GRADE AND ALL MANHOLE RIMS TO BE SET OUTSIDE THE MAINTENANCE PATH.
- ALL MAINTENANCE ACCESS ROADS SHALL NOT EXCEED 4% CROSS SLOPE OR 10% LONGITUDINAL SLOPE AND SHALL BE A MINIMUM 12' PER TOWN OF CASTLE ROCK CRITERIA.
- CONTRACTOR SHALL PROVIDE A MINIMUM SEVENTY TWO (72) HOURS' NOTICE TO THE ON-SITE TCR CONSTRUCTION INSPECTOR, (720) 733-2200, PRIOR TO MAKING ANY CONNECTIONS OR TIE-INS TO EXISTING WATER SYSTEM PROVIDED THAT THE UTILITY TIE-IN DOES NOT DISRUPT SERVICE TO EXISTING CR WATER CUSTOMERS. IF THE TIE-IN WILL DISRUPT UTILITY SERVICE, THEN CONTRACTOR SHALL PROVIDE A MINIMUM OF THREE (3) WEEKS' NOTICE TO THE TCR CONSTRUCTION INSPECTOR TO ALLOW TIME FOR CR WATER TO PROVIDE WRITTEN NOTIFICATION TO EXISTING CUSTOMERS AFFECTED BY THE TIE-IN. ALL TOWN UTILITY TIE-INS MUST BE APPROVED BY CR WATER PRIOR TO COMMENCING WORK.
- CONTRACTOR SHALL NOTIFY CASTLE ROCK WATER OF ANY WORK THAT REQUIRES SHUTDOWN OR INTERRUPTION OF SERVICE OF EXISTING WATER MAINS THREE WEEKS PRIOR TO THE PROPOSED SHUTDOWN OR INTERRUPTION UNLESS OTHERWISE APPROVED BY CASTLE ROCK WATER.
- WHERE WATER MAINS ARE CONSTRUCTED IN FILL AREAS, ALL FILL MATERIALS SHALL BE PLACED AND COMPACTED TO FINAL GRADE PRIOR TO THE INSTALLATION OF THE WATER MAIN AND APPURTENANCES. ALL FILL MATERIAL SHALL MEET THE TOWN'S STANDARDS AND BE APPROVED BY CASTLE ROCK WATER. WATER MAINS WITHIN FILL AREAS SHALL HAVE RESTRAINED JOINTS IN ACCORDANCE WITH STANDARD DETAIL W-18.
- ALL MANHOLES LOCATED OUTSIDE OF PAVED ROW SHALL BE CONSTRUCTED WITH A LOCKING-TYPE COVER WITH THE MANHOLE RING BOLTED TO THE MANHOLE CONE.

1 INDICATES UTILITY CROSSING NUMBER
(SEE CROSSING TABLE LEFT COLUMN)

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68



TOWN APPROVAL BLOCK

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

APPROVED BY:

DEVELOPMENT SERVICES DATE

Hines

Drawing Name

53SW10.dwg

Job Number

HINES CS3

Prepared For

HINES



Designer

Drafter

Checked

KWS

JAH

BKM



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CANYONS SOUTH FILING NO. 3

SANITARY SEWER AND WATER PLANS

SANITARY AND WATER PLAN AND PROFILE

Sheet

SW10

Date

MAY 10, 2022

16

of

22

APPENDIX G

REFERENCED DOCUMENTS

Canyons South

Downstream Pinery Wastewater System Evaluation

SANITARY SEWER REPORT

Prepared for:

**LC Macanta, LLC
c/o Lowe Enterprises
7400 E. Orchard Road Suite 2500N
Greenwood Village, CO 80110**

Prepared by:



1601 Blake Street, Suite 200
Denver, Colorado 80202
(303) 572-0200
fax (303) 572-0202

April 2015



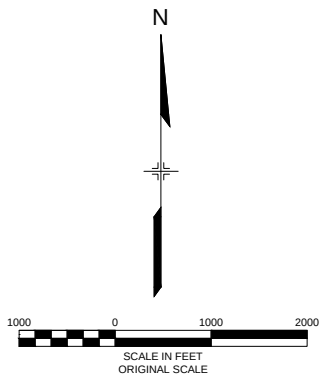
Know what's below.
Call before you dig.

NOTE:

THE PINERY SANITARY SEWER SYSTEM SHOWN REPRESENTS THE FUTURE BUILD OUT OF PINERY AND THE PREVIOUS, APPROVED FULL BUILD OUT OF THE CANYONS SOUTH SITE WHICH INCLUDES 968 SINGLE FAMILY HOMES, 2 SCHOOLS & A CLUB HOUSE.

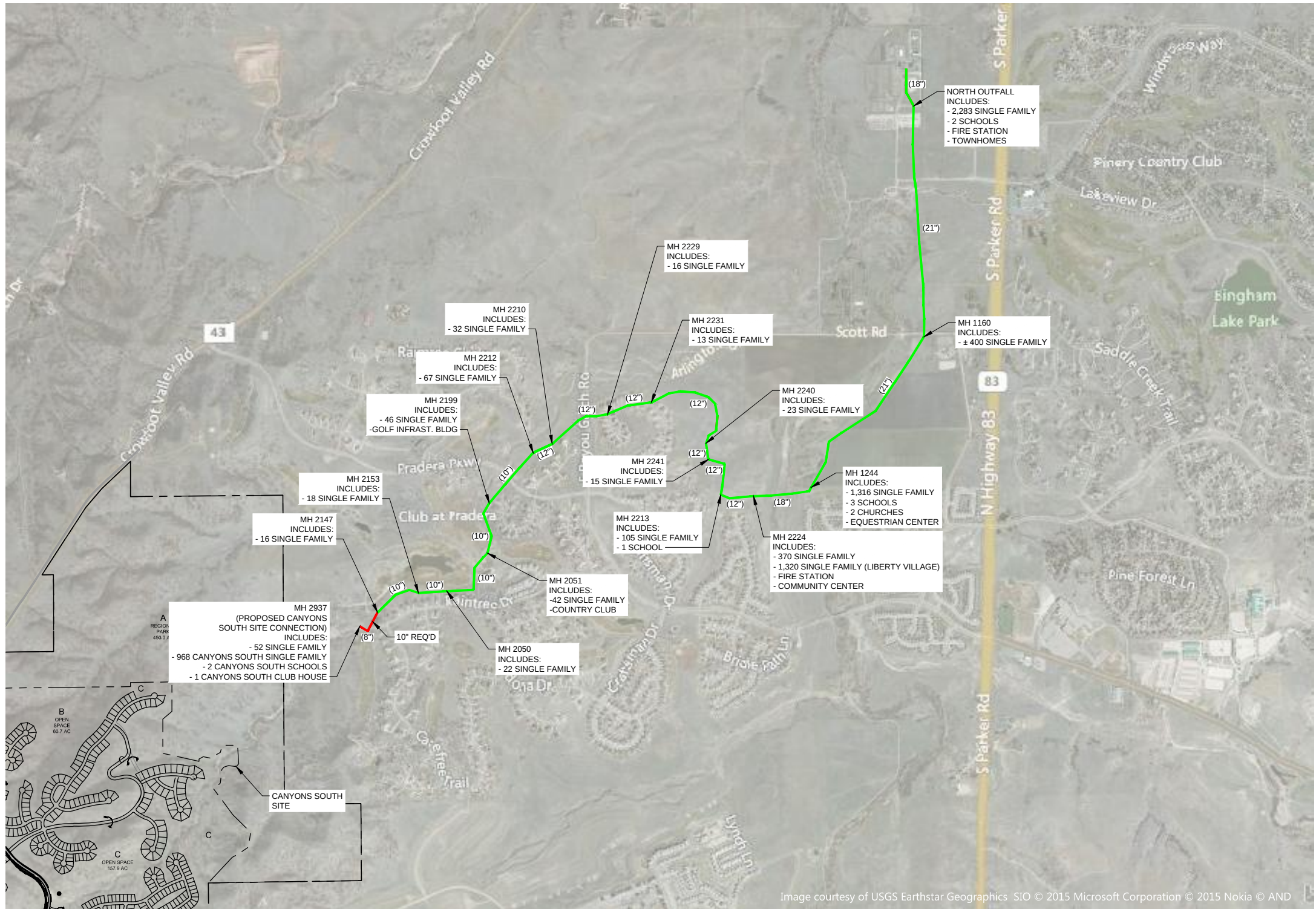
LEGEND

	DEMAND GREATER THAN 100% DESIGN CAPACITY
	DEMAND BETWEEN 86% - 100% DESIGN CAPACITY
	DEMAND LESS THAN 86% DESIGN CAPACITY
(XX")	EXISTING SIZE OF PIPE



PIPE REPLACEMENT QUANTITIES - ALL PIPES OVER 86% CAPACITY

<u>SIZE</u>	<u>QUANTITY</u>
10" PVC	335 LF



REFERENCE DRAWINGS										
X-Roadway X-MDG22x34 L-SP_Macanta AeraE_2008_v2										
No.	DATE									BY
									DESCRIPTION	
										REVISIONS
COMPUTER FILE MANAGEMENT										
FILE NAME: R:\13.176.009 (Macanta)\Dwg\Exhibits\Pinery Sanitary Exhibit.dwg										
CTB FILE: ----										
PLOT DATE: 4/15/2015 9:04 AM										
THIS DRAWING IS CURRENT AS OF PLOT DATE AND MAY BE SUBJECT TO CHANGE.										

SHEET KEY



--

PREPARED BY:

Matrix
DESIGN GROUP



SEAL

PRELIMINARY

THIS DRAWING HAS NOT
BEEN APPROVED BY
GOVERNING AGENCIES AND
IS SUBJECT TO CHANGE

FOR AND ON BEHALF OF
MATRIX DESIGN GROUP, INC.
PROJECT No. 13.176.009

<h1>CANYONS SOUTH</h1>				
<h2>CITY OF CASTLE ROCK EXHIBIT</h2>				
<h3>PINERY SANITARY SEWER SYSTEM W/ CANYONS SOUTH - 968 S.F. HOMES</h3>				
DESIGNED BY:	KSL	SCALE	DATE ISSUED:	APRIL 2015
DRAWN BY:	KSL	HORIZ 1" = 1000'		
CHECKED BY:	MAM	VERT N/A	SHEET	1 OF 2
				DRAWING No. EX.01

except between manhole 1160 and the north outfall which is RCP. A factor of 0.01 was used for Manning's Equation with PVC and 0.013 for RCP.

Existing flows in the pipes have been calculated based on the Pinery Criteria for single family homes, townhomes, multi-family homes, schools and commercial buildings. The full build-out of the Pinery has been considered in the calculation of the flows. The design points are shown in Figures EX.01 & EX.02.

There are 73 pipes between manholes 2252 and the Pinery Wastewater Treatment Facility totaling approximately 21,000 lineal feet. Slopes were provided on the as-built drawings. No as-built information is available for the north outfall into the Pinery Wastewater Treatment Facility and has been assumed to be at same size and slope of the pipes upstream. The pipe runs are categorized into three categories: <86% of full flow, 86%-100% of full flow, > 100% full flow.

The analysis was conducted under two different scenarios. The first scenario consisted of the previously approved Canyons South which had 968 units, two schools and a clubhouse as Pinery has been paid for and is currently obligated to provide service. The second scenario consisted of the updated Canyons South site which has 1575 units, two schools and a clubhouse. Figure EX.01 shows the pipe capacity in the first previously approved condition and Figure EX.02 shows the pipe capacity in the proposed second condition.

IV. CONCLUSIONS

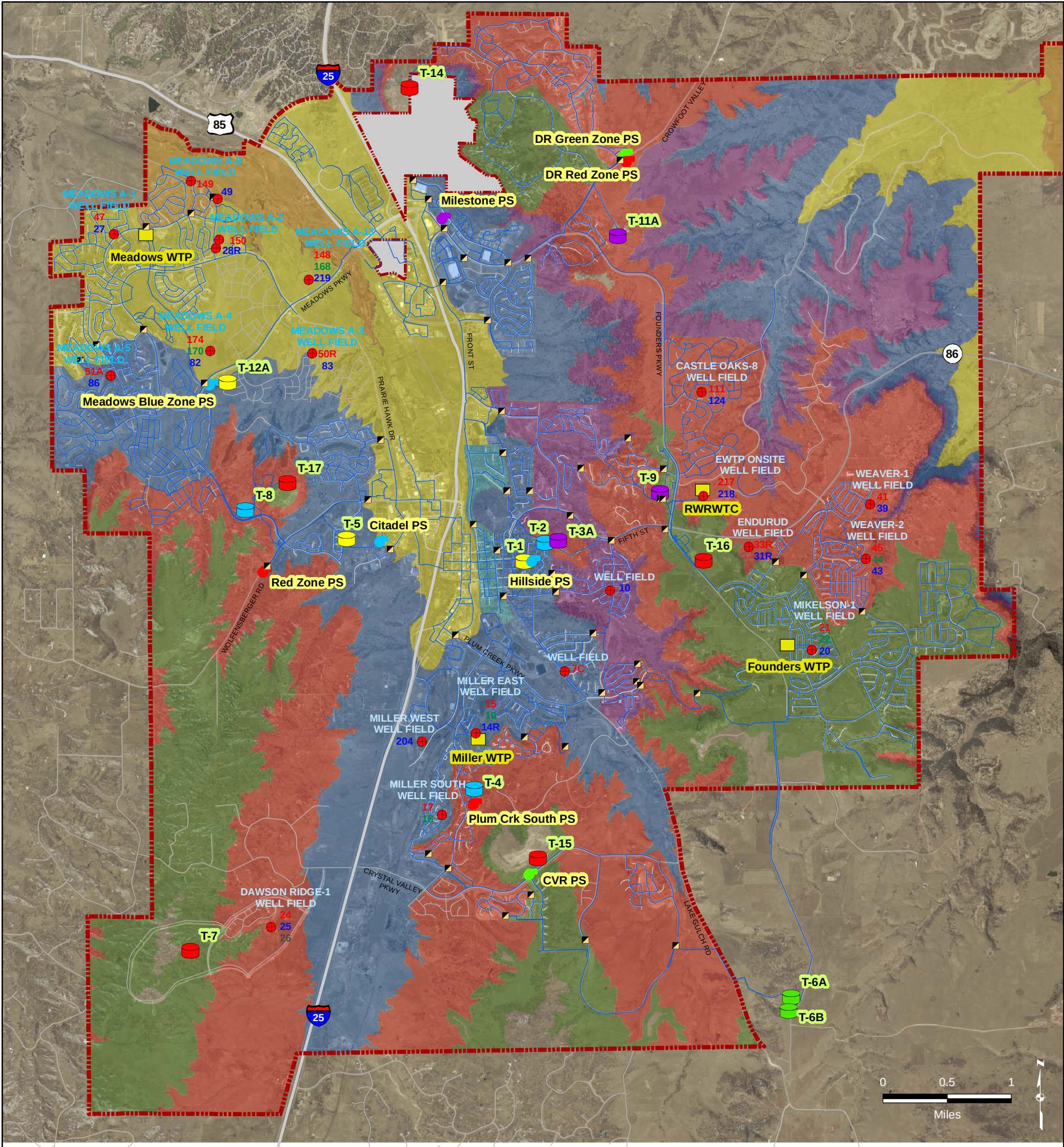
Scenario #1 for Canyons South with 968 units, school site, etc. results in the upstream run of pipe being undersized near the connection point into the Pinery system. The run of pipes upstream of manholes 2147 are undersized whereas all pipes downstream of manhole 2147 have sufficient capacity. The total lengths of pipes in each condition are:

- Below 86% of full flow: 20,665 LF
- 86% to 100% of full flow: 0 LF
- Over 100% of full flow: 335 LF

Scenario #2 for Canyons South development results in more pipes being undersized near the connection point into the Pinery system. All runs of pipe upstream of manhole 2051 are over 100% of full flow. The development of the additional 607 units creates around a 60% increase in the calculated flows from Canyons South and that has a moderate effect on the downstream system, creating 3% to 7.4% increase of the calculated flows. The pipe conditions by pipe length for the proposed Canyons South are:

- Below 86% of full flow: 15,055 LF
- 86% to 100% of full flow: 0 LF
- Over 100% of full flow: 5,945 LF

\\cobralgis\projects\TownOfCastleRock\GIS\MapFiles\14202_Existing_wells.mxd (June 19, 2006 09:46)



Existing Water Infrastructure		
Raw Water Wells		
Aquifer	Number of Wells	Total Pumping Capacity (gpm)
Dawson Aquifer	5	586
Denver Aquifer	15	4,300
Arapahoe Aquifer	16	8,140
Total	36	13,026 gpm (18.8 mgd)
Water Treatment Plants		
Water Treatment Plant	Treatment Capacity (mgd)	Treatment Provided
Ray Waterman Regional Water Treatment Center	8	Iron & Manganese oxidation, filtration, disinfection
Founders WTP	3.2	
Meadows WTP	8	
PS Miller WTP	2.16	
Total	21.36 mgd	
Pressure Zones		
Pressure Zone	Maximum Hydraulic Grade Line (feet)	Maximum Pressure (psi)
Green	6820	114
Red	6680	123
Purple	6591	84
Blue	6520	125
Light Blue	6383	66
Yellow	6349	120
Orange	6192	120

Legend

- Well Field Location¹
- Service Boundary
- Area Served By Others
- Major Highway
- Road
- Existing Water Main
- Tank (Color Denotes Pressure Zone Served)
- Pump (Color Denotes Pressure Zone Served)
- Water Treatment Plant
- PRV

Pressure Zone

- Green
- Red
- Purple
- Blue
- Light Blue
- Yellow
- Orange

Well Field Identification

- 355 Dawson Aquifer
- 355 Denver Aquifer
- 355 Arapahoe Aquifer
- 355 Laramie Fox Hills Aquifer

NOTES:
1. Alluvial wells are not shown in this figure.
2. Reservoir 7 is not in service

Storage Reservoirs		
Storage Reservoir	Capacity (MG)	Pressure Zone
Reservoir #1 (T-1)	0.5	Yellow
Reservoir #2 (T-2)	0.1	Blue
Reservoir #3 (T-3A)	1	Purple
Reservoir #4 (T-4)	1.5	Blue
Reservoir #5 (T-5)	0.5	Yellow
Reservoir #6a (T-6A)	2	Green
Reservoir #6b (T-6B)	2	Green
Reservoir #7 (T-7) ²	2	Red
Reservoir #8 (T-8)	2	Blue
Reservoir #9 (T-9)	1	Purple
Reservoir #11 (T-11A)	1.2	Purple
Reservoir #12 (T-12A)	4	Yellow
Reservoir #14 (T-14)	2	Red
Reservoir #15 (T-15)	4	Red
Reservoir #16 (T-16)	3.1	Red
Reservoir #17 (T-17)	2.2	Red
Total	27.1 MG	
Pump Stations		
Pump Station	Firm Capacity (gpm)	Pressure Zone
Meadows Blue Zone	1050 gpm	Blue
Citadel	800 gpm	Blue
Crystal Valley Ranch	1600 gpm	Green
Diamond Ridge	Green Zone – 940 gpm Red Zone – 720 gpm	Green and Red
Eastern WTP	Green Zone – 3480 gpm Red Zone – 3480 gpm	
Founders WTP	2200 gpm	Green
Hillside	800 gpm	Blue
Meadows WTP	4900 gpm	Yellow
Milestone	1500 gpm	Purple
Plum Creek South	1560 gpm	Red
PS Miller WTP	3050 gpm	Blue
Red Zone	700 gpm	Red
Reservoir #2	700 gpm	Purple

Figure 1.4.2-2
Existing Water
Infrastructure



Pump Stations

The Town's water system consists of nine booster pump stations and finished water pumps located at each of the WTPs. Water is pumped from WTPs to tanks and directly into the distribution system. Booster pumps provide the ability to move water to a higher zone for storage or distribution. The following section details each of the nine pump stations and WTP facilities. Appendix A includes the latest pump curve information provided by the Town in June, 2005. Table 1.4.2-5 summarizes pump station characteristics.

TABLE 1.4.2-5
Town of Castle Rock Water Distribution System Pump Station Characteristics

Pump Station	Zone	Number of Pumps	Total Pump Station Capacity	Firm Pump Station Capacity ¹
Meadows Blue Zone	Blue	2 1 Fire Pump	2750 gpm	1050 gpm
Citadel	Blue	2	1600 gpm	800 gpm
Crystal Valley Ranch	Green	3	2400 gpm	1600 gpm
Diamond Ridge	Green and Red	Green Zone - 4, 1 fire pump	Green Zone - 2440 gpm	Green Zone - 940 gpm
		Red Zone - 2	Red Zone - 1440 gpm	Red Zone - 720 gpm
RWRWTC	Green and Red	Green Zone - 3	Green Zone - 6260 gpm	Green Zone - 3480 gpm
		Red Zone-3	Red Zone - 6260 gpm	Red Zone - 3480 gpm
Founders WTP	Green	3	3400 gpm	2200 gpm
Hillside	Blue	2	1600 gpm	800 gpm
Meadows WTP	Yellow	4	6550 gpm	4900 gpm
Milestone	Purple	2	3000 gpm	1500 gpm
Plum Creek South	Red	3	2340 gpm	1560 gpm
PS Miller WTP	Blue	4	4100 gpm	3050 gpm
Red Zone	Red	2	1400 gpm	700 gpm
Reservoir #2	Purple	2	1400 gpm	700 gpm

¹Firm pump station capacity represents the total pump station capacity with the largest pump out of service.

Blue Zone Pump Station

The Blue Zone Pump Station is located on Meadows Boulevard, just northeast of the Meadows Boulevard and Coachline Road intersection. It pumps water from the yellow zone and Reservoir 12 for distribution in the blue zone and for storage in Reservoir 8. The pump station has two constant speed pumps with motor speeds of 1765 rpm and 1775 rpm, and one variable frequency drive (VFD) fire pump. Table 1.4.2-6 summarizes operating points for each pump.



CANYONS SOUTH – FILING 1A

Final Utility Report

PROJECT NUMBER CD18-0032

AUGUST 2019

For:

**HT Canyons South Development LP
1125 17th Street, Suite 700
Denver, CO 80202**

Prepared By:

**Calibre Engineering, Inc.
9090 S. Ridgeline Blvd. Suite 105
Highlands Ranch, CO 80129**

Contact: Brian Moss

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CANYONS SOUTH – FILING 1A

FINAL UTILITY REPORT

Page i of ii

UTILITY REPORT APPROVAL BLOCKS

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 and Pinery Water and Wastewater District criteria for water systems and sanitary systems 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: _____

Brian K. Moss, Registered Professional Engineer

State Of Colorado No. 37702

(Affix Seal)



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.

A handwritten signature in blue ink, appearing to read "Richard Cross", written over a horizontal line.

Richard Cross,
HT Canyons South Development LP

Town of Castle Rock Acceptance Block



DEVELOPMENT SERVICES

APPROVED

TOWN OF
Development Services Department
CASTLE ROCK
COLORADO

By tkucewesky
on 02/12/2020

Date

Approved CD18-0032 Fnl Util Rpt.pdf

Record Document on File

Utilities Director or Designee

Date

CANYONS SOUTH – FILING 1A

FINAL UTILITY REPORT

Page ii of ii

TABLE OF CONTENTS

SCOPE	1
1.0 GENERAL LOCATION AND DESCRIPTION	1
2.0 DOMESTIC WATER	2
3.0 SANITARY SEWER.....	6
4.0 CONCLUSIONS	8
REFERENCES.....	9

APPENDICES

- A. Water Demands
- B. Water Storage
- C. Water Hydraulic Analysis and Modeling
- D. Wastewater Flows
- E. Wastewater Hydraulic Modeling
- F. Maps and Plans

SCOPE

The purpose of this study is to determine and analyse the water demands and sanitary sewer generations associated with the development of the Canyons South – Filing 1A property.

1.0 GENERAL LOCATION AND DESCRIPTION

1.1 Location

The project is located as follows:

- See the Vicinity Map in Appendix E.
- Canyons South – Filing 1A project site is located in the following areas:
 - The southeast and southwest quarters of Section 19, Township 7 South, Range 66 West of the 6th Principle Meridian
 - The northeast and northwest quarters of Section 30, Township 7 South, Range 66 West of the 6th Principle Meridian
 - The northwest quarter of Section 25, Township 7 South, Range 67 West of the 6th Principle Meridian.
- The site is bounded on the northwest by Crowfoot Valley Road and on the southwest by Tower Road.
- Portions of the Castle Oaks development are south and southeast of the site and Liberty Village is east of the site. The Pradera development is northeast of the site.

1.2 Description of Property

The following are characteristics of the site:

- Canyons South – Filing 1A will cover approximately 387 acres.
- The total number of SFE's for the entire development will be 968 with 278 of those to be included in Filing 1.
- Filing 1 will include 304 single family detached lots on 387 acres. There will be an elementary school on a 10-acre parcel, a recreation center on a 5.75-acre parcel and a 2.4-acre park. The remainder of the acreage will be open space.
- At this time, the exact size of the elementary school is unknown.
- For sewage demands, Pinery Water and Wastewater District guidelines have been used. For water demands, Castle Rock guidelines have been used.
- There are no mapped floodplains in Filing 1. Almost all of Filing 1 is in the upper portions of the Scott Gulch drainageway.
- Canyons South – Filing 1A has no significant geologic or topographic features.
- There are no irrigation canals or irrigation ditches on the property.
- There are no On-Site Wastewater Treatment Systems (OWTS). There are water wells on the site, however, none are currently in use.

2.0 DOMESTIC WATER

2.1 Calculated Demands

- Average Day Demands
 - The domestic demands for the single family residences is based on the TOCR values of 400 gpd per unit which includes irrigation demand. The average day demand for Canyons South – Filing 1A is 94 gpm. The projected full buildout demand is 295 gpm.
 - As stated above, the water demands for the elementary school have been based on the typical values in section 4.4.1 of the TOCR Water System Design Criteria to include irrigation flow rates. For the recreation center, a sewage production value of 50gpd/100sf was used and domestic water demand was assumed to be 1.5 times that value for a total of 5,250 gpd.
- Max Day Demands
 - The max day demand is computed from the average day demand and the max day factor of 2.5 plus irrigation demand. The max day demand for Filing 1 is 219 gpm. The estimated max day demand for the full buildout is 717 gpm.
 - For the elementary school, it was assumed that the building will be of Type IIA construction, less than 39,000 sf and sprinklered. Per the 2015 edition of the IFC, Table B105.2, this would require 2,750 gpm for 2 hours. The sprinkler system would reduce the fire flow by up to 75% but not less than 1,000 gpm for 2 hours. The recreation center is assumed to be of Type IIB construction and approximately 7,000 sf. Per the IFC, this would yield a required fire flow rate of 1,750 gpm for two hours before any reductions provided by a sprinkler system. For this modeling effort, the full fire flow rates were utilized for each type of facility without any sprinkler reductions.
 - Per Castle Rock FD, the residential fire flow used for this report is 1,500 gpm for residences under 3,600 sf. Some lot groupings are expected to have larger square footage homes. It has been assumed for these lots that the homes will be in the range of 3,600 to 4,800 sf and from 7,700 to 9,400 sf. The fire flow rates for these lots has been taken from IFC Table B105.1(2) as 1,750gpm and 2,500gpm respectively. Due to resulting high pipe velocities, all homes exceeding 7,700 sf are required to be constructed with an automatic sprinkler system, reducing the required fire flow rate to the minimum 1,500 gpm.
 - Irrigation flows are currently limited to the elementary school, park and rec center and the values used are from section 4.4.1 of the Town of Castle Rock Water Design Criteria Manual. Irrigation flows for residential units are included in the 400 gpd/dwelling unit Average Day Demand rate.
 - The required storage volume for Canyons South – Filing 1A is 0.65 MG. The current tank in the red pressure zone is Tank 14 and holds 2 MG. Another red zone tank is planned for either next to tank 14 or tank 16 and will add another 2 MG of storage.

