AGENDA
CITY OF SHERIDAN
JANUARY 15, 2024
REGULAR COUNCIL MEETING START 7:00 P.M.

1. Call to Order

2. Pledge of Allegiance

3. Invocation to be given by Gary Kopsa, Chaplain with Volunteers of America

4. Roll Call of Members

5. Consideration of Agenda

6. Community Update

   A. Sheridan County Historical Society - Danielle Stuckle, Executive Director of the Museum at the Bighorns

   B. National Human Trafficking Proclamation - Executive Director of Uprising Teri Markham

7. Comments from the Public

8. Public Hearings

   A. Public Hearing for PL-23-44, Ordinance 2274, 1600 Solutions Way Rezone 3.45 Acres from B-2 to HE - Public Works Director Hanns Mercer

      i. Consideration of First Reading of PL-23-44, Ordinance 2274, 1600 Solutions Way Rezone 3.45 Acres from B2 to HE

   B. Public Hearing for PL-23-51, Ordinance 2278, Story House Property Company Rezone 38.38 Acres from B-2 to PUD - Public Works Director Hanns Mercer

      i. Consideration of First Reading of PL-23-51, Ordinance 2278, Story House Property Company Rezone 38.38 Acres from B-2 to PUD

9. Consent Agenda

   A. Consideration of Two (2) Year City Prosecutor Appointment to Zachary Leininger

B. Final Acceptance of Public Infrastructure for VOA Life House Fire Hydrant

C. Appointment of Brandy Campbell to the Planning Commission to fill the remainder of Evelyn Gernaat's term expiring 7/1/24.

D. Minutes of Regular Council Meeting January 2, 2024

E. Claims

OLD BUSINESS

NEW BUSINESS

10. Consideration of the Extension of the Funding Agreement between the City and SEEDA Joint Powers Board - City Attorney Brendon Kerns

11. Consideration of PL-23-49, Resolution 02-49, Teal Springs Subdivision PUD Phase I - Public Works Director Hanns Mercer

12. Consideration of Award for Fire Service MasterPlan Study in the Amount of not to exceed $50,403.00 to Emergency Service Consulting Int'l- Fire Chief Gary Harnish

13. Consideration of Resolution 01-24 Submission of Federal Mineral Royalty Capital Construction Account Grant (MRG) Application in the Amount of $1,000,000 for the Hub on Smith Parking Lot Improvements - Public Works Director Hanns Mercer

14. Council Comments and Requests for Future Agenda Items

15. Adjournment

CITY OF SHERIDAN, WYOMING
55 Grinnell Street, P.O. Box 848, Sheridan Wyoming 82801
Ph (307) 674-6483 Fax (307) 674-2195

Executive

MEMORANDUM

RE: National Human Trafficking Proclamation - Executive Director of Uprising Teri Markham
From: Jennifer Rizer, Executive Assistant
To: City Council
CC:
Date: 01/15/2024

Recommendation:
Please see the attached Proclamation.

Attachments

Human Trafficking Proclamation

PROCLAMATION
Human Trafficking Proclamation

WHEREAS, Human trafficking is a nationwide public health and civil rights crisis that includes both labor and sex trafficking. Its victims and survivors are everywhere, with Wyoming being no exception.

WHEREAS, Anyone can become a victim of trafficking. Victims/survivors come from every background, race, gender, sexual orientation, and economic status. Traffickers target individuals who, for any reason, are vulnerable.

WHEREAS, Young people are particularly vulnerable to trafficking and exploitation; we recognize our duty to provide prevention education to this population, their parents, and caregivers.

WHEREAS, Increased community education on how to identify victims of human trafficking, along with increased knowledge of local resources and services for those affected by these criminal actions, can help restore freedom and dignity to identified survivors, as well as help diminish the number of future victims.

WHEREAS, Wyoming must continue to seek to prevent human trafficking before it can occur by promoting safe, healthy, and supportive environments.

WHEREAS, Sheridan County joins the statewide Human Trafficking Task Force, Uprising, and our community partners in striving to become a place where human trafficking does not exist, where all people have opportunities available to them and are treated as fully human and worthy of a supportive community and freedom.

NOW, THEREFORE, the City of Sheridan, in partnership with Uprising, do hereby proclaim the month of January as Human Trafficking Prevention Month and encourage all our citizens to become more informed on this growing problem, to be vigilant and report suspicious activity, to work towards solutions to end human trafficking, and to start the conversations about human trafficking and exploitation in all its forms in our communities. If you see something that doesn't look right, take action and call the National Human Trafficking Hotline at (888) 373-7888.

IN WITNESS WHEREOF, I, Richard Bridger, Mayor of the City of Sheridan, Wyoming, have hereunto set my hand and seal of the City of Sheridan to be affixed this 15th day of January 2024.

_____

Richard Bridger, Mayor
City of Sheridan

CITY OF SHERIDAN, WYOMING

55 Grinnell Street, P.O. Box 848, Sheridan Wyoming 82801
Ph (307) 674-6483 Fax (307) 674-2195

Public Works

MEMORANDUM

RE: Public Hearing for PL-23-44, Ordinance 2274, 1600 Solutions Way Rezone 3.45 Acres from B-2 to HE - Public Works Director Hanns Mercer

From: Hanns Mercer, Public Works Director

To: City Council

CC:

Date: 12/19/2023

Recommendation:

Staff received a positive recommendation from the Planning Commission regarding PL-23-44, a request to rezone a 3.45-acre parcel at 1600 Solutions Way from B-2 Business District (B-2) to Higher Education District (HE). Approval of the rezoning request would allow the Northern Wyoming Community College District (NWCCD), the "Applicant", to incorporate the parcel into their Campus, which is located primarily west of I-90 but is expanding in accordance with the Sheridan College Facilities Master Plan – 2023 Update.

Background:

A 25,000 ft.^{2} storage warehouse is currently on the property, surrounded by concrete slab parking totaling 92,612 ft.^{2}. The parcel is located on the southeast corner of Heartland Drive and Solutions Way, the combination of roads that currently serves as the primary access route. Adjacent parcels to the north, west, and south are, and will remain, zoned B-2; the parcel to the east is B-1. Current nearby land uses include a home improvement stores, RV and ATV dealers, automotive repair shops, professional services, and agriculture.

From the Sheridan College Master Plan 2023 Update:

The Advanced Manufacturing and Applied Sciences Center will provide critical workforce training for our region in the areas of composite materials, design, fabrication, automation, additive manufacturing (3D printing), and robotics. This facility will also support training in the construction trades particularly HVAC, plumbing, and commercial and residential electric. In addition, the center will house a new manufacturing incubator, supporting the technical needs of entrepreneurs seeking to develop an idea and move it to the next level.

The Master Plan schedule estimates completion of the Center in Summer 2024.

Staff sent out 10 nearest neighbor notifications to the property owners within 300 feet as part of this application. In addition, legal ads were published in the paper and a sign posted on the property.

Discussion:

Required Findings

Sheridan City Code Appendix A §16 grants the City Council authority to:

...from time to time, in accordance with the provisions of law [...] after report by the Planning Commission and after a hearing in relation thereto [...] amend, supplement, change, modify or repeal the regulations herein and the boundaries of districts herein or subsequently established.

Should the Planning Commission recommend approval of this rezoning request, its report and recommendation will be presented to the Sheridan City Council at a properly noticed public hearing.

According to Appendix A §8, higher education facilities are a permitted land use in the B-2 Business District by omission of such facilities in the prohibited use section of the code. The Higher Education District (Appendix A, §9A) was established through Ordinance No. 2048, recorded 10/1/2008 in Book 30, Page 0784. Ordinance 2048 was created to enable the diverse activities, offerings, and facilities Sheridan College (and any other post-secondary education institution) builds and uses. The activities proposed for the property in the Sheridan College Master Plan 2023 Update would be permissible in the HE District.

Staff Comments

All rezoning requests to a Higher Education (HE) District must provide a Master Plan to be approved as part of the rezoning process. The Applicant has provided a copy of the 2023 Master Plan Update, satisfying this requirement.

Would granting the rezone request be contrary to the public interest?

The rezoning of 1600 Solutions Way would allow Sheridan College to expand its capacity to provide workforce training and education in manufacturing and applied sciences. The 2017 Sheridan Land Use Plan includes community survey responses demonstrating a widely shared interest in the city's education and training opportunities. As this proposed rezoning and future development is intended to improve Sheridan College, it is in the public interest to approve this rezoning request.

Attachments

Aerial

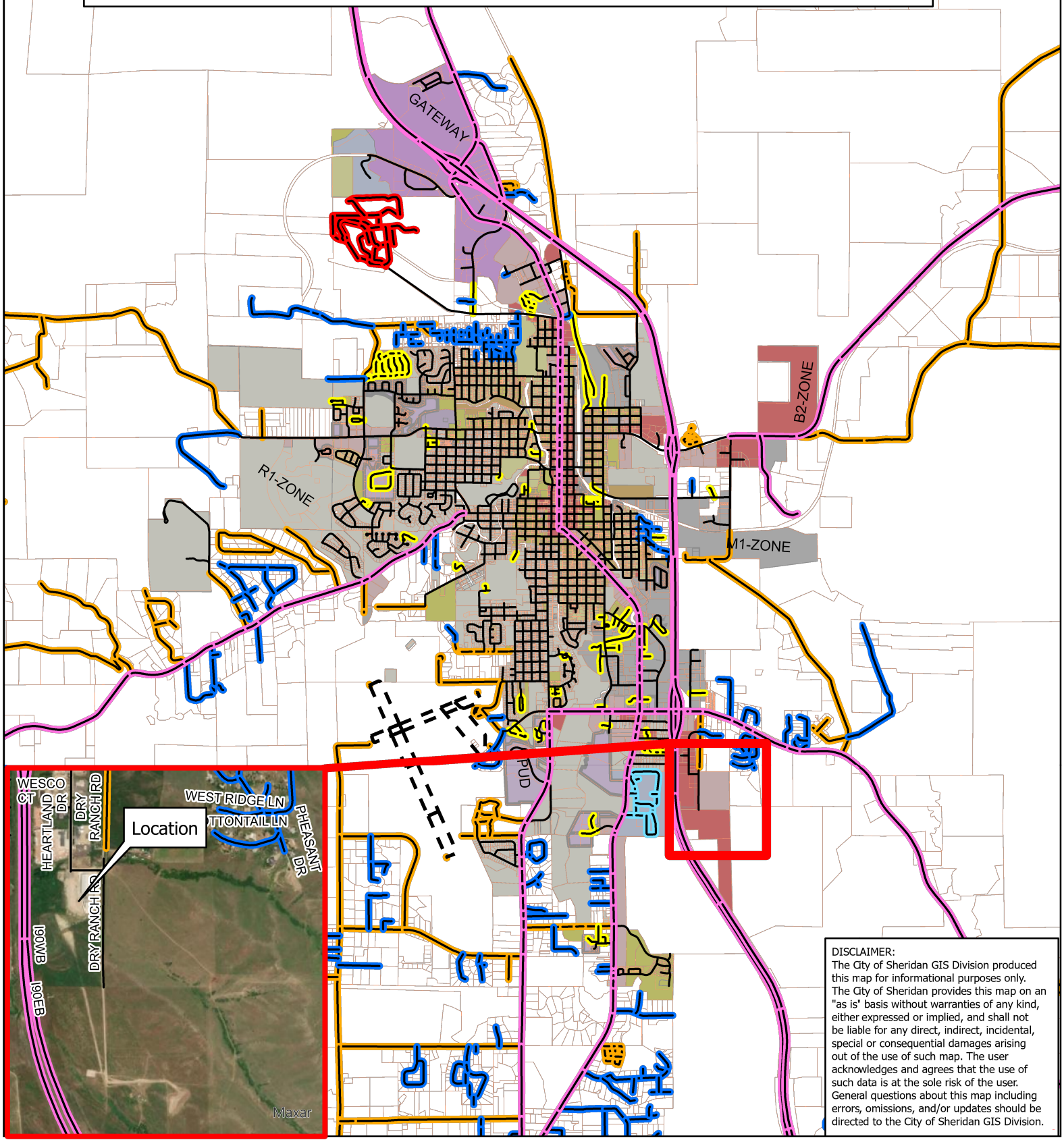
Rezone Petition

Rezone Exhibit

ORD 2274 with Exhibits

Master Plan

1600 Solutions Way rezone



DISCLAIMER:
The City of Sheridan GIS Division produced this map for informational purposes only. The City of Sheridan provides this map on an "as is" basis without warranties of any kind, either expressed or implied, and shall not be liable for any direct, indirect, incidental, special or consequential damages arising out of the use of such map. The user acknowledges and agrees that the use of such data is at the sole risk of the user. General questions about this map including errors, omissions, and/or updates should be directed to the City of Sheridan GIS Division.

CITY OF Sheridan WYOMING

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Date: 12/4/2023 9:38 AM User: sgoodman

PETITION FOR REZONING

TO THE CITY COUNCIL OF THE CITY OF SHERIDAN, WYOMING:

Pursuant to the provisions of W.S. 15-1-601, 15-1-602, 15-1-603 et. seq., and other applicable statutes, and Appendix A, Sec. 16 of the Sheridan City Code, the undersigned landowner(s) respectfully petition and show the City Council as follows:

1. This is a petition for the rezoning of parcels of land within the city limits of Sheridan, Wyoming, having a legal description as follows:

   See Attached

2. Northwest Community College District are the owners or authorized agents of said described land proposed to be rezoned.

3. A map of the area sought to be rezoned is attached hereto and made a part hereof.

4. Petitioners hereby request that said lands be zoned Higher Education District.

Therefore, Petitioners pray said parcel(s) be rezoned Higher Education District, pursuant to and in accordance with the applicable Wyoming Statutes and City Ordinances after proper notice and public hearing.

Dated this 31st day of Oct, 2023

Signed by the Petitioners:

FACILITIES DIRECTOR

Subscribed and Sworn before me this 31st day of October, 2023

Notary Public

RANDY SCHMIDT - NOTARY PUBLIC
COUNTY OF SHERIDAN STATE OF WYOMING
MY COMMISSION EXPIRES MARCH 25, 2025

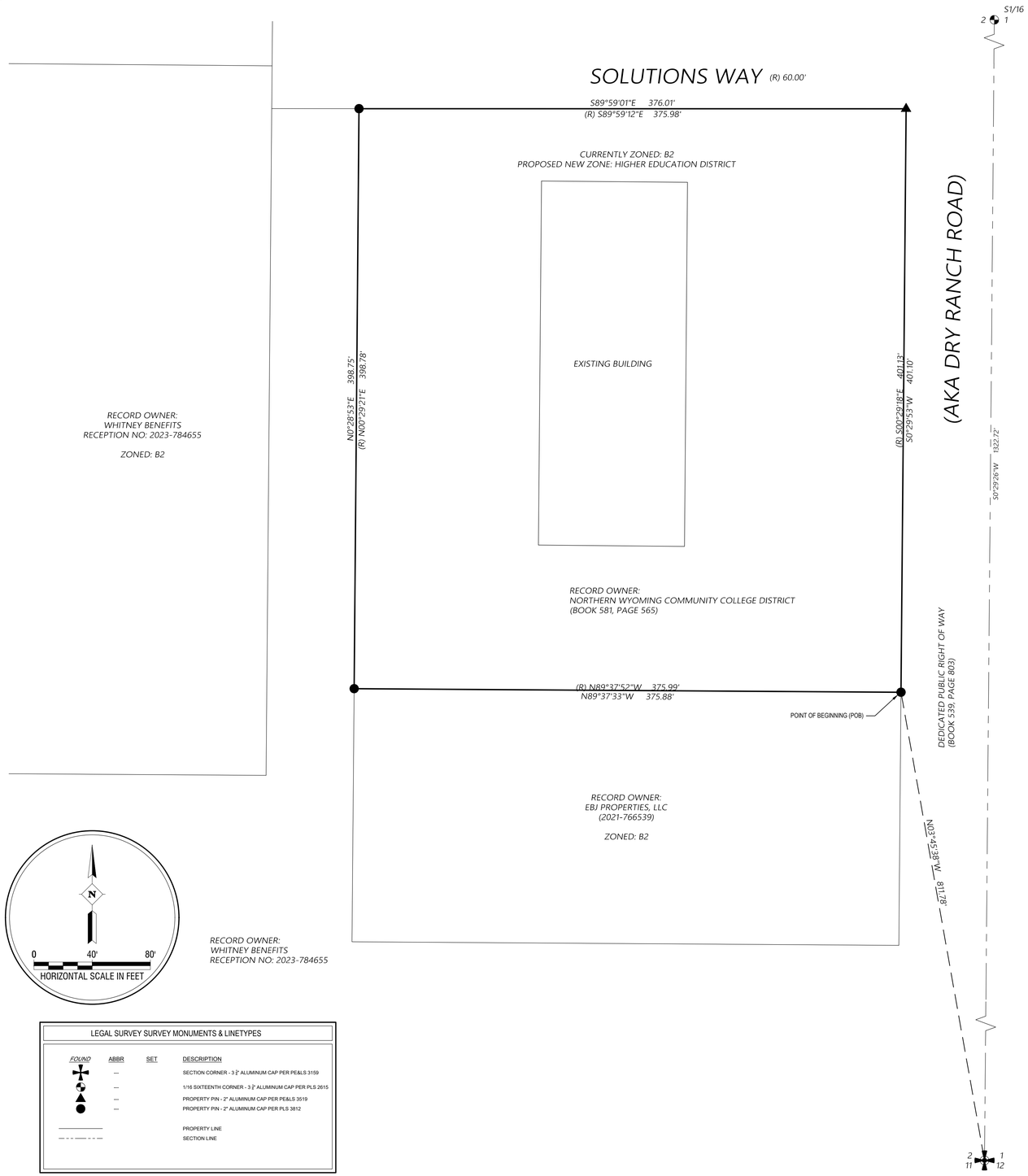
My commission expires: March 25, 2025

LEGAL DESCRIPTION

A tract of land situated in the SE1/4SE1/4 of Section 2, Township 55 North, Range 84 West, 6th P.M., City of Sheridan, Sheridan County, Wyoming; said tract of land being more particularly described as follows:

Commencing at the southeast corner of said Section 2 (Monumented with a 3 ¼" Aluminum Cap per PE&LS 3159); thence N03°45'38'W, 811.78 feet to the POINT OF BEGINNING of said tract, said point being the northeast corner of a tract of land described in Document Number 2021-766539; thence N89°37'33"W, 375.88 feet along the north line of said tract described in Document Number 2021-766539; thence N00°28'53"E, 398.75 feet to a point, said point lying on the south right-of-way line of Solutions Way; thence S89°59'01"E, 376.01 feet along said south right-of-way line of Solutions Way to a point, said point being the northeast corner of a tract of land described in Book 581 of Deeds, Page 565, and lying on the west line of a right-of-way dedication described in Book 539 of Deeds, Page 803; thence S00°29'53", 401.10 feet along the east line of said tract described in Book 581 of Deeds, Page 565, and the west line of said right-of-way dedication described in Book 539 of Deeds, Page 803 to the POINT OF BEGINNING of said tract.

Said tract contains 3.45 acres of land, more or less.



LEGAL SURVEY SURVEY MONUMENTS & LINETYPES

FOUND	ABBR	SET	DESCRIPTION
✛	---		SECTION CORNER - 3 ¼" ALUMINUM CAP PER PE&LS 3159
⊕	---		1/16 SIXTEENTH CORNER - 3 ¼" ALUMINUM CAP PER PLS 2615
▲	---		PROPERTY PIN - 2" ALUMINUM CAP PER PE&LS 3519
●	---		PROPERTY PIN - 2" ALUMINUM CAP PER PLS 3812
			PROPERTY LINE
			SECTION LINE

VICINITY MAP N.T.S.

*NOTE
CURRENT ZONING PROTRACTED FROM CITY
GIS DATA AS OF SEPTEMBER 2023

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Said tract contains 3.45 acres of land, more or less.

CERTIFICATE OF RECORDER

STATE OF WYOMING :ss
COUNTY OF SHERIDAN

THIS PLAT WAS FILED FOR RECORD IN THE OFFICE OF THE CLERK AND RECORDER AT _____ O'CLOCK _____.M.,

THIS _____ DAY OF _____, 20_____, AND IS DULY RECORDED IN PLAT BOOK _____, PAGE _____

FEE $ _____

_____ _____ STAMP RECEIVING NUMBER _____
COUNTY CLERK

PETITIONERS

NAME: NORTHERN WYOMING COMMUNITY COLLEGE DISTRICT

ADDRESS: 1 WHITNEY WAY
SHERIDAN, WY 82801

CITY PLANNING & ZONING

REVIEWED BY THE CITY OF SHERIDAN PLANNING COMMISSION THIS _____, DAY OF _____, 20_____.

_____ _____
ATTEST: VICE-CHAIRMAN CHAIRMAN

CITY COUNCIL

APPROVED BY THE CITY COUNCIL OF THE CITY OF SHERIDAN, WYOMING, THIS _____, DAY OF _____, 20_____.

_____ _____
ATTEST: CITY CLERK MAYOR

SURVEYOR'S CERTIFICATE

I, ANDRAYA STAMENKOVIC, A DULY REGISTERED LAND SURVEYOR IN THE STATE OF WYOMING, DO HEREBY STATE THAT THIS PLAT REPRESENTS THE RESULTS OF A SURVEY MADE BY ME OR UNDER MY DIRECT SUPERVISION.

Professional Land Surveyor
ANDRAYA STAMENKOVIC
19344
Date:
WYOMING

"PLAT IS VALID ONLY IF PRINT HAS ORIGINAL SIGNATURE OF SURVEYOR SIGNED AND DATED."

INTERSTATE ENGINEERING
Professionals you need, people you trust.
Interstate Engineering
2161 Coffeen Avenue, Suite 603
Sheridan, WY 82801
www.interstateeng.com

SEC	T	R
02	55N	84W

SHERIDAN COUNTY, WY

OWNER(S): NORTHERN WYOMING COUMMUNITY COLLEGE DISTRICT
FOR: MC2 ENGINEERING
PURPOSE: REZONE

Drawn By: MDR | Surveyed By: AS | Project No: WR23-09-029
Checked By: AS | Designed By: MDR | Date: 08/2023

1 OF 1
SHEET NO.

FINAL PLAT
RE-ZONE FROM B2 TO HE
(HIGHER EDUCATION DISTRICT)

c 2022, INTERSTATE ENGINEERING, INC.

X:\2023\WR\09\WR23-09-029-MC2_Rezone_Exhibit\20_CADD_WR2309029\090_Exhibits\LEGAL_SURV_REZONE_WR2309029.dwg 12/14/2023

ORDINANCE NO 2274

AN ORDINANCE to rezone the entirety of the land located at 1600 Solutions Way, Sheridan, Wyoming more particularly and shown on the attached Exhibit A, from a B-2 Business District to a Higher Education H-E District.

WHEREAS, the owner of the following described land has petitioned the City Governing Body to rezone the same from a B-2 Business District to a Higher Education H-E District, and a public hearing having been held thereon by the Governing Body; and

WHEREAS, the City Planning Commission held a public hearing on January 8, 2024 in accordance with City of Sheridan Code Appendix A, Chapter 16 with notice published on January 2, 2024; and

WHEREAS, notice of the Governing Body public hearing, as required by W.S. 15-1-602 was published on December 29, 2023; and

WHEREAS, the City did not receive a protest against the change of district boundary in accordance with W.S. 15-1-603; and

WHEREAS, the owner has submitted a Master Plan to be approved as part of the rezone process in accordance with City of Sheridan Code Appendix A, Chapter 9A.

THEREFORE BE IT ORDAINED BY THE CITY OF SHERIDAN GOVERNING BODY:

Section1 . The rezone to a Higher Education H-E District is suitable for the location.

Section 2.
The following described land is hereby rezoned from B-2 Business District to a Higher Education H-E District, to wit:

(See Attached EXHIBITS)

Section 3.
The City of Sheridan Zoning Map shall be updated in accordance with this Ordinance.

Section 4.
If any provision or portion of this ordinance is declared by any court of competent jurisdiction to be void, unconstitutional, or unenforceable, than all remaining provisions and portions of this ordinance shall remain in full force and effect.

Section 5.
That this ordinance shall be in full force and effect immediately upon its passage and publication as provided by law.