- Peak Hour Demands
 - The peak hour demand for Canyons South – Filing 1A is 469 gpm. For the full buildout of Canyons South, the peak hour demand is estimated at 1,559 gpm.
- Irrigation demands have been estimated for the elementary school, rec center and park and total 11gpm. This is the total irrigation demand for Canyons South – Filing 1A.

2.2 Existing Water System

- The Canyons South – Filing 1A will tie to the existing water system near the intersection of Crowfoot Valley Rd and Sapphire Pointe Blvd.
 - There are no known restrictions on water for the proposed Canyons South – Filing 1A.
 - The current total booster pump capacity for the red zone, with the largest pump out of service, is 6,360 gpm.
 - Hydraulic Grade Lines (HGL's) were provided by Castle Rock Water for the red zone. The HGL's are 6680 for a full tank and 6661.4 for the tank 20% full. These were utilized for the reservoir elevations in the water model.
- Existing Supply Facilities
 - Service to the Canyons South – Filing 1A is not specifically addressed in the 2017 Town of Castle Rock Water Master Plan. However, under Developer Funded Projects, the Canyons South Developer is specifically mentioned in the Crowfoot to Crimson Sky 16-inch transmission main installation from RHR to Tank 16.
 - From existing pressure zone maps, it appears that the Red zone will be supplying water to the title project. The junction elevations for Canyons South – Filing 1A range between 6430 ft to 6512 ft.
 - The closest red zone tank to the Canyons South – Filing 1A project is tank 14 which is currently a 2.0 MG tank. There is proposed an additional red zone tank that would be located next to either tank 14 or tank 16. The proposed tank would provide another 2.0 MG of storage. The current Filing – 1 storage requirement is 0.65 MG.

2.3 Proposed Water System

- Description of water distribution system
 - The proposed water system will include two connections to the existing 16-inch water main within Crowfoot Valley Road to loop the Filing 1 water system. One connection is adjacent to Castle Rock Fire Station 155 and the second connection is at the intersection of Crowfoot Valley Road and Sapphire Point Boulevard. The water system is within the existing Red Zone system. The existing 16-inch pipe will be extended though Crowfoot Valley Road to the proposed intersection at Macanta Boulevard. The 16-inch line will also be run down Macanta Boulevard south to the limits of the Filing 1 development. A 12-inch pipe will be run from the intersection at

Canyons South – Filing 1A

Final Utility Report

Page 4 of 9

Macanta Boulevard and Longstory Avenue down Longstory Avenue to the limits of the Filing 1 development. Eight-inch pipe will serve all the residential areas. Any future development of the existing water infrastructure needed to serve this site is the responsibility of the developer.

- The proposed 16-inch line that will run south along Macanta Boulevard will, at first, stop at the development limits on Macanta. Eventually, the line will connect back to the Red Zone system at Crimson Sky. This is in conformance with the TOCR Water Master Plan under Transmission and Distribution for the 2026 to Buildout Planning Horizon. The 16-inch pipe proposed along Crowfoot Valley will run from the connection point near Crowfoot Valley and Sapphire Pointe to the proposed fire access road south of the intersection with Macanta Boulevard. This will allow the eastern most lots in planning area 3 to be looped. This 16-inch line will eventually run further east along Crowfoot Valley to the intersection with Longstory Avenue. Initially, a 12-inch pipe is proposed to tie into the proposed 16-inch line at the intersection of Macanta and Longstory in the Filing 1 limits. This 12-inch will run along Longstory to the Filing 1 limits at the east end. Future filings of the Canyons project will extend this 12-inch line back to the intersection with Longstory and Crowfoot Valley where it will connect to the future 16-inch pipe completing the loop.
- There are no assumptions made in the 2017 Water Master Plan for the Canyons South development except for the developer participation in the 16" transmission main that will move water from RHR to tank 16. This assumption is still valid.
- No additional supply facilities are required for Canyons South – Filing 1A. The planned additional red zone tank would enhance water storage for the full buildout of the Canyons South Development.
- Required Fire Flow – For modeling purposes, the full un-sprinklered fire flow rates were used. The fire flow rates used are the following:
 - Single Family Residential – Homes are planned to be standard stick-built construction and will have varying square footages from less than 3600 sf to 4,800 square feet and between 7,701 sf to 9,400 sf. The minimum fire flow for the housing areas is 1500gpm per Castle Rock Fire Department with greater flows of 1,750 and 2,250gpm for lots with larger homes. The duration is 2 hours.
 - Elementary School – The school has been assumed to be less than 39,000 square feet, of Type IIA construction and sprinklered with an automatic sprinkler system. Per Table B105.1(2), the required fire flow without the sprinkler reduction is 2,750gpm for 2 hours. The IFC does allow for a reduction of the required fire flow of up to 75% for a sprinkler system. Minimum fire flow per Town of Castle Rock standards is 1,500 gpm fire flow.
 - The recreation center is assumed to be of Type IIB construction and approximately 7,000 square feet. The facility will be sprinklered. The required fire flow without a reduction for the sprinkler system is 1750 gpm for two hours. The IFC does allow for

a reduction of the required fire flow of up to 75% for a sprinkler system. Minimum fire flow per Town of Castle Rock standards is 1,500 gpm fire flow.

- Land Dedication Requirements
 - There are a few locations that the looping of the water lines required the lines to be outside of the public right of way. These areas will have dedicated easements for utility access. These easements are not included in the Plat and will be dedicated by separate document to the Town of Castle Rock.
 - Portions of the proposed water system are location within open space for looping purposes. Areas where main infrastructure is located outside of public right-of-way are provided with a maintenance access path per Town of Castle Rock standards. Maintenance paths have been provided to all water main that is located outside of paved roadway per Town of Castle Rock standards.

2.4 Proposed Water System Analysis and Modeling

- WaterCAD 2018 has been used to model the water system for Canyons South Filing 1. The starting HGL's used for the Red Zone system are 6680 for full tank and 6661.4 for the 20% tank level. See Appendix C for water modeling results.
- Hydraulic Modeling Scenarios:
 - The static pressures for the different HGL's are as follows:
 - For the full tank, pressures range between 72 to 108 psi
 - For the tank 20% full, pressures range between 64 and 100psi.
 - Junctions J-127 through J-135 report larger pressures due to anticipated demand from future filings placed at one point on the main line. This analysis was set up for confirmation of adequate line size for future development. Utility reports for future filing development will provide detailed analysis of looping and interior sizing.
 - All hydraulic modeling has been performed with the Tank at 20% of capacity (HGL 6661.4).
 - For the MDD plus Fire Flow scenario, pipe 94 at the south eastern most connection to the 16" pipe in Macanta Boulevard was closed. Pressures and pipe velocities are within TOCR design requirements. All junctions were subject to fire flow of 1500gpm except for:
 - J7 was chosen for the school fire flow and domestic demand. The fire flow is 2,750gpm.
 - J64 was chosen for the rec center fire flow and domestic demand. The fire flow is 1,750gpm.

- J96 and J84 were chosen as the lots that will likely include larger homes and a dead-end main. A fire flow of 2,250gpm was applied to the end of the cul-de-sac as a maximum fire flow. Homes larger than 7,700 sf shall be sprinklered to reduce high velocities produced from a 2,500gpm fire flow demand.
 - J55 was chosen as a critical point where fire flow was applied directly to the junction.
- Hydraulic Modeling Results
 - The Junction reports for two static scenarios, the MDD plus fire flow scenario and the PHD scenario are in Appendix C.
 - The total domestic demand for the MDD scenario is 219 gpm. The maximum fire flow is 2780 gpm. For the PHD, the total demand is 469 gpm.
 - The pipe reports for the hydraulic scenarios are located in Appendix C.
 - The proposed system performs well using the Red Pressure Zone. Select locations have static pressures on the high side at 107 to 108 psi. However, the system pressures are below the required 125psi. Velocities under the fire flow scenario top out at 14fps, less than the maximum 15fps. Pipe velocities in other scenarios are well below the published maximums. The two junctions representing dead-end lines (J-84 and J-96) show fire flow available while remaining under 15fps within the pipe.

3.0 SANITARY SEWER

3.1 Site Location

- See section 1.1 for Site Location Information
- See Section 1.2 for Description of Property and Land Use.

3.2 Calculated Flows

- Due to the Canyons South – Filing 1A sewer discharging into the Pinery Water and Wastewater District, sewer generation calculations have been computed using the Pinery Water and Wastewater District Technical Specifications, April 1998. Construction specifications shall follow the Town of Castle Rock Wastewater Collection Design Criteria Manual.
- There are 304 lots planned for Filing 1A. However, there are 19 additional lots that will tie to the Filing 1 sewer system from Canyons South Filing 2 and Filing 3. Including those additional lots brings the total to 323. For the full buildout of the Canyons South – Filing 1A, 323 single family homes were assumed, an elementary school, and an amenity center have been assumed.

Canyons South – Filing 1A

Final Utility Report

Page 7 of 9

- The average daily flows for Canyons South – Filing 1A are calculated to be 77 gpm.
- The peak day flow total for the individual basins of Canyons South Filing 1 are calculated to be 306 gpm using a peaking factor of 4.0. The peak day flows for Canyons South Filing 1 as a whole is 230 gpm using a peaking factor of 3.0.

3.3 Existing Wastewater System

- The Canyons South Development will discharge all sanitary flows to the Pinery Water and Wastewater District. The connection point for the discharge is in the west end of the Pradera development at a metering station to be constructed with the Canyons South development. Reference Canyons South-Filing 1 Sanitary Sewer Outfall Final Wastewater Utility Report, Project Number CD18-0033 and Canyons South Filing No. 1A Proposed Sanitary Sewer Outfall Plans for metering station and Pinery wastewater system information.
- The Canyons South Downstream Pinery Wastewater System Evaluation dated April, 2015 prepared by Matrix Design Group has been referenced for design, connection and downstream capacity. Calibre Engineering supports the report and its findings of the downstream sanitary system within the Pradera development.

3.4 Proposed Wastewater System

- Proposed Collection System
 - The sanitary demands for Canyons South – Filing 1A can be met with the use of 8-inch pipe at minimum slope. See Appendix E for pipe calculations. Some areas of Canyons South – Filing 1A system include pipe at the maximum slope, but velocities are well below the 10 fps limit.
 - The proposed sanitary outfall system will consist of 8-inch main and tie to the sanitary outfall system for the Canyons South Development. The sanitary outfall system has been shown to have capacity for the Canyons South Development Filing No. 1A including 278 single family homes, one school and an amenity center.
 - The Canyons South Development will ultimately discharge all wastewater to the Pinery Water and Wastewater District in accordance with the TOCR Wastewater Master Plan. In addition, a flow measuring station will be installed at the lowest point on the Canyons South system. The stated assumptions in the TOCR Wastewater Master Plan is that the Canyons South project will discharge all wastewater to the Pinery and install a flow metering station are still valid. Town of Castle Rock ownership will begin at the metering station and the sanitary system upstream and within the Canyons South development. The Pinery Water and Wastewater District will own and maintain the metering station and the sanitary system downstream. Reference Canyons South-Filing 1 Sanitary Sewer Outfall Final Wastewater Utility Report, Project Number CD18-0033 for sanitary outfall and metering information.

Canyons South – Filing 1A

Final Utility Report

Page 8 of 9

- The only proposed wastewater facility required for the Canyons South Development is the installation of a flow metering station at the developments discharge point to the Pinery.
- Land Dedication Requirements
 - Sanitary sewer lines that are not in the public ROW will have utility easements dedicated for access and maintenance purposes.
 - Some collectors are running through open space with steeper slopes. Areas where main infrastructure is located outside of public right-of-way are provided with a maintenance access path per Town of Castle Rock standards. Manholes that do not lie within direct access from the maintenance path have been placed within 300' of an upstream and a downstream manhole for jetting.

3.5 Proposed Wastewater System Analysis and Modeling

- Pipes for the Canyons South – Filing 1A wastewater system have been modeled using Bentley Flow Master.
- Pipe analysis is included in Appendix C.
- Generated flows will be per the Pinery Water and Wastewater District Technical Criteria.
- Pipe velocities for both the ADF and the PDF are within 2 fps and 10 fps. Pipes are considered full at a d/D of 75%.

4.0 CONCLUSIONS

- The proposed water improvements will provide service to Canyons South – Filing 1A in general accordance with City's requirements.
- The proposed sanitary sewer improvements will provide service to the Canyons South – Filing 1A development in general accordance with the City's requirements and the Pinery Water and Wastewater Technical Criteria.

Canyons South – Filing 1A

Final Utility Report

Page 9 of 9

REFERENCES

1. *Town of Castle Rock Water System Design Criteria Manual*, Town of Castle Rock, December 2018.
2. *Town of Castle Rock Wastewater Collection Design Criteria Manual*, Town of Castle Rock, December 2018
3. *Pinery Water and Wastewater District Technical Specifications*, Pinery Water & Wastewater District, Douglas County, April 1998.
4. *Canyons South Downstream Pinery Wastewater System Evaluation Sanitary Sewer Report*, Matrix Design Group, April 2015.
5. *International Fire Code*, International Code Council, 2015
6. *Castle Rock/ Canyons South Water Service Intergovernmental Agreement*, Town of Castle Rock, June 14, 2005.

APPENDIX A

WATER DEMANDS

CANYONS SOUTH FILING 1

PROJECTED WATER DEMAND GENERATION



RESIDENTIAL	400 GPUD	Elementary School		Recreation Ctr ²		Park	
MAX. DAY / AVG. DAY	2.50	Base Demand	3375 GPD	Base Demand	5250 GPD	Irrigation Demand	3750 GPD/ACRE
PEAK HOUR / FLOW RATIO	5.50	Irrigation Demand	3000 GPD	Irrigation Demand ⁴	3750 GPD		
FIRE DEMAND							
RESIDENTIAL UNITS	1,500 GPM	MED RES ³	1750 GPM	REC CENTER	1750	GPM	
SCHOOLS ¹	2,750 GPM	LG RES ³	2500 GPM				

BASIN	LAND USE	ACRES	NO. OF LOTS	AVG. DAY DEMAND (GPM)	AVG. DAY DEMAND (GPD)	AVG. DAY DEMAND (AC-FT/YR)	MAX. DAY DEMAND (GPD)	MAX. DAY DEMAND (GPM)	PEAK HOUR DEMAND (GPM)	PEAK HOUR DEMAND (GPD)	IRRIGATION DEMAND (GPM) ⁵	IRRIGATION DEMAND (GPD) ⁵	MAX. DAY + FIRE FLOW + IRR(GPM)
J58	RESIDENTIAL		18	5.0	7,200	8.1	18,000	12.5	27.5	39,600	0.0	0	1,513
J60	RESIDENTIAL		18	5.0	7,200	8.1	18,000	12.5	27.5	39,600	0.0	0	1,513
J61	RESIDENTIAL		16	4.4	6,400	7.2	16,000	11.1	24.4	35,200	0.0	0	1,511
J62	RESIDENTIAL		11	3.1	4,400	4.9	11,000	7.6	16.8	24,200	0.0	0	1,508
J34	RESIDENTIAL		11	3.1	4,400	4.9	11,000	7.6	16.8	24,200	0.0	0	1,508
J36	RESIDENTIAL		14	3.9	5,600	6.3	14,000	9.7	21.4	30,800	0.0	0	1,510
J37	RESIDENTIAL		19	5.3	7,600	8.5	19,000	13.2	29.0	41,800	0.0	0	1,513
J54	RESIDENTIAL		11	3.1	4,400	4.9	11,000	7.6	16.8	24,200	0.0	0	1,508
J52	RESIDENTIAL		14	3.9	5,600	6.3	14,000	9.7	21.4	30,800	0.0	0	1,510
J51	RESIDENTIAL		17	4.7	6,800	7.6	17,000	11.8	26.0	37,400	0.0	0	1,512
J26	RESIDENTIAL		25	6.9	10,000	11.2	25,000	17.4	38.2	55,000	0.0	0	1,517
J49	RESIDENTIAL		16	4.4	6,400	7.2	16,000	11.1	24.4	35,200	0.0	0	1,511
J48	RESIDENTIAL		14	3.9	5,600	6.3	14,000	9.7	21.4	30,800	0.0	0	1,510
J47	RESIDENTIAL		11	3.1	4,400	4.9	11,000	7.6	16.8	24,200	0.0	0	1,508
J44	RESIDENTIAL		24	6.7	9,600	10.8	24,000	16.7	36.7	52,800	0.0	0	1,517
J7	SCHOOL		1	4.4	6,375	7.1	11,438	7.9	15.0	21,563	2.1	3,000	2,758
J64	REC CENTER	1	1	6.3	9,000	10.1	16,875	11.7	22.7	32,625	2.6	3,750	1,762
J95	LG RES		9	2.5	3,600	4.0	9,000	6.3	13.8	19,800	0.0	0	2,506
J88	MED RES		14	3.9	5,600	6.3	14,000	9.7	21.4	30,800	0.0	0	1,760
J79	MED RES		16	4.4	6,400	7.2	16,000	11.1	24.4	35,200	0.0	0	1,761
J4	PARK	2.4	1	6.3	9,000	10.1	9,000	6.3	6.3	9,000	6.3	9,000	6
TOTALS			281	94	135,575	152	315,313	219	469	674,788	10.9	15750.0	33,219

¹ The fire flow for the elementary school is based on Type IIA construction, a maximum size of 39,000 sq ft. per Table B105.1(2) of the IFC.

² The water demand for the recreation center is based on 1.5 times the sewage production. A value of 75gal/100sf was used and assumed a 7000 sf facility.

³ The fire flow demand for the medium and large residences is based on square footages between 3,601 and 4,800sf for medium and between 7,701 and 9,400sf for large residences. Flow rates are per table B105.1(2).

⁴ The recreation center is assumed to have 1 acre of irrigated land. The flow rate assumes the TOCR standard for irrigated land.

⁵ Residential irrigation demand is included in the 400 gpd/dwelling unit Average Day Demand rate and is shown as zero demand in the residential irrigation demand column.

CANYONS SOUTH FULL BUILDOUT PROJECTED WATER DEMAND GENERATION



RESIDENTIAL	400 GPUD	Elementary School		Recreation Center		Middle School	
MAX. DAY / AVG. DAY	2.50	Base Demand	3375 GPD	Base Demand	5250 GPD	Base Demand	8500 GPD
PEAK HOUR / FLOW RATIO	5.50	Irrigation Demand	3000 GPD	Irrigation Demand	3750 GPD/Acre	Irrigation Demand	5250 GPD
FIRE DEMAND							
SFD UNITS	1,500 GPM	MIDDLE SCHOOL	3750 GPM				
ELEMENTARY SCHOOL ¹	2,750 GPM	RECREATION CTR	1750 GPM				

BASIN	LAND USE	ACRES	NO. OF LOTS	AVG. DAY DEMAND (GPM)	AVG. DAY DEMAND (GPD)	AVG. DAY DEMAND (AC-FT/YR)	MAX. DAY DEMAND (GPD)	MAX. DAY DEMAND (GPM)	PEAK HOUR DEMAND (GPM)	PEAK HOUR DEMAND (GPD)	IRRIGATION DEMAND (GPM)	IRRIGATION DEMAND (GPD)	MAX. DAY + FIRE FLOW + PEAK IRR(GPM)
	RESIDENTIAL		968	268.9	387,200	433.7	968,000	672.2	1478.9	2,129,600	0.0	0	2,172
Elementary School	School	10	1	4.4	6,375.0	7.1	11,438	7.9	15.0	21,563	2.1	3,000	2,758
Middle School	School	25	1	9.5	13,750.0	15.4	26,500	18.4	36.1	52,000	3.6	5,250	3,768
Park	Park	2.4	1	6.3	9,000.0	10.1	9,000	6.3	6.3	9,000	6.3	9,000	6
Recreation Center ²	Commercial		1	6.3	9,000.0	10.1	16,875	11.7	22.7	32,625	2.6	3,750	1,762
TOTALS			972	295	425,325	476	1,031,813	717	1,559	2,244,788	14.6	21,000	32,217

¹ For middle school fire flow, Type IIA construction is assumed with a floor square footage no larger than 72,000 sf.

² The water demand for the recreation center is based on 1.5 times the sewage production. A value of 75gal/100sf was used and assumed a 7000 sf facility.

APPENDIX B

WATER STORAGE



CANYONS SOUTH FILING 1 STORAGE REQUIREMENTS

STORAGE REQUIRED:			Storage (gal)	Storage (MG)
Max Day Demand	219.0	gpm	315,313	0.315
Fire Flow Demand	2,750	gpm for 2 hrs	330,000	0.330
		Total	645,313	0.645

APPENDIX C

WATER HYDRAULIC ANALYSIS AND MODELING

Active Scenario: Static High Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
34	J-1	6,433.68	<Collection: 0 items>	0	6,680.00	107
36	J-2	6,430.45	<Collection: 0 items>	0	6,680.00	108
38	J-3	6,433.58	<Collection: 0 items>	0	6,680.00	107
40	J-4	6,448.18	<Collection: 0 items>	0	6,680.00	100
42	J-5	6,464.06	<Collection: 0 items>	0	6,680.00	93
44	J-6	6,473.78	<Collection: 0 items>	0	6,680.00	89
46	J-7	6,512.21	<Collection: 0 items>	0	6,680.00	73
48	J-8	6,465.64	<Collection: 0 items>	0	6,680.00	93
50	J-9	6,472.10	<Collection: 0 items>	0	6,680.00	90
52	J-10	6,476.37	<Collection: 0 items>	0	6,680.00	88
54	J-11	6,477.25	<Collection: 0 items>	0	6,680.00	88
56	J-12	6,464.69	<Collection: 0 items>	0	6,680.00	93
62	J-13	6,465.64	<Collection: 0 items>	0	6,680.00	93
65	J-14	6,452.09	<Collection: 0 items>	0	6,680.00	99
67	J-15	6,450.90	<Collection: 0 items>	0	6,680.00	99
83	J-23	6,473.66	<Collection: 0 items>	0	6,680.00	89
85	J-24	6,470.82	<Collection: 0 items>	0	6,680.00	91
89	J-25	6,468.03	<Collection: 0 items>	0	6,680.00	92
91	J-26	6,467.05	<Collection: 0 items>	0	6,680.00	92
93	J-27	6,456.64	<Collection: 0 items>	0	6,680.00	97
95	J-28	6,439.61	<Collection: 0 items>	0	6,680.00	104
97	J-29	6,431.83	<Collection: 0 items>	0	6,680.00	107
99	J-30	6,431.87	<Collection: 0 items>	0	6,680.00	107
106	J-32	6,455.36	<Collection: 0 items>	0	6,680.00	97
109	J-33	6,455.32	<Collection: 0 items>	0	6,680.00	97
111	J-34	6,468.67	<Collection: 0 items>	0	6,680.00	91
113	J-35	6,468.21	<Collection: 0 items>	0	6,680.00	92
115	J-36	6,463.44	<Collection: 0 items>	0	6,680.00	94
117	J-37	6,463.90	<Collection: 0 items>	0	6,680.00	93
119	J-38	6,463.52	<Collection: 0 items>	0	6,680.00	94
121	J-39	6,442.67	<Collection: 0 items>	0	6,680.00	103
123	J-40	6,445.39	<Collection: 0 items>	0	6,680.00	102
125	J-41	6,462.50	<Collection: 0 items>	0	6,680.00	94
128	J-42	6,460.18	<Collection: 0 items>	0	6,680.00	95
131	J-43	6,467.94	<Collection: 0 items>	0	6,680.00	92
133	J-44	6,467.22	<Collection: 0 items>	0	6,680.00	92
135	J-45	6,454.15	<Collection: 0 items>	0	6,680.00	98
137	J-46	6,454.75	<Collection: 0 items>	0	6,680.00	97
139	J-47	6,459.91	<Collection: 0 items>	0	6,680.00	95
141	J-48	6,467.90	<Collection: 0 items>	0	6,680.00	92
144	J-49	6,472.22	<Collection: 0 items>	0	6,680.00	90
147	J-50	6,473.50	<Collection: 0 items>	0	6,680.00	89
149	J-51	6,483.40	<Collection: 0 items>	0	6,680.00	85
151	J-52	6,494.00	<Collection: 0 items>	0	6,680.00	80
153	J-53	6,506.43	<Collection: 0 items>	0	6,680.00	75
155	J-54	6,507.93	<Collection: 0 items>	0	6,680.00	74
157	J-55	6,502.21	<Collection: 0 items>	0	6,680.00	77
159	J-56	6,512.55	<Collection: 0 items>	0	6,680.00	72
162	J-57	6,511.88	<Collection: 0 items>	0	6,680.00	73
164	J-58	6,493.73	<Collection: 0 items>	0	6,680.00	81
166	J-59	6,492.08	<Collection: 0 items>	0	6,680.00	81
168	J-60	6,481.32	<Collection: 0 items>	0	6,680.00	86
170	J-61	6,468.66	<Collection: 0 items>	0	6,680.00	91
172	J-62	6,456.66	<Collection: 0 items>	0	6,680.00	97

Active Scenario: Static High Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
174	J-63	6,455.47	<Collection: 0 items>	0	6,680.00	97
176	J-64	6,474.16	<Collection: 0 items>	0	6,680.00	89
179	J-65	6,485.80	<Collection: 0 items>	0	6,680.00	84
181	J-66	6,474.66	<Collection: 0 items>	0	6,680.00	89
183	J-67	6,481.45	<Collection: 0 items>	0	6,680.00	86
186	J-68	6,468.83	<Collection: 0 items>	0	6,680.00	91
188	J-69	6,462.78	<Collection: 0 items>	0	6,680.00	94
190	J-70	6,454.44	<Collection: 0 items>	0	6,680.00	98
193	J-71	6,442.15	<Collection: 0 items>	0	6,680.00	103
195	J-72	6,469.96	<Collection: 0 items>	0	6,680.00	91
211	J-74	6,466.83	<Collection: 0 items>	0	6,680.00	92
221	J-77	6,463.22	<Collection: 0 items>	0	6,680.00	94
223	J-78	6,461.06	<Collection: 0 items>	0	6,680.00	95
235	J-79	6,449.21	<Collection: 0 items>	0	6,680.00	100
237	J-80	6,449.46	<Collection: 0 items>	0	6,680.00	100
239	J-81	6,449.11	<Collection: 0 items>	0	6,680.00	100
241	J-82	6,449.41	<Collection: 0 items>	0	6,680.00	100
243	J-83	6,454.85	<Collection: 0 items>	0	6,680.00	97
246	J-84	6,452.11	<Collection: 0 items>	0	6,680.00	99
248	J-85	6,455.97	<Collection: 0 items>	0	6,680.00	97
250	J-86	6,459.08	<Collection: 0 items>	0	6,680.00	96
252	J-87	6,459.57	<Collection: 0 items>	0	6,680.00	95
254	J-88	6,461.65	<Collection: 0 items>	0	6,680.00	94
258	J-89	6,462.70	<Collection: 0 items>	0	6,680.00	94
260	J-90	6,477.68	<Collection: 0 items>	0	6,680.00	88
263	J-91	6,481.24	<Collection: 0 items>	0	6,680.00	86
265	J-92	6,477.12	<Collection: 0 items>	0	6,680.00	88
269	J-94	6,479.70	<Collection: 0 items>	0	6,680.00	87
271	J-95	6,478.01	<Collection: 0 items>	0	6,680.00	87
275	J-96	6,467.73	<Collection: 0 items>	0	6,680.00	92
279	J-97	6,475.24	<Collection: 0 items>	0	6,680.00	89
284	J-98	6,475.51	<Collection: 0 items>	0	6,680.00	88
310	J-105	6,484.00	<Collection: 0 items>	0	6,680.00	85
368	J-124	6,448.00	<Collection: 0 items>	0	6,680.00	100
375	J-127	6,340.00	<Collection: 0 items>	0	6,680.00	147
377	J-128	6,445.00	<Collection: 0 items>	0	6,680.00	102
381	J-129	6,449.21	<Collection: 0 items>	0	6,680.00	100
383	J-130	6,360.00	<Collection: 0 items>	0	6,680.00	138
385	J-131	6,350.00	<Collection: 0 items>	0	6,680.00	143
387	J-132	6,330.00	<Collection: 0 items>	0	6,680.00	151
389	J-133	6,440.00	<Collection: 0 items>	0	6,680.00	104
391	J-134	6,450.00	<Collection: 0 items>	0	6,680.00	100
395	J-135	6,455.00	<Collection: 0 items>	0	6,680.00	97