PASSED, APPROVED, AND ADOPTED this _____ day of _____, 2024

ATTEST: _____
Richard Bridger, Mayor

_____
Cecilia Good, City Clerk
State of Wyoming)
)SS
County of Sheridan)

Subscribed and sworn to (or affirmed) before me this _____day of

_____, 2024 by _____.

_____
Notary Public My commission expires _____.

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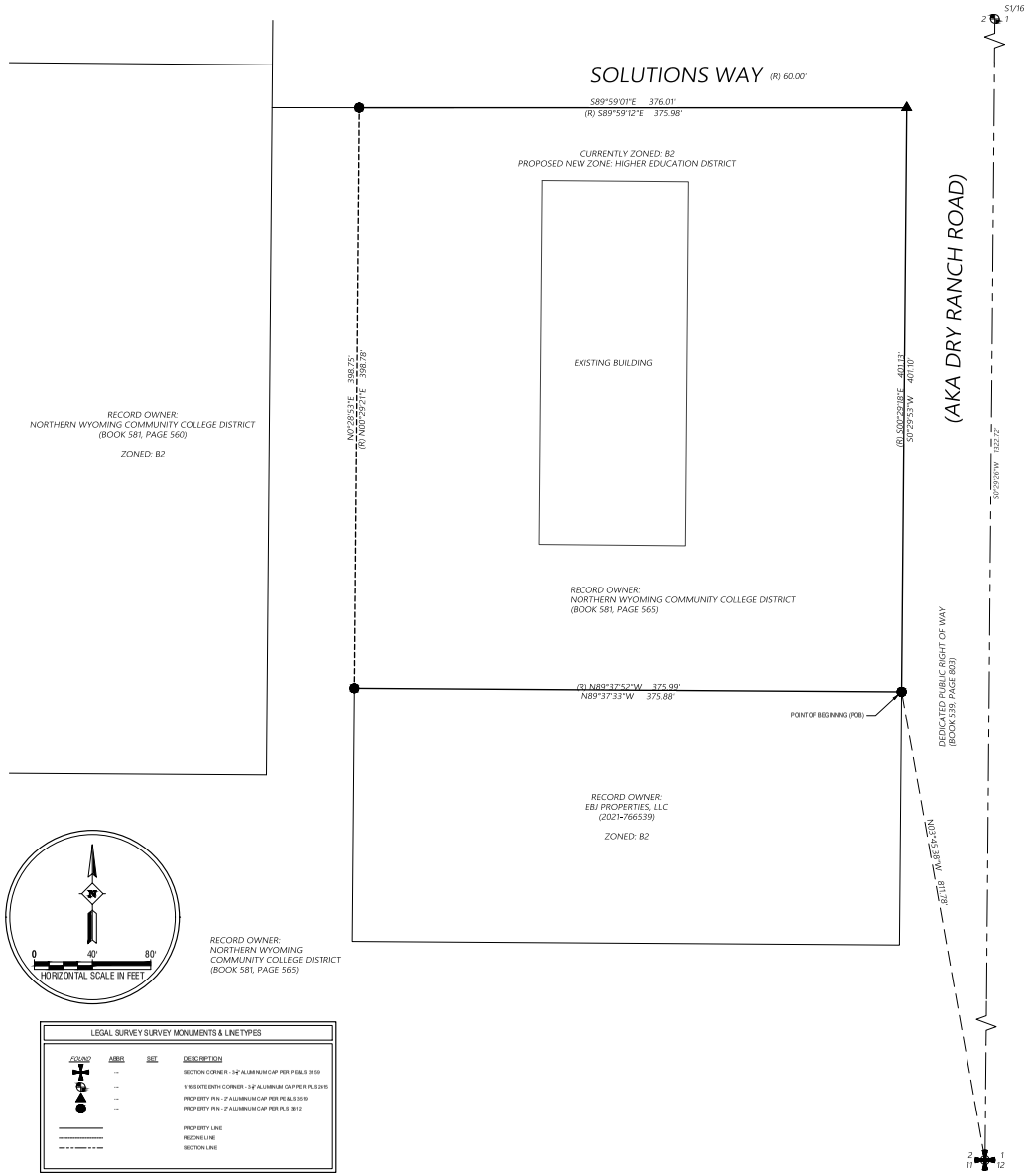
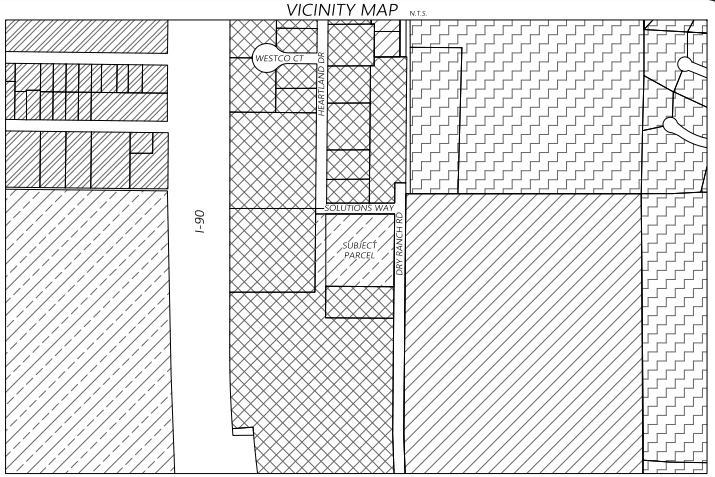


VICINITY MAP

N.T.S.



CITY ZONING - B1

CITY ZONING - B2

CITY ZONING - HIGHER EDUCATION DISTRICT

CITY ZONING - R1

COUNTY ZONING - URBAN RESIDENTIAL

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COUNTY CLERK

PETITIONERS

NAME: NORTHERN WYOMING COMMUNITY COLLEGE DISTRICT

ADDRESS: 1 WHITNEY WAY
SHERIDAN, WY 82801

CITY PLANNING & ZONING

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_____ _____
ATTEST: VICE-CHAIRMAN CHAIRMAN

CITY COUNCIL

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_____ _____
ATTEST: CITY CLERK MAYOR

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I, ANDRAY A STAMENKOVIC, A DULY REGISTERED LAND SURVEYOR IN THE STATE OF WYOMING, DO HEREBY STATE THAT THIS PLAT REPRESENTS THE RESULTS OF A SURVEY MADE BY ME OR UNDER MY DIRECT SUPERVISION.

Professional Land Surveyor · ANDRAY A. STAMENKOVIC · 19346 · Wyoming · Date _____

PRELIMINARY

"PLAT IS VALID ONLY IF PRINT HAS ORIGINAL SIGNATURE OF SURVEYOR SIGNED AND DATED"

LEGAL SURVEY SURVEY MONUMENTS & LINETYPES

FOUND	ABBR	SET	DESCRIPTION
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	--		1/16 SIXTEENTH CORNER - 3/4" ALUMINUM CAP PER PLS 2615
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	--		PROPERTY PIN - 2" ALUMINUM CAP PER PLS 3812
			PROPERTY LINE
			REZONE LINE
			SECTION LINE

Interstate Engineering
2161 Coffeen Avenue, Suite 603
Sheridan, WY 82801
www.interstateeng.com

SEC	T	R
02	55N	84W

SHERIDAN COUNTY, WY

OWNER(S): NORTHERN WYOMING COUMMUNITY COLLEGE DISTRICT
FOR: MC2 ENGINEERING
PURPOSE: REZONE

Drawn By: MDR | Surveyed By: AS | Project No: WR23-09-029
Checked By: AS | Designed By: MDR | Date: 08/2023

1 OF 1
SHEET NO.

FINAL PLAT
RE-ZONE FROM B1 TO HE
(HIGHER EDUCATION DISTRICT)

c 2022, INTERSTATE ENGINEERING, INC.

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Sheridan College
Northern Wyoming Community College District

2023 UPDATE

Facilities Master Plan

Thorne-Rider Campus Center,
South Entrance

Sheridan College
Northern Wyoming Community College District

Table of Contents

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Recently Completed Projects

- Centennial Hall 8
- Perkins Health Science Center 9

Upcoming/Projected Projects

- Advanced Manufacturing & Applied Sciences Center 10
- Science Center Renovation 11
- Student Success Center / Griffith Memorial Building Renovation 12
- Recreation/Athletic Complex Renovation and Expansion 13
- North Hall Renovation 14

Whitney Mall

FACILITIES MASTER PLAN
Introduction

Sheridan College's vision as an institution of higher education contains the guiding principle to, "provide all students with a diverse range of experiences to prepare for a dynamic future."

Overview

The Sheridan College Facilities Master Plan articulates a path to realizing SC's vision through the built environment by identifying and prioritizing key capital projects with anticipated schedules and resources necessary for completion. The Facilities Master Plan works hand in hand with the college's strategic direction and program planning and development. Working in concert, these efforts form SC's framework for supporting student and community success.

Recently completed projects like the Perkins Health Science Center and future projects such as the Advanced Manufacturing & Applied Sciences Center help to tangibly realize goals of:

- Supporting education and workforce training by providing adequate modern instructional and training spaces that align with academic programming and development.
- Creating an advanced manufacturing center that contains flexible space that brings together the latest in technical instruction and local business support and innovation.
- Improving the student experience and creating a welcoming environment by providing student life, residency and student services spaces that are accessible, and a network of support and campus vibrancy.
- Encouraging the efficient use of existing facilities through strategic reuse, reconfiguration, and expansion.
- Improving campus circulation and connectivity with pedestrian paths and way-finding, while carefully staging parking and roadways away from centers of student activity.

The plan components include:

1. A map of existing college facilities and projects.
2. Information on recently completed projects.
3. Descriptions, schedules and costs of upcoming projects.

Sheridan College
Northern Wyoming Community College District

1 Whitney Way
Sheridan, WY 82801
(307) 675-0505
www.sheridan.edu

Buildings

1. Bruce Hoffman Golden Dome
2. Watt Agriculture Center, University of Wyoming
3. Farrier Barn
4. Innominate House
5. Griffith Memorial Building
6. Thorne-Rider Campus Center
7. Technical Center
8. Whitney Center for the Arts
9. Whitney Building
10. Edward A. Whitney Academic Center
11. Perkins Health Science Center
12. Mohns Center
13. Science Center
14. Mars Agriculture Center

Student Housing

- H1 East Hall
- H2 Founders Hall
- H3 South Hall
- H4 Centennial Hall
- H5 North Halls
- H6 Whitney Villas
- H7 Lofts

- X Parking

Estimated Facilities Timeline

		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028+
1	Centennial Hall											
2	Perkins Health Science Center (two phases)											
3	Advanced Manufacturing & Applied Sciences Ctr.											
4	Science Center Capital Renewal											
5	Student Success Center - Griffith Memorial Bldg.											
6	Recreation/Athletic Complex Renovation and Expansion											
7	North Hall Renovation											

Approximate Schedule

Edward A. Whitney Academic Center

RECENTLY COMPLETED PROJECT

Centennial Hall

Centennial Hall is a 100-bed, three-floor residence hall which includes traditional rooms, common lounges, and study areas. The hall is located just east of the Thorne-Rider Campus Center. The name of the hall recognizes the 100-year milestone of Edward A. Whitney's legacy, a local businessman and philanthropist whose foundation continues to support Sheridan College and its students.

- **Budget:** $8.7 million
- **Scope:** 32,000 sq. ft. new construction
- **Schedule:** Completed Summer 2019

RECENTLY COMPLETED PROJECT

Perkins Health Science Center

The B.F. and Rose H. Perkins Health Science Center provides first rate teaching and learning spaces for students in the health science fields including dental hygiene, medical assistant, and nursing. The center includes the Kim and Mary Kay Love Dental Hygiene Clinic, which is open to the community for basic dental care.

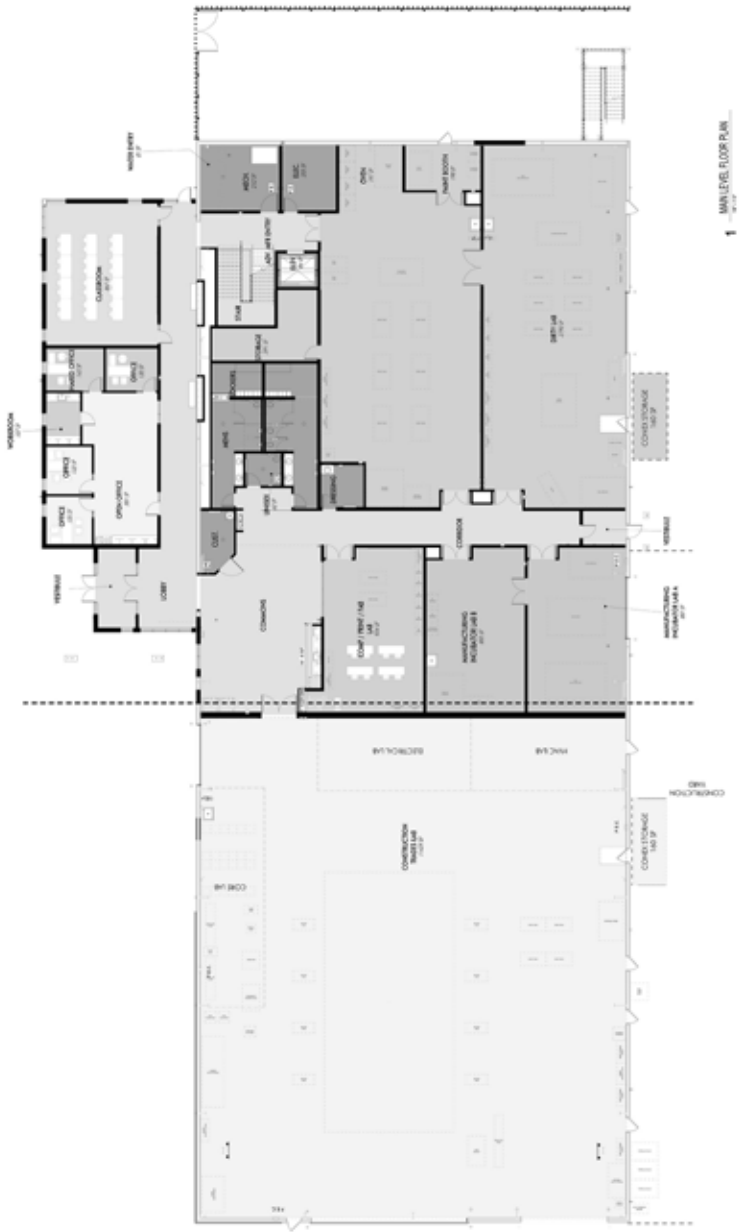
- **Budget:** $13 million
- **Scope:** 10,000 sq. ft. remodel, 22,000 sq. ft. new construction
- **Schedule:** Completed Summer 2023

PROJECT UNDERWAY

Advanced Manufacturing and Applied Sciences Center

The Advanced Manufacturing and Applied Sciences Center will provide critical workforce training for our region in the areas of composite materials, design, fabrication, automation, additive manufacturing (3D printing), and robotics. This facility will also support training in the construction trades particularly HVAC, plumbing, and commercial and residential electric. In addition, the center will house a new manufacturing incubator, supporting the technical needs of entrepreneurs seeking to develop an idea and move it to the next level.

- **Budget:** $8.3 million
- **Scope:** 25,000 sq. ft. remodel, 5,000 sq. ft. new construction
- **Schedule:** Estimated Completion Summer 2024



FUTURE PROJECT

Science Center Capital Renewal

The Science Center was built in the early 1980s. This renewal project will bring outdated teaching and learning spaces up to 21st-century standards. The project will include efficiency and aesthetic upgrades to the building envelope as well.

- **Budget:** Estimated $6-8 million
- **Scope:** 24,000 sq. ft. remodel
- **Schedule:** Level one design estimated completion 2023, project timeline 2024-2026

FUTURE PROJECT

Student Success Center - Griffith Memorial Building Renovation

The Griffith Memorial Building houses the Kooi Library, SC Foundation, Information Technology Services, Human Resources, Student Success Center, and classrooms. As more students are served, more and updated space is required. This project expands access to services and technology for students and the greater public.

- **Budget:** Estimated $6-8 million
- **Scope:** 39,000 sq. ft. remodel
- **Schedule:** In development

FUTURE PROJECT

Recreation/Athletic Complex Renovation and Expansion

The Bruce Hoffman Golden Dome is the center of athletic and health and wellness-related activities on campus. However, academic programming in the areas of athletic training, exercise science, general health, recreation, community interest, and student activities compete for use of this space. In addition, ADA compliance updates are needed in restrooms and for second floor access. The detailed scope of this project continues to be defined.

- **Budget:** Estimated $12-15 million
- **Scope:** In development
- **Schedule:** Estimated 2027-2028

FUTURE PROJECT

North Hall Renovation

Built in the 1960s, Crook, Conner, and Kearney Halls are the oldest residence halls on the campus. Each hall is 4,000 sq. ft. and lacks modern amenities such as air conditioning and gathering spaces that facilitate engagement and student success. The final scope of this project will incorporate needs identified through further engagement of key stakeholders.

- **Budget:** Estimated $4-6 million
- **Scope:** In development
- **Schedule:** Estimated 2027-2028

Mars Agriculture Center

Sheridan College
1948 – 2023

Sheridan College
1 Whitney Way
Sheridan, WY 82801
(307) 675-0505
(888) 675-0505

Campus Entrance, Veterans Plaza

Our Mission

NWCCD welcomes all learners, empowers student success, and encourages and strengthens community development.

May 2023

Northern Wyoming Community College District prohibits discrimination in employment, educational programs and activities on the basis of race, national origin, color, creed, religion, sex, pregnancy, age, disability, veteran status, sexual orientation, gender identity, or any other class protected under state and federal law. The District also affirms its commitment to providing equal opportunities and equal access to its facilities. Inquiries concerning Title VI, Title VII, Title IX, Section 504, and the Americans with Disabilities Act may be referred to the Assistant Vice President for Human Resources, Jennifer McArthur, NWCCD's Title IX and Section 504 Coordinator, Sheridan College, Griffith Memorial Building, Room 141D, 1 Whitney Way, Sheridan, WY 82801; 307-675-0505. Inquiries also may be made to the Office for Civil Rights, U.S. Department of Education, Federal Building, Suite 310, 1244 Speer Boulevard, Denver, CO 80204-3582; 303-844-3417; or TDD 303-844-3417.

CITY OF SHERIDAN, WYOMING

55 Grinnell Street, P.O. Box 848, Sheridan Wyoming 82801
Ph (307) 674-6483 Fax (307) 674-2195

Public Works

MEMORANDUM

RE: Public Hearing for PL-23-51, Ordinance 2278, Story House Property Company Rezone 38.38 Acres from B-2 to PUD - Public Works Director Hanns Mercer

From: Hanns Mercer, Public Works Director

To: City Council

CC:

Date: 12/27/2023

Recommendation:

Staff received a positive recommendation from the Planning Commission regarding PL-23-51, Ordinance 2278. The applicant, Story House Property Company, LLC, is requesting to rezone 38.38 acres from B-2 Business District to a Planned Unit Development, PUD. Located at 2323 E. 5th St. (PIN 56842410000333).

Background:

The proposed PUD subdivision is located east of I-90 on the north side of WY Hwy 336, also known as Wyarno Road or E 5th Street. The subdivision's primary access roadway will originate at the existing Hwy 336/Industrial Lane junction, creating a four-way intersection. Future phases will be developed to the north of Phase 1, on the remainder of the 175.56 acres included in the Story House Village PUD Master Plan not included in Phase 1.

The Applicant intends to use existing city zoning regulations to determine permissible land uses in the PUD. Parcels designated "commercial" or "mixed use" will adhere to B-1 zoning standards, while "residential" parcels will adhere to R-3 standards. The primary difference between existing zoning standards and the proposed layout of the PUD is in setbacks: the PUD setbacks will be reduced, allowing for greater lot coverage. Parcels to the south are zoned M-1 (Industrial) and are used for industry, and parcels to the west, north, and east are agricultural.

Type of Dwelling Units and Proposed Lot Uses

The Applicant is proposing 85 residential lots, four mixed-use lots, and two open space lots for Phase 1 of the PUD. To facilitate development of different housing types (single family, multifamily, townhouse, and condominium units), the sizes of the residential lots vary widely. The smallest residential lots are on the east side of the proposed subdivision, increasing in size towards the center of the subdivision to accommodate larger multi-unit projects.

Discussion:

Staff sent out 7 nearest neighbor notifications to the property owners within 300 feet as part of this application. In addition, legal ads were published in the paper and a sign posted on the property.

Attachments

Aerial

Ordinance 2278

Plat
PUD Design Report
Radius Variance Request

Story House Village PUD

DISCLAIMER:
The City of Sheridan GIS Division produced this map for informational purposes only. The City of Sheridan provides this map on an "as is" basis without warranties of any kind, either expressed or implied, and shall not be liable for any direct, indirect, incidental, special or consequential damages arising out of the use of such map. The user acknowledges and agrees that the use of such data is at the sole risk of the user. General questions about this map including errors, omissions, and/or updates should be directed to the City of Sheridan GIS Division.

CITY OF Sheridan WYOMING

Legend

Roads
- County Road
- Forest Service Road
- Private Road
- PUBLIC ROAD
- City of Sheridan Road
- Sheridan College Road
- Sheridan County Airport
- State of Wyoming Road
- VA Road
- Parcels

Zoning City
- MA - Medical Arts District
- R1 - Residence District
- R2 - Residence District
- R3 - Residence District
- R4 - Residence District

Miles 0 ¾ 1½

Date: 12/27/2023 3:41 PM User: sgoodman

ORDINANCE NO 2278

AN ORDINANCE amending Ordinance No. 826, the Zoning Ordinance of the City of Sheridan, to zone the entirety of the land more particularly described in Appendix A Section 1., and shown on the attached Exhibit A, from an B-2 Business District to a Planned Unit Development (PUD); for the property designated as Story House Village Planned Unit Development Phase 1 to the City of Sheridan, Wyoming containing +/- 38.38 acres

WHEREAS, the owner of the following described land has petitioned the City Governing Body to rezone the same from an B-2 Business District to PUD, and a public hearing having been held thereon by the City Governing Body;

THEREFOREBE IT ORDAINED BY THE CITY OF SHERIDAN GOVERNING BODY:

Section 1.
The following described land is hereby rezoned from a B-2 Business District to a PUD, to wit:

> Story House Village Planned Unit Development Phase 1 to the City of Sheridan, Wyoming containing +/-38.38 acres

Section 2.
That Ordinance No. 826, The Zoning Ordinance of the City of Sheridan is hereby amended to conform herewith.

Section 3.
From the City of Sheridan Ordinance Appendix B Article 803, the PUD is found to:

1. Be compatible with the goals and policies of the City Master Plan and other applicable adopted plans and policies.
2. Be compatible with the area surrounding the project site.
3. Place no greater demand on existing City facilities and services than can be furnished by the City.
4. Insofar as practicable, preserves the landscape in its natural state by minimizing tree and soil removal.
5. Promotes the efficient use of land by means of more economical arrangement of buildings/lots, circulation systems, land uses, densities, and utilities.
6. Provides for useable and suitably located open space such as, but not limited to, bicycle paths, playground areas, courtyards, tennis courts, swimming pools, planned gardens, outdoor seating areas, outdoor picnic areas, and similar open space.
7. Demonstrates flexibility and quality in design to permit diversification in the location, type, and uses of structures.
8. Combines and coordinates architectural styles, building forms, and building relationships within the development and in concert with adjacent and surrounding land and development.
9. Be designed and controlled as a whole under the control of one (1) owner, partnership, corporation, or agency.
10. Give special attention to vehicular and pedestrian circulation and parking, the location and number of access points to public streets, width of interior drives and access points, general interior circulation, separation of pedestrian and vehicular traffic, and the arrangement of parking areas that are safe and convenient and, insofar as practicable, do not detract from the design of proposed structures and neighboring properties.

Section 3.
If any provision or portion of this ordinance is declared by any court of competent jurisdiction to be void, unconstitutional, or unenforceable, than all remaining provisions and portions of this ordinance shall remain in full force and effect.

Section 4.
The Developer and the City of Sheridan shall enter into a Development Agreement which shall be controlling and binding over the rest of the property owned by the Developer, known as "Story House" and is currently zoned B-2. The City shall not grant or authorize any permit for construction or development of Story House property until such time as both parties have entered into the Development Agreement.

Section 5.
That this ordinance shall be in full force and effect immediately upon its passage and publication as provided by law.

PASSED, APPROVED, AND ADOPTED this _____ day of _____, 2024.