LONGSTORY
AVE.-12" MAIN

LONGSTORY
AVE.-12" MAIN

Active Scenario: Static Low Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
34	J-1	6,433.68	<Collection: 0 items>	0	6,661.00	98
36	J-2	6,430.45	<Collection: 0 items>	0	6,661.00	100
38	J-3	6,433.58	<Collection: 0 items>	0	6,661.00	98
40	J-4	6,448.18	<Collection: 0 items>	0	6,661.00	92
42	J-5	6,464.06	<Collection: 0 items>	0	6,661.00	85
44	J-6	6,473.78	<Collection: 0 items>	0	6,661.00	81
46	J-7	6,512.21	<Collection: 0 items>	0	6,661.00	64
48	J-8	6,465.64	<Collection: 0 items>	0	6,661.00	85
50	J-9	6,472.10	<Collection: 0 items>	0	6,661.00	82
52	J-10	6,476.37	<Collection: 0 items>	0	6,661.00	80
54	J-11	6,477.25	<Collection: 0 items>	0	6,661.00	80
56	J-12	6,464.69	<Collection: 0 items>	0	6,661.00	85
62	J-13	6,465.64	<Collection: 0 items>	0	6,661.00	85
65	J-14	6,452.09	<Collection: 0 items>	0	6,661.00	90
67	J-15	6,450.90	<Collection: 0 items>	0	6,661.00	91
83	J-23	6,473.66	<Collection: 0 items>	0	6,661.00	81
85	J-24	6,470.82	<Collection: 0 items>	0	6,661.00	82
89	J-25	6,468.03	<Collection: 0 items>	0	6,661.00	83
91	J-26	6,467.05	<Collection: 0 items>	0	6,661.00	84
93	J-27	6,456.64	<Collection: 0 items>	0	6,661.00	88
95	J-28	6,439.61	<Collection: 0 items>	0	6,661.00	96
97	J-29	6,431.83	<Collection: 0 items>	0	6,661.00	99
99	J-30	6,431.87	<Collection: 0 items>	0	6,661.00	99
106	J-32	6,455.36	<Collection: 0 items>	0	6,661.00	89
109	J-33	6,455.32	<Collection: 0 items>	0	6,661.00	89
111	J-34	6,468.67	<Collection: 0 items>	0	6,661.00	83
113	J-35	6,468.21	<Collection: 0 items>	0	6,661.00	83
115	J-36	6,463.44	<Collection: 0 items>	0	6,661.00	85
117	J-37	6,463.90	<Collection: 0 items>	0	6,661.00	85
119	J-38	6,463.52	<Collection: 0 items>	0	6,661.00	85
121	J-39	6,442.67	<Collection: 0 items>	0	6,661.00	94
123	J-40	6,445.39	<Collection: 0 items>	0	6,661.00	93
125	J-41	6,462.50	<Collection: 0 items>	0	6,661.00	86
128	J-42	6,460.18	<Collection: 0 items>	0	6,661.00	87
131	J-43	6,467.94	<Collection: 0 items>	0	6,661.00	84
133	J-44	6,467.22	<Collection: 0 items>	0	6,661.00	84
135	J-45	6,454.15	<Collection: 0 items>	0	6,661.00	89
137	J-46	6,454.75	<Collection: 0 items>	0	6,661.00	89
139	J-47	6,459.91	<Collection: 0 items>	0	6,661.00	87
141	J-48	6,467.90	<Collection: 0 items>	0	6,661.00	84
144	J-49	6,472.22	<Collection: 0 items>	0	6,661.00	82
147	J-50	6,473.50	<Collection: 0 items>	0	6,661.00	81
149	J-51	6,483.40	<Collection: 0 items>	0	6,661.00	77
151	J-52	6,494.00	<Collection: 0 items>	0	6,661.00	72
153	J-53	6,506.43	<Collection: 0 items>	0	6,661.00	67
155	J-54	6,507.93	<Collection: 0 items>	0	6,661.00	66
157	J-55	6,502.21	<Collection: 0 items>	0	6,661.00	69
159	J-56	6,512.55	<Collection: 0 items>	0	6,661.00	64
162	J-57	6,511.88	<Collection: 0 items>	0	6,661.00	65
164	J-58	6,493.73	<Collection: 0 items>	0	6,661.00	72
166	J-59	6,492.08	<Collection: 0 items>	0	6,661.00	73
168	J-60	6,481.32	<Collection: 0 items>	0	6,661.00	78
170	J-61	6,468.66	<Collection: 0 items>	0	6,661.00	83
172	J-62	6,456.66	<Collection: 0 items>	0	6,661.00	88

Active Scenario: Static Low Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
174	J-63	6,455.47	<Collection: 0 items>	0	6,661.00	89
176	J-64	6,474.16	<Collection: 0 items>	0	6,661.00	81
179	J-65	6,485.80	<Collection: 0 items>	0	6,661.00	76
181	J-66	6,474.66	<Collection: 0 items>	0	6,661.00	81
183	J-67	6,481.45	<Collection: 0 items>	0	6,661.00	78
186	J-68	6,468.83	<Collection: 0 items>	0	6,661.00	83
188	J-69	6,462.78	<Collection: 0 items>	0	6,661.00	86
190	J-70	6,454.44	<Collection: 0 items>	0	6,661.00	89
193	J-71	6,442.15	<Collection: 0 items>	0	6,661.00	95
195	J-72	6,469.96	<Collection: 0 items>	0	6,661.00	83
211	J-74	6,466.83	<Collection: 0 items>	0	6,661.00	84
221	J-77	6,463.22	<Collection: 0 items>	0	6,661.00	86
223	J-78	6,461.06	<Collection: 0 items>	0	6,661.00	87
235	J-79	6,449.21	<Collection: 0 items>	0	6,661.00	92
237	J-80	6,449.46	<Collection: 0 items>	0	6,661.00	92
239	J-81	6,449.11	<Collection: 0 items>	0	6,661.00	92
241	J-82	6,449.41	<Collection: 0 items>	0	6,661.00	92
243	J-83	6,454.85	<Collection: 0 items>	0	6,661.00	89
246	J-84	6,452.11	<Collection: 0 items>	0	6,661.00	90
248	J-85	6,455.97	<Collection: 0 items>	0	6,661.00	89
250	J-86	6,459.08	<Collection: 0 items>	0	6,661.00	87
252	J-87	6,459.57	<Collection: 0 items>	0	6,661.00	87
254	J-88	6,461.65	<Collection: 0 items>	0	6,661.00	86
258	J-89	6,462.70	<Collection: 0 items>	0	6,661.00	86
260	J-90	6,477.68	<Collection: 0 items>	0	6,661.00	79
263	J-91	6,481.24	<Collection: 0 items>	0	6,661.00	78
265	J-92	6,477.12	<Collection: 0 items>	0	6,661.00	80
269	J-94	6,479.70	<Collection: 0 items>	0	6,661.00	78
271	J-95	6,478.01	<Collection: 0 items>	0	6,661.00	79
275	J-96	6,467.73	<Collection: 0 items>	0	6,661.00	84
279	J-97	6,475.24	<Collection: 0 items>	0	6,661.00	80
284	J-98	6,475.51	<Collection: 0 items>	0	6,661.00	80
310	J-105	6,484.00	<Collection: 0 items>	0	6,661.00	77
368	J-124	6,448.00	<Collection: 0 items>	0	6,661.00	92
375	J-127	6,340.00	<Collection: 0 items>	0	6,661.00	139
377	J-128	6,445.00	<Collection: 0 items>	0	6,661.00	93
381	J-129	6,449.21	<Collection: 0 items>	0	6,661.00	92
383	J-130	6,360.00	<Collection: 0 items>	0	6,661.00	130
385	J-131	6,350.00	<Collection: 0 items>	0	6,661.00	135
387	J-132	6,330.00	<Collection: 0 items>	0	6,661.00	143
389	J-133	6,440.00	<Collection: 0 items>	0	6,661.00	96
391	J-134	6,450.00	<Collection: 0 items>	0	6,661.00	91
395	J-135	6,455.00	<Collection: 0 items>	0	6,661.00	89

LONGSTORY
AVE.-12" MAIN

LONGSTORY
AVE.-12" MAIN

Active Scenario: Max Day - Low Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
34	J-1	6,433.68	<Collection: 0 items>	0	6,659.96	98
36	J-2	6,430.45	<Collection: 0 items>	0	6,659.96	99
38	J-3	6,433.58	<Collection: 0 items>	0	6,659.96	98
40	J-4	6,448.18	<Collection: 0 items>	6	6,659.95	92
42	J-5	6,464.06	<Collection: 0 items>	0	6,659.95	85
44	J-6	6,473.78	<Collection: 0 items>	0	6,659.95	81
46	J-7	6,512.21	<Collection: 0 items>	8	6,659.95	64
48	J-8	6,465.64	<Collection: 0 items>	0	6,659.95	84
50	J-9	6,472.10	<Collection: 0 items>	0	6,659.91	81
52	J-10	6,476.37	<Collection: 0 items>	0	6,659.88	79
54	J-11	6,477.25	<Collection: 0 items>	0	6,659.87	79
56	J-12	6,464.69	<Collection: 0 items>	0	6,659.84	84
62	J-13	6,465.64	<Collection: 0 items>	0	6,659.84	84
65	J-14	6,452.09	<Collection: 0 items>	0	6,659.83	90
67	J-15	6,450.90	<Collection: 0 items>	0	6,659.83	90
83	J-23	6,473.66	<Collection: 0 items>	0	6,659.90	81
85	J-24	6,470.82	<Collection: 0 items>	0	6,659.90	82
89	J-25	6,468.03	<Collection: 0 items>	0	6,659.89	83
91	J-26	6,467.05	<Collection: 0 items>	17	6,659.89	83
93	J-27	6,456.64	<Collection: 0 items>	0	6,659.91	88
95	J-28	6,439.61	<Collection: 0 items>	0	6,659.93	95
97	J-29	6,431.83	<Collection: 0 items>	0	6,659.93	99
99	J-30	6,431.87	<Collection: 0 items>	0	6,659.95	99
106	J-32	6,455.36	<Collection: 0 items>	0	6,659.96	89
109	J-33	6,455.32	<Collection: 0 items>	0	6,659.97	89
111	J-34	6,468.67	<Collection: 0 items>	8	6,660.04	83
113	J-35	6,468.21	<Collection: 0 items>	0	6,660.06	83
115	J-36	6,463.44	<Collection: 0 items>	10	6,660.29	85
117	J-37	6,463.90	<Collection: 0 items>	13	6,660.37	85
119	J-38	6,463.52	<Collection: 0 items>	0	6,660.37	85
121	J-39	6,442.67	<Collection: 0 items>	0	6,660.34	94
123	J-40	6,445.39	<Collection: 0 items>	0	6,660.32	93
125	J-41	6,462.50	<Collection: 0 items>	0	6,660.29	86
128	J-42	6,460.18	<Collection: 0 items>	0	6,660.00	86
131	J-43	6,467.94	<Collection: 0 items>	0	6,659.84	83
133	J-44	6,467.22	<Collection: 0 items>	17	6,659.84	83
135	J-45	6,454.15	<Collection: 0 items>	0	6,659.84	89
137	J-46	6,454.75	<Collection: 0 items>	0	6,659.84	89
139	J-47	6,459.91	<Collection: 0 items>	8	6,659.84	87
141	J-48	6,467.90	<Collection: 0 items>	10	6,659.84	83
144	J-49	6,472.22	<Collection: 0 items>	11	6,659.86	81
147	J-50	6,473.50	<Collection: 0 items>	17	6,659.90	81
149	J-51	6,483.40	<Collection: 0 items>	12	6,659.90	76
151	J-52	6,494.00	<Collection: 0 items>	10	6,659.91	72
153	J-53	6,506.43	<Collection: 0 items>	0	6,659.93	66
155	J-54	6,507.93	<Collection: 0 items>	8	6,659.93	66
157	J-55	6,502.21	<Collection: 0 items>	16	6,659.92	68

Active Scenario: Max Day - Low Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
159	J-56	6,512.55	<Collection: 0 items>	0	6,659.93	64
162	J-57	6,511.88	<Collection: 0 items>	0	6,659.97	64
164	J-58	6,493.73	<Collection: 0 items>	12	6,660.19	72
166	J-59	6,492.08	<Collection: 0 items>	0	6,660.19	73
168	J-60	6,481.32	<Collection: 0 items>	12	6,660.19	77
170	J-61	6,468.66	<Collection: 0 items>	11	6,660.12	83
172	J-62	6,456.66	<Collection: 0 items>	8	6,660.09	88
174	J-63	6,455.47	<Collection: 0 items>	0	6,660.09	89
176	J-64	6,474.16	<Collection: 0 items>	12	6,659.96	80
179	J-65	6,485.80	<Collection: 0 items>	0	6,660.30	75
181	J-66	6,474.66	<Collection: 0 items>	0	6,660.36	80
183	J-67	6,481.45	<Collection: 0 items>	0	6,660.20	77
186	J-68	6,468.83	<Collection: 0 items>	0	6,660.12	83
188	J-69	6,462.78	<Collection: 0 items>	0	6,660.11	85
190	J-70	6,454.44	<Collection: 0 items>	0	6,660.10	89
193	J-71	6,442.15	<Collection: 0 items>	0	6,659.84	94
195	J-72	6,469.96	<Collection: 0 items>	0	6,660.85	83
211	J-74	6,466.83	<Collection: 0 items>	0	6,660.99	84
221	J-77	6,463.22	<Collection: 0 items>	0	6,660.58	85
223	J-78	6,461.06	<Collection: 0 items>	0	6,660.45	86
235	J-79	6,449.21	<Collection: 0 items>	11	6,659.82	91
237	J-80	6,449.46	<Collection: 0 items>	0	6,659.82	91
239	J-81	6,449.11	<Collection: 0 items>	0	6,659.82	91
241	J-82	6,449.41	<Collection: 0 items>	0	6,659.82	91
243	J-83	6,454.85	<Collection: 0 items>	0	6,659.83	89
246	J-84	6,452.11	<Collection: 0 items>	0	6,659.82	90
248	J-85	6,455.97	<Collection: 0 items>	0	6,659.83	88
250	J-86	6,459.08	<Collection: 0 items>	0	6,659.83	87
252	J-87	6,459.57	<Collection: 0 items>	0	6,659.83	87
254	J-88	6,461.65	<Collection: 0 items>	10	6,659.84	86
258	J-89	6,462.70	<Collection: 0 items>	0	6,659.83	85
260	J-90	6,477.68	<Collection: 0 items>	0	6,659.88	79
263	J-91	6,481.24	<Collection: 0 items>	0	6,659.88	77
265	J-92	6,477.12	<Collection: 0 items>	0	6,659.87	79
269	J-94	6,479.70	<Collection: 0 items>	0	6,659.87	78
271	J-95	6,478.01	<Collection: 0 items>	0	6,659.87	79
275	J-96	6,467.73	<Collection: 0 items>	6	6,659.87	83
279	J-97	6,475.24	<Collection: 0 items>	0	6,659.87	80
284	J-98	6,475.51	<Collection: 0 items>	0	6,660.37	80
310	J-105	6,484.00	<Collection: 0 items>	0	6,660.92	77
368	J-124	6,448.00	<Collection: 0 items>	0	6,660.43	92
375	J-127	6,340.00	<Collection: 0 items>	8	6,660.23	139
377	J-128	6,445.00	<Collection: 0 items>	0	6,660.19	93
381	J-129	6,449.21	<Collection: 0 items>	126	6,659.80	91
383	J-130	6,360.00	<Collection: 0 items>	24	6,659.81	130
385	J-131	6,350.00	<Collection: 0 items>	44	6,659.83	134
387	J-132	6,330.00	<Collection: 0 items>	44	6,659.85	143

LONGSTORY
AVE.-12" MAIN

LONGSTORY
AVE.-12" MAIN

Active Scenario: Max Day - Low Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
389	J-133	6,440.00	<Collection: 0 items>	0	6,659.99	95
391	J-134	6,450.00	<Collection: 0 items>	167	6,660.05	91
395	J-135	6,455.00	<Collection: 0 items>	0	6,660.37	89
410	J-139	6,436.00	<Collection: 0 items>	0	6,659.93	97
412	J-140	6,435.00	<Collection: 0 items>	14	6,659.93	97
414	J-141	6,430.00	<Collection: 0 items>	0	6,659.93	99

LONGSTORY
AVE.-12" MAIN

Active Scenario: Max Day - Low Tank

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
37	P-2	103	J-1	J-2	16.0	Ductile Iron	120.0	124	0.20	0.000
39	P-3	347	J-2	J-3	16.0	Ductile Iron	120.0	124	0.20	0.000
41	P-4	415	J-3	J-4	16.0	Ductile Iron	120.0	80	0.13	0.000
43	P-5	474	J-4	J-5	16.0	Ductile Iron	120.0	73	0.12	0.000
45	P-6	398	J-5	J-6	16.0	Ductile Iron	120.0	-71	0.11	0.000
47	P-7	1,008	J-6	J-7	16.0	Ductile Iron	120.0	-13	0.02	0.000
58	P-13	52	J-5	J-8	12.0	PVC	120.0	144	0.41	0.000
59	P-14	490	J-8	J-9	12.0	PVC	120.0	144	0.41	0.000
261	P-16(1)	64	J-10	J-90	12.0	PVC	120.0	110	0.31	0.000
272	P-16(2)(1)	249	J-90	J-95	12.0	PVC	120.0	91	0.26	0.000
273	P-16(2)(2)	35	J-95	J-11	12.0	PVC	120.0	104	0.29	0.000
63	P-17	530	J-11	J-13	12.0	PVC	120.0	104	0.29	0.000
64	P-18	46	J-13	J-12	12.0	PVC	120.0	101	0.29	0.000
255	P-19(1)	143	J-12	J-88	12.0	PVC	120.0	101	0.29	0.000
256	P-19(2)	441	J-88	J-14	12.0	PVC	120.0	71	0.20	0.000
68	P-20	54	J-14	J-15	12.0	PVC	120.0	71	0.20	0.000
86	P-29	75	J-9	J-24	12.0	PVC	120.0	144	0.41	0.000
87	P-30	394	J-24	J-10	12.0	PVC	120.0	110	0.31	0.000
88	P-31	295	J-23	J-24	8.0	PVC	120.0	-5	0.03	0.000
90	P-32	250	J-24	J-25	8.0	PVC	120.0	29	0.19	0.000
92	P-33	47	J-25	J-26	8.0	PVC	120.0	-13	0.08	0.000
94	P-34	504	J-26	J-27	8.0	PVC	120.0	-30	0.19	0.000
96	P-35	556	J-27	J-28	8.0	PVC	120.0	-30	0.19	0.000
98	P-36	146	J-28	J-29	8.0	PVC	120.0	-28	0.18	0.000
100	P-37	317	J-29	J-30	8.0	PVC	120.0	-44	0.28	0.000
101	P-38	51	J-30	J-3	8.0	PVC	120.0	-44	0.28	0.000
108	P-42	336	J-32	J-1	16.0	Ductile Iron	120.0	65	0.10	0.000
110	P-43	45	J-32	J-33	8.0	PVC	120.0	-65	0.41	0.000
112	P-44	554	J-33	J-34	8.0	PVC	120.0	-65	0.41	0.000
114	P-45	34	J-34	J-35	8.0	PVC	120.0	-131	0.84	0.001
116	P-46	464	J-35	J-36	8.0	PVC	120.0	-131	0.84	0.000
118	P-47	281	J-36	J-37	8.0	PVC	120.0	-100	0.64	0.000
120	P-48	33	J-37	J-38	8.0	PVC	120.0	41	0.26	0.000
122	P-49	537	J-38	J-39	8.0	PVC	120.0	41	0.26	0.000
124	P-50	368	J-39	J-40	8.0	PVC	120.0	41	0.26	0.000
126	P-51	450	J-40	J-41	8.0	PVC	120.0	41	0.26	0.000
127	P-52	58	J-41	J-36	8.0	PVC	120.0	41	0.26	0.000
129	P-53	410	J-34	J-42	8.0	PVC	120.0	59	0.38	0.000
130	P-54	309	J-42	J-1	8.0	PVC	120.0	59	0.38	0.000
132	P-55	261	J-13	J-43	8.0	PVC	120.0	3	0.02	0.000

Active Scenario: Max Day - Low Tank

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
134	P-56	34	J-43	J-44	8.0	PVC	120.0	22	0.14	0.000
136	P-57	632	J-44	J-45	8.0	PVC	120.0	5	0.03	0.000
138	P-58	858	J-45	J-46	8.0	PVC	120.0	5	0.03	0.000
140	P-59	183	J-46	J-47	8.0	PVC	120.0	5	0.03	0.000
142	P-60	422	J-47	J-48	8.0	PVC	120.0	-3	0.02	0.000
143	P-61	359	J-48	J-43	8.0	PVC	120.0	-12	0.08	0.000
145	P-62	464	J-43	J-49	8.0	PVC	120.0	-31	0.20	0.000
146	P-63	541	J-49	J-25	8.0	PVC	120.0	-42	0.27	0.000
148	P-64	167	J-23	J-50	8.0	PVC	120.0	17	0.11	0.000
150	P-65	459	J-23	J-51	8.0	PVC	120.0	-11	0.07	0.000
152	P-66	460	J-51	J-52	8.0	PVC	120.0	-23	0.15	0.000
154	P-67	345	J-52	J-53	8.0	PVC	120.0	-33	0.21	0.000
156	P-68	37	J-53	J-54	8.0	PVC	120.0	-33	0.21	0.000
158	P-69	190	J-54	J-55	8.0	PVC	120.0	16	0.10	0.000
160	P-70	184	J-54	J-56	8.0	PVC	120.0	0	0.00	0.000
161	P-71	260	J-54	J-7	8.0	PVC	120.0	-57	0.36	0.000
163	P-72	71	J-7	J-57	8.0	PVC	120.0	-78	0.50	0.000
165	P-73	1,200	J-57	J-58	8.0	PVC	120.0	-78	0.50	0.000
167	P-74	40	J-58	J-59	8.0	PVC	120.0	-4	0.03	0.000
169	P-75	260	J-59	J-60	8.0	PVC	120.0	-4	0.03	0.000
171	P-76	306	J-60	J-61	8.0	PVC	120.0	88	0.56	0.000
173	P-77	294	J-61	J-62	8.0	PVC	120.0	53	0.34	0.000
175	P-78	29	J-62	J-63	8.0	PVC	120.0	70	0.44	0.000
177	P-79	829	J-63	J-64	8.0	PVC	120.0	70	0.44	0.000
178	P-80	71	J-64	J-6	8.0	PVC	120.0	58	0.37	0.000
180	P-81	476	J-58	J-65	8.0	PVC	120.0	-86	0.55	0.000
184	P-83	493	J-66	J-67	8.0	PVC	120.0	105	0.67	0.000
185	P-84	34	J-67	J-60	8.0	PVC	120.0	105	0.67	0.000
187	P-85	34	J-61	J-68	8.0	PVC	120.0	25	0.16	0.000
189	P-86	437	J-68	J-69	8.0	PVC	120.0	25	0.16	0.000
191	P-87	381	J-69	J-70	8.0	PVC	120.0	25	0.16	0.000
192	P-88	354	J-70	J-62	8.0	PVC	120.0	25	0.16	0.000
194	P-89	320	J-46	J-71	8.0	PVC	120.0	0	0.00	0.000
210	P-94	374	J-32	J-72	16.0	Ductile Iron	120.0	0	0.00	0.000
212	P-95	765	J-72	J-74	16.0	Ductile Iron	120.0	-487	0.78	0.000
216	P-97	44	J-74	LOW TANK	16.0	Ductile Iron	120.0	-487	0.78	0.000
218	P-98	40	J-74	FULL TANK	16.0	Ductile Iron	120.0	0	0.00	0.000
222	P-100	1,399	J-72	J-77	16.0	Ductile Iron	120.0	487	0.78	0.000
224	P-101	115	J-77	J-78	8.0	PVC	120.0	203	1.29	0.001
225	P-102	116	J-78	J-37	8.0	PVC	120.0	154	0.99	0.001
236	P-103	247	J-15	J-79	12.0	PVC	120.0	75	0.21	0.000
238	P-104	247	J-79	J-80	8.0	PVC	120.0	-16	0.10	0.000

Active Scenario: Max Day - Low Tank

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
240	P-105	39	J-80	J-81	8.0	PVC	120.0	-16	0.10	0.000
242	P-106	63	J-81	J-82	8.0	PVC	120.0	-16	0.10	0.000
244	P-107	242	J-82	J-83	8.0	PVC	120.0	-16	0.10	0.000
245	P-108	259	J-83	J-15	8.0	PVC	120.0	4	0.02	0.000
247	P-109	880	J-82	J-84	8.0	PVC	120.0	0	0.00	0.000
249	P-110	46	J-83	J-85	8.0	PVC	120.0	-20	0.13	0.000
251	P-111	190	J-85	J-86	8.0	PVC	120.0	-20	0.13	0.000
253	P-112	48	J-86	J-87	8.0	PVC	120.0	-20	0.13	0.000
257	P-113	424	J-87	J-88	8.0	PVC	120.0	-20	0.13	0.000
259	P-114	305	J-86	J-89	8.0	PVC	120.0	0	0.00	0.000
264	P-115	117	J-90	J-91	8.0	PVC	120.0	19	0.12	0.000
266	P-116	395	J-91	J-92	8.0	PVC	120.0	19	0.12	0.000
274	P-119	275	J-95	J-92	8.0	PVC	120.0	-13	0.08	0.000
280	P-120(1)	52	J-92	J-97	8.0	PVC	120.0	6	0.04	0.000
281	P-120(2)	327	J-97	J-96	8.0	PVC	120.0	6	0.04	0.000
282	P-121	271	J-92	J-94	8.0	PVC	120.0	0	0.00	0.000
285	P-122(1)	324	J-65	J-98	8.0	PVC	120.0	-86	0.55	0.000
286	P-122(2)	27	J-98	J-66	8.0	PVC	120.0	105	0.67	0.000
311	P-123(1)	552	J-98	J-105	8.0	PVC	120.0	-191	1.22	0.001
312	P-123(2)	60	J-105	FULL TANK -West	8.0	PVC	120.0	0	0.00	0.000
314	P-129	85	J-105	LOW TANK -West	8.0	PVC	120.0	-191	1.22	0.001
370	P-150	2,165	J-77	J-124	16.0	Ductile Iron	120.0	284	0.45	0.000
396	P-153(1)	1,033	J-78	J-135	8.0	PVC	120.0	49	0.31	0.000
397	P-153(2)	1,839	J-135	J-127	8.0	PVC	120.0	49	0.31	0.000
380	P-154	591	J-127	J-128	8.0	PVC	120.0	41	0.26	0.000
382	P-155	863	J-79	J-129	12.0	PVC	120.0	80	0.23	0.000
384	P-156	1,289	J-129	J-130	12.0	PVC	120.0	-46	0.13	0.000
386	P-157	823	J-130	J-131	12.0	PVC	120.0	-70	0.20	0.000
388	P-158	387	J-131	J-132	12.0	PVC	120.0	-114	0.32	0.000
390	P-159	1,522	J-132	J-133	12.0	PVC	120.0	-158	0.45	0.000
392	P-160	612	J-133	J-134	12.0	PVC	120.0	-158	0.45	0.000
393	P-161	385	J-134	J-128	12.0	PVC	120.0	-325	0.92	0.000
394	P-162	813	J-128	J-124	12.0	PVC	120.0	-284	0.81	0.000
411	P-165	320	J-29	J-139	8.0	PVC	120.0	16	0.10	0.000
413	P-166	100	J-139	J-140	8.0	PVC	120.0	16	0.10	0.000
415	P-167	222	J-140	J-141	8.0	PVC	120.0	0	0.00	0.000
421	P-170	589	J-28	J-140	8.0	PVC	120.0	-2	0.01	0.000

Active Scenario: Peak Hour-Low Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
34	J-1	6,433.68	<Collection: 0 items>	0	6,659.74	98
36	J-2	6,430.45	<Collection: 0 items>	0	6,659.71	99
38	J-3	6,433.58	<Collection: 0 items>	0	6,659.59	98
40	J-4	6,448.18	<Collection: 0 items>	6	6,659.51	91
42	J-5	6,464.06	<Collection: 0 items>	0	6,659.42	85
44	J-6	6,473.78	<Collection: 0 items>	0	6,659.42	80
46	J-7	6,512.21	<Collection: 0 items>	15	6,659.42	64
48	J-8	6,465.64	<Collection: 0 items>	0	6,659.39	84
50	J-9	6,472.10	<Collection: 0 items>	0	6,659.06	81
52	J-10	6,476.37	<Collection: 0 items>	0	6,658.82	79
54	J-11	6,477.25	<Collection: 0 items>	0	6,658.68	79
56	J-12	6,464.69	<Collection: 0 items>	0	6,658.41	84
62	J-13	6,465.64	<Collection: 0 items>	0	6,658.44	83
65	J-14	6,452.09	<Collection: 0 items>	0	6,658.19	89
67	J-15	6,450.90	<Collection: 0 items>	0	6,658.17	90
83	J-23	6,473.66	<Collection: 0 items>	0	6,659.02	80
85	J-24	6,470.82	<Collection: 0 items>	0	6,659.01	81
89	J-25	6,468.03	<Collection: 0 items>	0	6,658.96	83
91	J-26	6,467.05	<Collection: 0 items>	38	6,658.97	83
93	J-27	6,456.64	<Collection: 0 items>	0	6,659.12	88
95	J-28	6,439.61	<Collection: 0 items>	0	6,659.29	95
97	J-29	6,431.83	<Collection: 0 items>	31	6,659.33	98
99	J-30	6,431.87	<Collection: 0 items>	0	6,659.56	99
106	J-32	6,455.36	<Collection: 0 items>	0	6,659.86	88
109	J-33	6,455.32	<Collection: 0 items>	0	6,659.85	88
111	J-34	6,468.67	<Collection: 0 items>	17	6,659.74	83
113	J-35	6,468.21	<Collection: 0 items>	0	6,659.73	83
115	J-36	6,463.44	<Collection: 0 items>	21	6,659.64	85
117	J-37	6,463.90	<Collection: 0 items>	29	6,659.62	85
119	J-38	6,463.52	<Collection: 0 items>	0	6,659.62	85
121	J-39	6,442.67	<Collection: 0 items>	0	6,659.63	94
123	J-40	6,445.39	<Collection: 0 items>	0	6,659.63	93
125	J-41	6,462.50	<Collection: 0 items>	0	6,659.64	85
128	J-42	6,460.18	<Collection: 0 items>	0	6,659.74	86
131	J-43	6,467.94	<Collection: 0 items>	0	6,658.46	82
133	J-44	6,467.22	<Collection: 0 items>	37	6,658.46	83
135	J-45	6,454.15	<Collection: 0 items>	0	6,658.45	88
137	J-46	6,454.75	<Collection: 0 items>	0	6,658.45	88
139	J-47	6,459.91	<Collection: 0 items>	17	6,658.45	86
141	J-48	6,467.90	<Collection: 0 items>	21	6,658.45	82
144	J-49	6,472.22	<Collection: 0 items>	24	6,658.65	81
147	J-50	6,473.50	<Collection: 0 items>	37	6,659.01	80
149	J-51	6,483.40	<Collection: 0 items>	26	6,659.06	76
151	J-52	6,494.00	<Collection: 0 items>	21	6,659.14	71
153	J-53	6,506.43	<Collection: 0 items>	0	6,659.24	66
155	J-54	6,507.93	<Collection: 0 items>	17	6,659.25	65
157	J-55	6,502.21	<Collection: 0 items>	35	6,659.24	68

Active Scenario: Peak Hour-Low Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
159	J-56	6,512.55	<Collection: 0 items>	0	6,659.25	63
162	J-57	6,511.88	<Collection: 0 items>	0	6,659.43	64
164	J-58	6,493.73	<Collection: 0 items>	28	6,659.69	72
166	J-59	6,492.08	<Collection: 0 items>	0	6,659.69	73
168	J-60	6,481.32	<Collection: 0 items>	28	6,659.69	77
170	J-61	6,468.66	<Collection: 0 items>	24	6,659.58	83
172	J-62	6,456.66	<Collection: 0 items>	17	6,659.55	88
174	J-63	6,455.47	<Collection: 0 items>	0	6,659.55	88
176	J-64	6,474.16	<Collection: 0 items>	23	6,659.43	80
179	J-65	6,485.80	<Collection: 0 items>	0	6,659.86	75
181	J-66	6,474.66	<Collection: 0 items>	0	6,659.97	80
183	J-67	6,481.45	<Collection: 0 items>	0	6,659.71	77
186	J-68	6,468.83	<Collection: 0 items>	0	6,659.58	83
188	J-69	6,462.78	<Collection: 0 items>	0	6,659.57	85
190	J-70	6,454.44	<Collection: 0 items>	0	6,659.56	89
193	J-71	6,442.15	<Collection: 0 items>	0	6,658.45	94
195	J-72	6,469.96	<Collection: 0 items>	0	6,660.02	82
211	J-74	6,466.83	<Collection: 0 items>	0	6,660.95	84
221	J-77	6,463.22	<Collection: 0 items>	0	6,659.66	85
223	J-78	6,461.06	<Collection: 0 items>	0	6,659.62	86
235	J-79	6,449.21	<Collection: 0 items>	24	6,658.08	90
237	J-80	6,449.46	<Collection: 0 items>	0	6,658.12	90
239	J-81	6,449.11	<Collection: 0 items>	0	6,658.13	90
241	J-82	6,449.41	<Collection: 0 items>	0	6,658.14	90
243	J-83	6,454.85	<Collection: 0 items>	0	6,658.17	88
246	J-84	6,452.11	<Collection: 0 items>	0	6,658.14	89
248	J-85	6,455.97	<Collection: 0 items>	0	6,658.18	87
250	J-86	6,459.08	<Collection: 0 items>	0	6,658.23	86
252	J-87	6,459.57	<Collection: 0 items>	0	6,658.24	86
254	J-88	6,461.65	<Collection: 0 items>	21	6,658.33	85
258	J-89	6,462.70	<Collection: 0 items>	0	6,658.23	85
260	J-90	6,477.68	<Collection: 0 items>	0	6,658.79	78
263	J-91	6,481.24	<Collection: 0 items>	0	6,658.77	77
265	J-92	6,477.12	<Collection: 0 items>	0	6,658.72	79
269	J-94	6,479.70	<Collection: 0 items>	0	6,658.72	77
271	J-95	6,478.01	<Collection: 0 items>	0	6,658.70	78
275	J-96	6,467.73	<Collection: 0 items>	14	6,658.72	83
279	J-97	6,475.24	<Collection: 0 items>	0	6,658.72	79
284	J-98	6,475.51	<Collection: 0 items>	0	6,659.98	80
310	J-105	6,484.00	<Collection: 0 items>	0	6,660.86	77
368	J-124	6,448.00	<Collection: 0 items>	0	6,659.27	91
375	J-127	6,340.00	<Collection: 0 items>	15	6,658.76	138
377	J-128	6,445.00	<Collection: 0 items>	0	6,658.69	92
381	J-129	6,449.21	<Collection: 0 items>	277	6,657.69	90
383	J-130	6,360.00	<Collection: 0 items>	54	6,657.65	129
385	J-131	6,350.00	<Collection: 0 items>	98	6,657.64	133
387	J-132	6,330.00	<Collection: 0 items>	96	6,657.65	142

LONGSTORY
AVE.-12" MAIN

LONGSTORY
AVE.-12" MAIN

Active Scenario: Peak Hour-Low Tank

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
389	J-133	6,440.00	<Collection: 0 items>	367	6,657.80	94
391	J-134	6,450.00	<Collection: 0 items>	0	6,658.35	90
395	J-135	6,455.00	<Collection: 0 items>	61	6,659.08	88
410	J-139	6,436.00	<Collection: 0 items>	0	6,659.30	97
412	J-140	6,435.00	<Collection: 0 items>	31	6,659.30	97
414	J-141	6,430.00	<Collection: 0 items>	0	6,659.30	99

LONGSTORY
AVE.-12" MAIN

Active Scenario: Peak Hour-Low Tank

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
37	P-2	103	J-1	J-2	16.0	Ductile Iron	120.0	653	1.04	0.000
39	P-3	347	J-2	J-3	16.0	Ductile Iron	120.0	653	1.04	0.000
41	P-4	415	J-3	J-4	16.0	Ductile Iron	120.0	491	0.78	0.000
43	P-5	474	J-4	J-5	16.0	Ductile Iron	120.0	485	0.77	0.000
45	P-6	398	J-5	J-6	16.0	Ductile Iron	120.0	37	0.06	0.000
47	P-7	1,008	J-6	J-7	16.0	Ductile Iron	120.0	82	0.13	0.000
58	P-13	52	J-5	J-8	12.0	PVC	120.0	448	1.27	0.001
59	P-14	490	J-8	J-9	12.0	PVC	120.0	448	1.27	0.001
261	P-16(1)	64	J-10	J-90	12.0	PVC	120.0	381	1.08	0.000
272	P-16(2)(1)	249	J-90	J-95	12.0	PVC	120.0	318	0.90	0.000
273	P-16(2)(2)	35	J-95	J-11	12.0	PVC	120.0	367	1.04	0.000
63	P-17	530	J-11	J-13	12.0	PVC	120.0	367	1.04	0.000
64	P-18	46	J-13	J-12	12.0	PVC	120.0	412	1.17	0.001
255	P-19(1)	143	J-12	J-88	12.0	PVC	120.0	412	1.17	0.001
256	P-19(2)	441	J-88	J-14	12.0	PVC	120.0	305	0.86	0.000
68	P-20	54	J-14	J-15	12.0	PVC	120.0	305	0.86	0.000
86	P-29	75	J-9	J-24	12.0	PVC	120.0	448	1.27	0.001
87	P-30	394	J-24	J-10	12.0	PVC	120.0	381	1.08	0.000
88	P-31	295	J-23	J-24	8.0	PVC	120.0	14	0.09	0.000
90	P-32	250	J-24	J-25	8.0	PVC	120.0	81	0.52	0.000
92	P-33	47	J-25	J-26	8.0	PVC	120.0	-63	0.40	0.000
94	P-34	504	J-26	J-27	8.0	PVC	120.0	-101	0.65	0.000
96	P-35	556	J-27	J-28	8.0	PVC	120.0	-101	0.65	0.000
98	P-36	146	J-28	J-29	8.0	PVC	120.0	-87	0.55	0.000
100	P-37	317	J-29	J-30	8.0	PVC	120.0	-162	1.04	0.001
101	P-38	51	J-30	J-3	8.0	PVC	120.0	-162	1.04	0.001
108	P-42	336	J-32	J-1	16.0	Ductile Iron	120.0	668	1.07	0.000
110	P-43	45	J-32	J-33	8.0	PVC	120.0	81	0.52	0.000
112	P-44	554	J-33	J-34	8.0	PVC	120.0	81	0.52	0.000
114	P-45	34	J-34	J-35	8.0	PVC	120.0	80	0.51	0.000
116	P-46	464	J-35	J-36	8.0	PVC	120.0	80	0.51	0.000
118	P-47	281	J-36	J-37	8.0	PVC	120.0	41	0.26	0.000
120	P-48	33	J-37	J-38	8.0	PVC	120.0	-17	0.11	0.000
122	P-49	537	J-38	J-39	8.0	PVC	120.0	-17	0.11	0.000
124	P-50	368	J-39	J-40	8.0	PVC	120.0	-17	0.11	0.000
126	P-51	450	J-40	J-41	8.0	PVC	120.0	-17	0.11	0.000
127	P-52	58	J-41	J-36	8.0	PVC	120.0	-17	0.11	0.000
129	P-53	410	J-34	J-42	8.0	PVC	120.0	-15	0.10	0.000
130	P-54	309	J-42	J-1	8.0	PVC	120.0	-15	0.10	0.000
132	P-55	261	J-13	J-43	8.0	PVC	120.0	-44	0.28	0.000

Active Scenario: Peak Hour-Low Tank

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
134	P-56	34	J-43	J-44	8.0	PVC	120.0	47	0.30	0.000
136	P-57	632	J-44	J-45	8.0	PVC	120.0	11	0.07	0.000
138	P-58	858	J-45	J-46	8.0	PVC	120.0	11	0.07	0.000
140	P-59	183	J-46	J-47	8.0	PVC	120.0	11	0.07	0.000
142	P-60	422	J-47	J-48	8.0	PVC	120.0	-6	0.04	0.000
143	P-61	359	J-48	J-43	8.0	PVC	120.0	-28	0.18	0.000
145	P-62	464	J-43	J-49	8.0	PVC	120.0	-119	0.76	0.000
146	P-63	541	J-49	J-25	8.0	PVC	120.0	-144	0.92	0.001
148	P-64	167	J-23	J-50	8.0	PVC	120.0	37	0.23	0.000
150	P-65	459	J-23	J-51	8.0	PVC	120.0	-51	0.33	0.000
152	P-66	460	J-51	J-52	8.0	PVC	120.0	-77	0.49	0.000
154	P-67	345	J-52	J-53	8.0	PVC	120.0	-98	0.63	0.000
156	P-68	37	J-53	J-54	8.0	PVC	120.0	-98	0.63	0.000
158	P-69	190	J-54	J-55	8.0	PVC	120.0	35	0.22	0.000
160	P-70	184	J-54	J-56	8.0	PVC	120.0	0	0.00	0.000
161	P-71	260	J-54	J-7	8.0	PVC	120.0	-151	0.96	0.001
163	P-72	71	J-7	J-57	8.0	PVC	120.0	-84	0.54	0.000
165	P-73	1,200	J-57	J-58	8.0	PVC	120.0	-84	0.54	0.000
167	P-74	40	J-58	J-59	8.0	PVC	120.0	0	0.00	0.000
169	P-75	260	J-59	J-60	8.0	PVC	120.0	0	0.00	0.000
171	P-76	306	J-60	J-61	8.0	PVC	120.0	109	0.69	0.000
173	P-77	294	J-61	J-62	8.0	PVC	120.0	58	0.37	0.000
175	P-78	29	J-62	J-63	8.0	PVC	120.0	68	0.43	0.000
177	P-79	829	J-63	J-64	8.0	PVC	120.0	68	0.43	0.000
178	P-80	71	J-64	J-6	8.0	PVC	120.0	45	0.29	0.000
180	P-81	476	J-58	J-65	8.0	PVC	120.0	-112	0.71	0.000
184	P-83	493	J-66	J-67	8.0	PVC	120.0	136	0.87	0.001
185	P-84	34	J-67	J-60	8.0	PVC	120.0	136	0.87	0.001
187	P-85	34	J-61	J-68	8.0	PVC	120.0	27	0.17	0.000
189	P-86	437	J-68	J-69	8.0	PVC	120.0	27	0.17	0.000
191	P-87	381	J-69	J-70	8.0	PVC	120.0	27	0.17	0.000
192	P-88	354	J-70	J-62	8.0	PVC	120.0	27	0.17	0.000
194	P-89	320	J-46	J-71	8.0	PVC	120.0	0	0.00	0.000
210	P-94	374	J-32	J-72	16.0	Ductile Iron	120.0	-750	1.20	0.000
212	P-95	765	J-72	J-74	16.0	Ductile Iron	120.0	-1,323	2.11	0.001
216	P-97	44	J-74	LOW TANK	16.0	Ductile Iron	120.0	-1,323	2.11	0.001
218	P-98	40	J-74	FULL TANK	16.0	Ductile Iron	120.0	0	0.00	0.000
222	P-100	1,399	J-72	J-77	16.0	Ductile Iron	120.0	573	0.91	0.000
224	P-101	115	J-77	J-78	8.0	PVC	120.0	106	0.68	0.000
225	P-102	116	J-78	J-37	8.0	PVC	120.0	-30	0.19	0.000
236	P-103	247	J-15	J-79	12.0	PVC	120.0	320	0.91	0.000
238	P-104	247	J-79	J-80	8.0	PVC	120.0	-70	0.45	0.000

Active Scenario: Peak Hour-Low Tank

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
240	P-105	39	J-80	J-81	8.0	PVC	120.0	-70	0.45	0.000
242	P-106	63	J-81	J-82	8.0	PVC	120.0	-70	0.45	0.000
244	P-107	242	J-82	J-83	8.0	PVC	120.0	-70	0.45	0.000
245	P-108	259	J-83	J-15	8.0	PVC	120.0	16	0.10	0.000
247	P-109	880	J-82	J-84	8.0	PVC	120.0	0	0.00	0.000
249	P-110	46	J-83	J-85	8.0	PVC	120.0	-86	0.55	0.000
251	P-111	190	J-85	J-86	8.0	PVC	120.0	-86	0.55	0.000
253	P-112	48	J-86	J-87	8.0	PVC	120.0	-86	0.55	0.000
257	P-113	424	J-87	J-88	8.0	PVC	120.0	-86	0.55	0.000
259	P-114	305	J-86	J-89	8.0	PVC	120.0	0	0.00	0.000
264	P-115	117	J-90	J-91	8.0	PVC	120.0	63	0.40	0.000
266	P-116	395	J-91	J-92	8.0	PVC	120.0	63	0.40	0.000
274	P-119	275	J-95	J-92	8.0	PVC	120.0	-49	0.32	0.000
280	P-120(1)	52	J-92	J-97	8.0	PVC	120.0	14	0.09	0.000
281	P-120(2)	327	J-97	J-96	8.0	PVC	120.0	14	0.09	0.000
282	P-121	271	J-92	J-94	8.0	PVC	120.0	0	0.00	0.000
285	P-122(1)	324	J-65	J-98	8.0	PVC	120.0	-112	0.71	0.000
286	P-122(2)	27	J-98	J-66	8.0	PVC	120.0	136	0.87	0.001
311	P-123(1)	552	J-98	J-105	8.0	PVC	120.0	-248	1.58	0.002
312	P-123(2)	60	J-105	FULL TANK -West	8.0	PVC	120.0	0	0.00	0.000
314	P-129	85	J-105	LOW TANK -West	8.0	PVC	120.0	-248	1.58	0.002
370	P-150	2,165	J-77	J-124	16.0	Ductile Iron	120.0	467	0.74	0.000
396	P-153(1)	1,033	J-78	J-135	8.0	PVC	120.0	136	0.87	0.001
397	P-153(2)	1,839	J-135	J-127	8.0	PVC	120.0	75	0.48	0.000
380	P-154	591	J-127	J-128	8.0	PVC	120.0	60	0.38	0.000
382	P-155	863	J-79	J-129	12.0	PVC	120.0	366	1.04	0.000
384	P-156	1,289	J-129	J-130	12.0	PVC	120.0	89	0.25	0.000
386	P-157	823	J-130	J-131	12.0	PVC	120.0	35	0.10	0.000
388	P-158	387	J-131	J-132	12.0	PVC	120.0	-63	0.18	0.000
390	P-159	1,522	J-132	J-133	12.0	PVC	120.0	-159	0.45	0.000
392	P-160	612	J-133	J-134	12.0	PVC	120.0	-526	1.49	0.001
393	P-161	385	J-134	J-128	12.0	PVC	120.0	-526	1.49	0.001
394	P-162	813	J-128	J-124	12.0	PVC	120.0	-467	1.32	0.001
411	P-165	320	J-29	J-139	8.0	PVC	120.0	45	0.29	0.000
413	P-166	100	J-139	J-140	8.0	PVC	120.0	45	0.29	0.000
415	P-167	222	J-140	J-141	8.0	PVC	120.0	0	0.00	0.000
421	P-170	589	J-28	J-140	8.0	PVC	120.0	-14	0.09	0.000

Active Scenario: Max Day + Fire Flow

Fire Flow Node FlexTable: Fire Flow Report

Label	Fire Flow Iterations	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Pressure (Zone Lower Limit) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)	Is Fire Flow Run Balanced?	Velocity of Maximum Pipe (ft/s)
J-1	2	True	1,500	2,000	1,500	2,000	20	90	0	56	J-56	56	J-56	True	5.90
J-2	2	True	1,500	2,000	1,500	2,000	20	91	0	56	J-56	56	J-56	True	5.89
J-3	2	True	1,500	2,000	1,500	2,000	20	90	0	56	J-56	56	J-56	True	5.85
J-4	2	True	1,500	2,000	1,506	2,006	20	83	0	56	J-56	56	J-56	True	5.80
J-5	2	True	1,500	2,000	1,500	2,000	20	77	0	56	J-56	56	J-56	True	5.75
J-6	2	True	1,500	2,000	1,500	2,000	20	72	0	56	J-56	56	J-56	True	5.72
J-7	2	True	2,750	3,500	2,758	3,508	20	42	0	42	J-56	42	J-56	True	9.24
J-8	2	True	1,500	2,000	1,500	2,000	20	76	0	56	J-56	56	J-56	True	5.75
J-9	2	True	1,500	2,000	1,500	2,000	20	73	0	56	J-56	56	J-56	True	5.69
J-10	2	True	1,500	2,000	1,500	2,000	20	70	0	56	J-56	56	J-56	True	5.63
J-11	2	True	1,500	2,000	1,500	2,000	20	70	0	56	J-56	56	J-56	True	5.59
J-12	2	True	1,500	2,000	1,500	2,000	20	75	0	57	J-56	57	J-56	True	5.51
J-13	2	True	1,500	2,000	1,500	2,000	20	75	0	57	J-56	57	J-56	True	5.52
J-14	2	True	1,500	2,000	1,500	2,000	20	80	0	57	J-56	57	J-56	True	5.42
J-15	2	True	1,500	2,000	1,500	2,000	20	80	0	57	J-56	57	J-56	True	5.41
J-23	2	True	1,500	2,000	1,500	2,000	20	67	0	55	J-56	55	J-56	True	9.03
J-24	2	True	1,500	2,000	1,500	2,000	20	73	0	56	J-56	56	J-56	True	5.68
J-25	2	True	1,500	2,000	1,500	2,000	20	72	0	56	J-56	56	J-56	True	7.08
J-26	2	True	1,500	2,000	1,517	2,017	20	72	0	56	J-56	56	J-56	True	9.60
J-27	2	True	1,500	2,000	1,500	2,000	20	72	0	56	J-56	56	J-56	True	7.12
J-28	2	True	1,500	2,000	1,500	2,000	20	81	0	56	J-56	56	J-56	True	8.14
J-29	2	True	1,500	2,000	1,500	2,000	20	85	0	56	J-56	56	J-56	True	8.55
J-30	2	True	1,500	2,000	1,500	2,000	20	89	0	56	J-56	56	J-56	True	10.94
J-32	2	True	1,500	2,000	1,500	2,000	20	80	0	56	J-56	56	J-56	True	5.93
J-33	2	True	1,500	2,000	1,500	2,000	20	79	0	56	J-56	56	J-56	True	9.29
J-34	2	True	1,500	2,000	1,508	2,008	20	74	0	57	J-56	57	J-56	True	6.50
J-35	2	True	1,500	2,000	1,500	2,000	20	74	0	57	J-56	57	J-56	True	6.60
J-36	2	True	1,500	2,000	1,510	2,010	20	77	0	59	J-56	59	J-56	True	8.63
J-37	2	True	1,500	2,000	1,513	2,013	20	79	0	60	J-56	60	J-56	True	9.62
J-38	2	True	1,500	2,000	1,500	2,000	20	78	0	60	J-56	60	J-56	True	11.11
J-39	2	True	1,500	2,000	1,500	2,000	20	81	0	60	J-56	60	J-56	True	9.35
J-40	2	True	1,500	2,000	1,500	2,000	20	80	0	60	J-56	60	J-56	True	9.15
J-41	2	True	1,500	2,000	1,500	2,000	20	77	0	59	J-56	59	J-56	True	9.74
J-42	2	True	1,500	2,000	1,500	2,000	20	75	0	56	J-56	56	J-56	True	6.89
J-43	2	True	1,500	2,000	1,500	2,000	20	70	0	56	J-56	56	J-56	True	8.66
J-44	2	True	1,500	2,000	1,517	2,017	20	69	0	56	J-56	56	J-56	True	11.73
J-45	2	True	1,500	2,000	1,500	2,000	20	66	0	56	J-56	56	J-56	True	8.66
J-46	2	True	1,500	2,000	1,500	2,000	20	65	0	56	J-56	56	J-56	True	8.66
J-47	2	True	1,500	2,000	1,508	2,008	20	63	0	56	J-56	56	J-56	True	8.66
J-48	2	True	1,500	2,000	1,510	2,010	20	63	0	56	J-56	56	J-56	True	9.31
J-49	2	True	1,500	2,000	1,511	2,011	20	66	0	56	J-56	56	J-56	True	6.68
J-50	2	True	1,500	2,000	1,500	2,000	20	62	0	55	J-56	55	J-56	True	12.77
J-51	2	True	1,500	2,000	1,512	2,012	20	60	0	54	J-56	54	J-56	True	7.09
J-52	2	True	1,500	2,000	1,510	2,010	20	56	0	52	J-56	52	J-56	True	7.63
J-53	2	True	1,500	2,000	1,500	2,000	20	53	0	51	J-56	51	J-56	True	9.14
J-54	2	True	1,500	2,000	1,508	2,008	20	53	0	51	J-56	51	J-56	True	9.34
J-55	2	True	1,500	2,000	1,516	2,016	20	49	0	51	J-56	51	J-56	True	12.87
J-56	2	True	1,500	2,000	1,500	2,000	20	45	0	53	J-54	53	J-54	True	12.77
J-57	2	True	1,500	2,000	1,500	2,000	20	54	0	56	J-56	56	J-56	True	9.31
J-58	2	True	1,500	2,000	1,512	2,012	20	62	0	58	J-56	58	J-56	True	7.14
J-59	2	True	1,500	2,000	1,500	2,000	20	63	0	58	J-56	58	J-56	True	7.16
J-60	2	True	1,500	2,000	1,512	2,012	20	68	0	58	J-56	58	J-56	True	7.18
J-61	2	True	1,500	2,000	1,511	2,011	20	70	0	57	J-56	57	J-56	True	7.98
J-62	2	True	1,500	2,000	1,508	2,008	20	75	0	57	J-56	57	J-56	True	7.36
J-63	2	True	1,500	2,000	1,500	2,000	20	75	0	57	J-56	57	J-56	True	7.24