ATTEST: _____
Richard Bridger, Mayor

_____
Cecilia Good, City Clerk
State of Wyoming)
)SS
County of Sheridan)

Subscribed and sworn to (or affirmed) before me this _____day of

_____, 2024 by _____.

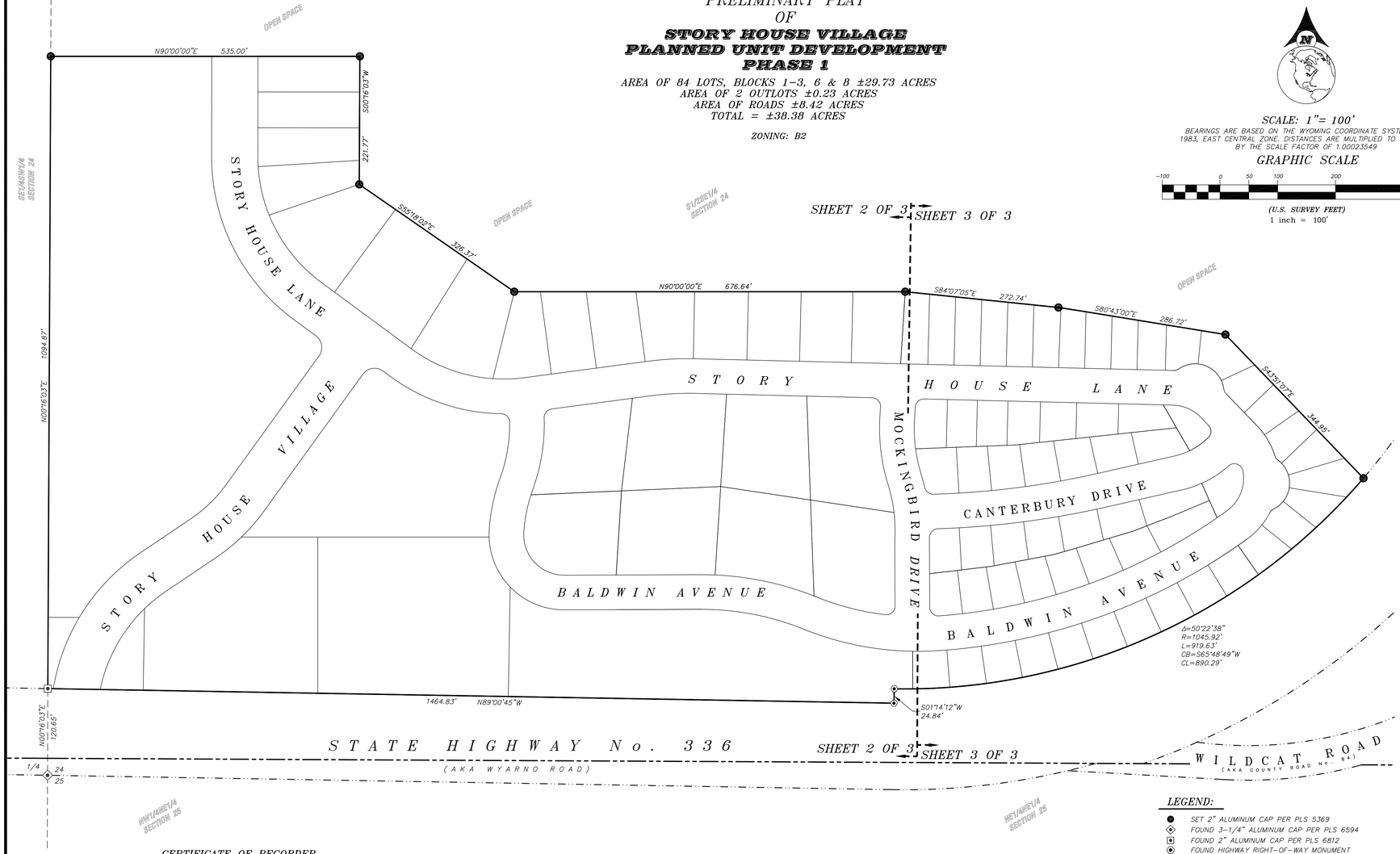
_____
Notary Public

My commission expires _____.

PRELIMINARY PLAT
OF
STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1

AREA OF 84 LOTS, BLOCKS 1-3, 6 & 8 ±29.73 ACRES
AREA OF 2 OUTLOTS ±0.23 ACRES
AREA OF ROADS ±8.42 ACRES
TOTAL = ±38.38 ACRES

ZONING: B2



SCALE: 1"= 100'

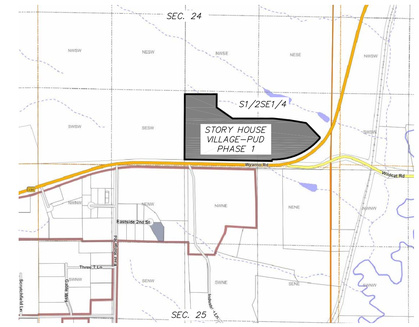
BEARINGS ARE BASED ON THE WYOMING COORDINATE SYSTEM NAD 1983, EAST CENTRAL ZONE. DISTANCES ARE MULTIPLIED TO SURFACE BY THE SCALE FACTOR OF 1.00023549

GRAPHIC SCALE

-100 0 50 100 200 400

(U.S. SURVEY FEET)
1 inch = 100'

T56N R84W



LOCATION MAP

NO TRUE SCALE

CERTIFICATE OF DEDICATION

KNOWN ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED STORY HOUSE PROPERTY COMPANY LLC BEING THE OWNER(S), PROPRIETORS OR PARTIES OF INTEREST IN THE LAND SHOWN ON THIS PLAT, DO HEREBY STATE:

THAT THE FOREGOING PLAT DESIGNATED AS **STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1** IS A SUBDIVISION OF THE S1/2SE1/4, SECTION 24, TOWNSHIP 56 NORTH, RANGE 84 WEST 6TH PRINCIPAL MERIDIAN, CITY OF SHERIDAN, SHERIDAN COUNTY, WYOMING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

Commencing at the quarter corner of said Section 24 (monumented with a 3¼" Aluminum Cap per PLS 6594); thence N00°16'03"E, 120.65 feet along the west line of said S½SE¼ to a 2" Aluminum Cap per PLS 6812 being the POINT OF BEGINNING this tract;
thence N00°16'03"E, 1094.87 feet along said west line to a 2" Aluminum Cap per PLS 5369;
thence N90°00'00"E, 535.00 feet to a 2" Aluminum Cap per PLS 5369;
thence S00°16'03"W, 221.77 feet to a 2" Aluminum Cap per PLS 5369;
thence S55°18'02"E, 326.37 feet to a 2" Aluminum Cap per PLS 5369;
thence N90°00'00"E, 676.64 feet to a 2" Aluminum Cap per PLS 5369;
thence S84°07'05"E, 272.74 feet to a 2" Aluminum Cap per PLS 5369;
thence S80°43'00"E, 286.72 feet to a 2" Aluminum Cap per PLS 5369;
thence S43°51'07"E, 344.95 feet to a 2" Aluminum Cap per PLS 5369, lying on the north right of way line of the Wyarno Road (AKA State Highway No. 336);
thence along said north right of way line, through a curve to the right, having a central angle of 50°22'38", a radius of 1045.92 feet, an arc length of 919.63 feet, a chord bearing of S65°48'49"W and a chord distance of 890.29 feet to a standard WYDOT right of way monument at the end of said curve to the right;
thence along said north right of way line S01°14'12"W, 24.84 feet to a standard WYDOT right of way monument;
thence N89°00'45"W, 1464.83 feet along said north right of way line to the POINT OF BEGINNING.

SAID SUBDIVISION CONTAINS **±38.38 ACRES** OF LAND, MORE OR LESS.

STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1, AS IT IS DESCRIBED AND AS IT APPEARS ON THIS PLAT, IS MADE WITH THE FREE CONSENT AND IN ACCORDANCE WITH THE DESIRES OF THE UNDERSIGNED OWNER(S) AND PROPRIETORS; AND THAT THIS IS A CORRECT PLAT OF THE AREA AS IT IS DIVIDED INTO LOTS, OUTLOTS, STREETS AND EASEMENTS.

THE UNDERSIGNED OWNER(S) OF THE LAND SHOWN AND DESCRIBED ON THIS PLAT DO HEREBY DEDICATE TO THE CITY OF SHERIDAN AND ITS LICENSEES FOR PUBLIC USE FOR THE INDICATED PURPOSES, ALL STREETS, EASEMENTS AND OTHER PUBLIC LANDS, AS INDICATED, AND NOT ALREADY OTHERWISE DEDICATED FOR PUBLIC USE.

UTILITY EASEMENTS, AS DESIGNATED ON THE PLAT, ARE HEREBY GRANTED TO THE CITY OF SHERIDAN AND IT'S LICENSEES FOR PUBLIC USE FOR THE PURPOSE OF INSTALLING, REPAIRING, REINSTALLING, REPLACING AND MAINTAINING SANITARY SEWERS, STORM SEWERS, WATER LINES, GAS LINES, ELECTRIC LINES, TELEPHONE LINES, CABLE TV LINE, AND OTHER FORMS AND TYPES OF PUBLIC UTILITIES NOW OR HEREAFTER GENERALLY UTILIZED BY THE PUBLIC.

OUTLOTS ARE DRAINAGE EASEMENTS, OTHER EASEMENTS (AS SHOWN & DEFINED), AND OPEN SPACES WHICH ARE OWNED & MAINTAINED BY THE HOMEOWNER'S ASSOCIATION.

CERTIFICATE OF RECORDER

STATE OF WYOMING :ss
COUNTY OF SHERIDAN

THIS PLAT WAS FILED FOR RECORD IN THE OFFICE OF THE CLERK AND RECORDER AT_____ O'CLOCK __M.,
THIS_____, DAY OF_____, 20_____, AND IS RECORDED IN PLAT BOOK _____, PAGE _____

_____ STAMP RECEIVING NUMBER _____
COUNTY CLERK

CITY OF SHERIDAN CERTIFICATES OF APPROVAL

REVIEWED BY THE CITY OF SHERIDAN PLANNING COMMISSION THIS_____ DAY OF_____, _____.

_____ _____
ATTEST: VICE-CHAIRMAN CHAIRMAN

_____
DIRECTOR OF PUBLIC WORKS

APPROVED BY THE CITY COUNCIL OF THE CITY OF SHERIDAN, WYOMING, THIS___DAY OF_____, _____.

_____ _____
ATTEST: CITY CLERK MAYOR

DECLARATION EXTINGUISHING PREVIOUS EASEMENTS

1) ALL EARLIER EASEMENTS OR PORTIONS THEREOF ENCOMPASSED BY THE BOUNDARY OF THIS PLAT ARE HEREBY EXTINGUISHED UNLESS NOTED OTHERWISE.

2) EXISTING UTILITIES PLACED IN PREVIOUS RECORDED EASEMENTS WITHIN THE BOUNDARY OF THIS PLAT HAVE SENIOR RIGHTS AND ARE NOW PROTECTED BY EASEMENTS OR ROADS AS SHOWN ON THIS PLAT.

SURVEYOR'S CERTIFICATE

STATE OF WYOMING :ss
COUNTY OF SHERIDAN

I, THONE STEWART, DO HEREBY STATE THAT I AM A REGISTERED LAND SURVEYOR, LICENSED UNDER THE LAWS OF THE STATE OF WYOMING, THAT THIS PLAT IS A TRUE, CORRECT AND COMPLETE PLAT OF **STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1,** AS LAID OUT, PLATTED, DEDICATED AND SHOWN HEREON, THAT THIS PLAT WAS MADE FROM AN ACCURATE SURVEY OF SAID PROPERTY CONDUCTED BY ME OR UNDER MY DIRECT SUPERVISION AND CORRECTLY SHOWS THE LOCATION AND DIMENSIONS OF ALL LOTS, EASEMENTS AND STREETS OF SAID SUBDIVISION IN COMPLIANCE WITH THE CITY OF SHERIDAN REGULATIONS GOVERNING THE SUBDIVISION OF LAND.

Professional Land Surveyor THONE STEWART Date: WYOMING

PRELIMINARY DRAFT

"PLAT IS VALID ONLY IF PRINT HAS ORIGINAL SIGNATURE OF SURVEYOR SIGNED AND DATED"

LEGEND:

- SET 2" ALUMINUM CAP PER PLS 5369
- FOUND 3-1/4" ALUMINUM CAP PER PLS 6594
- FOUND 2" ALUMINUM CAP PER PLS 6812
- FOUND HIGHWAY RIGHT-OF-WAY MONUMENT
- BOUNDARY LINE
- LOT LINE
- SECTION LINE
- INTERIOR SECTION LINE
- HIGHWAY RIGHT-OF-WAY

IN TESTIMONY WHEREOF:

ALL RIGHTS UNDER AND BY VIRTUE OF THE HOMESTEAD EXEMPTION LAWS OF THE STATE OF WYOMING ARE HEREBY WAIVED AND RELEASED.

THE UNDERSIGNED HAVE CAUSED THESE PRESENTS TO BE SIGNED THIS_____ DAY OF_____

FP STORY HOUSE PROPERTY COMPANY, LLC

BY:_____
, MEMBER

STATE OF WYOMING :ss
COUNTY OF SHERIDAN

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BY xxxxxxxxxxx BEFORE ME THIS DAY OF _____, _____.

WITNESS MY HAND AND OFFICIAL SEAL. MY COMMISSION EXPIRES _____

_____
NOTARY PUBLIC

SIGNED BY AFFIDAVIT

BY: SECURITY STATE BANK ("LIEN HOLDER"), SEE AFFIDAVIT FILED AT THE SHERIDAN COUNTY COURTHOUSE.
DOCUMENT NUMBER: _____

PRELIMINARY PLAT
OF
STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1

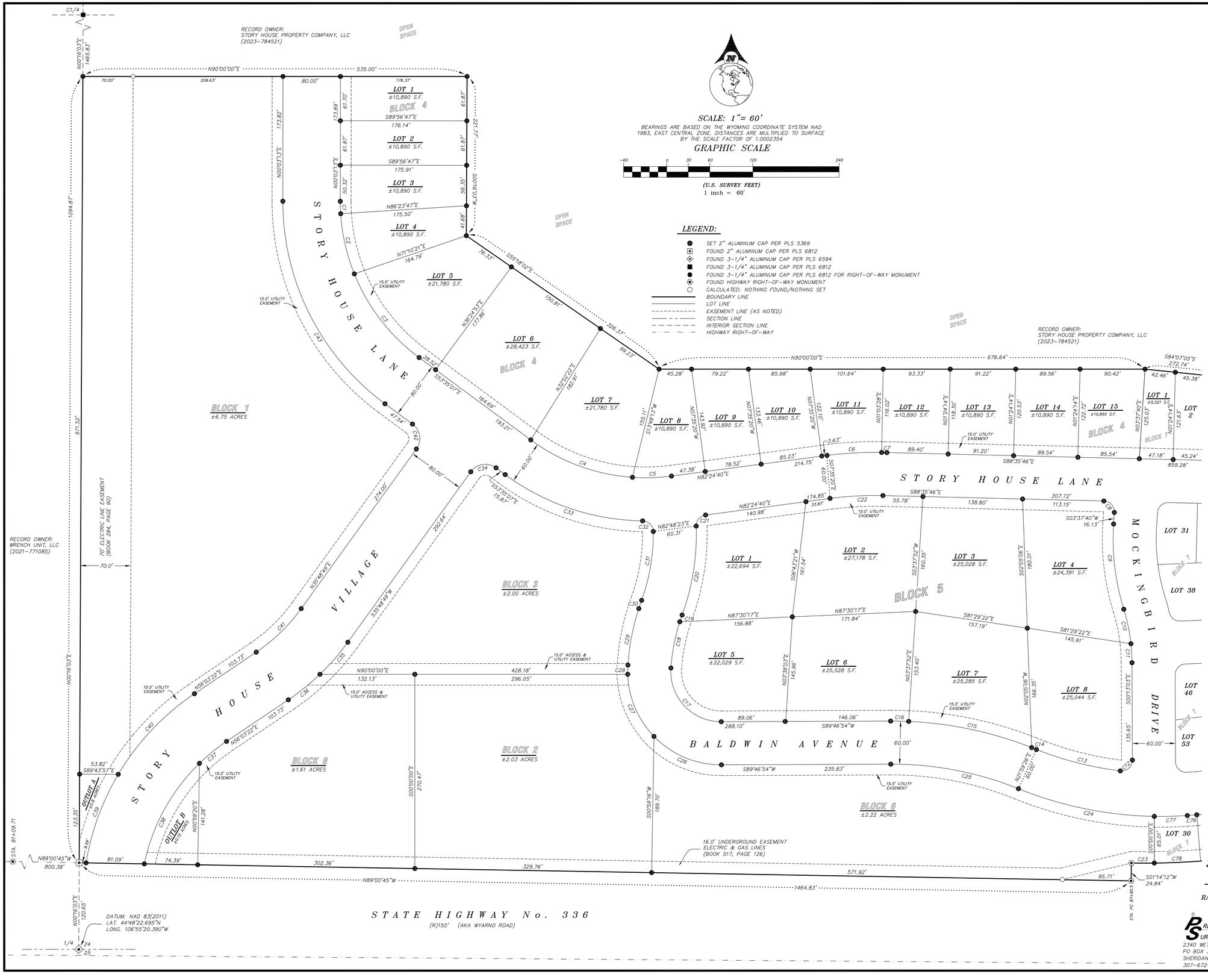
SITUATED IN THE S/2SE1/4 OF SECTION 24, TOWNSHIP 56 NORTH, RANGE 84 WEST, 6TH PRINCIPAL MERIDIAN, SHERIDAN COUNTY, WYOMING

DEVELOPER: STORY HOUSE PROPERTY COMPANY, LLC
40 EAST WORKS STREET, SUITE 18
SHERIDAN WY, 82801

PRESTFELDT SURVEYING
2340 WETLANDS DR., SUITE 100
PO BOX 3082
SHERIDAN, WY 82801
307-672-7415

CLIENT: WWC ENGINEERING
1849 TERRA AVENUE
SHERIDAN, WY 82801

JN: 2023-058
DN: 2023-058PUD
PF: T2023-058
REVIEWED BY: JSP
DECEMBER 19, 2023



SCALE: 1"= 60'

BEARINGS ARE BASED ON THE WYOMING COORDINATE SYSTEM NAD 1983, EAST CENTRAL ZONE. DISTANCES ARE MULTIPLIED TO SURFACE BY THE SCALE FACTOR OF 1.0002354

GRAPHIC SCALE

-60 0 30 60 120 240

(U.S. SURVEY FEET)
1 inch = 60'

LEGEND:

- SET 2" ALUMINUM CAP PER PLS 5369
- FOUND 2" ALUMINUM CAP PER PLS 6812
- FOUND 3-1/4" ALUMINUM CAP PER PLS 6594
- FOUND 3-1/4" ALUMINUM CAP PER PLS 6812
- FOUND 3-1/4" ALUMINUM CAP PER PLS 6812 FOR RIGHT-OF-WAY MONUMENT
- FOUND HIGHWAY RIGHT-OF-WAY MONUMENT
- CALCULATED: NOTHING FOUND/NOTHING SET
- BOUNDARY LINE
- LOT LINE
- EASEMENT LINE (AS NOTED)
- SECTION LINE
- INTERIOR SECTION LINE
- HIGHWAY RIGHT-OF-WAY

CURVE TABLE

CURVE	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C1	3°39'25"	270.00'	17.23'	S01°46'30"E	17.23'
C2	18°19'08"	270.00'	86.33'	S12°45'47"E	85.96'
C3	31°39'47"	270.00'	149.21'	S37°45'14"E	147.32'
C4	32°26'57"	270.00'	152.91'	S69°48'36"E	150.88'
C5	11°33'16"	270.00'	54.45'	N88°11'18"E	54.36'
C6	8°38'49"	530.00'	79.99'	N86°44'04"E	79.91'
C7	0°20'46"	530.00'	3.20'	S88°46'09"E	3.20'
C8	92°13'26"	15.00'	24.14'	N42°29'03"W	21.62'
C9	20°53'28"	329.56'	120.17'	S06°49'04"E	119.50'
C10	17°02'45"	254.21'	75.63'	N08°44'25"W	75.35'
C11	17°02'45"	254.21'	75.63'	N08°44'25"W	75.35'
C12	97°08'28"	15.00'	25.43'	N48°21'11"E	22.49'
C13	15°04'01"	470.00'	123.60'	S75°32'35"E	123.24'
C14	0°28'37"	530.00'	4.41'	N68°14'52"W	4.41'
C15	19°00'43"	530.00'	175.87'	N77°59'33"W	175.06'
C16	2°43'11"	530.00'	25.16'	N88°51'30"W	25.16'
C17	94°08'19"	70.00'	115.01'	S43°08'56"E	102.50'
C18	13°56'56"	270.00'	65.73'	S10°53'41"W	65.57'
C19	2°06'21"	270.00'	9.92'	S18°55'20"W	9.92'
C20	21°54'40"	330.00'	126.20'	N09°01'10"E	125.43'
C21	84°20'49"	15.00'	22.08'	S40°14'15"W	20.14'
C22	8°59'34"	470.00'	73.77'	S86°54'27"W	73.69'
C23	1°44'42"	1045.92'	31.86'	S89°52'13"E	31.85'
C24	20°59'06"	530.00'	194.12'	S78°30'07"E	193.03'
C25	22°12'32"	470.00'	182.18'	N79°06'50"W	181.04'
C26	46°08'30"	130.00'	104.69'	S67°08'51"E	101.89'
C27	42°20'16"	130.00'	96.06'	S22°54'28"E	93.89'
C28	5°39'33"	130.00'	12.84'	S01°05'26"W	12.84'
C29	13°56'56"	330.00'	80.34'	S10°53'41"W	80.14'
C30	2°06'21"	330.00'	12.13'	S18°55'20"W	12.13'
C31	20°44'18"	270.00'	97.73'	N09°36'21"E	97.19'
C32	88°27'13"	15.00'	23.16'	N44°59'24"W	20.93'
C33	35°37'54"	330.00'	205.22'	S71°24'04"E	201.93'
C34	90°36'04"	25.00'	39.53'	S81°06'51"W	35.54'
C35	20°14'33"	328.00'	115.88'	N45°56'05"E	115.28'
C36	20°14'33"	328.00'	115.88'	N45°56'05"E	115.28'
C37	101°3'50"	272.00'	48.57'	S50°56'27"W	48.50'
C38	34°08'12"	272.00'	162.06'	S28°45'26"W	159.67'
C39	21°28'22"	352.00'	131.92'	S19°58'25"W	131.15'
C40	25°20'46"	352.00'	155.72'	S43°22'59"W	154.45'
C41	20°14'33"	248.00'	87.62'	N45°56'05"E	87.16'
C42	89°23'56"	25.00'	39.01'	N08°53'09"W	35.17'
C43	53°38'20"	350.00'	327.66'	S26°45'57"E	315.83'

PRELIMINARY PLAT
OF
STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1

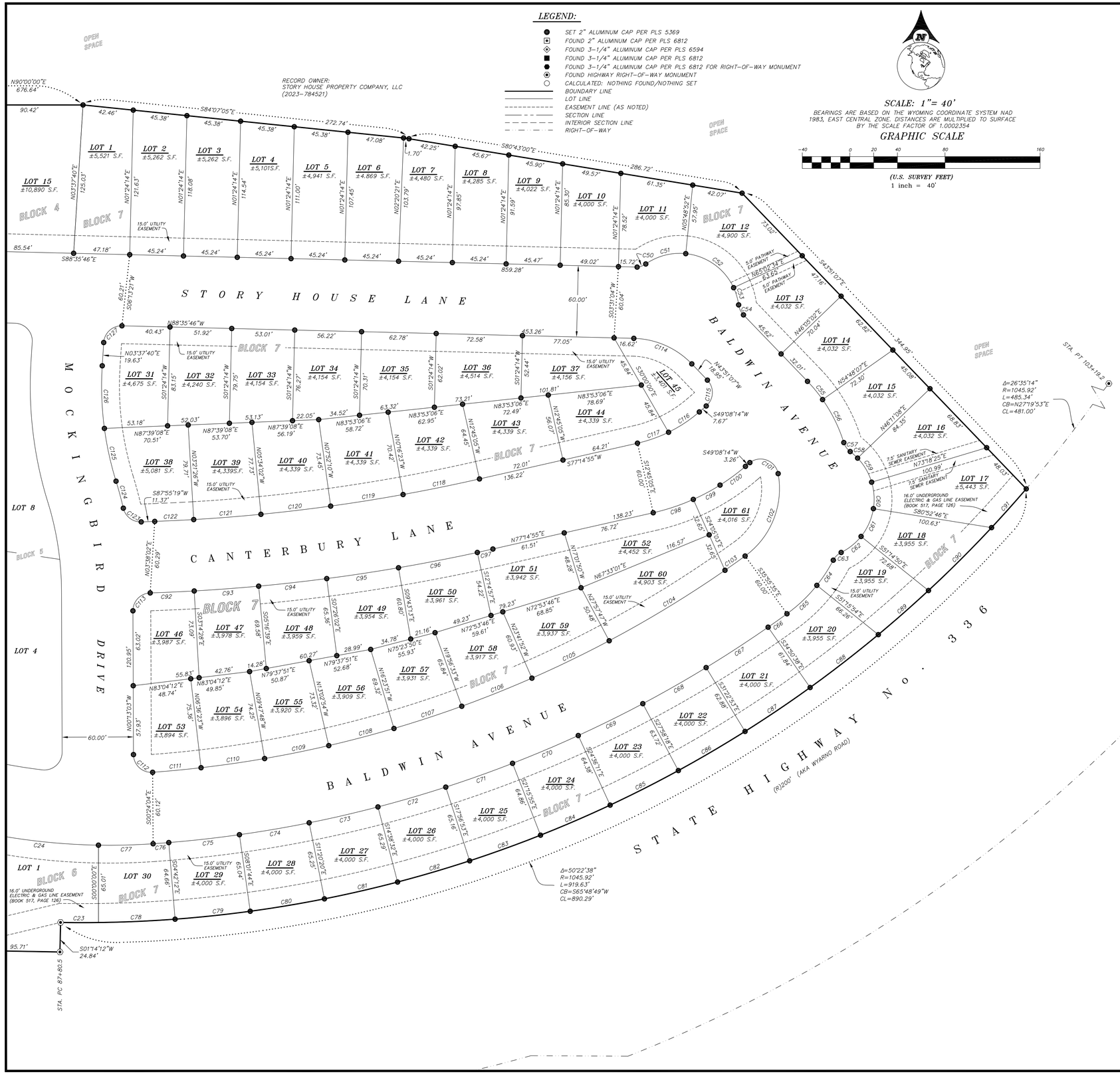
SITUATED IN THE S/2SE1/4 OF SECTION 24, TOWNSHIP 56 NORTH, RANGE 84 WEST, 6TH PRINCIPAL MERIDIAN, SHERIDAN COUNTY, WYOMING