Active Scenario: Max Day + Fire Flow

Fire Flow Node FlexTable: Fire Flow Report

Label	Fire Flow Iterations	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Pressure (Zone Lower Limit) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)	Is Fire Flow Run Balanced?	Velocity of Maximum Pipe (ft/s)
J-64	2	True	1,750	2,000	1,762	2,012	20	71	0	56	J-56	56	J-56	True	9.66
J-65	2	True	1,500	2,000	1,500	2,000	20	64	0	58	J-56	58	J-56	True	7.60
J-66	2	True	1,500	2,000	1,500	2,000	20	72	0	59	J-56	59	J-56	True	9.70
J-67	2	True	1,500	2,000	1,500	2,000	20	67	0	58	J-56	58	J-56	True	7.76
J-68	2	True	1,500	2,000	1,500	2,000	20	69	0	57	J-56	57	J-56	True	10.65
J-69	2	True	1,500	2,000	1,500	2,000	20	68	0	57	J-56	57	J-56	True	7.78
J-70	2	True	1,500	2,000	1,500	2,000	20	72	0	57	J-56	57	J-56	True	7.71
J-71	2	True	1,500	2,000	1,500	2,000	20	59	0	56	J-56	56	J-56	True	12.77
J-72	2	True	1,500	2,000	1,500	2,000	20	81	0	63	J-56	63	J-56	True	3.73
J-74	2	True	1,500	2,000	1,500	2,000	20	84	0	64	J-56	64	J-56	True	3.94
J-77	2	True	1,500	2,000	1,500	2,000	20	83	0	61	J-56	61	J-56	True	3.47
J-78	2	True	1,500	2,000	1,500	2,000	20	82	0	61	J-56	61	J-56	True	9.52
J-79	2	True	1,500	2,000	1,511	2,011	20	81	0	57	J-56	57	J-56	True	5.38
J-80	2	True	1,500	2,000	1,500	2,000	20	78	0	57	J-56	57	J-56	True	7.30
J-81	2	True	1,500	2,000	1,500	2,000	20	78	0	57	J-56	57	J-56	True	6.91
J-82	2	True	1,500	2,000	1,500	2,000	20	78	0	57	J-56	57	J-56	True	6.46
J-83	2	True	1,500	2,000	1,500	2,000	20	77	0	57	J-56	57	J-56	True	5.61
J-84	2	True	2,250	2,251	2,250	2,251	20	38	0	55	J-56	55	J-56	True	14.37
J-85	2	True	1,500	2,000	1,500	2,000	20	76	0	57	J-56	57	J-56	True	8.67
J-86	2	True	1,500	2,000	1,500	2,000	20	74	0	57	J-56	57	J-56	True	6.91
J-87	2	True	1,500	2,000	1,500	2,000	20	73	0	57	J-56	57	J-56	True	6.51
J-88	2	True	1,500	2,000	1,510	2,010	20	76	0	57	J-56	57	J-56	True	5.48
J-89	2	True	2,250	2,251	2,250	2,251	20	57	0	55	J-56	55	J-56	True	14.37
J-90	2	True	1,500	2,000	1,500	2,000	20	70	0	56	J-56	56	J-56	True	5.62
J-91	2	True	1,500	2,000	1,500	2,000	20	66	0	56	J-56	56	J-56	True	9.20
J-92	2	True	1,500	2,000	1,506	2,006	20	66	0	56	J-56	56	J-56	True	7.47
J-94	2	True	1,500	2,000	1,500	2,000	20	56	0	56	J-56	56	J-56	True	12.77
J-95	2	True	1,500	2,000	1,500	2,000	20	69	0	56	J-56	56	J-56	True	5.60
J-96	2	True	2,250	2,251	2,256	2,257	20	52	0	55	J-56	55	J-56	True	14.41
J-97	2	True	1,500	2,000	1,500	2,000	20	66	0	56	J-56	56	J-56	True	12.81
J-98	2	True	1,500	2,000	1,500	2,000	20	72	0	59	J-56	59	J-56	True	7.91
J-105	2	True	1,500	2,000	1,500	2,000	20	74	0	62	J-56	62	J-56	True	11.53
J-124	2	True	1,500	2,000	1,500	2,000	20	87	0	61	J-56	61	J-56	True	3.41
J-127	2	True	1,500	2,000	1,508	2,008	20	124	0	60	J-56	60	J-56	True	8.71
J-128	2	True	1,500	2,000	1,500	2,000	20	87	0	60	J-56	60	J-56	True	4.30
J-129	2	True	1,500	2,000	1,626	2,126	20	80	0	58	J-56	58	J-56	True	5.20
J-130	2	True	1,500	2,000	1,524	2,024	20	119	0	58	J-56	58	J-56	True	4.92
J-131	2	True	1,500	2,000	1,544	2,044	20	124	0	59	J-56	59	J-56	True	4.74
J-132	2	True	1,500	2,000	1,544	2,044	20	133	0	59	J-56	59	J-56	True	4.64
J-133	2	True	1,500	2,000	1,500	2,000	20	87	0	60	J-56	60	J-56	True	4.65
J-134	2	True	1,500	2,000	1,667	2,167	20	84	0	60	J-56	60	J-56	True	4.90
J-135	2	True	1,500	2,000	1,500	2,000	20	71	0	60	J-56	60	J-56	True	7.86
J-139	2	True	1,500	2,000	1,500	2,000	20	79	0	56	J-56	56	J-56	True	8.44
J-140	2	True	1,500	2,000	1,514	2,014	20	79	0	56	J-56	56	J-56	True	8.43
J-141	2	True	1,500	2,000	1,500	2,000	20	74	0	56	J-56	56	J-56	True	12.77

LONGSTORY AVE.-12" MAIN

LONGSTORY AVE.-12" MAIN

Active Scenario: Max Day + Fire Flow J55

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
34	J-1	6,433.68	<Collection: 0 items>	0	6,648.37	93
36	J-2	6,430.45	<Collection: 0 items>	0	6,648.34	94
38	J-3	6,433.58	<Collection: 0 items>	0	6,648.24	93
40	J-4	6,448.18	<Collection: 0 items>	6	6,648.15	87
42	J-5	6,464.06	<Collection: 0 items>	0	6,648.04	80
44	J-6	6,473.78	<Collection: 0 items>	0	6,647.98	75
46	J-7	6,512.21	<Collection: 0 items>	8	6,647.54	59
48	J-8	6,465.64	<Collection: 0 items>	0	6,648.04	79
50	J-9	6,472.10	<Collection: 0 items>	0	6,648.03	76
52	J-10	6,476.37	<Collection: 0 items>	0	6,648.13	74
54	J-11	6,477.25	<Collection: 0 items>	0	6,648.21	74
56	J-12	6,464.69	<Collection: 0 items>	0	6,648.39	79
62	J-13	6,465.64	<Collection: 0 items>	0	6,648.36	79
65	J-14	6,452.09	<Collection: 0 items>	0	6,648.62	85
67	J-15	6,450.90	<Collection: 0 items>	0	6,648.64	86
83	J-23	6,473.66	<Collection: 0 items>	0	6,646.58	75
85	J-24	6,470.82	<Collection: 0 items>	0	6,648.03	77
89	J-25	6,468.03	<Collection: 0 items>	0	6,648.10	78
91	J-26	6,467.05	<Collection: 0 items>	17	6,648.10	78
93	J-27	6,456.64	<Collection: 0 items>	0	6,648.14	83
95	J-28	6,439.61	<Collection: 0 items>	0	6,648.19	90
97	J-29	6,431.83	<Collection: 0 items>	0	6,648.20	94
99	J-30	6,431.87	<Collection: 0 items>	0	6,648.24	94
106	J-32	6,455.36	<Collection: 0 items>	0	6,648.40	84
109	J-33	6,455.32	<Collection: 0 items>	0	6,648.51	84
111	J-34	6,468.67	<Collection: 0 items>	8	6,649.88	78
113	J-35	6,468.21	<Collection: 0 items>	0	6,650.17	79
115	J-36	6,463.44	<Collection: 0 items>	10	6,654.08	82
117	J-37	6,463.90	<Collection: 0 items>	13	6,655.37	83
119	J-38	6,463.52	<Collection: 0 items>	0	6,655.34	83
121	J-39	6,442.67	<Collection: 0 items>	0	6,654.86	92
123	J-40	6,445.39	<Collection: 0 items>	0	6,654.53	90
125	J-41	6,462.50	<Collection: 0 items>	0	6,654.13	83
128	J-42	6,460.18	<Collection: 0 items>	0	6,649.02	82
131	J-43	6,467.94	<Collection: 0 items>	0	6,648.27	78
133	J-44	6,467.22	<Collection: 0 items>	17	6,648.27	78
135	J-45	6,454.15	<Collection: 0 items>	0	6,648.27	84
137	J-46	6,454.75	<Collection: 0 items>	0	6,648.27	84
139	J-47	6,459.91	<Collection: 0 items>	8	6,648.27	81
141	J-48	6,467.90	<Collection: 0 items>	10	6,648.27	78
144	J-49	6,472.22	<Collection: 0 items>	11	6,648.18	76
147	J-50	6,473.50	<Collection: 1 items>	17	6,646.58	75
149	J-51	6,483.40	<Collection: 0 items>	12	6,644.48	70
151	J-52	6,494.00	<Collection: 0 items>	10	6,642.47	64
153	J-53	6,506.43	<Collection: 0 items>	0	6,641.03	58
155	J-54	6,507.93	<Collection: 1 items>	8	6,640.88	58
157	J-55	6,502.21	<Collection: 1 items>	1,516	6,632.19	56

Active Scenario: Max Day + Fire Flow J55

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	
159	J-56	6,512.55	<Collection: 0 items>	0	6,640.88	56	
162	J-57	6,511.88	<Collection: 0 items>	0	6,647.77	59	
164	J-58	6,493.73	<Collection: 0 items>	12	6,651.55	68	
166	J-59	6,492.08	<Collection: 0 items>	0	6,651.56	69	
168	J-60	6,481.32	<Collection: 0 items>	12	6,651.57	74	
170	J-61	6,468.66	<Collection: 0 items>	11	6,650.71	79	
172	J-62	6,456.66	<Collection: 0 items>	8	6,650.33	84	
174	J-63	6,455.47	<Collection: 0 items>	0	6,650.25	84	
176	J-64	6,474.16	<Collection: 0 items>	12	6,648.15	75	
179	J-65	6,485.80	<Collection: 0 items>	0	6,652.81	72	
181	J-66	6,474.66	<Collection: 0 items>	0	6,653.57	77	
183	J-67	6,481.45	<Collection: 0 items>	0	6,651.70	74	
186	J-68	6,468.83	<Collection: 0 items>	0	6,650.70	79	
188	J-69	6,462.78	<Collection: 0 items>	0	6,650.56	81	
190	J-70	6,454.44	<Collection: 0 items>	0	6,650.44	85	
193	J-71	6,442.15	<Collection: 0 items>	0	6,648.27	89	
195	J-72	6,469.96	<Collection: 0 items>	0	6,659.81	82	
211	J-74	6,466.83	<Collection: 0 items>	0	6,660.94	84	
221	J-77	6,463.22	<Collection: 0 items>	0	6,657.76	84	
223	J-78	6,461.06	<Collection: 0 items>	0	6,656.41	85	
235	J-79	6,449.21	<Collection: 0 items>	11	6,648.74	86	LONGSTORY AVE.-12" MAIN
237	J-80	6,449.46	<Collection: 0 items>	0	6,648.70	86	
239	J-81	6,449.11	<Collection: 0 items>	0	6,648.69	86	
241	J-82	6,449.41	<Collection: 0 items>	0	6,648.68	86	
243	J-83	6,454.85	<Collection: 0 items>	0	6,648.64	84	
246	J-84	6,452.11	<Collection: 0 items>	0	6,648.68	85	
248	J-85	6,455.97	<Collection: 0 items>	0	6,648.63	83	
250	J-86	6,459.08	<Collection: 0 items>	0	6,648.58	82	
252	J-87	6,459.57	<Collection: 0 items>	0	6,648.57	82	
254	J-88	6,461.65	<Collection: 0 items>	10	6,648.47	81	
258	J-89	6,462.70	<Collection: 0 items>	0	6,648.58	80	
260	J-90	6,477.68	<Collection: 0 items>	0	6,648.15	74	
263	J-91	6,481.24	<Collection: 0 items>	0	6,648.16	72	
265	J-92	6,477.12	<Collection: 0 items>	6	6,648.18	74	
269	J-94	6,479.70	<Collection: 0 items>	0	6,648.18	73	
271	J-95	6,478.01	<Collection: 0 items>	0	6,648.20	74	
275	J-96	6,467.73	<Collection: 0 items>	6	6,648.18	78	
279	J-97	6,475.24	<Collection: 0 items>	0	6,648.18	75	
284	J-98	6,475.51	<Collection: 0 items>	0	6,653.67	77	
310	J-105	6,484.00	<Collection: 0 items>	0	6,660.02	76	
368	J-124	6,448.00	<Collection: 0 items>	0	6,656.86	90	LONGSTORY AVE.-12" MAIN
375	J-127	6,340.00	<Collection: 0 items>	8	6,655.64	137	
377	J-128	6,445.00	<Collection: 0 items>	0	6,655.50	91	
381	J-129	6,449.21	<Collection: 0 items>	126	6,649.25	87	
383	J-130	6,360.00	<Collection: 0 items>	24	6,650.49	126	
385	J-131	6,350.00	<Collection: 0 items>	44	6,651.35	130	
387	J-132	6,330.00	<Collection: 0 items>	44	6,651.81	139	

Active Scenario: Max Day + Fire Flow J55

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	
389	J-133	6,440.00	<Collection: 0 items>	0	6,653.88	93	LONGSTORY AVE.-12" MAIN
391	J-134	6,450.00	<Collection: 0 items>	167	6,654.71	89	
395	J-135	6,455.00	<Collection: 0 items>	0	6,656.13	87	
410	J-139	6,436.00	<Collection: 0 items>	0	6,648.19	92	
412	J-140	6,435.00	<Collection: 0 items>	14	6,648.19	92	
414	J-141	6,430.00	<Collection: 0 items>	0	6,648.19	94	

Active Scenario: Max Day + Fire Flow J55 w/Critical Loop Out

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
37	P-2	103	J-1	J-2	16.0	Ductile Iron	120.0	600	0.96	0.000
39	P-3	347	J-2	J-3	16.0	Ductile Iron	120.0	600	0.96	0.000
41	P-4	415	J-3	J-4	16.0	Ductile Iron	120.0	537	0.86	0.000
43	P-5	474	J-4	J-5	16.0	Ductile Iron	120.0	531	0.85	0.000
45	P-6	398	J-5	J-6	16.0	Ductile Iron	120.0	451	0.72	0.000
47	P-7	1,008	J-6	J-7	16.0	Ductile Iron	120.0	758	1.21	0.000
58	P-13	52	J-5	J-8	12.0	PVC	120.0	79	0.23	0.000
59	P-14	490	J-8	J-9	12.0	PVC	120.0	79	0.23	0.000
261	P-16(1)	64	J-10	J-90	12.0	PVC	120.0	-275	0.78	0.000
272	P-16(2)(1)	249	J-90	J-95	12.0	PVC	120.0	-236	0.67	0.000
273	P-16(2)(2)	35	J-95	J-11	12.0	PVC	120.0	-287	0.82	0.000
63	P-17	530	J-11	J-13	12.0	PVC	120.0	-287	0.82	0.000
64	P-18	46	J-13	J-12	12.0	PVC	120.0	-400	1.14	0.001
255	P-19(1)	143	J-12	J-88	12.0	PVC	120.0	-400	1.14	0.001
256	P-19(2)	441	J-88	J-14	12.0	PVC	120.0	-320	0.91	0.000
68	P-20	54	J-14	J-15	12.0	PVC	120.0	-320	0.91	0.000
86	P-29	75	J-9	J-24	12.0	PVC	120.0	79	0.23	0.000
87	P-30	394	J-24	J-10	12.0	PVC	120.0	-275	0.78	0.000
88	P-31	295	J-23	J-24	8.0	PVC	120.0	-454	2.90	0.005
90	P-32	250	J-24	J-25	8.0	PVC	120.0	-100	0.64	0.000
92	P-33	47	J-25	J-26	8.0	PVC	120.0	-32	0.21	0.000
94	P-34	504	J-26	J-27	8.0	PVC	120.0	-50	0.32	0.000
96	P-35	556	J-27	J-28	8.0	PVC	120.0	-50	0.32	0.000
98	P-36	146	J-28	J-29	8.0	PVC	120.0	-42	0.27	0.000
100	P-37	317	J-29	J-30	8.0	PVC	120.0	-63	0.40	0.000
101	P-38	51	J-30	J-3	8.0	PVC	120.0	-63	0.40	0.000
108	P-42	336	J-32	J-1	16.0	Ductile Iron	120.0	313	0.50	0.000
110	P-43	45	J-32	J-33	8.0	PVC	120.0	-313	2.00	0.002
112	P-44	554	J-33	J-34	8.0	PVC	120.0	-313	2.00	0.002
114	P-45	34	J-34	J-35	8.0	PVC	120.0	-608	3.88	0.008
116	P-46	464	J-35	J-36	8.0	PVC	120.0	-608	3.88	0.008
118	P-47	281	J-36	J-37	8.0	PVC	120.0	-437	2.79	0.005
120	P-48	33	J-37	J-38	8.0	PVC	120.0	181	1.15	0.001
122	P-49	537	J-38	J-39	8.0	PVC	120.0	181	1.15	0.001
124	P-50	368	J-39	J-40	8.0	PVC	120.0	181	1.15	0.001
126	P-51	450	J-40	J-41	8.0	PVC	120.0	181	1.15	0.001
127	P-52	58	J-41	J-36	8.0	PVC	120.0	181	1.15	0.001
129	P-53	410	J-34	J-42	8.0	PVC	120.0	287	1.83	0.002
130	P-54	309	J-42	J-1	8.0	PVC	120.0	287	1.83	0.002
132	P-55	261	J-13	J-43	8.0	PVC	120.0	113	0.72	0.000

Active Scenario: Max Day + Fire Flow J55 w/Critical Loop Out

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
134	P-56	34	J-43	J-44	8.0	PVC	120.0	22	0.14	0.000
136	P-57	632	J-44	J-45	8.0	PVC	120.0	5	0.03	0.000
138	P-58	858	J-45	J-46	8.0	PVC	120.0	5	0.03	0.000
140	P-59	183	J-46	J-47	8.0	PVC	120.0	5	0.03	0.000
142	P-60	422	J-47	J-48	8.0	PVC	120.0	-3	0.02	0.000
143	P-61	359	J-48	J-43	8.0	PVC	120.0	-12	0.08	0.000
145	P-62	464	J-43	J-49	8.0	PVC	120.0	79	0.50	0.000
146	P-63	541	J-49	J-25	8.0	PVC	120.0	68	0.43	0.000
148	P-64	167	J-23	J-50	8.0	PVC	120.0	17	0.11	0.000
150	P-65	459	J-23	J-51	8.0	PVC	120.0	437	2.79	0.005
152	P-66	460	J-51	J-52	8.0	PVC	120.0	426	2.72	0.004
154	P-67	345	J-52	J-53	8.0	PVC	120.0	416	2.65	0.004
156	P-68	37	J-53	J-54	8.0	PVC	120.0	416	2.65	0.004
158	P-69	190	J-54	J-55	8.0	PVC	120.0	1,516	9.68	0.046
160	P-70	184	J-54	J-56	8.0	PVC	120.0	0	0.00	0.000
161	P-71	260	J-54	J-7	8.0	PVC	120.0	-1,108	7.07	0.026
163	P-72	71	J-7	J-57	8.0	PVC	120.0	-358	2.28	0.003
165	P-73	1,200	J-57	J-58	8.0	PVC	120.0	-358	2.28	0.003
167	P-74	40	J-58	J-59	8.0	PVC	120.0	-45	0.29	0.000
169	P-75	260	J-59	J-60	8.0	PVC	120.0	-45	0.29	0.000
171	P-76	306	J-60	J-61	8.0	PVC	120.0	337	2.15	0.003
173	P-77	294	J-61	J-62	8.0	PVC	120.0	222	1.42	0.001
175	P-78	29	J-62	J-63	8.0	PVC	120.0	318	2.03	0.003
177	P-79	829	J-63	J-64	8.0	PVC	120.0	318	2.03	0.003
178	P-80	71	J-64	J-6	8.0	PVC	120.0	306	1.96	0.002
180	P-81	476	J-58	J-65	8.0	PVC	120.0	-325	2.07	0.003
184	P-83	493	J-66	J-67	8.0	PVC	120.0	395	2.52	0.004
185	P-84	34	J-67	J-60	8.0	PVC	120.0	395	2.52	0.004
187	P-85	34	J-61	J-68	8.0	PVC	120.0	104	0.66	0.000
189	P-86	437	J-68	J-69	8.0	PVC	120.0	104	0.66	0.000
191	P-87	381	J-69	J-70	8.0	PVC	120.0	104	0.66	0.000
192	P-88	354	J-70	J-62	8.0	PVC	120.0	104	0.66	0.000
194	P-89	320	J-46	J-71	8.0	PVC	120.0	0	0.00	0.000
210	P-94 Closed Pipe	374	J-32	J-72	16.0	Ductile Iron	120.0	0	0.00	0.000
212	P-95	765	J-72	J-74	16.0	Ductile Iron	120.0	-1,465	2.34	0.001
216	P-97	44	J-74	LOW TANK	16.0	Ductile Iron	120.0	-1,465	2.34	0.001
218	P-98	40	J-74	FULL TANK	16.0	Ductile Iron	120.0	0	0.00	0.000
222	P-100	1,399	J-72	J-77	16.0	Ductile Iron	120.0	1,465	2.34	0.001
224	P-101	115	J-77	J-78	8.0	PVC	120.0	726	4.63	0.012
225	P-102	116	J-78	J-37	8.0	PVC	120.0	631	4.03	0.009
236	P-103	247	J-15	J-79	12.0	PVC	120.0	-336	0.95	0.000
238	P-104	247	J-79	J-80	8.0	PVC	120.0	73	0.47	0.000

Active Scenario: Max Day + Fire Flow J55 w/Critical Loop Out

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
240	P-105	39	J-80	J-81	8.0	PVC	120.0	73	0.47	0.000
242	P-106	63	J-81	J-82	8.0	PVC	120.0	73	0.47	0.000
244	P-107	242	J-82	J-83	8.0	PVC	120.0	73	0.47	0.000
245	P-108	259	J-83	J-15	8.0	PVC	120.0	-17	0.11	0.000
247	P-109	880	J-82	J-84	8.0	PVC	120.0	0	0.00	0.000
249	P-110	46	J-83	J-85	8.0	PVC	120.0	90	0.57	0.000
251	P-111	190	J-85	J-86	8.0	PVC	120.0	90	0.57	0.000
253	P-112	48	J-86	J-87	8.0	PVC	120.0	90	0.57	0.000
257	P-113	424	J-87	J-88	8.0	PVC	120.0	90	0.57	0.000
259	P-114	305	J-86	J-89	8.0	PVC	120.0	0	0.00	0.000
264	P-115	117	J-90	J-91	8.0	PVC	120.0	-39	0.25	0.000
266	P-116	395	J-91	J-92	8.0	PVC	120.0	-39	0.25	0.000
274	P-119	275	J-95	J-92	8.0	PVC	120.0	51	0.33	0.000
280	P-120(1)	52	J-92	J-97	8.0	PVC	120.0	6	0.04	0.000
281	P-120(2)	327	J-97	J-96	8.0	PVC	120.0	6	0.04	0.000
282	P-121	271	J-92	J-94	8.0	PVC	120.0	0	0.00	0.000
285	P-122(1)	324	J-65	J-98	8.0	PVC	120.0	-325	2.07	0.003
286	P-122(2)	27	J-98	J-66	8.0	PVC	120.0	395	2.52	0.004
311	P-123(1)	552	J-98	J-105	8.0	PVC	120.0	-720	4.59	0.012
312	P-123(2)	60	J-105	FULL TANK -West	8.0	PVC	120.0	0	0.00	0.000
314	P-129	85	J-105	LOW TANK -West	8.0	PVC	120.0	-720	4.59	0.012
370	P-150	2,165	J-77	J-124	16.0	Ductile Iron	120.0	739	1.18	0.000
396	P-153(1)	1,033	J-78	J-135	8.0	PVC	120.0	95	0.61	0.000
397	P-153(2)	1,839	J-135	J-127	8.0	PVC	120.0	95	0.61	0.000
380	P-154	591	J-127	J-128	8.0	PVC	120.0	87	0.55	0.000
382	P-155	863	J-79	J-129	12.0	PVC	120.0	-421	1.19	0.001
384	P-156	1,289	J-129	J-130	12.0	PVC	120.0	-547	1.55	0.001
386	P-157	823	J-130	J-131	12.0	PVC	120.0	-571	1.62	0.001
388	P-158	387	J-131	J-132	12.0	PVC	120.0	-615	1.75	0.001
390	P-159	1,522	J-132	J-133	12.0	PVC	120.0	-659	1.87	0.001
392	P-160	612	J-133	J-134	12.0	PVC	120.0	-659	1.87	0.001
393	P-161	385	J-134	J-128	12.0	PVC	120.0	-826	2.34	0.002
394	P-162	813	J-128	J-124	12.0	PVC	120.0	-739	2.10	0.002
411	P-165	320	J-29	J-139	8.0	PVC	120.0	21	0.14	0.000
413	P-166	100	J-139	J-140	8.0	PVC	120.0	21	0.14	0.000
415	P-167	222	J-140	J-141	8.0	PVC	120.0	0	0.00	0.000
421	P-170	589	J-28	J-140	8.0	PVC	120.0	-8	0.05	0.000

Active Scenario: Max Day + Fire Flow J96

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
34	J-1	6,433.68	<Collection: 0 items>	0	6,639.52	89
36	J-2	6,430.45	<Collection: 0 items>	0	6,639.47	90
38	J-3	6,433.58	<Collection: 0 items>	0	6,639.30	89
40	J-4	6,448.18	<Collection: 0 items>	6	6,639.21	83
42	J-5	6,464.06	<Collection: 0 items>	0	6,639.10	76
44	J-6	6,473.78	<Collection: 0 items>	0	6,639.22	72
46	J-7	6,512.21	<Collection: 0 items>	8	6,639.25	55
48	J-8	6,465.64	<Collection: 0 items>	0	6,638.90	75
50	J-9	6,472.10	<Collection: 0 items>	0	6,637.04	71
52	J-10	6,476.37	<Collection: 0 items>	0	6,634.64	68
54	J-11	6,477.25	<Collection: 0 items>	0	6,634.23	68
56	J-12	6,464.69	<Collection: 0 items>	0	6,635.53	74
62	J-13	6,465.64	<Collection: 0 items>	0	6,635.45	73
65	J-14	6,452.09	<Collection: 0 items>	0	6,636.21	80
67	J-15	6,450.90	<Collection: 0 items>	0	6,636.27	80
83	J-23	6,473.66	<Collection: 0 items>	0	6,637.10	71
85	J-24	6,470.82	<Collection: 0 items>	0	6,636.75	72
89	J-25	6,468.03	<Collection: 0 items>	0	6,636.76	73
91	J-26	6,467.05	<Collection: 0 items>	17	6,636.82	73
93	J-27	6,456.64	<Collection: 0 items>	0	6,637.63	78
95	J-28	6,439.61	<Collection: 0 items>	0	6,638.51	86
97	J-29	6,431.83	<Collection: 0 items>	0	6,638.65	89
99	J-30	6,431.87	<Collection: 0 items>	0	6,639.21	90
106	J-32	6,455.36	<Collection: 0 items>	0	6,639.56	80
109	J-33	6,455.32	<Collection: 0 items>	0	6,639.75	80
111	J-34	6,468.67	<Collection: 0 items>	8	6,642.08	75
113	J-35	6,468.21	<Collection: 0 items>	0	6,642.56	75
115	J-36	6,463.44	<Collection: 0 items>	10	6,649.16	80
117	J-37	6,463.90	<Collection: 0 items>	13	6,651.31	81
119	J-38	6,463.52	<Collection: 0 items>	0	6,651.26	81
121	J-39	6,442.67	<Collection: 0 items>	0	6,650.46	90
123	J-40	6,445.39	<Collection: 0 items>	0	6,649.92	88
125	J-41	6,462.50	<Collection: 0 items>	0	6,649.25	81
128	J-42	6,460.18	<Collection: 0 items>	0	6,640.61	78
131	J-43	6,467.94	<Collection: 0 items>	0	6,635.65	73
133	J-44	6,467.22	<Collection: 0 items>	17	6,635.65	73
135	J-45	6,454.15	<Collection: 0 items>	0	6,635.65	79
137	J-46	6,454.75	<Collection: 0 items>	0	6,635.65	78
139	J-47	6,459.91	<Collection: 0 items>	8	6,635.64	76
141	J-48	6,467.90	<Collection: 0 items>	10	6,635.65	73
144	J-49	6,472.22	<Collection: 0 items>	11	6,636.13	71
147	J-50	6,473.50	<Collection: 1 items>	0	6,637.10	71
149	J-51	6,483.40	<Collection: 0 items>	12	6,637.65	67
151	J-52	6,494.00	<Collection: 0 items>	10	6,638.26	62
153	J-53	6,506.43	<Collection: 0 items>	0	6,638.75	57
155	J-54	6,507.93	<Collection: 1 items>	8	6,638.81	57
157	J-55	6,502.21	<Collection: 0 items>	16	6,638.80	59

Active Scenario: Max Day + Fire Flow J96

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
159	J-56	6,512.55	<Collection: 0 items>	0	6,638.81	55
162	J-57	6,511.88	<Collection: 0 items>	0	6,639.61	55
164	J-58	6,493.73	<Collection: 0 items>	12	6,645.59	66
166	J-59	6,492.08	<Collection: 0 items>	0	6,645.59	66
168	J-60	6,481.32	<Collection: 0 items>	12	6,645.61	71
170	J-61	6,468.66	<Collection: 0 items>	11	6,644.11	76
172	J-62	6,456.66	<Collection: 0 items>	8	6,643.43	81
174	J-63	6,455.47	<Collection: 0 items>	0	6,643.29	81
176	J-64	6,474.16	<Collection: 0 items>	12	6,639.52	72
179	J-65	6,485.80	<Collection: 0 items>	0	6,647.64	70
181	J-66	6,474.66	<Collection: 0 items>	0	6,648.87	75
183	J-67	6,481.45	<Collection: 0 items>	0	6,645.82	71
186	J-68	6,468.83	<Collection: 0 items>	0	6,644.09	76
188	J-69	6,462.78	<Collection: 0 items>	0	6,643.84	78
190	J-70	6,454.44	<Collection: 0 items>	0	6,643.63	82
193	J-71	6,442.15	<Collection: 0 items>	0	6,635.65	84
195	J-72	6,469.96	<Collection: 0 items>	0	6,658.92	82
211	J-74	6,466.83	<Collection: 0 items>	0	6,660.89	84
221	J-77	6,463.22	<Collection: 0 items>	0	6,655.33	83
223	J-78	6,461.06	<Collection: 0 items>	0	6,653.05	83
235	J-79	6,449.21	<Collection: 0 items>	11	6,636.54	81
237	J-80	6,449.46	<Collection: 0 items>	0	6,636.42	81
239	J-81	6,449.11	<Collection: 0 items>	0	6,636.40	81
241	J-82	6,449.41	<Collection: 0 items>	0	6,636.37	81
243	J-83	6,454.85	<Collection: 0 items>	0	6,636.26	78
246	J-84	6,452.11	<Collection: 0 items>	0	6,636.37	80
248	J-85	6,455.97	<Collection: 0 items>	0	6,636.22	78
250	J-86	6,459.08	<Collection: 0 items>	0	6,636.09	77
252	J-87	6,459.57	<Collection: 0 items>	0	6,636.06	76
254	J-88	6,461.65	<Collection: 0 items>	10	6,635.75	75
258	J-89	6,462.70	<Collection: 0 items>	0	6,636.09	75
260	J-90	6,477.68	<Collection: 0 items>	0	6,634.30	68
263	J-91	6,481.24	<Collection: 0 items>	0	6,632.06	65
265	J-92	6,477.12	<Collection: 0 items>	6	6,624.48	64
269	J-94	6,479.70	<Collection: 0 items>	0	6,624.48	63
271	J-95	6,478.01	<Collection: 0 items>	0	6,634.14	68
275	J-96	6,467.73	<Collection: 1 items>	2,256	6,588.32	52
279	J-97	6,475.24	<Collection: 0 items>	0	6,619.55	62
284	J-98	6,475.51	<Collection: 0 items>	0	6,649.04	75
310	J-105	6,484.00	<Collection: 0 items>	0	6,659.40	76
368	J-124	6,448.00	<Collection: 0 items>	0	6,653.72	89
375	J-127	6,340.00	<Collection: 0 items>	8	6,651.54	135
377	J-128	6,445.00	<Collection: 0 items>	0	6,651.27	89
381	J-129	6,449.21	<Collection: 0 items>	126	6,637.99	82
383	J-130	6,360.00	<Collection: 0 items>	24	6,640.88	122
385	J-131	6,350.00	<Collection: 0 items>	44	6,642.82	127
387	J-132	6,330.00	<Collection: 0 items>	44	6,643.82	136

Active Scenario: Max Day + Fire Flow J96

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
389	J-133	6,440.00	<Collection: 0 items>	0	6,648.10	90
391	J-134	6,450.00	<Collection: 0 items>	167	6,649.82	86
395	J-135	6,455.00	<Collection: 0 items>	0	6,652.51	85
410	J-139	6,436.00	<Collection: 0 items>	0	6,638.60	88
412	J-140	6,435.00	<Collection: 0 items>	14	6,638.58	88
414	J-141	6,430.00	<Collection: 0 items>	0	6,638.58	90

Active Scenario: Max Day + Fire Flow J96 w/Critical Loop Out

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
37	P-2	103	J-1	J-2	16.0	Ductile Iron	120.0	799	1.27	0.000
39	P-3	347	J-2	J-3	16.0	Ductile Iron	120.0	799	1.27	0.000
41	P-4	415	J-3	J-4	16.0	Ductile Iron	120.0	538	0.86	0.000
43	P-5	474	J-4	J-5	16.0	Ductile Iron	120.0	531	0.85	0.000
45	P-6	398	J-5	J-6	16.0	Ductile Iron	120.0	-617	0.98	0.000
47	P-7	1,008	J-6	J-7	16.0	Ductile Iron	120.0	-193	0.31	0.000
58	P-13	52	J-5	J-8	12.0	PVC	120.0	1,149	3.26	0.004
59	P-14	490	J-8	J-9	12.0	PVC	120.0	1,149	3.26	0.004
261	P-16(1)	64	J-10	J-90	12.0	PVC	120.0	1,382	3.92	0.005
272	P-16(2)(1)	249	J-90	J-95	12.0	PVC	120.0	435	1.23	0.001
273	P-16(2)(2)	35	J-95	J-11	12.0	PVC	120.0	-880	2.50	0.002
63	P-17	530	J-11	J-13	12.0	PVC	120.0	-880	2.50	0.002
64	P-18	46	J-13	J-12	12.0	PVC	120.0	-717	2.03	0.002
255	P-19(1)	143	J-12	J-88	12.0	PVC	120.0	-717	2.03	0.002
256	P-19(2)	441	J-88	J-14	12.0	PVC	120.0	-567	1.61	0.001
68	P-20	54	J-14	J-15	12.0	PVC	120.0	-567	1.61	0.001
86	P-29	75	J-9	J-24	12.0	PVC	120.0	1,149	3.26	0.004
87	P-30	394	J-24	J-10	12.0	PVC	120.0	1,382	3.92	0.005
88	P-31	295	J-23	J-24	8.0	PVC	120.0	212	1.35	0.001
90	P-32	250	J-24	J-25	8.0	PVC	120.0	-22	0.14	0.000
92	P-33	47	J-25	J-26	8.0	PVC	120.0	-230	1.47	0.001
94	P-34	504	J-26	J-27	8.0	PVC	120.0	-247	1.58	0.002
96	P-35	556	J-27	J-28	8.0	PVC	120.0	-247	1.58	0.002
98	P-36	146	J-28	J-29	8.0	PVC	120.0	-188	1.20	0.001
100	P-37	317	J-29	J-30	8.0	PVC	120.0	-261	1.67	0.002
101	P-38	51	J-30	J-3	8.0	PVC	120.0	-261	1.67	0.002
108	P-42	336	J-32	J-1	16.0	Ductile Iron	120.0	417	0.67	0.000
110	P-43	45	J-32	J-33	8.0	PVC	120.0	-417	2.66	0.004
112	P-44	554	J-33	J-34	8.0	PVC	120.0	-417	2.66	0.004
114	P-45	34	J-34	J-35	8.0	PVC	120.0	-807	5.15	0.014
116	P-46	464	J-35	J-36	8.0	PVC	120.0	-807	5.15	0.014
118	P-47	281	J-36	J-37	8.0	PVC	120.0	-578	3.69	0.008
120	P-48	33	J-37	J-38	8.0	PVC	120.0	239	1.52	0.001
122	P-49	537	J-38	J-39	8.0	PVC	120.0	239	1.52	0.001
124	P-50	368	J-39	J-40	8.0	PVC	120.0	239	1.52	0.001
126	P-51	450	J-40	J-41	8.0	PVC	120.0	239	1.52	0.001
127	P-52	58	J-41	J-36	8.0	PVC	120.0	239	1.52	0.001
129	P-53	410	J-34	J-42	8.0	PVC	120.0	382	2.44	0.004
130	P-54	309	J-42	J-1	8.0	PVC	120.0	382	2.44	0.004
132	P-55	261	J-13	J-43	8.0	PVC	120.0	-163	1.04	0.001

Active Scenario: Max Day + Fire Flow J96 w/Critical Loop Out

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
134	P-56	34	J-43	J-44	8.0	PVC	120.0	22	0.14	0.000
136	P-57	632	J-44	J-45	8.0	PVC	120.0	5	0.03	0.000
138	P-58	858	J-45	J-46	8.0	PVC	120.0	5	0.03	0.000
140	P-59	183	J-46	J-47	8.0	PVC	120.0	5	0.03	0.000
142	P-60	422	J-47	J-48	8.0	PVC	120.0	-2	0.01	0.000
143	P-61	359	J-48	J-43	8.0	PVC	120.0	-12	0.08	0.000
145	P-62	464	J-43	J-49	8.0	PVC	120.0	-197	1.26	0.001
146	P-63	541	J-49	J-25	8.0	PVC	120.0	-208	1.33	0.001
148	P-64	167	J-23	J-50	8.0	PVC	120.0	0	0.00	0.000
150	P-65	459	J-23	J-51	8.0	PVC	120.0	-212	1.35	0.001
152	P-66	460	J-51	J-52	8.0	PVC	120.0	-224	1.43	0.001
154	P-67	345	J-52	J-53	8.0	PVC	120.0	-233	1.49	0.001
156	P-68	37	J-53	J-54	8.0	PVC	120.0	-233	1.49	0.001
158	P-69	190	J-54	J-55	8.0	PVC	120.0	16	0.10	0.000
160	P-70	184	J-54	J-56	8.0	PVC	120.0	0	0.00	0.000
161	P-71	260	J-54	J-7	8.0	PVC	120.0	-257	1.64	0.002
163	P-72	71	J-7	J-57	8.0	PVC	120.0	-458	2.92	0.005
165	P-73	1,200	J-57	J-58	8.0	PVC	120.0	-458	2.92	0.005
167	P-74	40	J-58	J-59	8.0	PVC	120.0	-47	0.30	0.000
169	P-75	260	J-59	J-60	8.0	PVC	120.0	-47	0.30	0.000
171	P-76	306	J-60	J-61	8.0	PVC	120.0	454	2.90	0.005
173	P-77	294	J-61	J-62	8.0	PVC	120.0	302	1.93	0.002
175	P-78	29	J-62	J-63	8.0	PVC	120.0	436	2.78	0.005
177	P-79	829	J-63	J-64	8.0	PVC	120.0	436	2.78	0.005
178	P-80	71	J-64	J-6	8.0	PVC	120.0	424	2.71	0.004
180	P-81	476	J-58	J-65	8.0	PVC	120.0	-423	2.70	0.004
184	P-83	493	J-66	J-67	8.0	PVC	120.0	514	3.28	0.006
185	P-84	34	J-67	J-60	8.0	PVC	120.0	514	3.28	0.006
187	P-85	34	J-61	J-68	8.0	PVC	120.0	141	0.90	0.001
189	P-86	437	J-68	J-69	8.0	PVC	120.0	141	0.90	0.001
191	P-87	381	J-69	J-70	8.0	PVC	120.0	141	0.90	0.001
192	P-88	354	J-70	J-62	8.0	PVC	120.0	141	0.90	0.001
194	P-89	320	J-46	J-71	8.0	PVC	120.0	0	0.00	0.000
210	P-94 Closed Pipe	374	J-32	J-72	16.0	Ductile Iron	120.0	0	0.00	0.000
212	P-95	765	J-72	J-74	16.0	Ductile Iron	120.0	-1,980	3.16	0.003
216	P-97	44	J-74	LOW TANK	16.0	Ductile Iron	120.0	-1,980	3.16	0.003
218	P-98	40	J-74	FULL TANK	16.0	Ductile Iron	120.0	0	0.00	0.000
222	P-100	1,399	J-72	J-77	16.0	Ductile Iron	120.0	1,980	3.16	0.003
224	P-101	115	J-77	J-78	8.0	PVC	120.0	965	6.16	0.020
225	P-102	116	J-78	J-37	8.0	PVC	120.0	829	5.29	0.015
236	P-103	247	J-15	J-79	12.0	PVC	120.0	-597	1.69	0.001
238	P-104	247	J-79	J-80	8.0	PVC	120.0	130	0.83	0.000

Active Scenario: Max Day + Fire Flow J96 w/Critical Loop Out
FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
240	P-105	39	J-80	J-81	8.0	PVC	120.0	130	0.83	0.000
242	P-106	63	J-81	J-82	8.0	PVC	120.0	130	0.83	0.000
244	P-107	242	J-82	J-83	8.0	PVC	120.0	130	0.83	0.000
245	P-108	259	J-83	J-15	8.0	PVC	120.0	-30	0.19	0.000
247	P-109	880	J-82	J-84	8.0	PVC	120.0	0	0.00	0.000
249	P-110	46	J-83	J-85	8.0	PVC	120.0	160	1.02	0.001
251	P-111	190	J-85	J-86	8.0	PVC	120.0	160	1.02	0.001
253	P-112	48	J-86	J-87	8.0	PVC	120.0	160	1.02	0.001
257	P-113	424	J-87	J-88	8.0	PVC	120.0	160	1.02	0.001
259	P-114	305	J-86	J-89	8.0	PVC	120.0	0	0.00	0.000
264	P-115	117	J-90	J-91	8.0	PVC	120.0	947	6.05	0.019
266	P-116	395	J-91	J-92	8.0	PVC	120.0	947	6.05	0.019
274	P-119	275	J-95	J-92	8.0	PVC	120.0	1,315	8.40	0.035
280	P-120(1)	52	J-92	J-97	8.0	PVC	120.0	2,256	14.40	0.096
281	P-120(2)	327	J-97	J-96	8.0	PVC	120.0	2,256	14.40	0.096
282	P-121	271	J-92	J-94	8.0	PVC	120.0	0	0.00	0.000
285	P-122(1)	324	J-65	J-98	8.0	PVC	120.0	-423	2.70	0.004
286	P-122(2)	27	J-98	J-66	8.0	PVC	120.0	514	3.28	0.006
311	P-123(1)	552	J-98	J-105	8.0	PVC	120.0	-937	5.98	0.019
312	P-123(2)	60	J-105	FULL TANK -West	8.0	PVC	120.0	0	0.00	0.000
314	P-129	85	J-105	LOW TANK -West	8.0	PVC	120.0	-937	5.98	0.019
370	P-150	2,165	J-77	J-124	16.0	Ductile Iron	120.0	1,015	1.62	0.001
396	P-153(1)	1,033	J-78	J-135	8.0	PVC	120.0	136	0.87	0.001
397	P-153(2)	1,839	J-135	J-127	8.0	PVC	120.0	136	0.87	0.001
380	P-154	591	J-127	J-128	8.0	PVC	120.0	128	0.82	0.000
382	P-155	863	J-79	J-129	12.0	PVC	120.0	-738	2.09	0.002
384	P-156	1,289	J-129	J-130	12.0	PVC	120.0	-864	2.45	0.002
386	P-157	823	J-130	J-131	12.0	PVC	120.0	-888	2.52	0.002
388	P-158	387	J-131	J-132	12.0	PVC	120.0	-932	2.65	0.003
390	P-159	1,522	J-132	J-133	12.0	PVC	120.0	-976	2.77	0.003
392	P-160	612	J-133	J-134	12.0	PVC	120.0	-976	2.77	0.003
393	P-161	385	J-134	J-128	12.0	PVC	120.0	-1,143	3.24	0.004
394	P-162	813	J-128	J-124	12.0	PVC	120.0	-1,015	2.88	0.003
411	P-165	320	J-29	J-139	8.0	PVC	120.0	74	0.47	0.000
413	P-166	100	J-139	J-140	8.0	PVC	120.0	74	0.47	0.000
415	P-167	222	J-140	J-141	8.0	PVC	120.0	0	0.00	0.000
421	P-170	589	J-28	J-140	8.0	PVC	120.0	-60	0.38	0.000

Active Scenario: Max Day + Fire Flow J84

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
34	J-1	6,433.68	<Collection: 0 items>	0	6,641.45	90
36	J-2	6,430.45	<Collection: 0 items>	0	6,641.40	91
38	J-3	6,433.58	<Collection: 0 items>	0	6,641.26	90
40	J-4	6,448.18	<Collection: 0 items>	6	6,641.19	84
42	J-5	6,464.06	<Collection: 0 items>	0	6,641.10	77
44	J-6	6,473.78	<Collection: 0 items>	0	6,641.21	72
46	J-7	6,512.21	<Collection: 0 items>	8	6,641.24	56
48	J-8	6,465.64	<Collection: 0 items>	0	6,640.93	76
50	J-9	6,472.10	<Collection: 0 items>	0	6,639.32	72
52	J-10	6,476.37	<Collection: 0 items>	0	6,637.68	70
54	J-11	6,477.25	<Collection: 0 items>	0	6,636.69	69
56	J-12	6,464.69	<Collection: 0 items>	0	6,634.58	74
62	J-13	6,465.64	<Collection: 0 items>	0	6,634.84	73
65	J-14	6,452.09	<Collection: 0 items>	0	6,632.62	78
67	J-15	6,450.90	<Collection: 0 items>	0	6,632.48	79
83	J-23	6,473.66	<Collection: 0 items>	0	6,639.37	72
85	J-24	6,470.82	<Collection: 0 items>	0	6,639.07	73
89	J-25	6,468.03	<Collection: 0 items>	0	6,638.90	74
91	J-26	6,467.05	<Collection: 0 items>	17	6,638.96	74
93	J-27	6,456.64	<Collection: 0 items>	0	6,639.71	79
95	J-28	6,439.61	<Collection: 0 items>	0	6,640.53	87
97	J-29	6,431.83	<Collection: 0 items>	0	6,640.66	90
99	J-30	6,431.87	<Collection: 0 items>	0	6,641.18	91
106	J-32	6,455.36	<Collection: 0 items>	0	6,641.49	81
109	J-33	6,455.32	<Collection: 0 items>	0	6,641.65	81
111	J-34	6,468.67	<Collection: 0 items>	8	6,643.63	76
113	J-35	6,468.21	<Collection: 0 items>	0	6,644.04	76
115	J-36	6,463.44	<Collection: 0 items>	10	6,649.67	81
117	J-37	6,463.90	<Collection: 0 items>	13	6,651.51	81
119	J-38	6,463.52	<Collection: 0 items>	0	6,651.47	81
121	J-39	6,442.67	<Collection: 0 items>	0	6,650.78	90
123	J-40	6,445.39	<Collection: 0 items>	0	6,650.31	89
125	J-41	6,462.50	<Collection: 0 items>	0	6,649.74	81
128	J-42	6,460.18	<Collection: 0 items>	0	6,642.38	79
131	J-43	6,467.94	<Collection: 0 items>	0	6,635.55	73
133	J-44	6,467.22	<Collection: 0 items>	17	6,635.55	73
135	J-45	6,454.15	<Collection: 0 items>	0	6,635.55	78
137	J-46	6,454.75	<Collection: 0 items>	0	6,635.55	78
139	J-47	6,459.91	<Collection: 0 items>	8	6,635.55	76
141	J-48	6,467.90	<Collection: 0 items>	10	6,635.55	73
144	J-49	6,472.22	<Collection: 0 items>	11	6,637.05	71
147	J-50	6,473.50	<Collection: 1 items>	0	6,639.37	72
149	J-51	6,483.40	<Collection: 0 items>	12	6,639.84	68
151	J-52	6,494.00	<Collection: 0 items>	10	6,640.37	63
153	J-53	6,506.43	<Collection: 0 items>	0	6,640.80	58
155	J-54	6,507.93	<Collection: 1 items>	8	6,640.85	58
157	J-55	6,502.21	<Collection: 0 items>	16	6,640.84	60

Active Scenario: Max Day + Fire Flow J84

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
159	J-56	6,512.55	<Collection: 0 items>	0	6,640.85	56
162	J-57	6,511.88	<Collection: 0 items>	0	6,641.56	56
164	J-58	6,493.73	<Collection: 0 items>	12	6,646.98	66
166	J-59	6,492.08	<Collection: 0 items>	0	6,646.98	67
168	J-60	6,481.32	<Collection: 0 items>	12	6,647.00	72
170	J-61	6,468.66	<Collection: 0 items>	11	6,645.63	77
172	J-62	6,456.66	<Collection: 0 items>	8	6,645.02	81
174	J-63	6,455.47	<Collection: 0 items>	0	6,644.90	82
176	J-64	6,474.16	<Collection: 0 items>	12	6,641.48	72
179	J-65	6,485.80	<Collection: 0 items>	0	6,648.84	71
181	J-66	6,474.66	<Collection: 0 items>	0	6,649.96	76
183	J-67	6,481.45	<Collection: 0 items>	0	6,647.19	72
186	J-68	6,468.83	<Collection: 0 items>	0	6,645.62	76
188	J-69	6,462.78	<Collection: 0 items>	0	6,645.39	79
190	J-70	6,454.44	<Collection: 0 items>	0	6,645.20	83
193	J-71	6,442.15	<Collection: 0 items>	0	6,635.55	84
195	J-72	6,469.96	<Collection: 0 items>	0	6,658.84	82
211	J-74	6,466.83	<Collection: 0 items>	0	6,660.88	84
221	J-77	6,463.22	<Collection: 0 items>	0	6,655.12	83
223	J-78	6,461.06	<Collection: 0 items>	0	6,653.00	83
235	J-79	6,449.21	<Collection: 0 items>	11	6,632.41	79
237	J-80	6,449.46	<Collection: 0 items>	0	6,626.05	76
239	J-81	6,449.11	<Collection: 0 items>	0	6,625.04	76
241	J-82	6,449.41	<Collection: 0 items>	0	6,623.42	75
243	J-83	6,454.85	<Collection: 0 items>	0	6,629.94	76
246	J-84	6,452.11	<Collection: 1 items>	2,250	6,539.69	38
248	J-85	6,455.97	<Collection: 0 items>	0	6,630.19	75
250	J-86	6,459.08	<Collection: 0 items>	0	6,631.22	74
252	J-87	6,459.57	<Collection: 0 items>	0	6,631.48	74
254	J-88	6,461.65	<Collection: 0 items>	10	6,633.77	74
258	J-89	6,462.70	<Collection: 0 items>	0	6,631.22	73
260	J-90	6,477.68	<Collection: 0 items>	0	6,637.45	69
263	J-91	6,481.24	<Collection: 0 items>	0	6,637.36	68
265	J-92	6,477.12	<Collection: 0 items>	6	6,637.03	69
269	J-94	6,479.70	<Collection: 1 items>	0	6,637.03	68
271	J-95	6,478.01	<Collection: 0 items>	0	6,636.81	69
275	J-96	6,467.73	<Collection: 1 items>	0	6,637.03	73
279	J-97	6,475.24	<Collection: 0 items>	0	6,637.03	70
284	J-98	6,475.51	<Collection: 0 items>	0	6,650.11	76
310	J-105	6,484.00	<Collection: 0 items>	0	6,659.55	76
368	J-124	6,448.00	<Collection: 0 items>	0	6,653.27	89
375	J-127	6,340.00	<Collection: 0 items>	8	6,650.85	134
377	J-128	6,445.00	<Collection: 0 items>	0	6,650.45	89
381	J-129	6,449.21	<Collection: 0 items>	126	6,634.27	80
383	J-130	6,360.00	<Collection: 0 items>	24	6,637.85	120
385	J-131	6,350.00	<Collection: 0 items>	44	6,640.25	126
387	J-132	6,330.00	<Collection: 0 items>	44	6,641.47	135

Active Scenario: Max Day + Fire Flow J84

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand Collection	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
389	J-133	6,440.00	<Collection: 0 items>	0	6,646.65	89
391	J-134	6,450.00	<Collection: 0 items>	167	6,648.74	86
395	J-135	6,455.00	<Collection: 0 items>	0	6,652.23	85
410	J-139	6,436.00	<Collection: 0 items>	0	6,640.61	89
412	J-140	6,435.00	<Collection: 0 items>	14	6,640.59	89
414	J-141	6,430.00	<Collection: 0 items>	0	6,640.59	91