DEVELOPER: STORY HOUSE PROPERTY COMPANY, LLC
40 EAST WORKS STREET, SUITE 18
SHERIDAN WY, 82801

PRESTFELDT SURVEYING
2340 WETLANDS DR., SUITE 100
P.O. BOX 3082
SHERIDAN, WY 82801
307-672-7415

CLIENT: WWC ENGINEERING
1849 TERRA AVENUE
SHERIDAN, WY 82801

JN: 2023-058
DN: 2023-058-PUD
PF: T2023-058
REVIEWED BY: JSP
DECEMBER 19, 2023



CURVE TABLE					
CURVE	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C50	29°51'54"	15.00'	7.82'	N70°06'35"E	7.73'
C51	40°38'14"	50.00'	35.46'	S75°29'45"W	34.72'
C52	59°13'43"	50.00'	51.69'	N54°34'17"W	49.42'
C53	17°19'27"	50.00'	15.12'	N16°17'42"W	15.06'
C54	36°16'58"	15.00'	9.50'	S25°46'28"E	9.34'
C55	8°46'55"	130.00'	19.93'	N39°35'21"W	19.91'
C56	17°50'51"	130.00'	40.49'	N26°16'27"W	40.33'
C57	35°59'59"	15.00'	9.42'	S35°21'02"E	9.27'
C58	9°32'09"	50.00'	8.32'	N48°34'57"W	8.31'
C59	27°07'16"	50.00'	23.67'	N30°15'14"W	23.45'
C60	25°48'49"	50.00'	22.53'	N03°47'11"W	22.34'
C61	29°37'56"	50.00'	25.86'	N23°56'12"E	25.57'
C62	24°49'08"	50.00'	21.66'	N51°09'45"E	21.49'
C63	35°59'59"	15.00'	9.42'	S45°34'19"W	9.27'
C64	11°09'47"	130.00'	25.33'	N33°09'13"E	25.29'
C65	15°20'19"	130.00'	34.80'	N46°24'15"E	34.70'
C66	1°04'57"	1030.00'	19.46'	N54°36'53"E	19.46'
C67	3°27'45"	1030.00'	62.24'	N56°53'14"E	62.24'
C68	3°24'35"	1030.00'	61.30'	N60°19'24"E	61.29'
C69	3°22'07"	1030.00'	60.56'	N63°42'45"E	60.55'
C70	3°20'17"	1030.00'	60.01'	N67°03'57"E	60.00'
C71	3°19'02"	1030.00'	59.63'	N70°23'36"E	59.62'
C72	3°18'21"	1030.00'	59.43'	N73°42'18"E	59.42'
C73	3°18'12"	1030.00'	59.38'	N77°00'34"E	59.38'
C74	3°18'36"	1030.00'	59.50'	N80°18'58"E	59.49'
C75	3°19'32"	1030.00'	59.78'	N83°38'02"E	59.78'
C76	0°44'07"	1030.00'	13.22'	N85°39'51"E	13.22'
C77	4°58'26"	530.00'	46.01'	N88°31'07"E	45.99'
C78	3°32'06"	1045.92'	64.53'	N87°29'23"E	64.52'
C79	3°28'53"	1045.92'	63.55'	N83°58'54"E	63.54'
C80	3°27'57"	1045.92'	63.27'	N80°30'29"E	63.26'
C81	3°27'33"	1045.92'	63.15'	N77°02'44"E	63.14'
C82	3°27'42"	1045.92'	63.19'	N73°35'06"E	63.18'
C83	3°28'23"	1045.92'	63.40'	N70°07'04"E	63.39'
C84	3°29'37"	1045.92'	63.77'	N66°38'04"E	63.76'
C85	3°31'26"	1045.92'	64.33'	N63°07'33"E	64.32'
C86	3°33'52"	1045.92'	65.07'	N59°34'54"E	65.06'
C87	3°37'00"	1045.92'	66.02'	N55°59'28"E	66.01'
C88	3°40'55"	1045.92'	67.21'	N52°20'30"E	67.20'
C89	4°05'08"	1045.92'	74.58'	N48°27'29"E	74.56'

CURVE TABLE					
CURVE	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C90	5°47'25"	1045.92'	105.70'	N43°31'12"E	105.66'
C91	5°47'25"	1045.92'	105.70'	N43°31'12"E	105.66'
C92	1°23'16"	1530.00'	37.06'	N87°27'10"E	37.05'
C93	2°02'11"	1530.00'	54.38'	N85°44'26"E	54.38'
C94	2°09'23"	1530.00'	57.58'	N83°38'39"E	57.58'
C95	2°17'10"	1530.00'	61.05'	N81°25'23"E	61.05'
C96	2°31'44"	1530.00'	67.53'	N79°00'55"E	67.53'
C97	0°30'09"	1530.00'	13.42'	N77°29'59"E	13.42'
C98	1°19'58"	180.00'	35.60'	N71°34'56"E	35.54'
C99	8°07'44"	180.00'	25.54'	N61°51'05"E	25.52'
C100	8°39'00"	180.00'	27.17'	N53°27'44"E	27.15'
C101	120°26'58"	15.00'	31.53'	N70°38'17"W	26.04'
C102	64°29'13"	70.00'	78.79'	N21°49'48"E	74.69'
C103	1°13'28"	970.00'	20.73'	N54°41'09"E	20.73'
C104	6°44'20"	970.00'	114.09'	N58°40'03"E	114.02'
C105	4°15'55"	970.00'	72.21'	N64°10'10"E	72.19'
C106	3°45'19"	970.00'	63.57'	N68°10'47"E	63.56'
C107	3°32'42"	970.00'	60.02'	N71°49'48"E	60.01'
C108	3°20'57"	970.00'	56.70'	N75°16'37"E	56.69'
C109	3°15'06"	970.00'	55.05'	N78°34'39"E	55.04'
C110	3°11'25"	970.00'	54.01'	N81°47'54"E	54.00'
C111	2°25'02"	970.00'	40.92'	N84°36'08"E	40.92'
C112	93°58'18"	15.00'	24.60'	S47°12'12"E	21.94'
C113	88°21'50"	15.00'	23.13'	S43°57'52"W	20.91'
C114	44°44'39"	70.00'	54.67'	N66°13'27"W	53.29'
C115	92°59'21"	15.00'	24.34'	N02°38'33"E	21.76'
C116	14°50'26"	120.00'	31.08'	N56°33'27"E	31.00'
C117	13°16'15"	120.00'	27.79'	N70°36'47"E	27.73'
C118	2°33'07"	1472.67'	65.59'	N78°26'59"E	65.58'
C119	2°24'13"	1470.00'	61.67'	N80°55'43"E	61.66'
C120	2°18'08"	1470.00'	59.06'	N83°16'54"E	59.06'
C121	2°12'36"	1470.00'	56.70'	N85°32'16"E	56.70'
C122	1°16'45"	1470.00'	32.82'	N87°16'56"E	32.82'
C123	79°06'29"	14.89'	20.56'	S52°31'26"E	18.97'
C124	4°17'29"	314.32'	23.54'	N15°07'02"W	23.54'
C125	9°40'24"	269.56'	45.51'	S12°25'36"E	45.46'
C126	11°13'04"	269.56'	52.78'	S01°58'52"E	52.69'
C127	87°46'34"	15.00'	22.98'	S47°30'57"W	20.80'

PRELIMINARY PLAT OF STORY HOUSE VILLAGE, PLANNED UNIT DEVELOPMENT PHASE 1

SITUATED IN THE S/2SE1/4 OF SECTION 24, TOWNSHIP 56 NORTH, RANGE 84 WEST, 6TH PRINCIPAL MERIDIAN, SHERIDAN COUNTY, WYOMING

DEVELOPER: STORY HOUSE PROPERTY COMPANY, LLC
40 EAST WORKS STREET, SUITE 18
SHERIDAN WY, 82801

PRESTFELDT SURVEYING
2340 WETLANDS DR., SUITE 100
PO BOX 3082
SHERIDAN, WY 82801
307-672-7415

CLIENT: WWC ENGINEERING
1849 TERRA AVENUE
SHERIDAN, WY 82801

JN: 2023-058
DN: 2023-058-PUD
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REVIEWED BY: JSP
DECEMBER 19, 2023

STORY HOUSE VILLAGE PUD
PHASE 1

PUD DESIGN REPORT

PREPARED FOR:

CITY OF SHERIDAN

ON BEHALF OF:

STORY HOUSE PROPERTY COMPANY, LLC

WWC ENGINEERING

December 2023

STORY HOUSE VILLAGE PUD – PHASE 1
PUD DESIGN REPORT

Prepared for:	City of Sheridan 55 Grinnell Plaza Sheridan, WY 82801
On Behalf of:	Story House Property Company, LLC 40 E Works Street #1B Sheridan, WY 82801
Prepared by:	WWC Engineering 1849 Terra Avenue Sheridan, WY 82801 (307) 672-0761
Reviewed by:	Sarah Rohrer, P.E., Project Manager Jeff Barron, P.E., Civil Department Manager

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- PARKING 3
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INTRODUCTION

This report provides information regarding the master plan for the Story House Village Planned Unit Development (PUD) Phase 1 (Project) located in Sheridan, WY. The proposed PUD is located east of Interstate 90 north of State Highway 336, also known as Wyarno Road. Phase 1 of the Project encompasses a subdivision of approximately 38.77 acres within the southern half of the southeast quarter of Section 24, T56N, R84W as shown on the plat and construction drawings included in Appendix A and B respectively. This report encompasses only Phase 1 of the Development. Future phases of the PUD would encompass the remainder of the 175.56-acre property and will be evaluated at that time.

PUD LAYOUT

OBJECTIVE

The objective of Phase 1 of the PUD is to encourage a thoroughly planned development while integrating a balance of residential, commercial, retail, offices, open space, and parks. The intent is to achieve a mixed-use development that integrates a way to best serve and support future business development as well as the housing market. The business development is targeted to be a mixture of retail and professional services and the housing marketing is targeted to be a mixture of single family and multifamily development. The mixture and ratio of these uses will be primarily driven by the market. The intent of the PUD is to allow for flexibility and the ability to adapt to the changing needs of the market. Open space with a pathway system and large designated open space.

RIGHT-OF-WAY & ROAD WIDTHS

- 80’ Right-of-Way/36’-56’ Road along Story House Village Road
- 80’ Right-of-Way/39’ Road along Story House Lane (west of Story House Village Road)
- 60’ Right-of-Way/36’ Road along Story House Lane (east of Story House Village Road)
- 60’ Right-of-Way/36’ Road along Baldwin Avenue
- 60’ Right-of-Way/36’ Road along Canterbury Drive
- 60’ Right-of-Way/36’ Road along Mockingbird Drive

OPEN SPACE/PARKS

The entirety of the Story House Village PUD will have 35+ acres of open space dedicated to the City of Sheridan (City). Open space will be addressed in a universal annexation agreement with the City. This satisfies the minimum requirement of 20% of the gross area of the PUD. Phase 1 of the PUD has dedicated open spaces in addition to the planned 35+ acres in future phases. Park and open space areas will have direct access from public streets. Open space will be owned and maintained by the HOA for the use and benefit of residents within the Story House Village PUD.

PUD Design Report

Uses and Building Types

Phase 1 of the PUD will be defined by two different planning areas, mixed use and residential. The mixed-use planning area will include a mixture of housing, businesses, and commercial uses. Type, size, and mixture of units will follow permitted uses within the City of Sheridan's B-2 regulations. This includes the use of single-family dwellings, multifamily dwellings, townhouses, condominiums, and commercial structures. Industrial type uses will be prohibited in the mixed-use planning area for Phase 1.

The residential planning area will include residential housing. Type, size, and mixture of units will follow permitted uses within the City of Sheridan's R-3 regulations. This includes the use of single-family dwellings, multifamily dwellings, townhouses, and condominiums.

Density

The proposed development for Phase 1 of the PUD includes both commercial and residential development. The density of the PUD includes 8 platted blocks that includes 85 residential planning area lots, 4 mixed-use planning area lots, and 2 greenspace outlots. It will include the installation of a potable water system, a low-pressure sewer system, and a package treatment plant. Roadways will include curb and gutter, sidewalks, and pathways. All infrastructure will be designed and constructed in accordance with current City of Sheridan specifications.

	Area (ac)	Number of Lots/Outlots
Mixed-Use	12.39	4
Residential	17.34	85
Open Space	0.54	2
Right-of-Way	8.41	--
Roadways	4.24	--
Easements	4.01	--

Parking

Parking for the mixed-use and residential planning areas of Phase 1 will conform to the parking requirements designated by the City of Sheridan's B-2 and R-3 uses respectively. Street parking will be allowed on all Phase 1 roadways except Story House Village Road.

Setbacks

All setbacks are measured from the property line. Setbacks for the mixed-use planning areas will conform to the setback requirements designated by the City of Sheridan's B-2 uses. Setbacks for the residential planning areas will conform to the following requirements:

Residential Planning Area Setbacks	
Front Yard	15’
Rear Yard	5’
Side Yard	5’

Construction and Maintenance

A contractor will be hired to construct the physical improvements for Phase 1 of the PUD. All streets and utilities will become the property of the City of Sheridan upon final acceptance of the improvements. Open space will be owned and maintained by the HOA for the use and benefit of residents within the Story House Village PUD.

Project Schedule

Phase 1 of the Story House Village PUD is anticipated to be completed within 5 years.

Landscaping

Landscaping will include appropriate landscaping to soften the built environment, assist with stormwater, augment buffers, and help create an aesthetically pleasing development. Landscaping shall be suitable for the climate in Sheridan, shall not include any plants considered noxious or invasive, and planted in such a way to ensure maximum success and health.

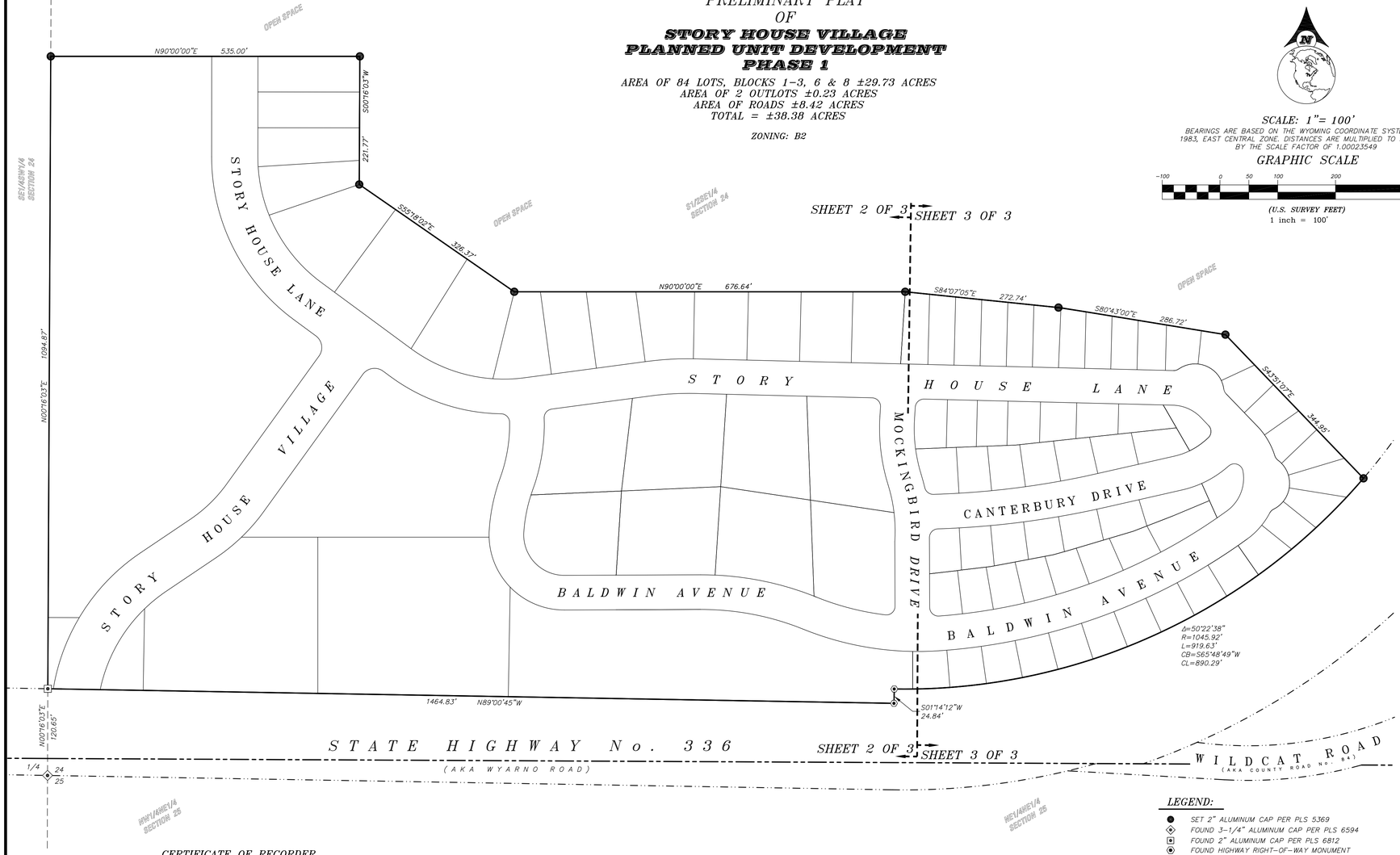
APPENDIX A

Plat

PRELIMINARY PLAT
OF
STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1

AREA OF 84 LOTS, BLOCKS 1-3, 6 & 8 ±29.73 ACRES
AREA OF 2 OUTLOTS ±0.23 ACRES
AREA OF ROADS ±8.42 ACRES
TOTAL = ±38.38 ACRES

ZONING: B2



SCALE: 1"= 100'

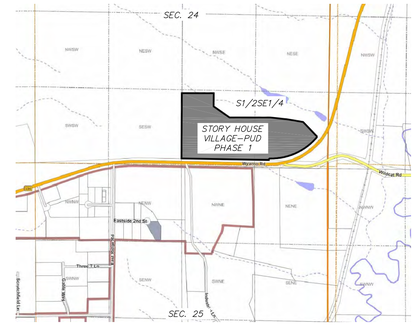
BEARINGS ARE BASED ON THE WYOMING COORDINATE SYSTEM NAD 1983, EAST CENTRAL ZONE. DISTANCES ARE MULTIPLIED TO SURFACE BY THE SCALE FACTOR OF 1.00023549

GRAPHIC SCALE

-100 0 50 100 200 400

(U.S. SURVEY FEET)
1 inch = 100'

T56N R84W



LOCATION MAP

NO TRUE SCALE

CERTIFICATE OF DEDICATION

KNOWN ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED STORY HOUSE PROPERTY COMPANY LLC BEING THE OWNER(S), PROPRIETORS OR PARTIES OF INTEREST IN THE LAND SHOWN ON THIS PLAT, DO HEREBY STATE:

THAT THE FOREGOING PLAT DESIGNATED AS ***STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1*** IS A SUBDIVISION OF THE S1/2SE1/4, SECTION 24, TOWNSHIP 56 NORTH, RANGE 84 WEST 6TH PRINCIPAL MERIDIAN, CITY OF SHERIDAN, SHERIDAN COUNTY, WYOMING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

Commencing at the quarter corner of said Section 24 (monumented with a 3¼" Aluminum Cap per PLS 6594); thence N00°16'03"E, 120.65 feet along the west line of said S½SE¼ to a 2" Aluminum Cap per PLS 6812 being the POINT OF BEGINNING this tract;
thence N00°16'03"E, 1094.87 feet along said west line to a 2" Aluminum Cap per PLS 5369;
thence N90°00'00"E, 535.00 feet to a 2" Aluminum Cap per PLS 5369;
thence S00°16'03"W, 221.77 feet to a 2" Aluminum Cap per PLS 5369;
thence S55°18'02"E, 326.37 feet to a 2" Aluminum Cap per PLS 5369;
thence N90°00'00"E, 676.64 feet to a 2" Aluminum Cap per PLS 5369;
thence S84°07'05"E, 272.74 feet to a 2" Aluminum Cap per PLS 5369;
thence S80°43'00"E, 286.72 feet to a 2" Aluminum Cap per PLS 5369;
thence S43°51'07"E, 344.95 feet to a 2" Aluminum Cap per PLS 5369, lying on the north right of way line of the Wyarno Road (AKA State Highway No. 336);
thence along said north right of way line, through a curve to the right, having a central angle of 50°22'38", a radius of 1045.92 feet, an arc length of 919.63 feet, a chord bearing of S65°48'49"W and a chord distance of 890.29 feet to a standard WYDOT right of way monument at the end of said curve to the right;
thence along said north right of way line S01°14'12"W, 24.84 feet to a standard WYDOT right of way monument;
thence N89°00'45"W, 1464.83 feet along said north right of way line to the POINT OF BEGINNING.

SAID SUBDIVISION CONTAINS ***±38.38 ACRES*** OF LAND, MORE OR LESS.

STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1, AS IT IS DESCRIBED AND AS IT APPEARS ON THIS PLAT, IS MADE WITH THE FREE CONSENT AND IN ACCORDANCE WITH THE DESIRES OF THE UNDERSIGNED OWNER(S) AND PROPRIETORS; AND THAT THIS IS A CORRECT PLAT OF THE AREA AS IT IS DIVIDED INTO LOTS, OUTLOTS, STREETS AND EASEMENTS.

THE UNDERSIGNED OWNER(S) OF THE LAND SHOWN AND DESCRIBED ON THIS PLAT DO HEREBY DEDICATE TO THE CITY OF SHERIDAN AND ITS LICENSEES FOR PUBLIC USE FOR THE INDICATED PURPOSES, ALL STREETS, EASEMENTS AND OTHER PUBLIC LANDS, AS INDICATED, AND NOT ALREADY OTHERWISE DEDICATED FOR PUBLIC USE.

UTILITY EASEMENTS, AS DESIGNATED ON THE PLAT, ARE HEREBY GRANTED TO THE CITY OF SHERIDAN AND IT'S LICENSEES FOR PUBLIC USE FOR THE PURPOSE OF INSTALLING, REPAIRING, REINSTALLING, REPLACING AND MAINTAINING SANITARY SEWERS, STORM SEWERS, WATER LINES, GAS LINES, ELECTRIC LINES, TELEPHONE LINES, CABLE TV LINE, AND OTHER FORMS AND TYPES OF PUBLIC UTILITIES NOW OR HEREAFTER GENERALLY UTILIZED BY THE PUBLIC.

OUTLOTS ARE DRAINAGE EASEMENTS, OTHER EASEMENTS (AS SHOWN & DEFINED), AND OPEN SPACES WHICH ARE OWNED & MAINTAINED BY THE HOMEOWNER'S ASSOCIATION.

CERTIFICATE OF RECORDER

STATE OF WYOMING :ss
COUNTY OF SHERIDAN

THIS PLAT WAS FILED FOR RECORD IN THE OFFICE OF THE CLERK AND RECORDER AT_____ O'CLOCK __M.,

THIS_____, DAY OF_____, 20_____, AND IS RECORDED IN PLAT BOOK _____, PAGE _____

_____ STAMP RECEIVING NUMBER _____
COUNTY CLERK

CITY OF SHERIDAN CERTIFICATES OF APPROVAL

REVIEWED BY THE CITY OF SHERIDAN PLANNING COMMISSION THIS_____ DAY OF _____, _____.

_____ _____
ATTEST: VICE-CHAIRMAN CHAIRMAN

_____
DIRECTOR OF PUBLIC WORKS

APPROVED BY THE CITY COUNCIL OF THE CITY OF SHERIDAN, WYOMING, THIS___DAY OF_____, ____.

_____ _____
ATTEST: CITY CLERK MAYOR

DECLARATION EXTINGUISHING PREVIOUS EASEMENTS

1) ALL EARLIER EASEMENTS OR PORTIONS THEREOF ENCOMPASSED BY THE BOUNDARY OF THIS PLAT ARE HEREBY EXTINGUISHED UNLESS NOTED OTHERWISE.

2) EXISTING UTILITIES PLACED IN PREVIOUS RECORDED EASEMENTS WITHIN THE BOUNDARY OF THIS PLAT HAVE SENIOR RIGHTS AND ARE NOW PROTECTED BY EASEMENTS OR ROADS AS SHOWN ON THIS PLAT.