Active Scenario: Max Day + Fire Flow J84 w/Critical Loop Out

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
37	P-2	103	J-1	J-2	16.0	Ductile Iron	120.0	732	1.17	0.000
39	P-3	347	J-2	J-3	16.0	Ductile Iron	120.0	732	1.17	0.000
41	P-4	415	J-3	J-4	16.0	Ductile Iron	120.0	481	0.77	0.000
43	P-5	474	J-4	J-5	16.0	Ductile Iron	120.0	475	0.76	0.000
45	P-6	398	J-5	J-6	16.0	Ductile Iron	120.0	-587	0.94	0.000
47	P-7	1,008	J-6	J-7	16.0	Ductile Iron	120.0	-186	0.30	0.000
58	P-13	52	J-5	J-8	12.0	PVC	120.0	1,062	3.01	0.003
59	P-14	490	J-8	J-9	12.0	PVC	120.0	1,062	3.01	0.003
261	P-16(1)	64	J-10	J-90	12.0	PVC	120.0	1,103	3.13	0.004
272	P-16(2)(1)	249	J-90	J-95	12.0	PVC	120.0	929	2.64	0.003
273	P-16(2)(2)	35	J-95	J-11	12.0	PVC	120.0	1,097	3.11	0.003
63	P-17	530	J-11	J-13	12.0	PVC	120.0	1,097	3.11	0.003
64	P-18	46	J-13	J-12	12.0	PVC	120.0	1,426	4.05	0.006
255	P-19(1)	143	J-12	J-88	12.0	PVC	120.0	1,426	4.05	0.006
256	P-19(2)	441	J-88	J-14	12.0	PVC	120.0	938	2.66	0.003
68	P-20	54	J-14	J-15	12.0	PVC	120.0	938	2.66	0.003
86	P-29	75	J-9	J-24	12.0	PVC	120.0	1,062	3.01	0.003
87	P-30	394	J-24	J-10	12.0	PVC	120.0	1,103	3.13	0.004
88	P-31	295	J-23	J-24	8.0	PVC	120.0	195	1.25	0.001
90	P-32	250	J-24	J-25	8.0	PVC	120.0	154	0.98	0.001
92	P-33	47	J-25	J-26	8.0	PVC	120.0	-220	1.40	0.001
94	P-34	504	J-26	J-27	8.0	PVC	120.0	-237	1.52	0.001
96	P-35	556	J-27	J-28	8.0	PVC	120.0	-237	1.52	0.001
98	P-36	146	J-28	J-29	8.0	PVC	120.0	-180	1.15	0.001
100	P-37	317	J-29	J-30	8.0	PVC	120.0	-251	1.60	0.002
101	P-38	51	J-30	J-3	8.0	PVC	120.0	-251	1.60	0.002
108	P-42	336	J-32	J-1	16.0	Ductile Iron	120.0	382	0.61	0.000
110	P-43	45	J-32	J-33	8.0	PVC	120.0	-382	2.44	0.004
112	P-44	554	J-33	J-34	8.0	PVC	120.0	-382	2.44	0.004
114	P-45	34	J-34	J-35	8.0	PVC	120.0	-740	4.72	0.012
116	P-46	464	J-35	J-36	8.0	PVC	120.0	-740	4.72	0.012
118	P-47	281	J-36	J-37	8.0	PVC	120.0	-531	3.39	0.007
120	P-48	33	J-37	J-38	8.0	PVC	120.0	219	1.40	0.001
122	P-49	537	J-38	J-39	8.0	PVC	120.0	219	1.40	0.001
124	P-50	368	J-39	J-40	8.0	PVC	120.0	219	1.40	0.001
126	P-51	450	J-40	J-41	8.0	PVC	120.0	219	1.40	0.001
127	P-52	58	J-41	J-36	8.0	PVC	120.0	219	1.40	0.001
129	P-53	410	J-34	J-42	8.0	PVC	120.0	350	2.23	0.003
130	P-54	309	J-42	J-1	8.0	PVC	120.0	350	2.23	0.003
132	P-55	261	J-13	J-43	8.0	PVC	120.0	-329	2.10	0.003

Active Scenario: Max Day + Fire Flow J84 w/Critical Loop Out

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
134	P-56	34	J-43	J-44	8.0	PVC	120.0	22	0.14	0.000
136	P-57	632	J-44	J-45	8.0	PVC	120.0	5	0.03	0.000
138	P-58	858	J-45	J-46	8.0	PVC	120.0	5	0.03	0.000
140	P-59	183	J-46	J-47	8.0	PVC	120.0	5	0.03	0.000
142	P-60	422	J-47	J-48	8.0	PVC	120.0	-2	0.01	0.000
143	P-61	359	J-48	J-43	8.0	PVC	120.0	-12	0.08	0.000
145	P-62	464	J-43	J-49	8.0	PVC	120.0	-363	2.32	0.003
146	P-63	541	J-49	J-25	8.0	PVC	120.0	-374	2.39	0.003
148	P-64	167	J-23	J-50	8.0	PVC	120.0	0	0.00	0.000
150	P-65	459	J-23	J-51	8.0	PVC	120.0	-195	1.25	0.001
152	P-66	460	J-51	J-52	8.0	PVC	120.0	-207	1.32	0.001
154	P-67	345	J-52	J-53	8.0	PVC	120.0	-217	1.38	0.001
156	P-68	37	J-53	J-54	8.0	PVC	120.0	-217	1.38	0.001
158	P-69	190	J-54	J-55	8.0	PVC	120.0	16	0.10	0.000
160	P-70	184	J-54	J-56	8.0	PVC	120.0	0	0.00	0.000
161	P-71	260	J-54	J-7	8.0	PVC	120.0	-240	1.53	0.002
163	P-72	71	J-7	J-57	8.0	PVC	120.0	-434	2.77	0.005
165	P-73	1,200	J-57	J-58	8.0	PVC	120.0	-434	2.77	0.005
167	P-74	40	J-58	J-59	8.0	PVC	120.0	-45	0.29	0.000
169	P-75	260	J-59	J-60	8.0	PVC	120.0	-45	0.29	0.000
171	P-76	306	J-60	J-61	8.0	PVC	120.0	432	2.76	0.004
173	P-77	294	J-61	J-62	8.0	PVC	120.0	287	1.83	0.002
175	P-78	29	J-62	J-63	8.0	PVC	120.0	413	2.64	0.004
177	P-79	829	J-63	J-64	8.0	PVC	120.0	413	2.64	0.004
178	P-80	71	J-64	J-6	8.0	PVC	120.0	401	2.56	0.004
180	P-81	476	J-58	J-65	8.0	PVC	120.0	-402	2.57	0.004
184	P-83	493	J-66	J-67	8.0	PVC	120.0	489	3.12	0.006
185	P-84	34	J-67	J-60	8.0	PVC	120.0	489	3.12	0.006
187	P-85	34	J-61	J-68	8.0	PVC	120.0	134	0.85	0.001
189	P-86	437	J-68	J-69	8.0	PVC	120.0	134	0.85	0.001
191	P-87	381	J-69	J-70	8.0	PVC	120.0	134	0.85	0.001
192	P-88	354	J-70	J-62	8.0	PVC	120.0	134	0.85	0.001
194	P-89	320	J-46	J-71	8.0	PVC	120.0	0	0.00	0.000
210	P-94 Closed Pipe	374	J-32	J-72	16.0	Ductile Iron	120.0	0	0.00	0.000
212	P-95	765	J-72	J-74	16.0	Ductile Iron	120.0	-2,020	3.22	0.003
216	P-97	44	J-74	LOW TANK	16.0	Ductile Iron	120.0	-2,020	3.22	0.003
218	P-98	40	J-74	FULL TANK	16.0	Ductile Iron	120.0	0	0.00	0.000
222	P-100	1,399	J-72	J-77	16.0	Ductile Iron	120.0	2,020	3.22	0.003
224	P-101	115	J-77	J-78	8.0	PVC	120.0	927	5.92	0.018
225	P-102	116	J-78	J-37	8.0	PVC	120.0	763	4.87	0.013
236	P-103	247	J-15	J-79	12.0	PVC	120.0	278	0.79	0.000
238	P-104	247	J-79	J-80	8.0	PVC	120.0	1,112	7.10	0.026

Active Scenario: Max Day + Fire Flow J84 w/Critical Loop Out

FlexTable: Pipe Table

ID	Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen- Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
240	P-105	39	J-80	J-81	8.0	PVC	120.0	1,112	7.10	0.026
242	P-106	63	J-81	J-82	8.0	PVC	120.0	1,112	7.10	0.026
244	P-107	242	J-82	J-83	8.0	PVC	120.0	-1,138	7.27	0.027
245	P-108	259	J-83	J-15	8.0	PVC	120.0	-660	4.21	0.010
247	P-109	880	J-82	J-84	8.0	PVC	120.0	2,250	14.36	0.095
249	P-110	46	J-83	J-85	8.0	PVC	120.0	-478	3.05	0.005
251	P-111	190	J-85	J-86	8.0	PVC	120.0	-478	3.05	0.005
253	P-112	48	J-86	J-87	8.0	PVC	120.0	-478	3.05	0.005
257	P-113	424	J-87	J-88	8.0	PVC	120.0	-478	3.05	0.005
259	P-114	305	J-86	J-89	8.0	PVC	120.0	0	0.00	0.000
264	P-115	117	J-90	J-91	8.0	PVC	120.0	174	1.11	0.001
266	P-116	395	J-91	J-92	8.0	PVC	120.0	174	1.11	0.001
274	P-119	275	J-95	J-92	8.0	PVC	120.0	-168	1.07	0.001
280	P-120(1)	52	J-92	J-97	8.0	PVC	120.0	0	0.00	0.000
281	P-120(2)	327	J-97	J-96	8.0	PVC	120.0	0	0.00	0.000
282	P-121	271	J-92	J-94	8.0	PVC	120.0	0	0.00	0.000
285	P-122(1)	324	J-65	J-98	8.0	PVC	120.0	-402	2.57	0.004
286	P-122(2)	27	J-98	J-66	8.0	PVC	120.0	489	3.12	0.006
311	P-123(1)	552	J-98	J-105	8.0	PVC	120.0	-891	5.69	0.017
312	P-123(2)	60	J-105	FULL TANK -West	8.0	PVC	120.0	0	0.00	0.000
314	P-129	85	J-105	LOW TANK -West	8.0	PVC	120.0	-891	5.69	0.017
370	P-150	2,165	J-77	J-124	16.0	Ductile Iron	120.0	1,093	1.74	0.001
396	P-153(1)	1,033	J-78	J-135	8.0	PVC	120.0	164	1.05	0.001
397	P-153(2)	1,839	J-135	J-127	8.0	PVC	120.0	164	1.05	0.001
380	P-154	591	J-127	J-128	8.0	PVC	120.0	156	1.00	0.001
382	P-155	863	J-79	J-129	12.0	PVC	120.0	-845	2.40	0.002
384	P-156	1,289	J-129	J-130	12.0	PVC	120.0	-971	2.75	0.003
386	P-157	823	J-130	J-131	12.0	PVC	120.0	-995	2.82	0.003
388	P-158	387	J-131	J-132	12.0	PVC	120.0	-1,039	2.95	0.003
390	P-159	1,522	J-132	J-133	12.0	PVC	120.0	-1,083	3.07	0.003
392	P-160	612	J-133	J-134	12.0	PVC	120.0	-1,083	3.07	0.003
393	P-161	385	J-134	J-128	12.0	PVC	120.0	-1,250	3.54	0.004
394	P-162	813	J-128	J-124	12.0	PVC	120.0	-1,093	3.10	0.003
411	P-165	320	J-29	J-139	8.0	PVC	120.0	71	0.45	0.000
413	P-166	100	J-139	J-140	8.0	PVC	120.0	71	0.45	0.000
415	P-167	222	J-140	J-141	8.0	PVC	120.0	0	0.00	0.000
421	P-170	589	J-28	J-140	8.0	PVC	120.0	-57	0.37	0.000

APPENDIX D

WASTEWATER FLOWS

CANYONS SOUTH FILING 1A

SANITARY SEWER GENERATION



RESIDENTIAL TYPE		Single Family Detached			DEMAND PER CAPITA			100 GPCD				CAPITA/UNIT	
												3.2	
DESIGN POINT	BASIN	LAND USE	NO. OF UNITS	CAPITA	AVG. DAY FLOW (GPD)	AVG. DAY FLOW (GPM)	AVG. DAY FLOW (CFS)	Peaking Factor	PEAK FLOW (GPD)	PEAK FLOW (GPM)	PEAK FLOW (CFS)		
DP-1	A	SF Detached	63	202	20,160	14.0	0.031	4.0	80,640	56	0.125		
DP-2	B	SF Detached	44	141	14,080	9.8	0.022	4.0	56,320	39	0.087		
DP-3	C ¹	SF Detached	61	195	19,520	13.6	0.030	4.0	78,080	54	0.121		
DP-4	D	SF Detached	52	166	16,640	11.6	0.026	4.0	66,560	46	0.103		
DP-5	E	SF Detached	58	186	18,560	12.9	0.029	4.0	74,240	52	0.115		
DP-6	F	SF Detached	45	144	14,400	10.0	0.022	4.0	57,600	40	0.089		
DP-7	G	Elementary School	1	N/A	3,375	2.3	0.005	4.0	13,500	9	0.021		
DP-8	H	Amenity Center	1	N/A	3,500	2.4	0.005	4.0	14,000	10	0.022		
Filing 1 Total			¹ 325	1034	110,235	77	0.171	3	330,705	230	0.512		
ONSITE SUM			325	1,034	110,235	77	0.171		440,940	306	0.682		

APPENDIX E

WASTEWATER HYDRAULIC MODELING

Filing No. 1A Flow

Worksheet for 8" ADF-Min Slope

Project Description

Friction Method	Manning Formula	
Solve For	Normal Depth	

Input Data

Roughness Coefficient	0.011	
Channel Slope	0.00400	ft/ft
Diameter	0.67	ft
Discharge	73.00	gpm

Results

Normal Depth	0.19	ft
Flow Area	0.08	ft ²
Wetted Perimeter	0.75	ft
Hydraulic Radius	0.11	ft
Top Width	0.60	ft
Critical Depth	0.18	ft
Percent Full	28.5	%
Critical Slope	0.00462	ft/ft
Velocity	1.96	ft/s
Velocity Head	0.06	ft
Specific Energy	0.25	ft
Froude Number	0.93	
Maximum Discharge	0.98	ft ³ /s
Discharge Full	0.92	ft ³ /s
Slope Full	0.00013	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	28.51	%
Downstream Velocity	Infinity	ft/s

Worksheet for 8" ADF-Min Slope

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.19	ft
Critical Depth	0.18	ft
Channel Slope	0.00400	ft/ft
Critical Slope	0.00462	ft/ft

Filing No. 1A Flow

Worksheet for 8" 8.1% Slope

Project Description

Friction Method	Manning Formula	
Solve For	Normal Depth	

Input Data

Roughness Coefficient	0.011	
Channel Slope	0.08100	ft/ft
Diameter	0.67	ft
Discharge	292.00	gpm

Results

Normal Depth	0.18	ft
Flow Area	0.08	ft ²
Wetted Perimeter	0.73	ft
Hydraulic Radius	0.10	ft
Top Width	0.59	ft
Critical Depth	0.38	ft
Percent Full	26.9	%
Critical Slope	0.00536	ft/ft
Velocity	8.53	ft/s
Velocity Head	1.13	ft
Specific Energy	1.31	ft
Froude Number	4.19	
Maximum Discharge	4.43	ft ³ /s
Discharge Full	4.12	ft ³ /s
Slope Full	0.00202	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	26.87	%
Downstream Velocity	Infinity	ft/s

Worksheet for 8" 8.1% Slope

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.18	ft
Critical Depth	0.38	ft
Channel Slope	0.08100	ft/ft
Critical Slope	0.00536	ft/ft

Filing No. 1A Flow

Worksheet for 8" 0.4% Slope-Capacity Check

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.011	
Channel Slope	0.00400	ft/ft
Normal Depth	0.53	ft
Diameter	0.67	ft

Results

Discharge	397.05	gpm
Flow Area	0.30	ft²
Wetted Perimeter	1.47	ft
Hydraulic Radius	0.20	ft
Top Width	0.54	ft
Critical Depth	0.45	ft
Percent Full	79.1	%
Critical Slope	0.00614	ft/ft
Velocity	2.96	ft/s
Velocity Head	0.14	ft
Specific Energy	0.67	ft
Froude Number	0.70	
Maximum Discharge	0.98	ft³/s
Discharge Full	0.92	ft³/s
Slope Full	0.00374	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	79.10	%
Downstream Velocity	Infinity	ft/s

Worksheet for 8" 0.4% Slope-Capacity Check

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.53	ft
Critical Depth	0.45	ft
Channel Slope	0.00400	ft/ft
Critical Slope	0.00614	ft/ft

Filing No. 1A Flow

Worksheet for 8" 0.4% Slope-Velocity Check

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.011	
Channel Slope	0.00400	ft/ft
Diameter	0.67	ft
Discharge	292.00	gpm

Results

Normal Depth	0.42	ft
Flow Area	0.23	ft ²
Wetted Perimeter	1.22	ft
Hydraulic Radius	0.19	ft
Top Width	0.65	ft
Critical Depth	0.38	ft
Percent Full	62.3	%
Critical Slope	0.00536	ft/ft
Velocity	2.82	ft/s
Velocity Head	0.12	ft
Specific Energy	0.54	ft
Froude Number	0.83	
Maximum Discharge	0.98	ft ³ /s
Discharge Full	0.92	ft ³ /s
Slope Full	0.00202	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	62.30	%
Downstream Velocity	Infinity	ft/s

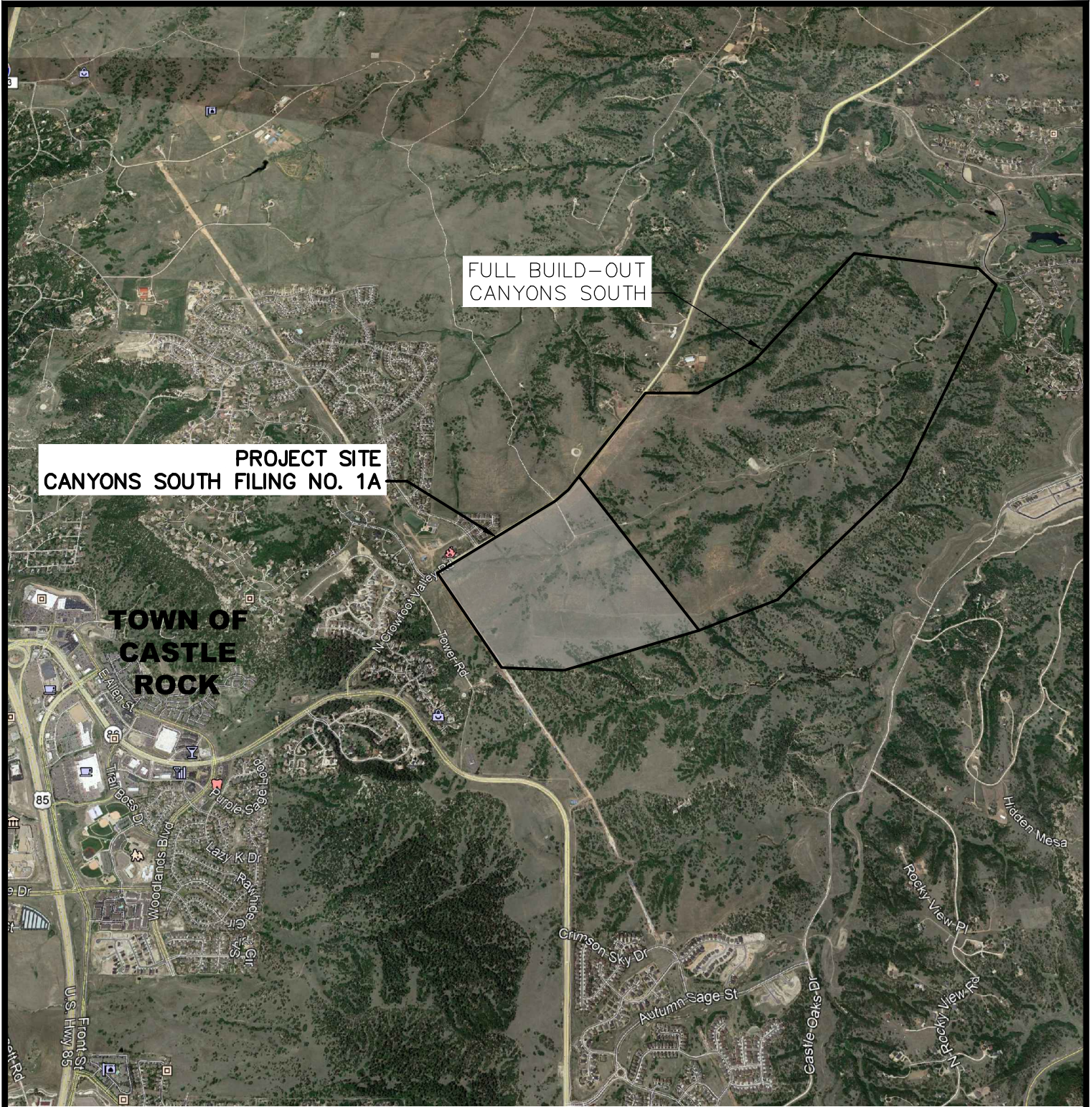
Worksheet for 8" 0.4% Slope-Velocity Check

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.42	ft
Critical Depth	0.38	ft
Channel Slope	0.00400	ft/ft
Critical Slope	0.00536	ft/ft

APPENDIX F

MAPS AND PLANS



Calibre

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Construction Management Civil Engineering Surveying

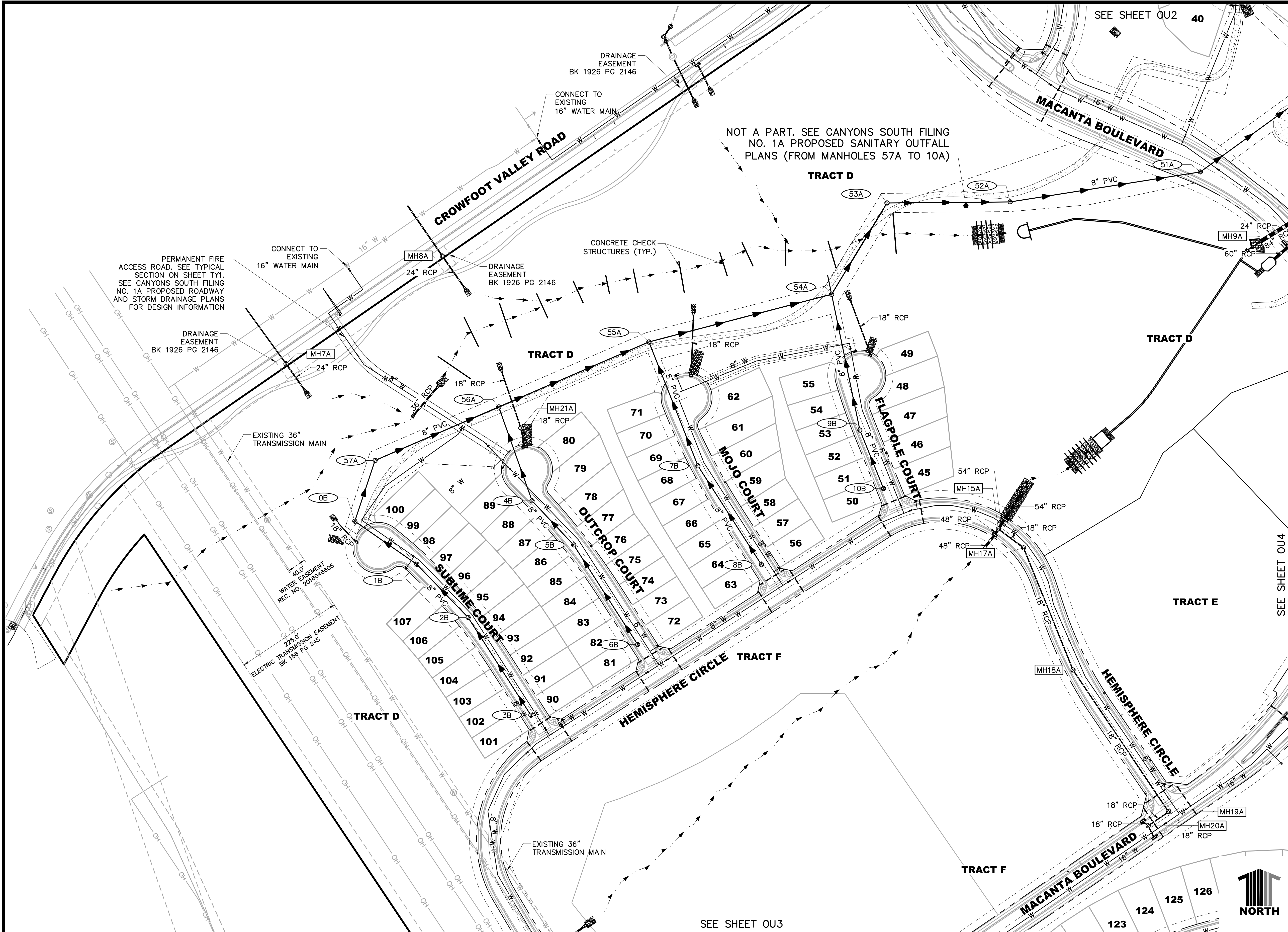
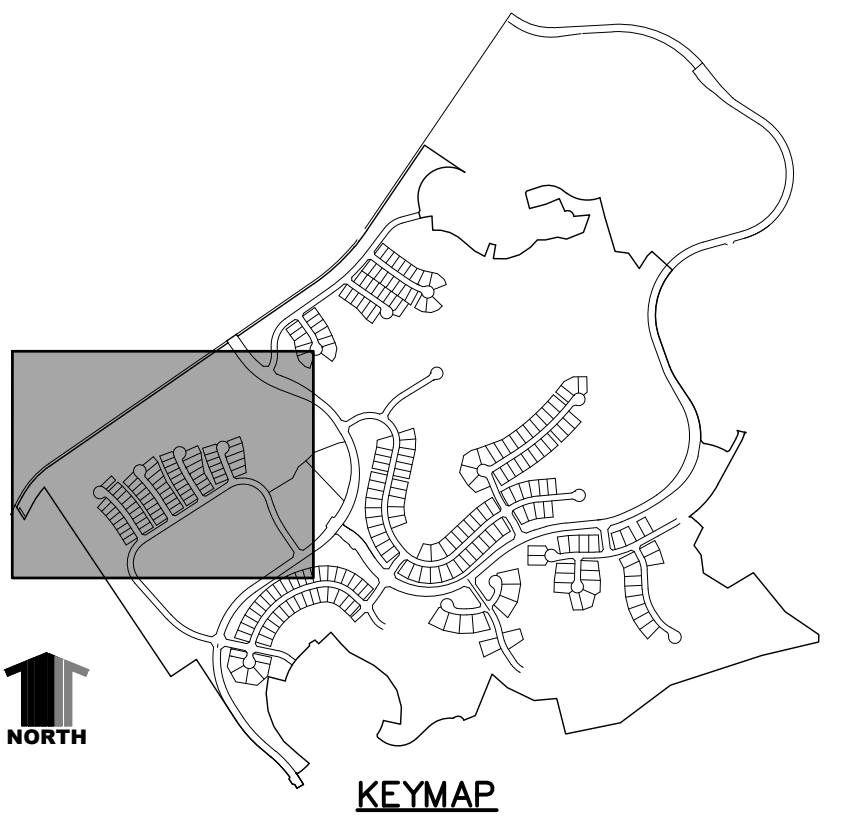
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Date
APRIL 2019

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PLOTTED BY: KYLER SANFORD PLOT DATE: 8/12/2019 12:01 PM
XREFS:



CONSTRUCTION NOTES:

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LEGEND

- PROPOSED STORM DRAIN MANHOLE
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN INLET
- EXISTING STORM DRAIN MANHOLE
- EXISTING STORM DRAIN
- EXISTING STORM DRAIN INLET
- PROPOSED SANITARY SEWER MAIN
- PROPOSED SANITARY SEWER MANHOLE
- EXISTING SANITARY SEWER MAIN
- EXISTING SANITARY SEWER MANHOLE
- PROPOSED WATERMAIN
- PROPOSED FIRE HYDRANT
- PROPOSED GATE VALVE
- EXISTING WATERMAIN
- EXISTING FIRE HYDRANT
- EXISTING GATE VALVE