SURVEYOR'S CERTIFICATE

STATE OF WYOMING :ss
COUNTY OF SHERIDAN

I, THONE STEWART, DO HEREBY STATE THAT I AM A REGISTERED LAND SURVEYOR, LICENSED UNDER THE LAWS OF THE STATE OF WYOMING, THAT THIS PLAT IS A TRUE, CORRECT AND COMPLETE PLAT OF ***STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1,*** AS LAID OUT, PLATTED, DEDICATED AND SHOWN HEREON, THAT THIS PLAT WAS MADE FROM AN ACCURATE SURVEY OF SAID PROPERTY CONDUCTED BY ME OR UNDER MY DIRECT SUPERVISION AND CORRECTLY SHOWS THE LOCATION AND DIMENSIONS OF ALL LOTS, EASEMENTS AND STREETS OF SAID SUBDIVISION IN COMPLIANCE WITH THE CITY OF SHERIDAN REGULATIONS GOVERNING THE SUBDIVISION OF LAND.

Professional Land Surveyor THONE STEWART Date: WYOMING

PRELIMINARY DRAFT

"PLAT IS VALID ONLY IF PRINT HAS ORIGINAL SIGNATURE OF SURVEYOR SIGNED AND DATED"

LEGEND:

- SET 2" ALUMINUM CAP PER PLS 5369
- FOUND 3-1/4" ALUMINUM CAP PER PLS 6594
- FOUND 2" ALUMINUM CAP PER PLS 6812
- FOUND HIGHWAY RIGHT-OF-WAY MONUMENT
- BOUNDARY LINE
- LOT LINE
- SECTION LINE
- INTERIOR SECTION LINE
- HIGHWAY RIGHT-OF-WAY

IN TESTIMONY WHEREOF:

ALL RIGHTS UNDER AND BY VIRTUE OF THE HOMESTEAD EXEMPTION LAWS OF THE STATE OF WYOMING ARE HEREBY WAIVED AND RELEASED.

THE UNDERSIGNED HAVE CAUSED THESE PRESENTS TO BE SIGNED THIS_____ DAY OF _____

FP STORY HOUSE PROPERTY COMPANY, LLC

BY:_____
, MEMBER

STATE OF WYOMING :ss
COUNTY OF SHERIDAN

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BY xxxxxxxxxxxx BEFORE ME THIS DAY OF _____, _____.

WITNESS MY HAND AND OFFICIAL SEAL. MY COMMISSION EXPIRES _____

_____
NOTARY PUBLIC

SIGNED BY AFFIDAVIT

BY: SECURITY STATE BANK ("LIEN HOLDER"), SEE AFFIDAVIT FILED AT THE SHERIDAN COUNTY COURTHOUSE.
DOCUMENT NUMBER: _____

PRELIMINARY PLAT
OF
STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1

SITUATED IN THE S/2SE1/4 OF SECTION 24, TOWNSHIP 56 NORTH, RANGE 84 WEST, 6TH PRINCIPAL MERIDIAN, SHERIDAN COUNTY, WYOMING

DEVELOPER: STORY HOUSE PROPERTY COMPANY, LLC
40 EAST WORKS STREET, SUITE 18
SHERIDAN WY, 82801

PRESTFELDT SURVEYING
2340 WETLANDS DR., SUITE 100
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SHERIDAN, WY 82801
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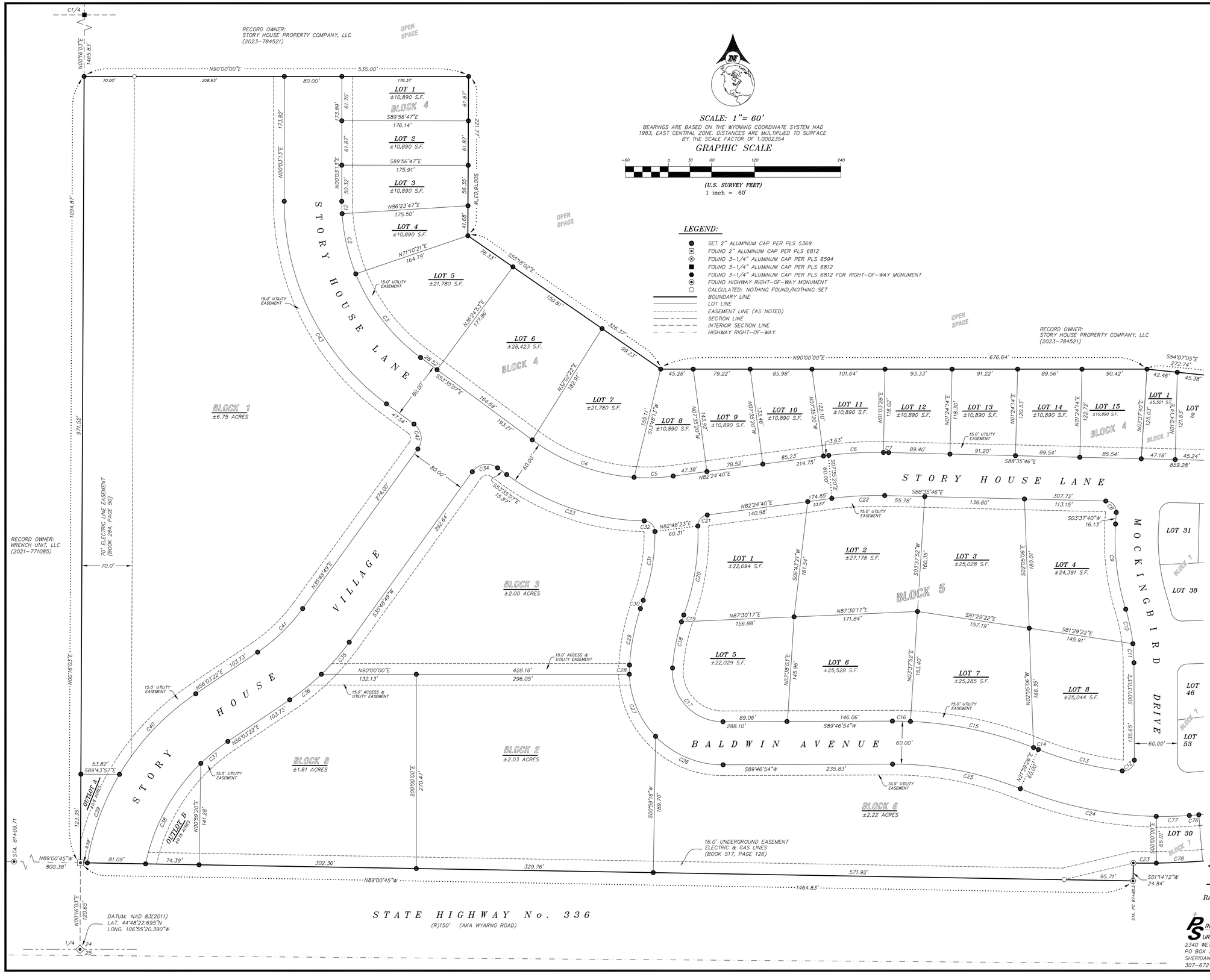


CURVE TABLE					
CURVE	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C1	3°39'25"	270.00'	17.23'	S01°46'30"E	17.23'
C2	18°19'08"	270.00'	86.33'	S12°45'47"E	85.96'
C3	31°39'47"	270.00'	149.21'	S37°45'14"E	147.32'
C4	32°26'57"	270.00'	152.91'	S69°48'36"E	150.88'
C5	11°33'16"	270.00'	54.45'	N88°11'18"E	54.36'
C6	8°38'49"	530.00'	79.99'	N86°44'04"E	79.91'
C7	0°20'46"	530.00'	3.20'	S88°46'09"E	3.20'
C8	92°13'26"	15.00'	24.14'	N42°29'03"W	21.62'
C9	20°53'28"	329.56'	120.17'	S06°49'04"E	119.50'
C10	17°02'45"	254.21'	75.63'	N08°44'25"W	75.35'
C11	17°02'45"	254.21'	75.63'	N08°44'25"W	75.35'
C12	97°08'28"	15.00'	25.43'	N48°21'11"E	22.49'
C13	15°04'01"	470.00'	123.60'	S75°32'35"E	123.24'
C14	0°28'37"	530.00'	4.41'	N68°14'52"W	4.41'
C15	19°00'43"	530.00'	175.87'	N77°59'33"W	175.06'
C16	2°43'11"	530.00'	25.16'	N88°51'30"W	25.16'
C17	94°08'19"	70.00'	115.01'	S43°08'56"E	102.50'
C18	13°56'56"	270.00'	65.73'	S10°53'41"W	65.57'
C19	2°06'21"	270.00'	9.92'	S18°55'20"W	9.92'
C20	21°54'40"	330.00'	126.20'	N09°01'10"E	125.43'
C21	84°20'49"	15.00'	22.08'	S40°14'15"W	20.14'
C22	8°59'34"	470.00'	73.77'	S86°54'27"W	73.69'
C23	1°44'42"	1045.92'	31.86'	S89°52'13"E	31.85'
C24	20°59'06"	530.00'	194.12'	S78°30'07"E	193.03'
C25	22°12'32"	470.00'	182.18'	N79°06'50"W	181.04'
C26	46°08'30"	130.00'	104.69'	S67°08'51"E	101.89'
C27	42°20'16"	130.00'	96.06'	S22°54'28"E	93.89'
C28	5°39'33"	130.00'	12.84'	S01°05'26"W	12.84'
C29	13°56'56"	330.00'	80.34'	S10°53'41"W	80.14'
C30	2°06'21"	330.00'	12.13'	S18°55'20"W	12.13'
C31	20°44'18"	270.00'	97.73'	N09°36'21"E	97.19'
C32	88°27'13"	15.00'	23.16'	N44°59'24"W	20.93'
C33	35°37'54"	330.00'	205.22'	S71°24'04"E	201.93'
C34	90°36'04"	25.00'	39.53'	S81°06'51"W	35.54'
C35	20°14'33"	328.00'	115.88'	N45°56'05"E	115.28'
C36	20°14'33"	328.00'	115.88'	N45°56'05"E	115.28'
C37	101°3'50"	272.00'	48.57'	S50°56'27"W	48.50'
C38	34°08'12"	272.00'	162.06'	S28°45'26"W	159.67'
C39	21°28'22"	352.00'	131.92'	S19°58'25"W	131.15'
C40	25°20'46"	352.00'	155.72'	S43°22'59"W	154.45'
C41	20°14'33"	248.00'	87.62'	N45°56'05"E	87.16'
C42	89°23'56"	25.00'	39.01'	N08°53'09"W	35.17'
C43	53°38'20"	350.00'	327.66'	S26°45'57"E	315.83'

PRELIMINARY PLAT
OF
STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1

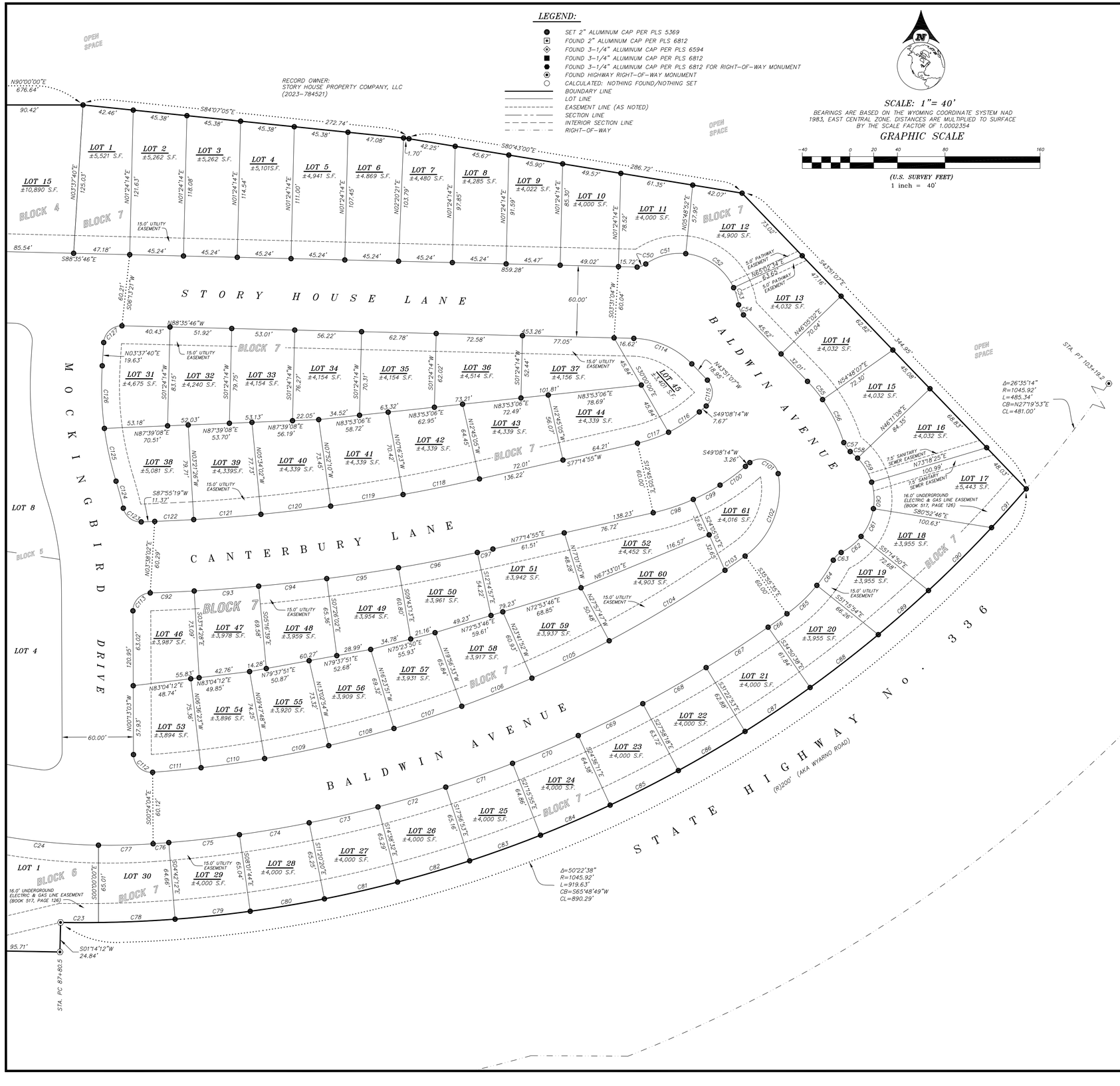
SITUATED IN THE S/2SE1/4 OF SECTION 24, TOWNSHIP 56 NORTH, RANGE 84 WEST, 6TH PRINCIPAL MERIDIAN, SHERIDAN COUNTY, WYOMING

DEVELOPER: STORY HOUSE PROPERTY COMPANY, LLC
40 EAST WORKS STREET, SUITE 18
SHERIDAN WY, 82801

PRESTFELDT SURVEYING
2340 WETLANDS DR., SUITE 100
P.O. BOX 3082
SHERIDAN, WY 82801
307-672-7415

CLIENT: WWC ENGINEERING
1849 TERRA AVENUE
SHERIDAN, WY 82801

JN: 2023-058
DN: 2023-058-PUD
PF: T2023-058
REVIEWED BY: JSP
DECEMBER 19, 2023



CURVE TABLE					
CURVE	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C50	29°51'54"	15.00'	7.82'	N70°06'35"E	7.73'
C51	40°38'14"	50.00'	35.46'	S75°29'45"W	34.72'
C52	59°13'43"	50.00'	51.69'	N54°34'17"W	49.42'
C53	17°19'27"	50.00'	15.12'	N16°17'42"W	15.06'
C54	36°16'58"	15.00'	9.50'	S25°46'28"E	9.34'
C55	8°46'55"	130.00'	19.93'	N39°35'21"W	19.91'
C56	17°50'51"	130.00'	40.49'	N26°16'27"W	40.33'
C57	35°59'59"	15.00'	9.42'	S35°21'02"E	9.27'
C58	9°32'09"	50.00'	8.32'	N48°34'57"W	8.31'
C59	27°07'16"	50.00'	23.67'	N30°15'14"W	23.45'
C60	25°48'49"	50.00'	22.53'	N03°47'11"W	22.34'
C61	29°37'56"	50.00'	25.86'	N23°56'12"E	25.57'
C62	24°49'08"	50.00'	21.66'	N51°09'45"E	21.49'
C63	35°59'59"	15.00'	9.42'	S45°34'19"W	9.27'
C64	11°09'47"	130.00'	25.33'	N33°09'13"E	25.29'
C65	15°20'19"	130.00'	34.80'	N46°24'15"E	34.70'
C66	1°04'57"	1030.00'	19.46'	N54°36'53"E	19.46'
C67	3°27'45"	1030.00'	62.24'	N56°53'14"E	62.24'
C68	3°24'35"	1030.00'	61.30'	N60°19'24"E	61.29'
C69	3°22'07"	1030.00'	60.56'	N63°42'45"E	60.55'
C70	3°20'17"	1030.00'	60.01'	N67°03'57"E	60.00'
C71	3°19'02"	1030.00'	59.63'	N70°23'36"E	59.62'
C72	3°18'21"	1030.00'	59.43'	N73°42'18"E	59.42'
C73	3°18'12"	1030.00'	59.38'	N77°00'34"E	59.38'
C74	3°18'36"	1030.00'	59.50'	N80°18'58"E	59.49'
C75	3°19'32"	1030.00'	59.78'	N83°38'02"E	59.78'
C76	0°44'07"	1030.00'	13.22'	N85°39'51"E	13.22'
C77	4°58'26"	530.00'	46.01'	N88°31'07"E	45.99'
C78	3°32'06"	1045.92'	64.53'	N87°29'23"E	64.52'
C79	3°28'53"	1045.92'	63.55'	N83°58'54"E	63.54'
C80	3°27'57"	1045.92'	63.27'	N80°30'29"E	63.26'
C81	3°27'33"	1045.92'	63.15'	N77°02'44"E	63.14'
C82	3°27'42"	1045.92'	63.19'	N73°35'06"E	63.18'
C83	3°28'23"	1045.92'	63.40'	N70°07'04"E	63.39'
C84	3°29'37"	1045.92'	63.77'	N66°38'04"E	63.76'
C85	3°31'26"	1045.92'	64.33'	N63°07'33"E	64.32'
C86	3°33'52"	1045.92'	65.07'	N59°34'54"E	65.06'
C87	3°37'00"	1045.92'	66.02'	N55°59'28"E	66.01'
C88	3°40'55"	1045.92'	67.21'	N52°20'30"E	67.20'
C89	4°05'08"	1045.92'	74.58'	N48°27'29"E	74.56'

CURVE TABLE					
CURVE	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C90	5°47'25"	1045.92'	105.70'	N43°31'12"E	105.66'
C91	5°47'25"	1045.92'	105.70'	N43°31'12"E	105.66'
C92	1°23'16"	1530.00'	37.06'	N87°27'10"E	37.05'
C93	2°02'11"	1530.00'	54.38'	N85°44'26"E	54.38'
C94	2°09'23"	1530.00'	57.58'	N83°38'39"E	57.58'
C95	2°17'10"	1530.00'	61.05'	N81°25'23"E	61.05'
C96	2°31'44"	1530.00'	67.53'	N79°00'55"E	67.53'
C97	0°30'09"	1530.00'	13.42'	N77°29'59"E	13.42'
C98	1°19'58"	180.00'	35.60'	N71°34'56"E	35.54'
C99	8°07'44"	180.00'	25.54'	N61°51'05"E	25.52'
C100	8°39'00"	180.00'	27.17'	N53°27'44"E	27.15'
C101	120°26'58"	15.00'	31.53'	N70°38'17"W	26.04'
C102	64°29'13"	70.00'	78.79'	N21°49'48"E	74.69'
C103	1°13'28"	970.00'	20.73'	N54°41'09"E	20.73'
C104	6°44'20"	970.00'	114.09'	N58°40'03"E	114.02'
C105	4°15'55"	970.00'	72.21'	N64°10'10"E	72.19'
C106	3°45'19"	970.00'	63.57'	N68°10'47"E	63.56'
C107	3°32'42"	970.00'	60.02'	N71°49'48"E	60.01'
C108	3°20'57"	970.00'	56.70'	N75°16'37"E	56.69'
C109	3°15'06"	970.00'	55.05'	N78°34'39"E	55.04'
C110	3°11'25"	970.00'	54.01'	N81°47'54"E	54.00'
C111	2°25'02"	970.00'	40.92'	N84°36'08"E	40.92'
C112	93°58'18"	15.00'	24.60'	S47°12'12"E	21.94'
C113	88°21'50"	15.00'	23.13'	S43°57'52"W	20.91'
C114	44°44'39"	70.00'	54.67'	N66°13'27"W	53.29'
C115	92°59'21"	15.00'	24.34'	N02°38'33"E	21.76'
C116	14°50'26"	120.00'	31.08'	N56°33'27"E	31.00'
C117	13°16'15"	120.00'	27.79'	N70°36'47"E	27.73'
C118	2°33'07"	1472.67'	65.59'	N78°26'59"E	65.58'
C119	2°24'13"	1470.00'	61.67'	N80°55'43"E	61.66'
C120	2°18'08"	1470.00'	59.06'	N83°16'54"E	59.06'
C121	2°12'36"	1470.00'	56.70'	N85°32'16"E	56.70'
C122	1°16'45"	1470.00'	32.82'	N87°16'56"E	32.82'
C123	79°06'29"	14.89'	20.56'	S52°31'26"E	18.97'
C124	4°17'29"	314.32'	23.54'	N15°07'02"W	23.54'
C125	9°40'24"	269.56'	45.51'	S12°25'36"E	45.46'
C126	11°13'04"	269.56'	52.78'	S01°58'52"E	52.69'
C127	87°46'34"	15.00'	22.98'	S47°30'57"W	20.80'

PRELIMINARY PLAT OF STORY HOUSE VILLAGE, PLANNED UNIT DEVELOPMENT PHASE 1

SITUATED IN THE S/2SE1/4 OF SECTION 24, TOWNSHIP 56 NORTH, RANGE 84 WEST, 6TH PRINCIPAL MERIDIAN, SHERIDAN COUNTY, WYOMING

DEVELOPER: STORY HOUSE PROPERTY COMPANY, LLC
40 EAST WORKS STREET, SUITE 18
SHERIDAN WY, 82801

PRESTFELDT SURVEYING
2340 WETLANDS DR., SUITE 100
PO BOX 3082
SHERIDAN, WY 82801
307-672-7415

CLIENT: WWC ENGINEERING
1849 TERRA AVENUE
SHERIDAN, WY 82801

JN: 2023-058
DN: 2023-058-PUD
PF: T2023-058
REVIEWED BY: JSP
DECEMBER 19, 2023

APPENDIX B

Design Drawings

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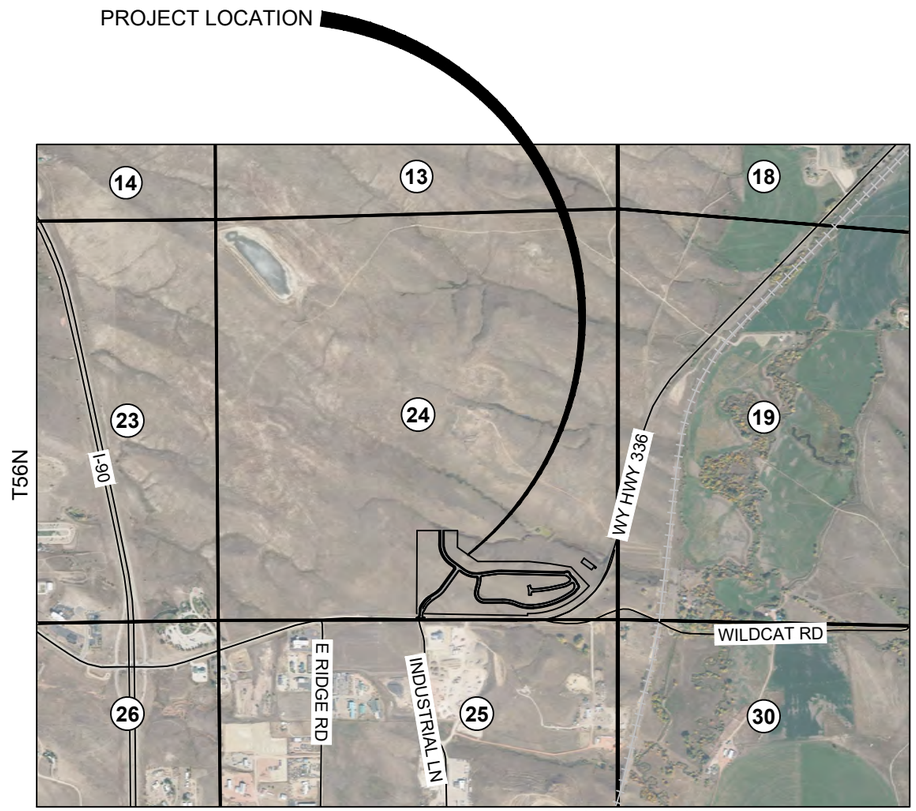
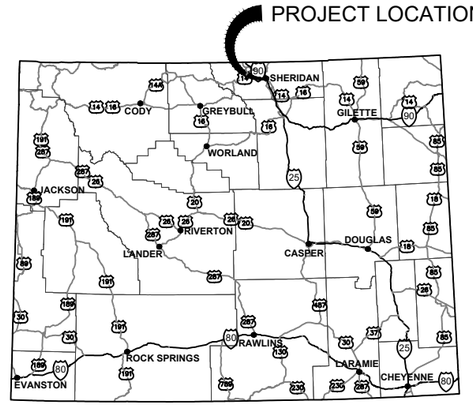
CONSTRUCTION DRAWINGS

STORY HOUSE PROPERTY COMPANY, LLC
STORY HOUSE VILLAGE PUD - PHASE 1



LOCATION MAP



SHERIDAN COUNTY, WYOMING

N

0 1000' 2000'

SCALE: 1" = 2000'
11" x 17" PAPER SIZE

Know what's below. Call before you dig.

DRAFT

PREPARED FOR:
STORY HOUSE PROPERTY COMPANY, LLC
40 E. WORKS STREET
SUITE #1B
SHERIDAN, WY 82801

PREPARED BY:
WWC ENGINEERING
1849 TERRA AVE.
SHERIDAN, WY 82801
(307) 672-0761
www.wwcengineering.com

PROJECT NO. 2023-137

NO.	REVISION	BY	DATE

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

DRAWING NO.
1

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Sheet List Table

Sheet Number	Sheet Title
1	COVER SHEET
2	SHEET LIST
3	GENERAL NOTES & LEGEND
4	PUD PHASING
5	EXISTING SITE
6	PROPOSED SITE
7	CONTROL ABSTRACT
8	ROAD KEY SHEET
9	STORY HOUSE VILLAGE - PLAN AND PROFILE
10	STORY HOUSE VILLAGE - PLAN AND PROFILE
11	STORY HOUSE LANE - PLAN AND PROFILE
12	STORY HOUSE LANE - PLAN AND PROFILE
13	STORY HOUSE LANE - PLAN AND PROFILE
14	STORY HOUSE LANE & BALDWIN AVE - PLAN AND PROFILE
15	BALDWIN AVENUE - PLAN AND PROFILE
16	BALDWIN AVENUE - PLAN AND PROFILE
17	BALDWIN AVENUE - PLAN AND PROFILE
18	BALDWIN AVENUE - PLAN AND PROFILE
19	CANTERBURY LN & MOCKINGBIRD DR - PLAN AND PROFILE
20	TYPICAL ROAD SECTIONS
21	TYPICAL ROAD SECTIONS
23	INTERSECTION DETAIL SHEET
24	INTERSECTION DETAIL SHEET
25	INTERSECTION DETAIL SHEET
26	INTERSECTION DETAIL SHEET
27	WATER KEY SHEET
28	WATER PLAN AND PROFILE SHEET

Sheet List Table

Sheet Number	Sheet Title
29	WATER PLAN AND PROFILE SHEET
30	WATER PLAN AND PROFILE SHEET
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35	WATER PLAN AND PROFILE SHEET
36	WATER PLAN AND PROFILE SHEET
37	WATER PLAN AND PROFILE SHEET
38	WATER PLAN AND PROFILE SHEET
39	SANITARY SEWER KEY SHEET
40	SANITARY SEWER PLAN AND PROFILE SHEET
41	SANITARY SEWER PLAN AND PROFILE SHEET
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43	SANITARY SEWER PLAN AND PROFILE SHEET
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52	ORENCO DETAIL SHEET
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56	ORENCO DETAIL SHEET

Sheet List Table

Sheet Number	Sheet Title
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DRAFT

NO.	REVISION	BY	DATE

PROJECT NO. 2023-137

PREPARED BY
WWC ENGINEERING
1849 TERRA AVE.
SHERIDAN, WY 82801
(307) 672-0761
www.wwcengineering.com

STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

SHEET LIST

SHERIDAN COUNTY, WYOMING

DESIGNED BY: *SER*
DRAWN BY: *CIG*
CHECKED BY: *JBG*
DATE: *12/20/2023*

SHEET
2

K:\Sheridan\story house management\20231137 story house village\05CAD\Sheets\PLAN SET\231137_VILG_PLNST_COVR.dwg GENERAL NOTES 12/20/2023 10:52:24 AM

GENERAL CONSTRUCTION NOTES

1. UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS, ALL WORK SHALL CONFORM TO LATEST EDITION OF CITY OF SHERIDAN STANDARD SPECIFICATIONS & DETAILS AND ANY SPECIAL PROVISIONS.
2. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 48 HOURS PRIOR TO BEGINNING ANY WORK.
3. THE CONTRACTOR SHALL CONFINE CONSTRUCTION TO EASEMENTS AND RIGHT-OF-WAYS SHOWN. CONTRACTOR IS TO PROTECT FROM DAMAGE ALL FEATURES INSIDE THE DESIGNATED AREAS SO NOTED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS REQUIRED AND CONSTRUCTION TESTING FOR CONSTRUCTION ACTIVITIES.
5. THE CONTRACTOR SHALL SUPPLY ALL NECESSARY FITTINGS, COUPLINGS, AND SPOOL PIECES FOR CONNECTING NEW UTILITIES TO EXISTING UTILITIES. THESE PLANS MAY NOT SHOW ALL REQUIRED COMPONENTS FOR MAKING THE CONNECTIONS.
6. THE CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR, WHO SHALL ALSO BE SOLELY RESPONSIBLE FOR THE MEANS, METHODS AND SEQUENCING (WITHIN THE REQUIREMENTS OF THE CONTRACT DOCUMENTS) OF CONSTRUCTION OPERATIONS.
7. THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST AND EROSION DURING CONSTRUCTION AT CONTRACTOR'S EXPENSE. EROSION SHALL BE CONTROLLED IN ACCORDANCE WITH WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY REGULATIONS.
8. THE CONTRACTOR SHALL PREPARE AND SUBMIT A STORM WATER CONTROL PLAN TO THE WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY AND OBTAIN REQUIRED CONSTRUCTION RELATED PERMITS PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES. A COPY OF ALL PERMITS SHALL BE PROVIDED TO THE ENGINEER.
9. WHEN GROUNDWATER IS ENCOUNTERED THE CONTRACTOR MUST UTILIZE AN EFFECTIVE DEWATER/NG PROGRAM ACCEPTABLE TO THE ENGINEER AND AT NO COST TO THE OWNER, TO INSTALL MATERIALS IN COMPLIANCE WITH THE SPECIFICATIONS. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY DISCHARGING WATER IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
10. THE LOCATION, DEPTH AND SIZE OF EXISTING UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE. FIELD VERIFICATION OF BURIED GAS, ELECTRIC, TELEPHONE, CABLE, FIBER, WATER, SEWER AND OTHER LINES WERE NOT PERFORMED.
11. WATER SERVICES AND SANITARY SEWER SERVICES ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE TO LOCATE ALL WATER AND SEWER SERVICE LINES AND ENSURE EACH HOUSE AND/OR LOT IS CONNECTED TO THE NEW WATER AND SEWER MAINS.
12. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES AND DETERMINE THE EXACT LOCATION OF ALL UNDERGROUND UTILITIES BEFORE TRENCHING OR EXCAVATING. 48-HOUR NOTICE IS REQUIRED (AT LEASE TWO FULL BUSINESS DAYS BEFORE A WEEKEND OR HOLIDAY). CONTRACTOR SHALL NOTIFY ONE-CALL-OF-WYOMING @ 811 or 1-800-849-2476 FOR ONSITE UTILITY LOCATION. ALTERNATIVELY, EXCAVATION TICKETS CAN BE SUBMITTED ONLINE AT https://www.onecallofwyoming.com/excavators/. ALL EXISTING UTILITIES SHALL BE MARKED PRIOR TO ANY EXCAVATION.
13. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ALL UTILITIES (WHETHER SHOWN ON DRAWINGS OR NOT) ENCOUNTERED DURING CONSTRUCTION AND SHALL NOT BACKFILL UNTIL THE ENGINEER HAS MADE A RECORD OF UTILITY TYPE, SIZE AND LOCATION. THE CONTRACTOR SHALL DOCUMENT THE SAME FOR HIS RECORDS. ENGINEER OR OWNER WILL NOT BE RESPONSIBLE FOR DELAYS TO CONSTRUCTION ACTIVITIES AS A RESULT OF UTILITY LOCATES, RELOCATION, UTILITIES ENCOUNTERED OR WHILE ENGINEER IS RECORDING UTILITY INFORMATION.
14. ALL UTILITY CONDUITS FOR IRRIGATION, ELECTRICAL, GAS, PHONE, CATV, FIBER, ETC. SHALL BE BURIED A MINIMUM 24" BELOW FINISHED GRADE, OR AS REQUIRED BY SUCH UTILITY, BEDDED WITH TYPE A BEDDING MATERIAL, AND THE TRENCH BACKFILLED WITH IMPORTED TRENCH BACKFILL MATERIAL, PER CITY SPECIFICATIONS. EXISTING TRENCH EXCAVATION MATERIAL MAY BE USED AS APPROVED BY THE ENGINEER.
15. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DESIGNING AND CONSTRUCTING STABLE, TEMPORARY EXCAVATIONS AND SHALL SHORE AND BRACE, SLOPE, OR BENCH THE SIDES OF THE EXCAVATIONS AS REQUIRED TO MAINTAIN STABILITY OF BOTH THE EXCAVATION SIDES AND BOTTOM. ALL EXCAVATIONS SHALL COMPLY WITH APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS INCLUDING THE CURRENT OSHA EXCAVATION AND TRENCH SAFETY STANDARDS 29 CFR PART 1926, SUBPART P - EXCAVATIONS.
16. IF GROUNDWATER IS ENCOUNTERED, WEEPLESS FIRE HYDRANTS SHALL BE INSTALLED.
17. PAVEMENT MARKINGS, STRIPING, AND SIGNS TO BE INSTALLED PER CURRENT VERSION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
18. THE LOCATIONS OF ALL PAVEMENT MARKINGS, STRIPING, AND SIGNS SHALL BE AS DIRECTED IN THE FIELD BY THE ENGINEER.
19. ALL DISTRUBED AREAS SHALL BE SEEDED BY THE CONTRACTOR USING A SEED MIX APPROVED BY THE ENGINEER.

BLOCK LEGEND

EXISTING	PROPOSED	EXISTING	PROPOSED	EXISTING	PROPOSED
	SANITARY SEWER MANHOLE		WATER VENT		FIBER OPTIC MANHOLE
	SANITARY SEWER CLEANOUT		WATER MANHOLE		FIBER OPTIC MARKER
	SANITARY SEWER CAP		WATER REDUCER		FIBER OPTIC PULL BOX
	SANITARY SEWER METER VAULT		WATER MARKER		FIBER OPTIC PEDESTAL
	SANITARY SEWER LIFT STATION		FIRE HYDRANT		FIBER OPTIC VAULT
	SANITARY SEWER FM (TEE)		WATER CURB STOP		NATURAL GAS MARKER
	SANITARY SEWER FM (11.25°)		WATER METER		NATURAL GAS METER
	SANITARY SEWER FM (22.5°)		WATER VAULT		NATURAL GAS VALVE
	SANITARY SEWER FM (45°)		WATER BOOSTER STATION		TELEPHONE MANHOLE
	SANITARY SEWER FM (90°)		WATER WELL		TELEPHONE MARKER
	SANITARY SEWER FM (CROSS)		WATER MONITORING WELL		TELEPHONE PULL BOX
	SANITARY SEWER FM FLANGE		WATER TEST STATION		TELEPHONE PEDESTAL
	SANITARY SEWER FM VALVE		CABLE TELEVISION MARKER		TELEPHONE VAULT
	SANITARY SEWER FM REDUCER		CABLE TELEVISION PULL BOX		TREE (DECIDUOUS)
	SANITARY SEWER FM BF PREV.		CABLE TELEVISION PEDESTAL		TREE (CONIFER)
	STORMWATER AREA INLET		CABLE TELEVISION VAULT		ADA RAMP
	STORMWATER COMBO INLET		POWER GUY ANCHOR		SIGN
	STORMWATER FLARED END		POWER GUY POLE		BOLLARD
	STORMWATER MANHOLE		POWER MANHOLE		MILEPOST
	STORMWATER PUMP STATION		POWER MARKER		CATTLE GUARD
	STORM SEWER HEAD WALL		ELECTRIC POWER METER		BORE LOCATION
	WATER FITTING BEND 11.25°		POWER POLE		PROP CORNER ALUMINUM CAP
	WATER FITTING BEND 22.5°		POWER TRANSFORMER		PROP CORNER BRASS CAP
	WATER FITTING BEND 45°		POWER VAULT		PROP CORNER CHISELED X
	WATER FITTING BEND 90°		STREET LIGHT		HIGHWAY ROW MONUMENT
	WATER FITTING CAP		IRRIGATION PULL BOX		PROP CORNER IRON PIPE
	WATER FITTING CROSS		IRRIGATION SPRINKLER HEAD		PROP CORNER LEAD & TACK
	WATER FITTING FLANGE		IRRIGATION VALVE		PROP CORNER REBAR
	WATER FITTING TEE		IRRIGATION VAULT		PROP CORNER STONE
	WATER FITTING VALVE				CONTROL POINT
					PROP CORNER PLASTIC CAP

LINE STYLE LEGEND

EXISTING	PROPOSED	
		MAJOR CONTOUR
		MINOR CONTOUR
OHT — OHT	OHT — OHT	OVERHEAD TELEPHONE
OHP — OHP	OHP — OHP	OVERHEAD POWER
NG — NG	NG — NG	NATURAL GAS
IR — IR	IR — IR	IRRIGATION LINE
FO — FO	FO — FO	FIBER OPTIC
FM — FM	FM — FM	FORCEMAIN
O — O	O — O	FENCE [CHAIN]
X — X	X — X	FENCE [BARBED]
[ ] — [ ]	[ ] — [ ]	FENCE [PRIVACY]
F — F	F — F	FIRE LINE
OHTV — OHTV	OHTV — OHTV	OVERHEAD TV
RW — RW	RW — RW	RAW WATER
SS — SS	SS — SS	SEWER
ST — ST	ST — ST	STORM
UGP — UGP	UGP — UGP	UNDERGROUND POWER
UGT — UGT	UGT — UGT	UNDERGROUND TELEPHONE
UGTV — UGTV	UGTV — UGTV	UNDERGROUND TV
W — W	W — W	WATER

DRAWING NOTATION

A / 10 — INDICATES CROSS SECTION LOCATION. "A" REFERS TO THE CROSS SECTION DESIGNATION. "10" REFERS TO THE SHEET NUMBER WHERE THE SECTION IS CUT OR SHOWN.

1 / 12 — INDICATES DETAIL LOCATION. "1" REFERS TO THE DETAIL DESIGNATION. "12" REFERS TO THE SHEET NUMBER WHERE THE DETAIL IS INDICATED OR SHOWN.

ABRREVIATIONS

ACI	AMERICAN CONCRETE INSTITUTE	HWY	HIGHWAY
BAR	REBAR	INV	INVERT ELEVATION
BMP	BEST MANAGEMENT PRACTICES	LF	LINEAR FEET
BOT	BOTTOM	MH	MANHOLE
BVC	BEGIN VERTICAL CURVE	MJ	MECHANICAL JOINT
CFS	CUBIC FEET PER SECOND	O.C.	ON CENTER
CL	CENTERLINE	O.C.E.F.	ON CENTER EACH FACE
CMP	CORRUGATED METAL PIPE	OHP	OVERHEAD POWER
CONC	CONCRETE OR CONCENTRIC	PI	POINT OF INTERSECTION
CP	CONTROL POINT	PC	POINT OF CURVATURE
CSP	CORRUGATED STEEL PIPE	PCC	POINT OF COMPOUND CURVE
CTR	CENTER	POT	POINT ON TANGENT
CU FT	CUBIC FEET	PRC	POINT OF REVERSE CURVE
CULV	CULVERT	PS	PIPE SUPPORT
DI	DUCTILE IRON OR DRAIN INLET	PT	POINT, POINT OF TANGENCY
DIA	DIAMETER	PVC	POLYVINYL CHLORIDE
EA	EACH	PWR	POWER
E.F.	EACH FACE	RCP	REINFORCED CONCRETE PIPE
EL, ELEV	ELEVATION	R/W OR ROW	RIGHT OF WAY
EOP	EDGE OF PAVEMENT	SAN	SANITARY
EVC	END VERTICAL CURVE	SST	STAINLESS STEEL
FT	FOOT OR FEET	STA	STATION
GPM	GALLONS PER MINUTE	TBC	TOP BACK OF CURB
HP	HORSEPOWER	TYP	TYPICAL
		UG	UNDERGROUND
		WTR	WATER

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NO.	REVISION	BY	DATE

PROJECT NO. 2023-137

PREPARED BY
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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

GENERAL NOTES & LEGEND

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET 3

STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

PUD PHASING

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
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DATE: 12/20/2023

SHEET 4

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

EXISTING SITE

SHERIDAN COUNTY, WYOMING

SHEET 5

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

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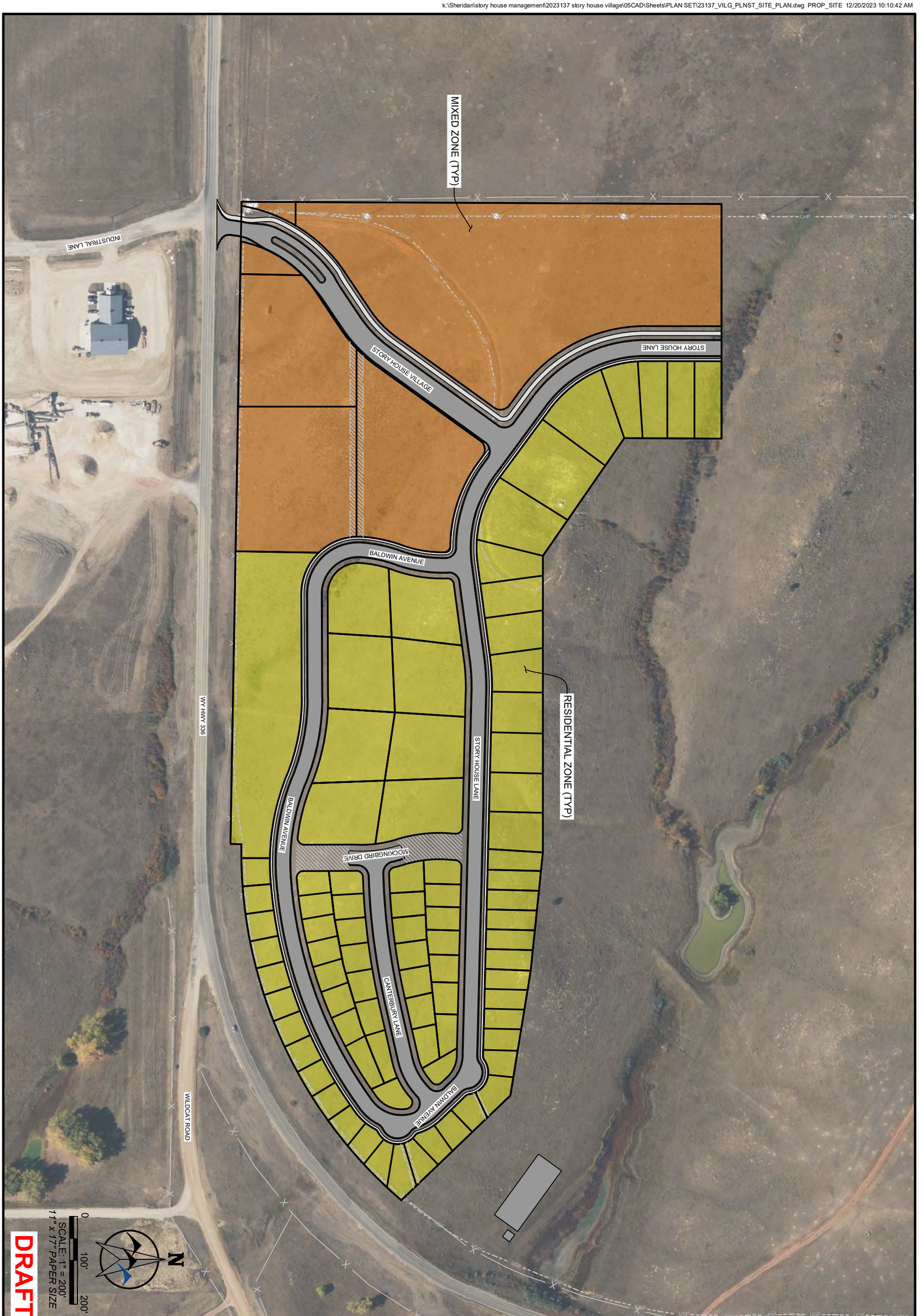

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

PROPOSED SITE

SHERIDAN COUNTY, WYOMING

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DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET 6

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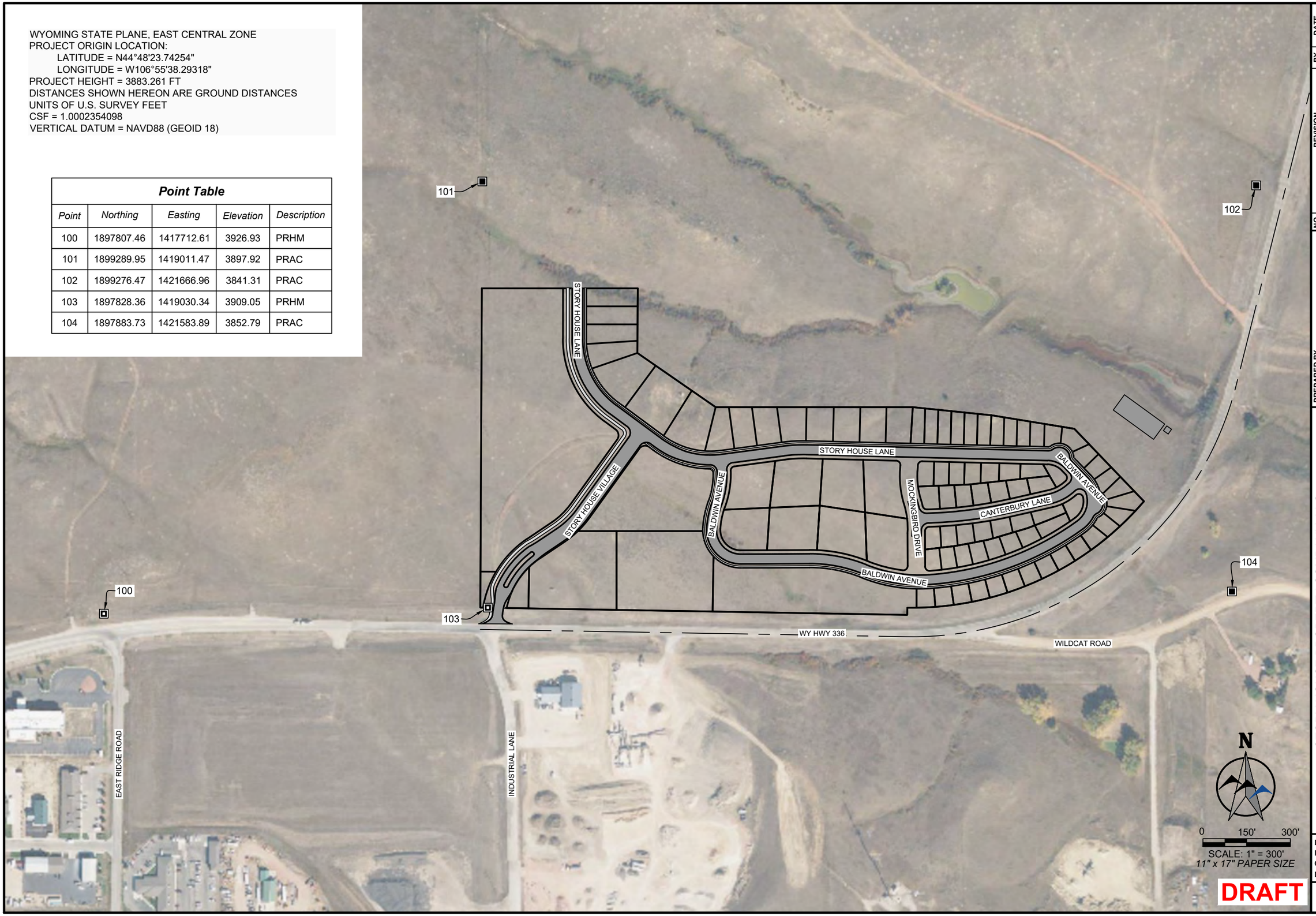
k:\Sheridan\story house management\2023137 story house village\05CAD\Sheets\PLAN SET\23137_VILG_PLNST_COVR.dwg CONTROL ABSTRACT 12/20/2023 10:52:24 AM