PROJECT BENCHMARK:

(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68



Utility Notification
Center of Colorado

TOWN APPROVAL BLOCK

TOWN OF CASTLE ROCK APPROVAL PLANS
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DATE OF DEVELOPMENT SERVICES APPROVAL

APPROVED BY: _____
DEVELOPMENT SERVICES _____ DATE _____

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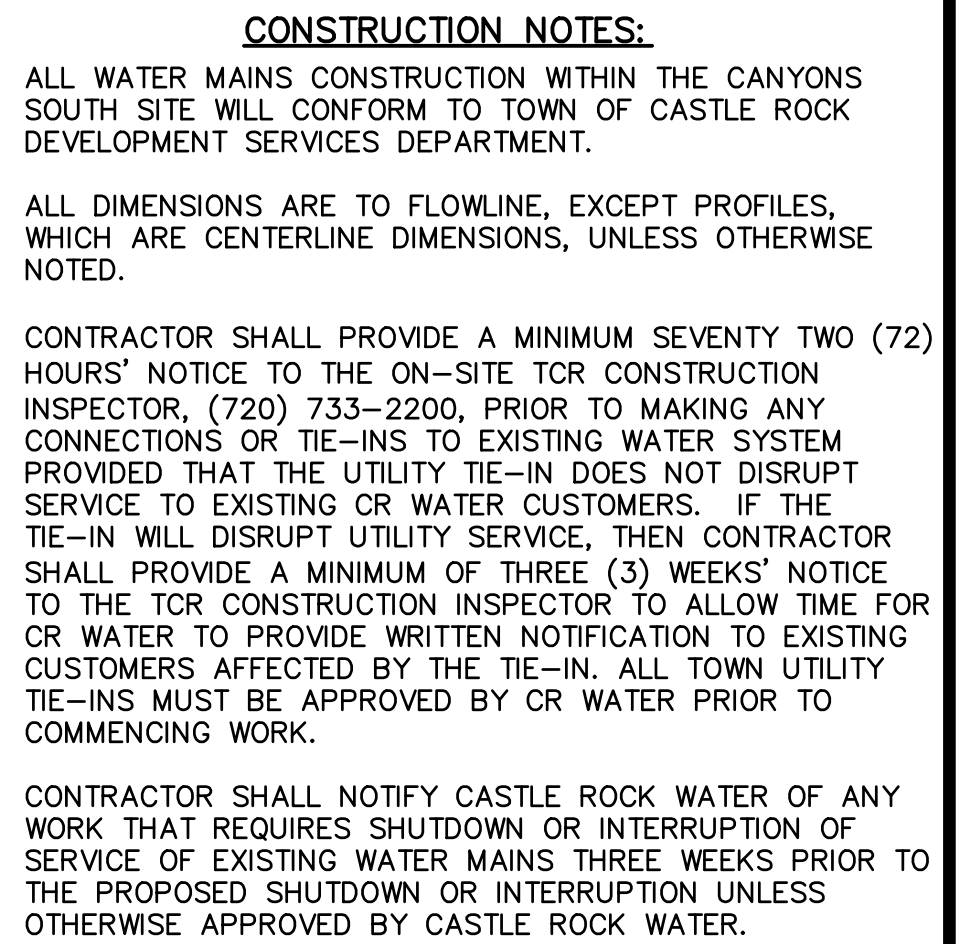
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Job Number	HINES CS
Prepared For	HINES
Designer	CAP
Drafter	JAH
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CANYONS SOUTH
SANITARY SEWER AND WATER PLANS
OVERALL UTILITY PLAN

Sheet
OU1
Date
AUGUST 12, 2019



	PROPOSED STORM DRAIN MANHOLE
	PROPOSED STORM DRAIN
	PROPOSED STORM DRAIN INLET
	EXISTING STORM DRAIN MANHOLE
	EXISTING STORM DRAIN
	EXISTING STORM DRAIN INLET
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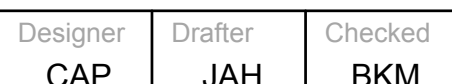
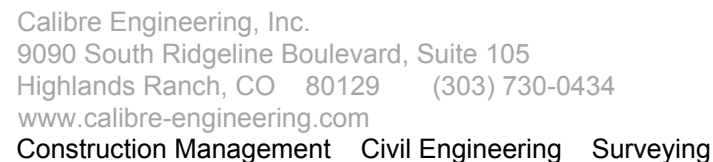
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DEVELOPMENT SERVICES	DATE
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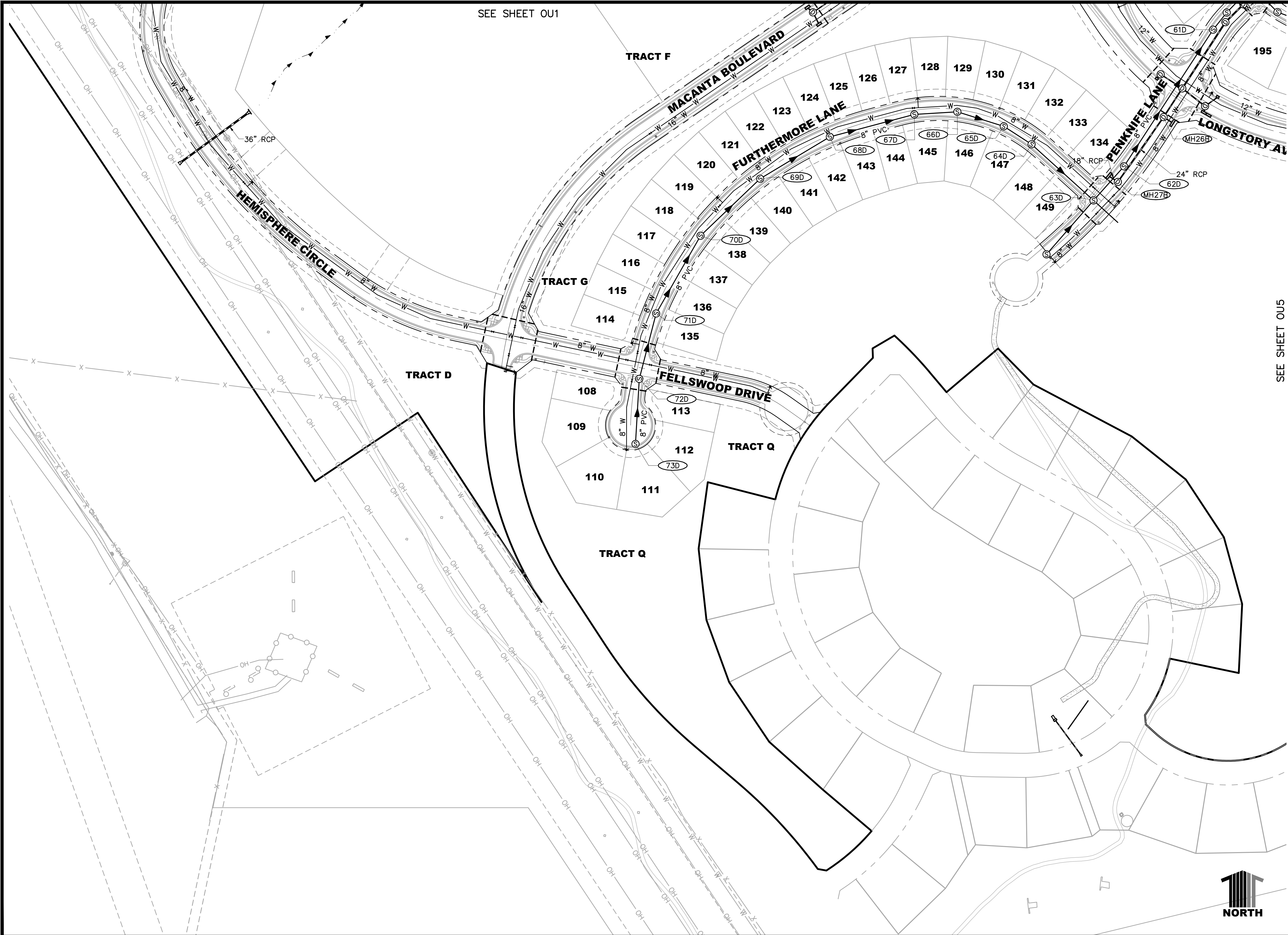
AUGUST 12, 2019



Hines

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HINES

SEE SHEET OU4



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 - EXISTING SANITARY SEWER MAIN
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 - PROPOSED FIRE HYDRANT
 - PROPOSED GATE VALVE
 - EXISTING WATERMAIN
 - EXISTING FIRE HYDRANT
 - EXISTING GATE VALVE

PROJECT BENCHMARK:
(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

811 UNCC
CALL BEFORE
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OR
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Center of Colorado

TOWN APPROVAL BLOCK

TOWN OF CASTLE ROCK APPROVAL PLANS
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DEVELOPMENT SERVICES _____ DATE _____

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DATE	REVISION	DESCRIPTION



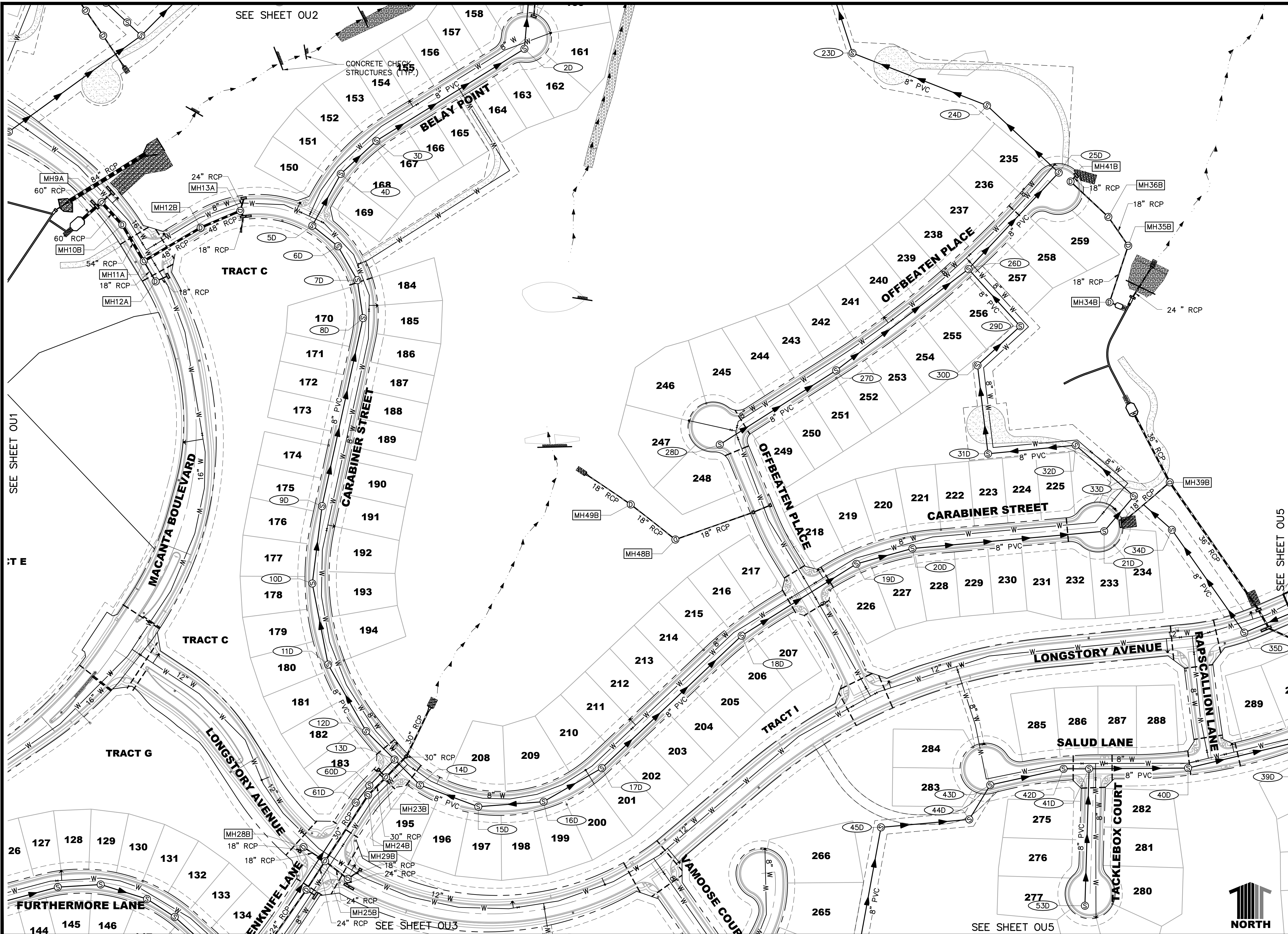
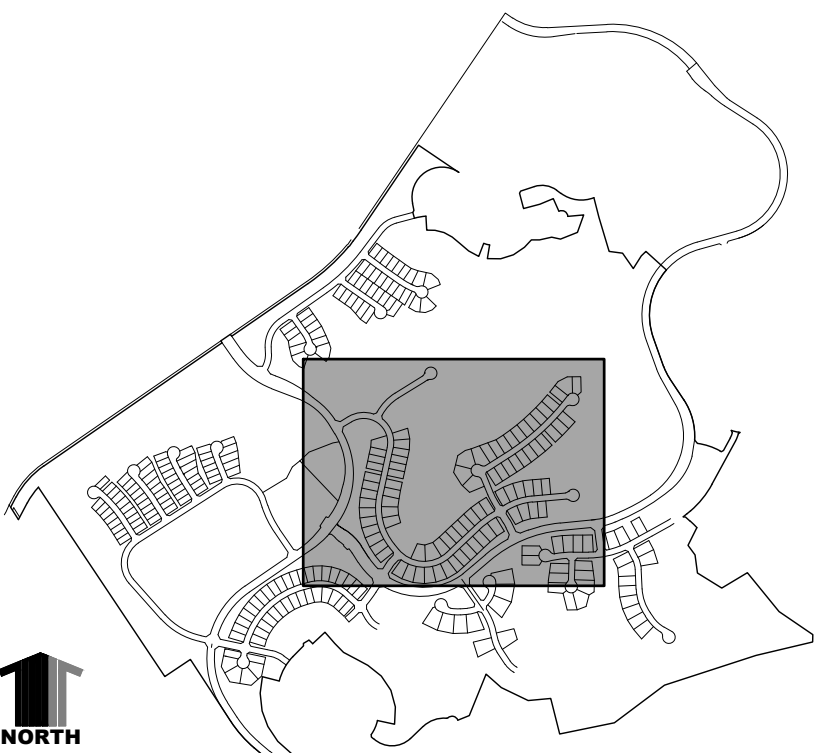
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Job Number HINES CS	Designer CAP
Prepared For HINES	Drafter JAH
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SANITARY SEWER AND WATER PLANS
OVERALL UTILITY PLAN

Sheet OU3 Date AUGUST 12, 2019	7 of 54
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DEVELOPMENT SERVICES DATE

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DATE	REVISION	DESCRIPTION

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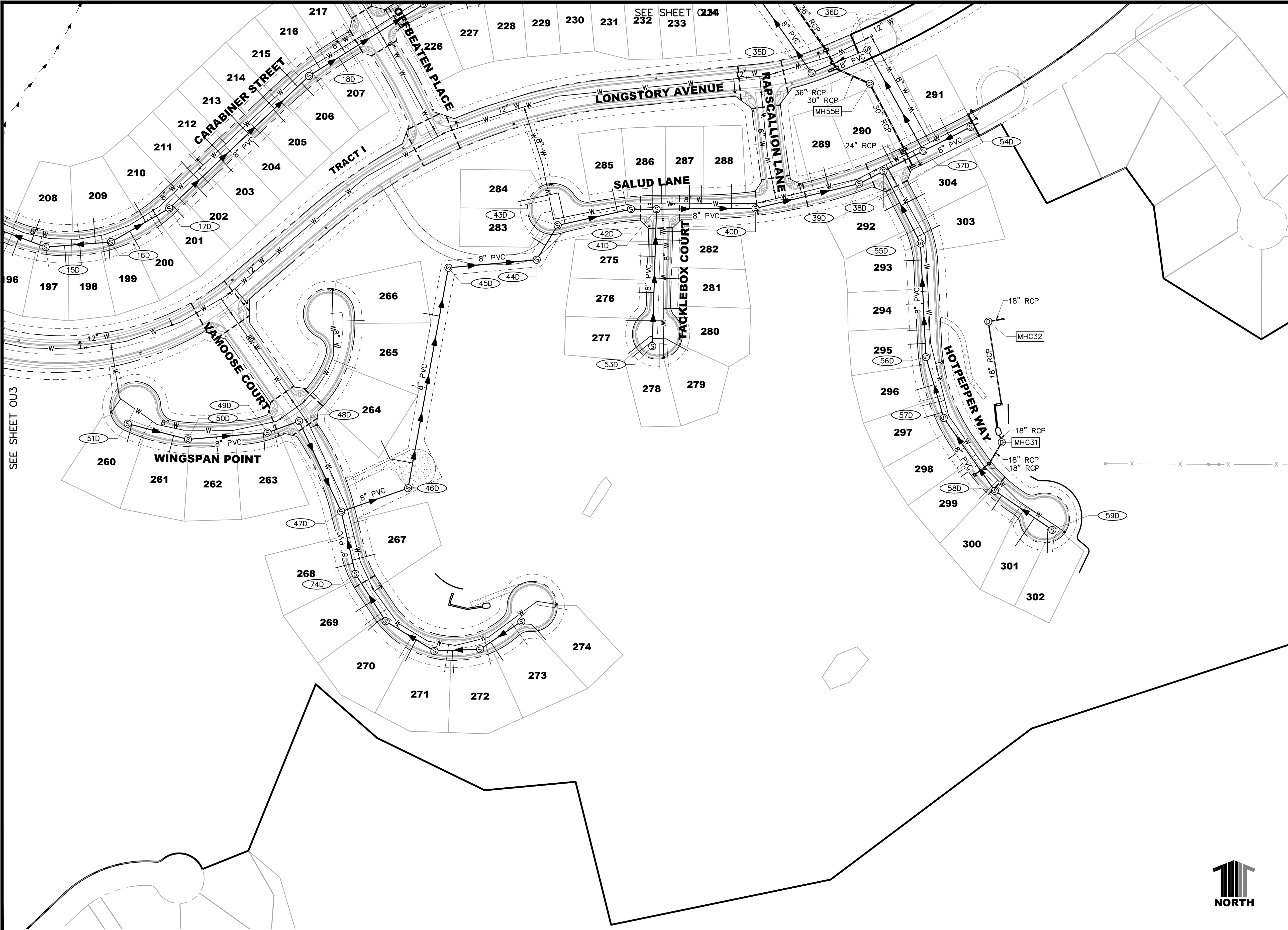
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SANITARY SEWER AND WATER PLANS
OVERALL UTILITY PLAN

Sheet OU4	8 of 54
Date AUGUST 12, 2019	



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(AZTEC #401)
DOUGLAS COUNTY BENCHMARK TT17A
(NAVD88 DATUM) ELEVATION=6483.68

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PLOT BY: KYLER SANFORD PLOT DATE: 8/12/2019 12:03 PM
XREFS:

DATE	REVISION	DESCRIPTION

Drawing Name
23OU5.dwg
Job Number
HINES CS
Prepared For
HINES

0 50 100 200
1 inch = 100 ft. Horizontal

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SANITARY SEWER AND WATER PLANS
OVERALL UTILITY PLAN

Sheet
0U5
Date
AUGUST 12, 2019

9
of
54



LEGEND

PROPOSED BASIN LINE

PROPOSED BASIN LABEL

J1

1

BASIN DESIGNATION

NUMBER OF UNITS

Color Coding Legend

Pipe: Diameter (in)

<= 8.0

<= 12.0

<= 16.0

CANYONS SOUTH FILING 2

LONGSTORY AVE.

N. CROWFOOT VALLEY RD.

MACANTA BLVD.

CANYONS SOUTH FILING 1

PATH: P:\HINES\CS\UTILITY\CANYONS SOUTH FILING 1 WATER MODEL\20190620.DWG
PLOTTED BY: COREY PETERSEN PLOT DATE: 6/24/2019 1:07 PM
XREFS: 30BBase, 20WECN, 23UTILITYB, 20EUT, 20PPN, 20EPN, 20int, 20Basse.

DATE	REVISION	DESCRIPTION



Drawing Name

Canyons South Filing 1 Water Model 20190620.DWG

Job Number

HINES CS

Prepared For

HINES

Designer

KLK

Drafter

KLK

Checked

KLH

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CANYONS SOUTH

UTILITY STUDY

WATER MODEL EXHIBIT

Sheet

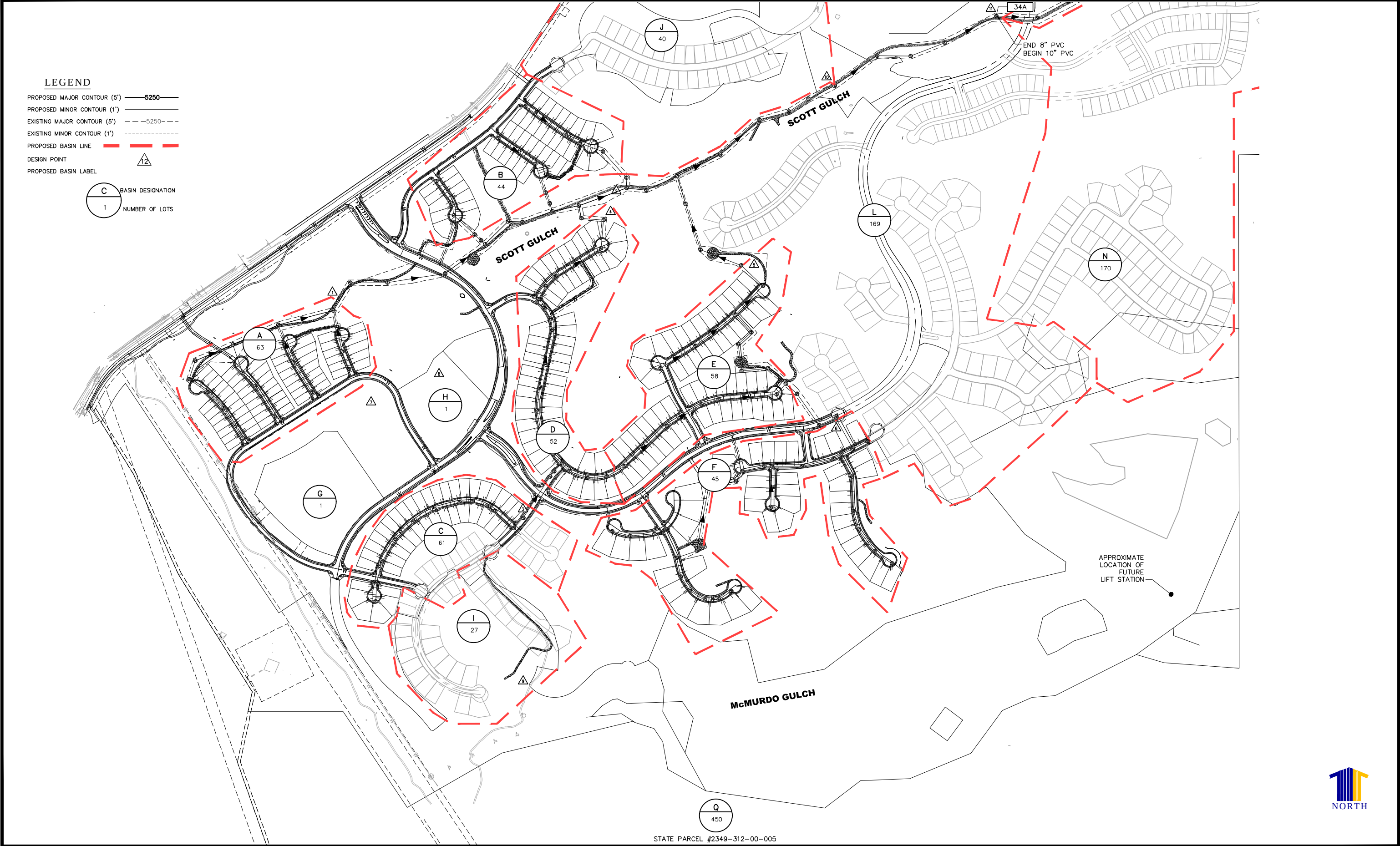
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1 of 1

Date

JUNE 2019

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DATE	REVISION	DESCRIPTION



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Job Number	HINES CS
Prepared For	HINES

Designer	Drafter	Checked
KLB	KLB	KLH



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UTILITY STUDY
SANITARY SEWER EXHIBIT

Sheet
SS1
Date
MARCH 2019

1
of
2



Canyons South

Downstream Pinery
Wastewater System Evaluation

SANITARY SEWER REPORT

Prepared for:

LC Macanta, LLC
c/o Lowe Enterprises
7400 E. Orchard Road Suite 2500N
Greenwood Village, CO 80110

Prepared by:



1601 Blake Street, Suite 200
Denver, Colorado 80202
(303) 572-0200
fax (303) 572-0202

April 2015

[illegible]

except between manhole 1160 and the north outfall which is RCP. A factor of 0.01 was used for Manning's Equation with PVC and 0.013 for RCP.

Existing flows in the pipes have been calculated based on the Pinery Criteria for single family homes, townhomes, multi-family homes, schools and commercial buildings. The full build-out of the Pinery has been considered in the calculation of the flows. The design points are shown in Figures EX.01 & EX.02.

There are 73 pipes between manholes 2252 and the Pinery Wastewater Treatment Facility totaling approximately 21,000 lineal feet. Slopes were provided on the as-built drawings. No as-built information is available for the north outfall into the Pinery Wastewater Treatment Facility and has been assumed to be at same size and slope of the pipes upstream. The pipe runs are categorized into three categories: <86% of full flow, 86%-100% of full flow, > 100% full flow.

The analysis was conducted under two different scenarios. The first scenario consisted of the previously approved Canyons South which had 968 units, two schools and a clubhouse as Pinery has been paid for and is currently obligated to provide service. The second scenario consisted of the updated Canyons South site which has 1575 units, two schools and a clubhouse. Figure EX.01 shows the pipe capacity in the first previously approved condition and Figure EX.02 shows the pipe capacity in the proposed second condition.

IV. CONCLUSIONS

Scenario #1 for Canyons South with 968 units, school site, etc. results in the upstream run of pipe being undersized near the connection point into the Pinery system. The run of pipes upstream of manholes 2147 are undersized whereas all pipes downstream of manhole 2147 have sufficient capacity. The total lengths of pipes in each condition are:

- Below 86% of full flow: 20,665 LF
- 86% to 100% of full flow: 0 LF
- Over 100% of full flow: 335 LF

Scenario #2 for Canyons South development results in more pipes being undersized near the connection point into the Pinery system. All runs of pipe upstream of manhole 2051 are over 100% of full flow. The development of the additional 607 units creates around a 60% increase in the calculated flows from Canyons South and that has a moderate effect on the downstream system, creating 3% to 7.4% increase of the calculated flows. The pipe conditions by pipe length for the proposed Canyons South are:

- Below 86% of full flow: 15,055 LF
- 86% to 100% of full flow: 0 LF
- Over 100% of full flow: 5,945 LF