WYOMING STATE PLANE, EAST CENTRAL ZONE
PROJECT ORIGIN LOCATION:
LATITUDE = N44°48'23.74254"
LONGITUDE = W106°55'38.29318"
PROJECT HEIGHT = 3883.261 FT
DISTANCES SHOWN HEREON ARE GROUND DISTANCES
UNITS OF U.S. SURVEY FEET
CSF = 1.0002354098
VERTICAL DATUM = NAVD88 (GEOID 18)

Point Table

Point	*Northing*	*Easting*	*Elevation*	*Description*
100	1897807.46	1417712.61	3926.93	PRHM
101	1899289.95	1419011.47	3897.92	PRAC
102	1899276.47	1421666.96	3841.31	PRAC
103	1897828.36	1419030.34	3909.05	PRHM
104	1897883.73	1421583.89	3852.79	PRAC



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STORY HOUSE PROPERTY COMPANY, LLC

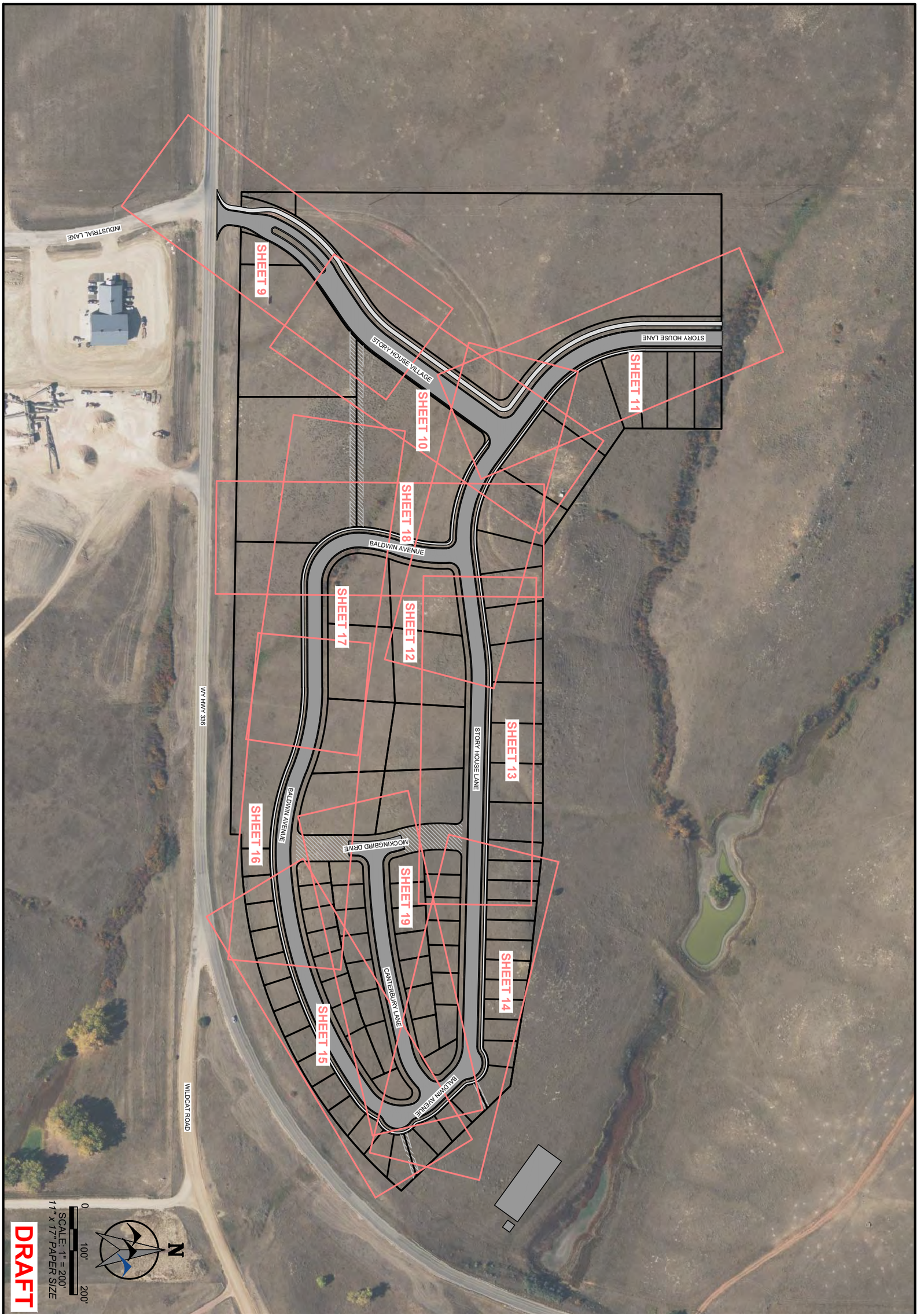
STORY HOUSE VILLAGE PUD - PHASE 1

CONTROL ABSTRACT

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET
7



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STORY HOUSE VILLAGE PUD - PHASE 1

ROAD KEY SHEET

SHERIDAN COUNTY, WYOMING

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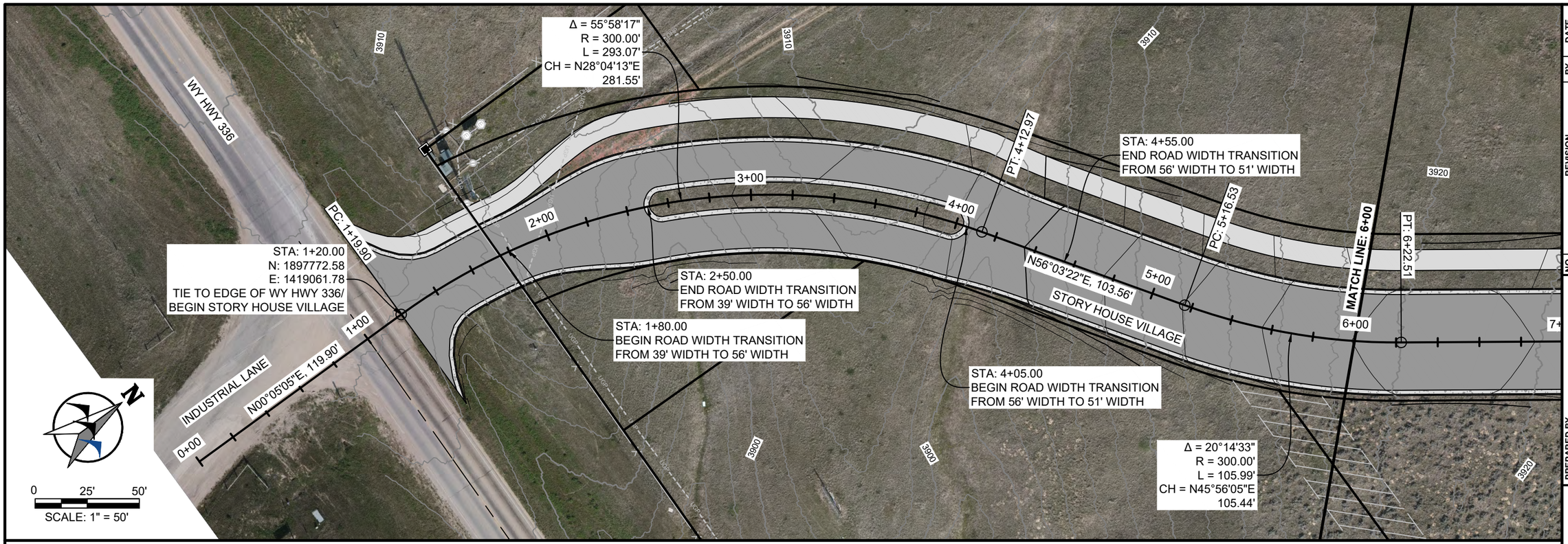

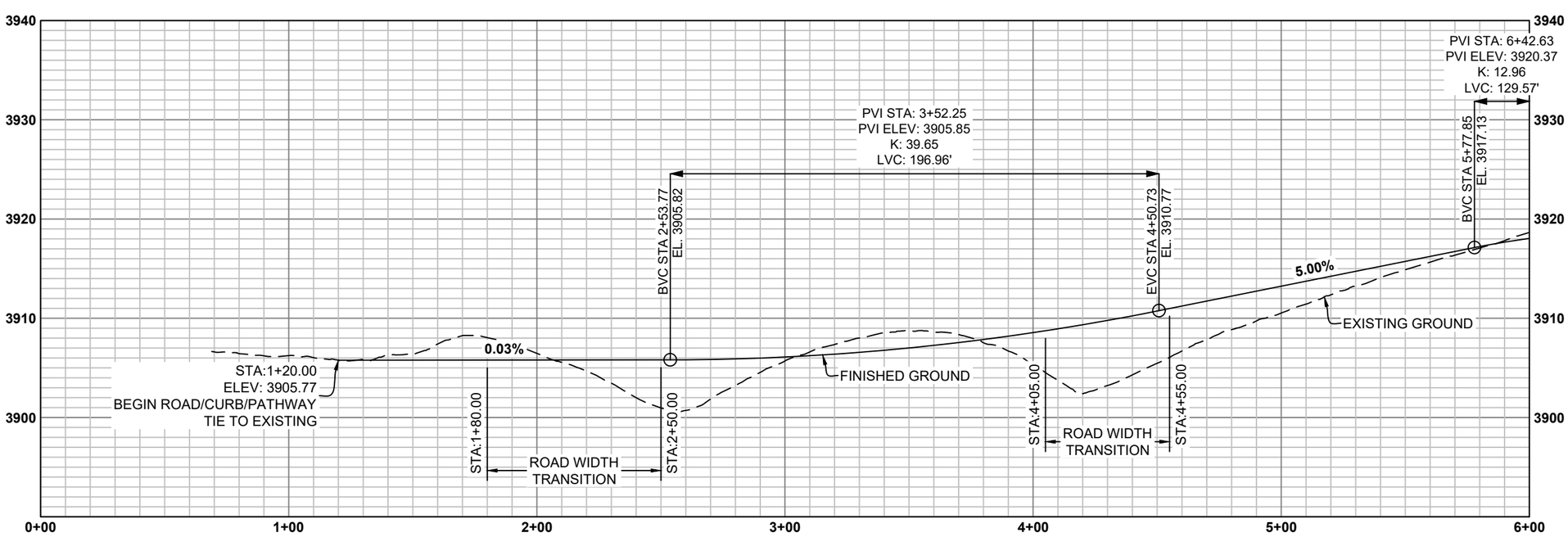

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STORY HOUSE VILLAGE PUD - PHASE 1

STORY HOUSE VILLAGE - PLAN AND PROFILE

SHERIDAN COUNTY, WYOMING

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SHEET
9

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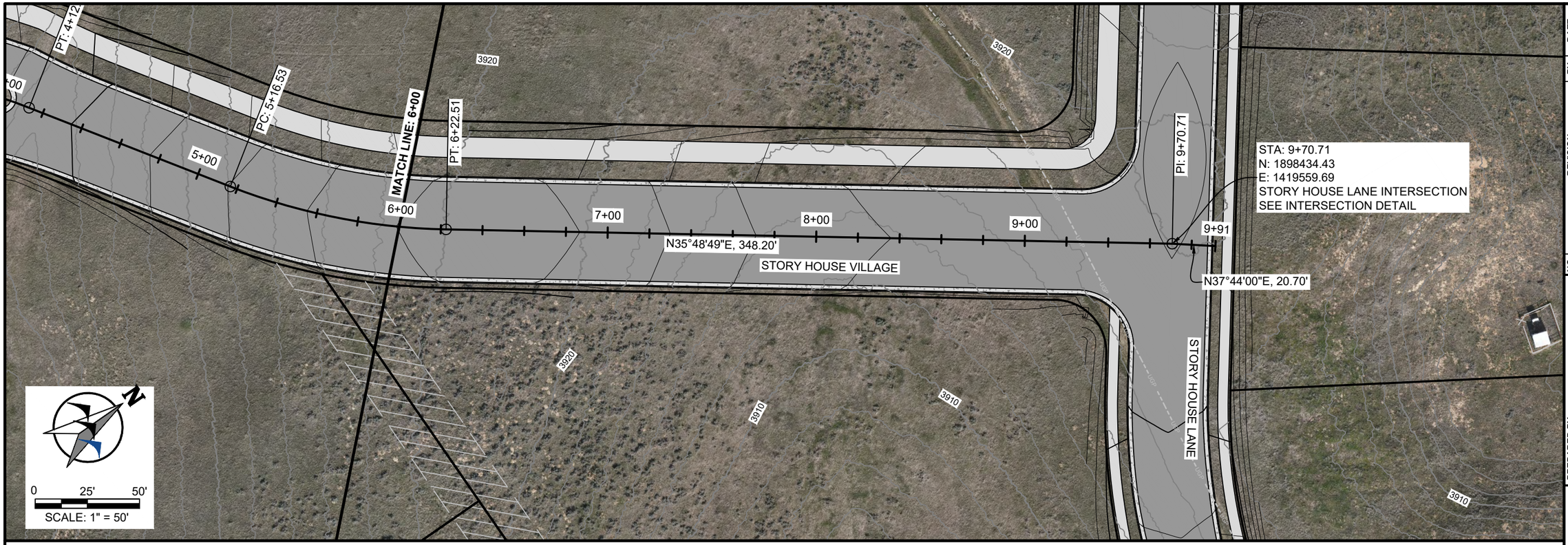

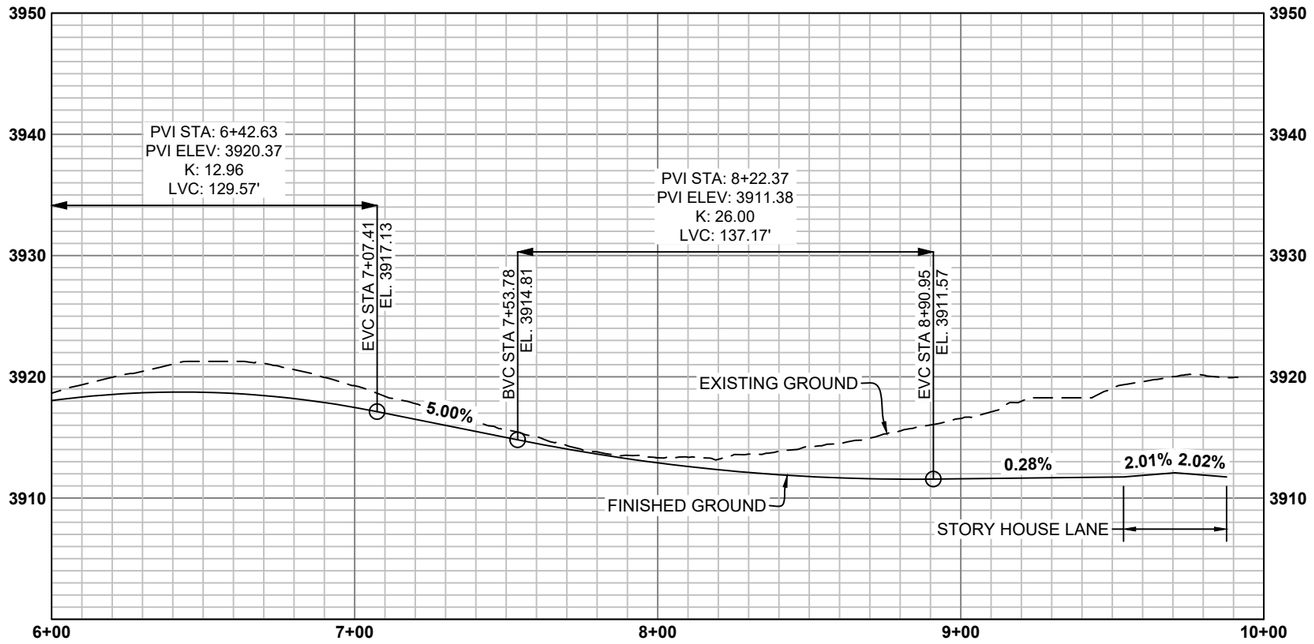

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STORY HOUSE VILLAGE - PLAN AND PROFILE

SHERIDAN COUNTY, WYOMING

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SHEET
10

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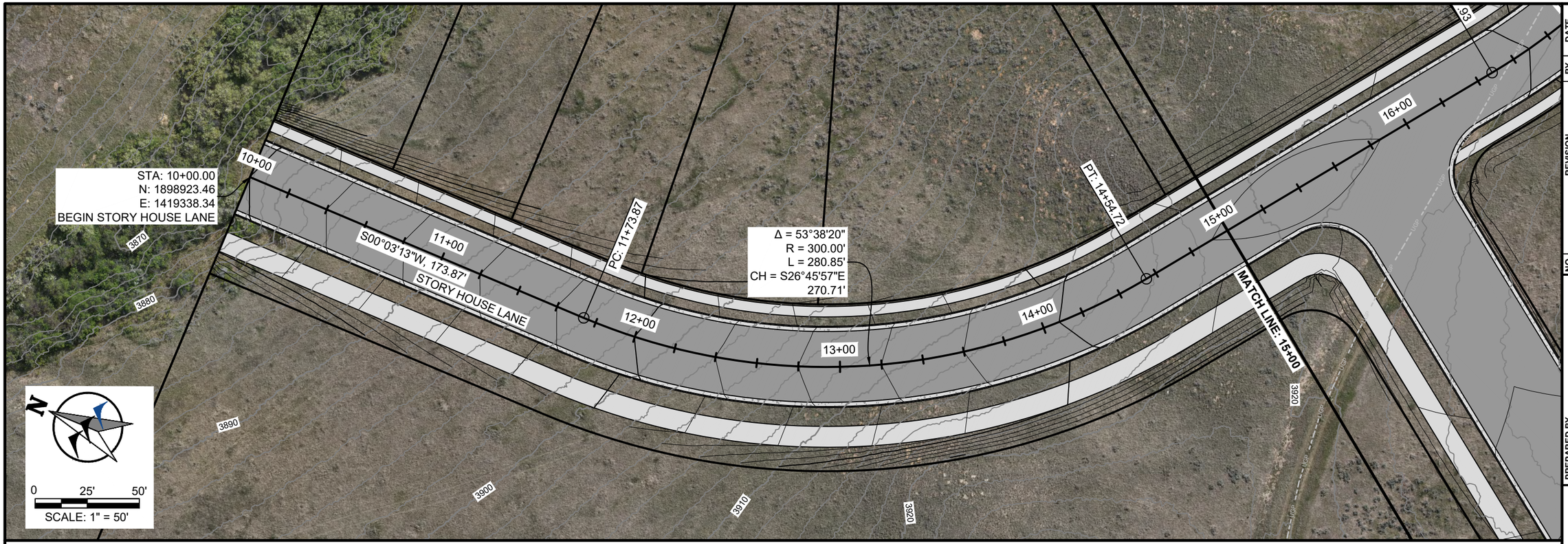

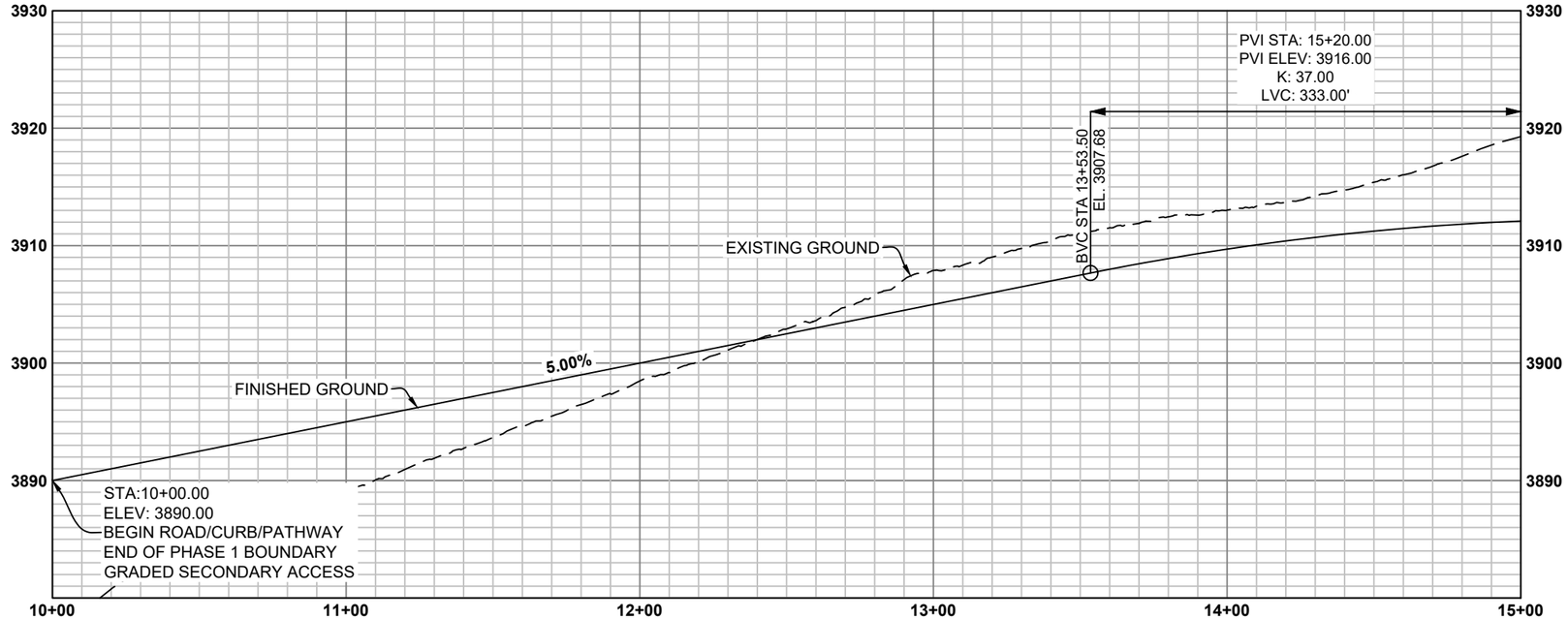

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STORY HOUSE LANE - PLAN AND PROFILE

SHERIDAN COUNTY, WYOMING

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SHEET
11

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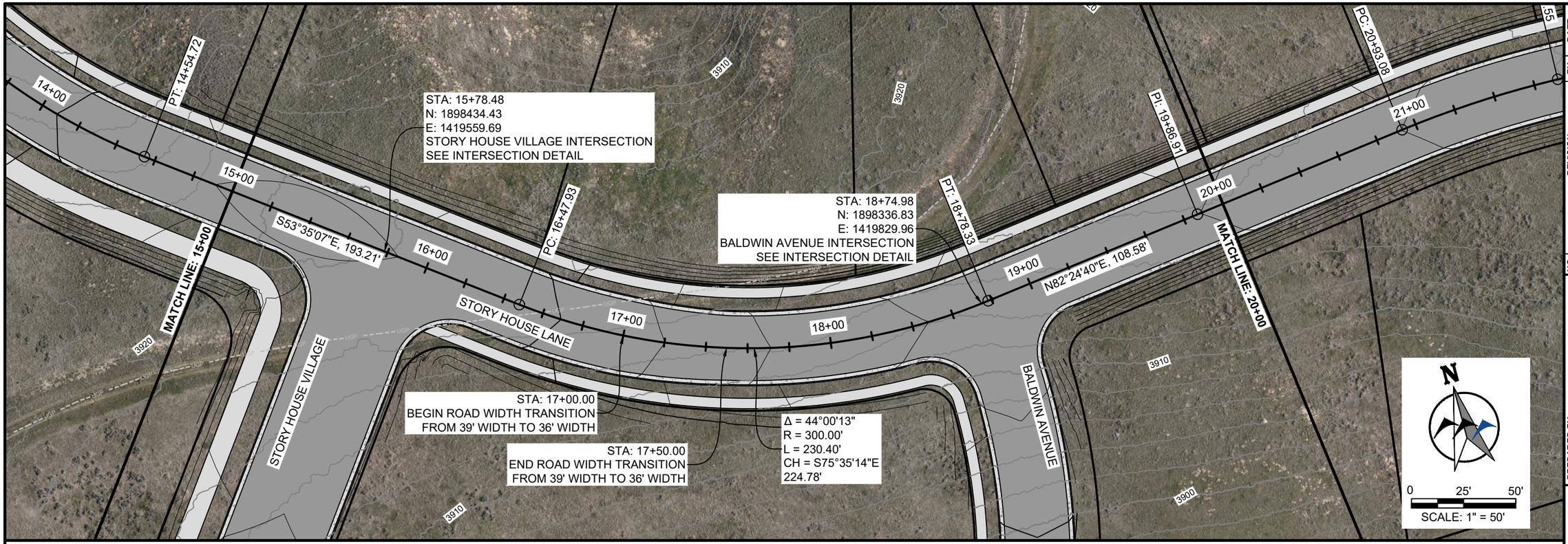

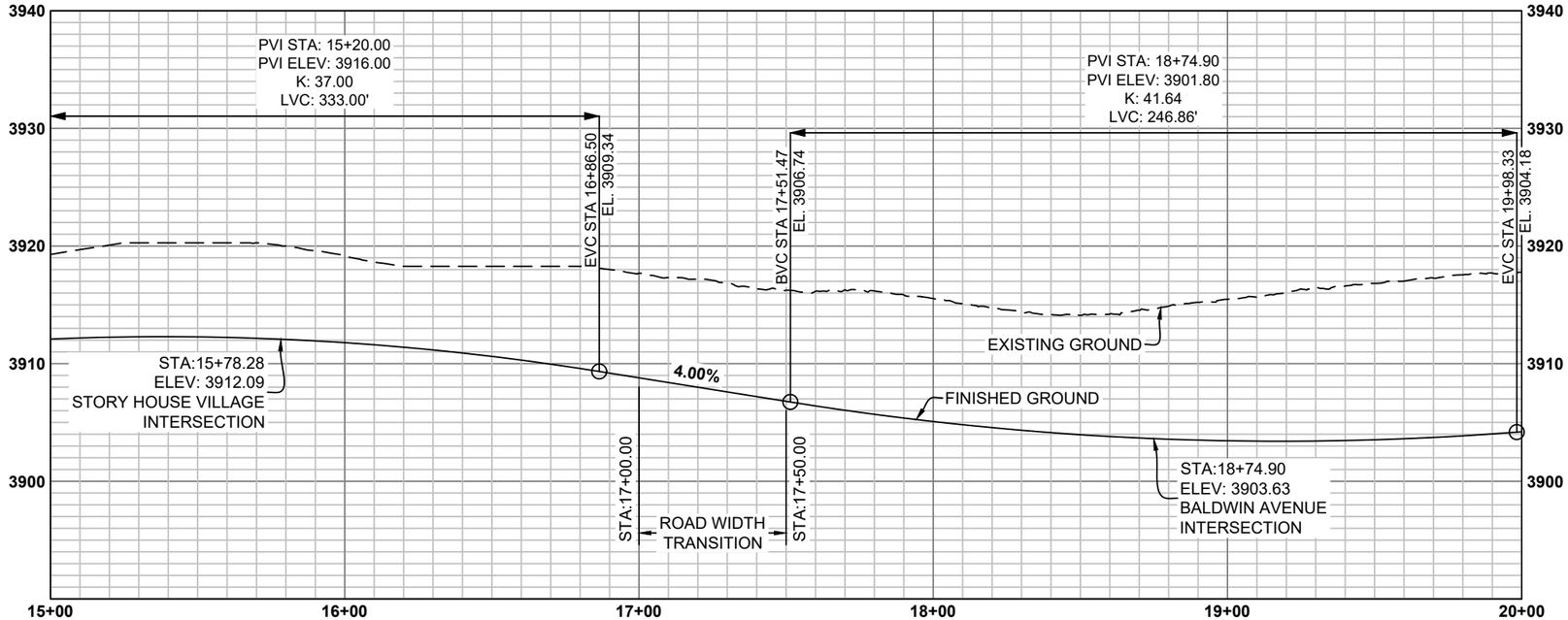

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SHERIDAN COUNTY, WYOMING

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SHEET
12

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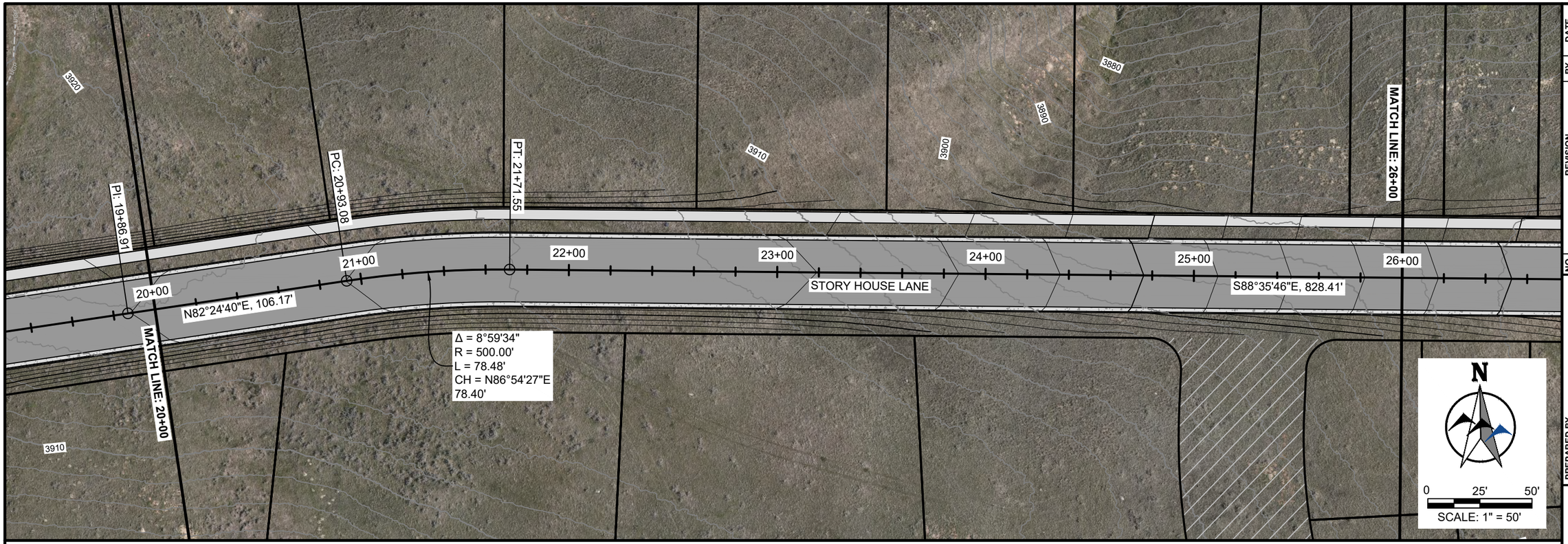

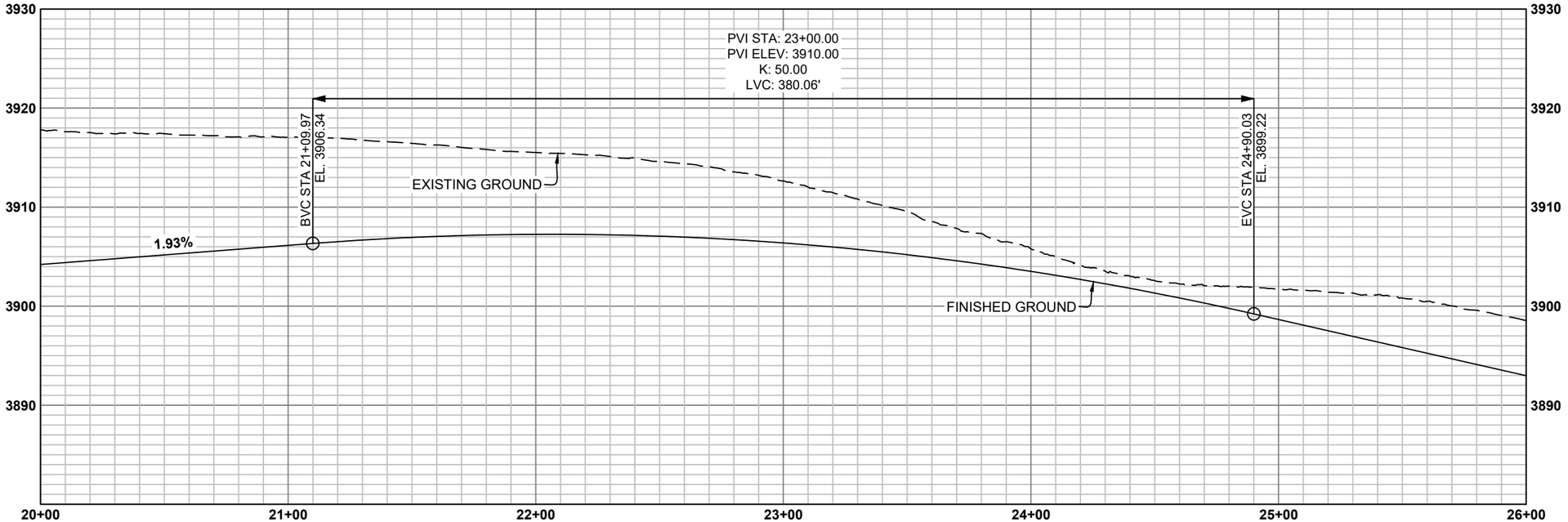

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STORY HOUSE VILLAGE PUD - PHASE 1

STORY HOUSE LANE - PLAN AND PROFILE

SHERIDAN COUNTY, WYOMING

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DATE: 12/20/2023

SHEET
13

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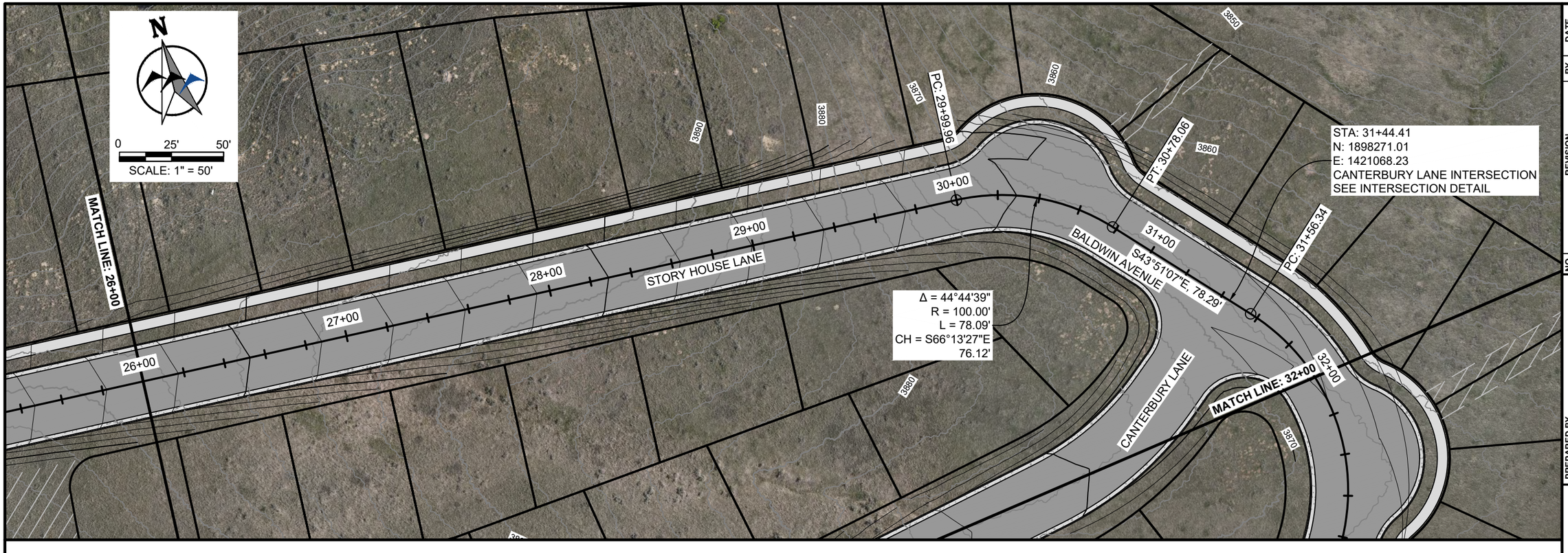

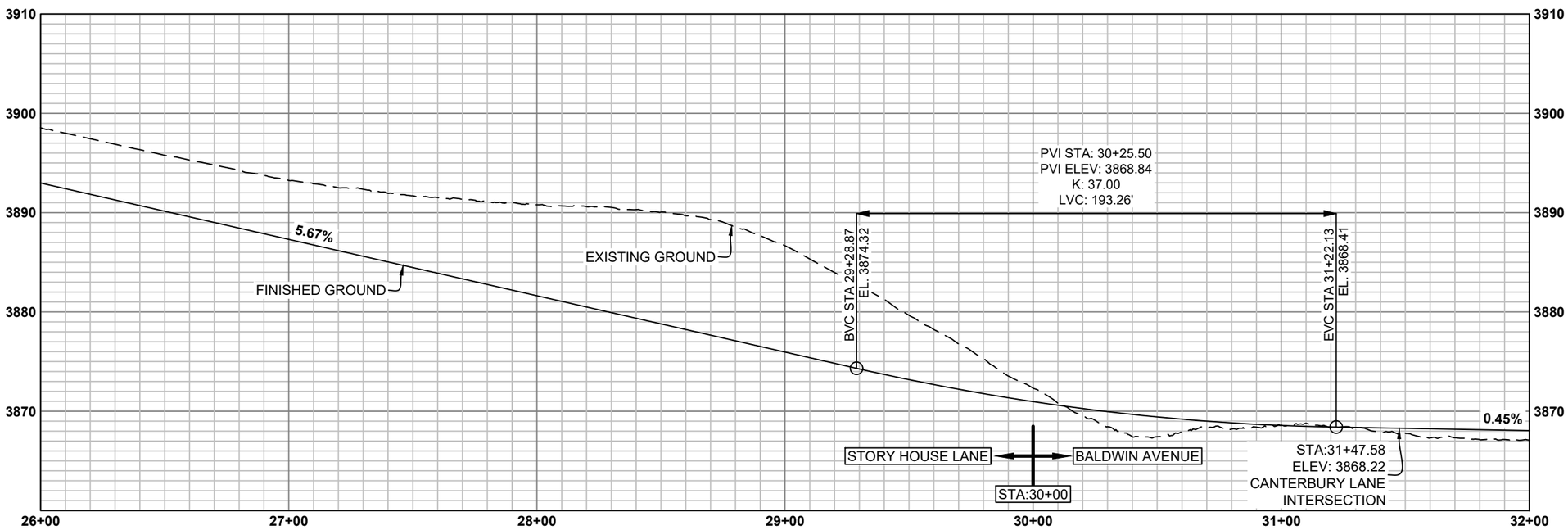

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

STORY HOUSE LANE & BALDWIN AVE - PLAN AND PROFILE

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET
14

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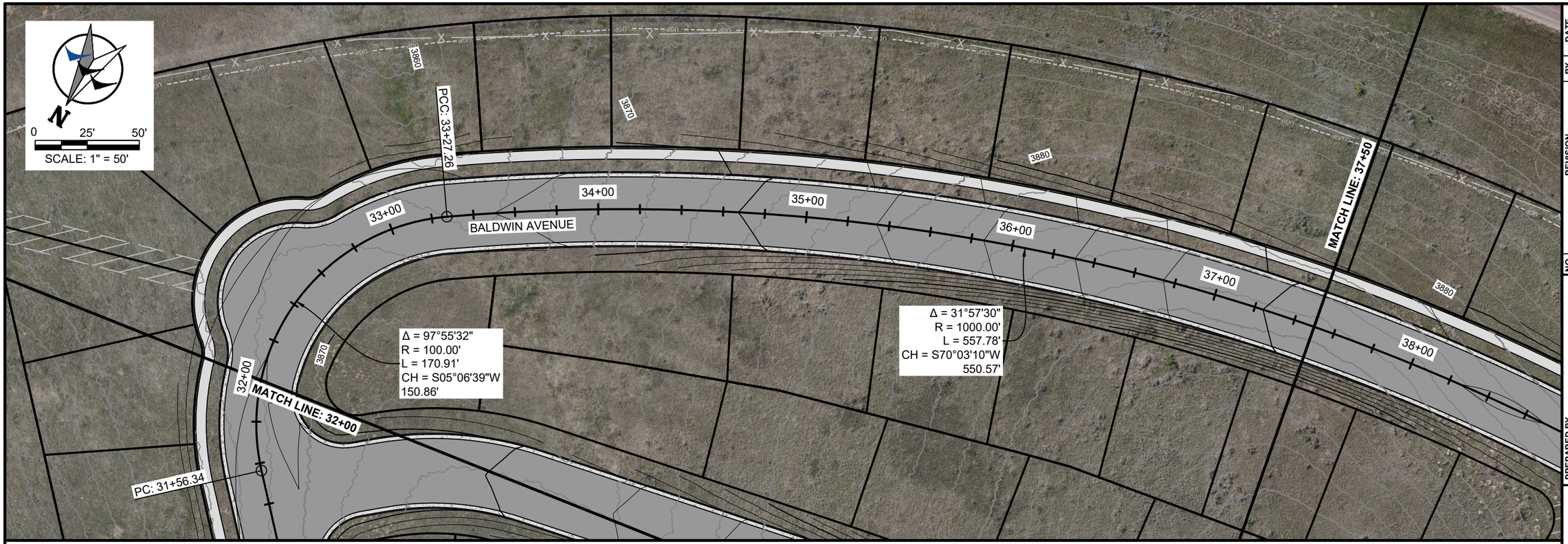

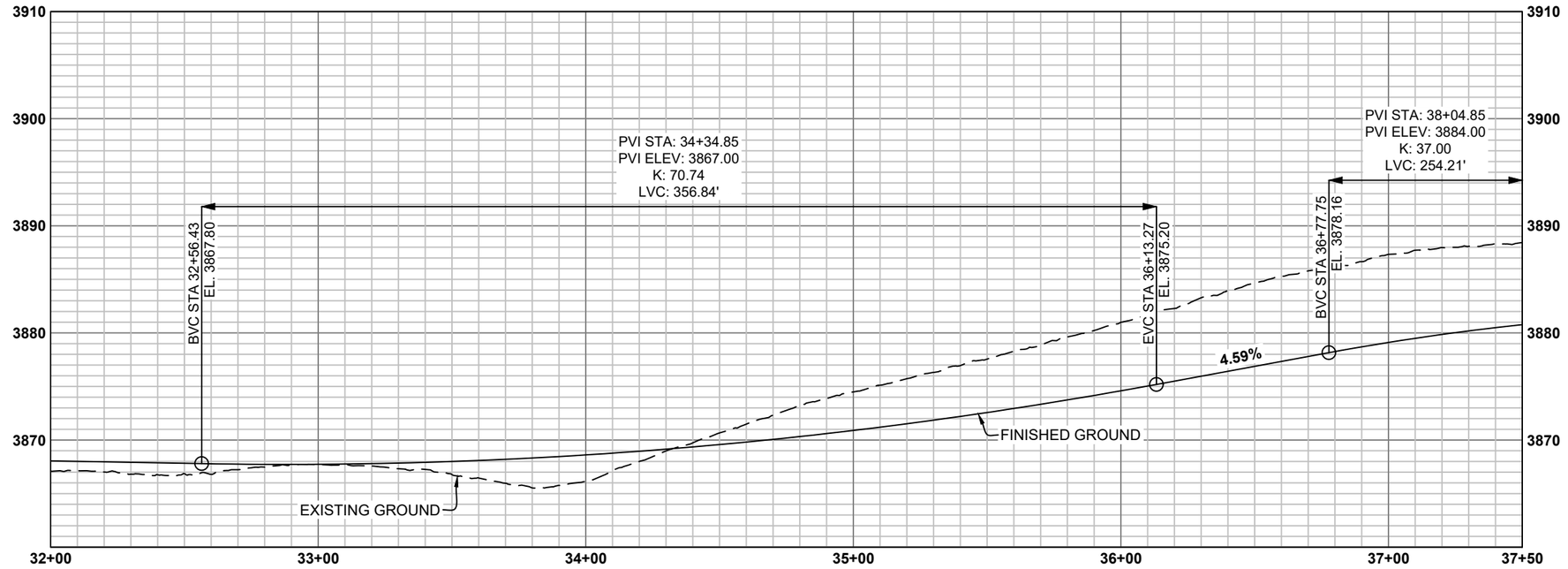

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

BALDWIN AVENUE - PLAN AND PROFILE

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET
15

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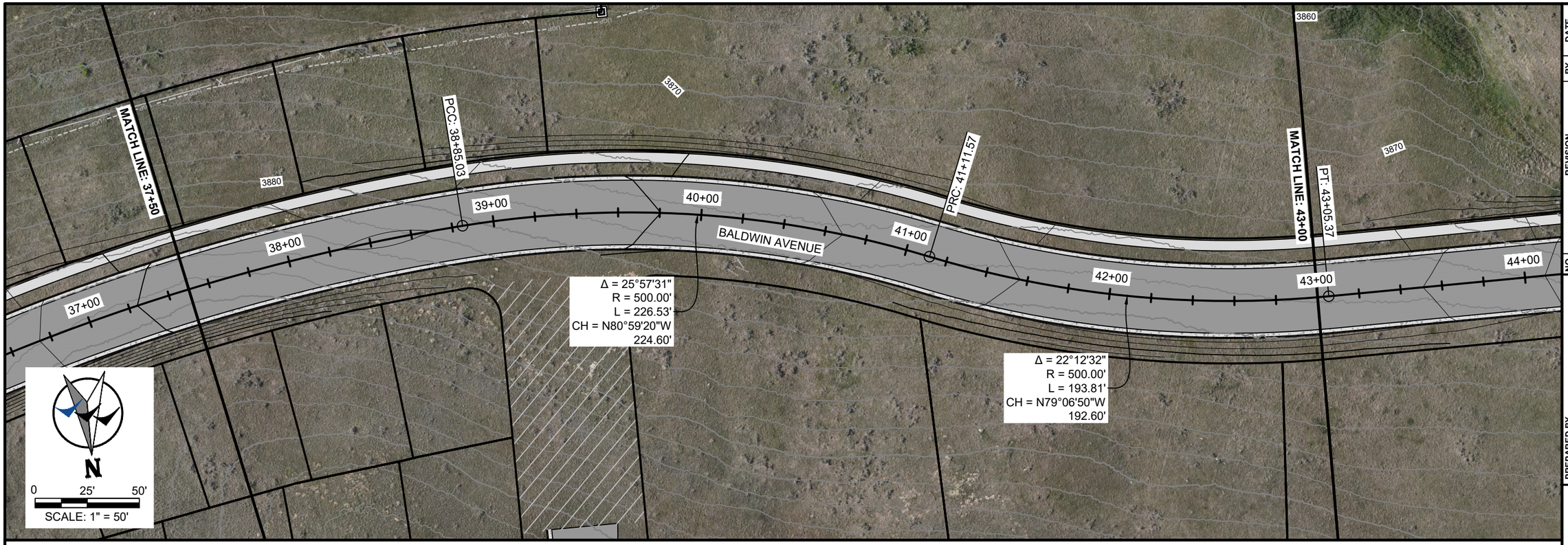

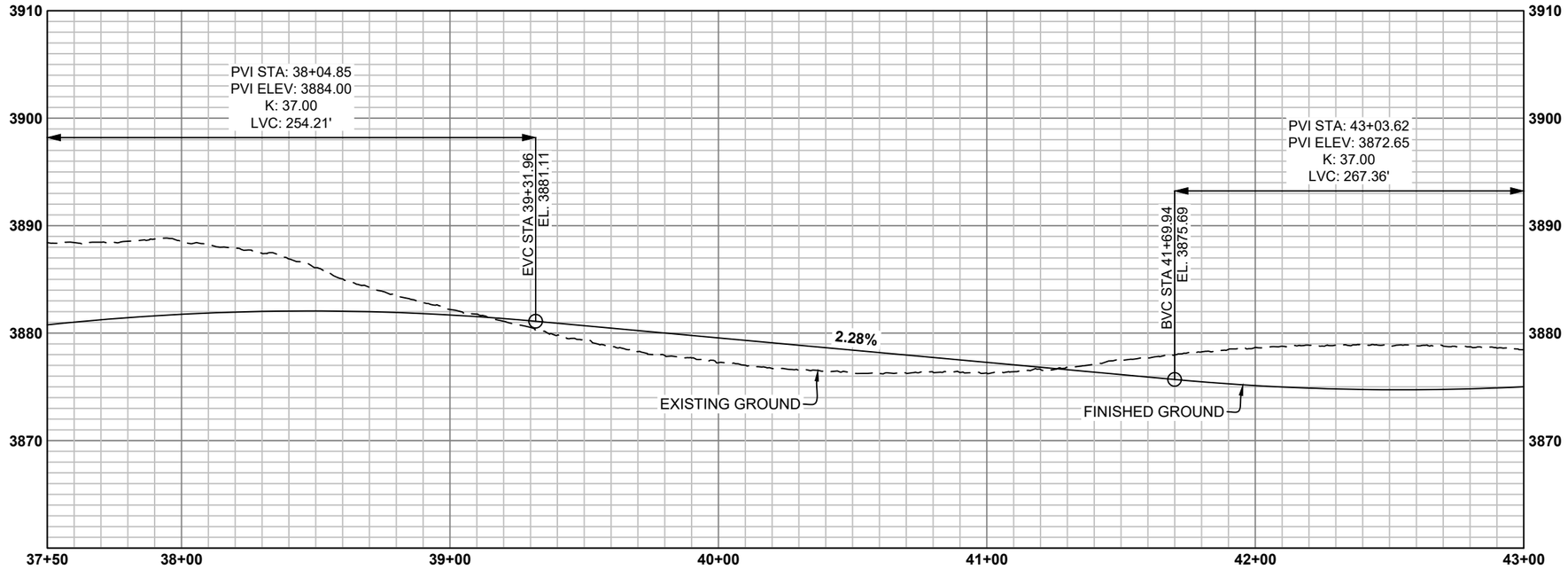

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

BALDWIN AVENUE - PLAN AND PROFILE

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET
16

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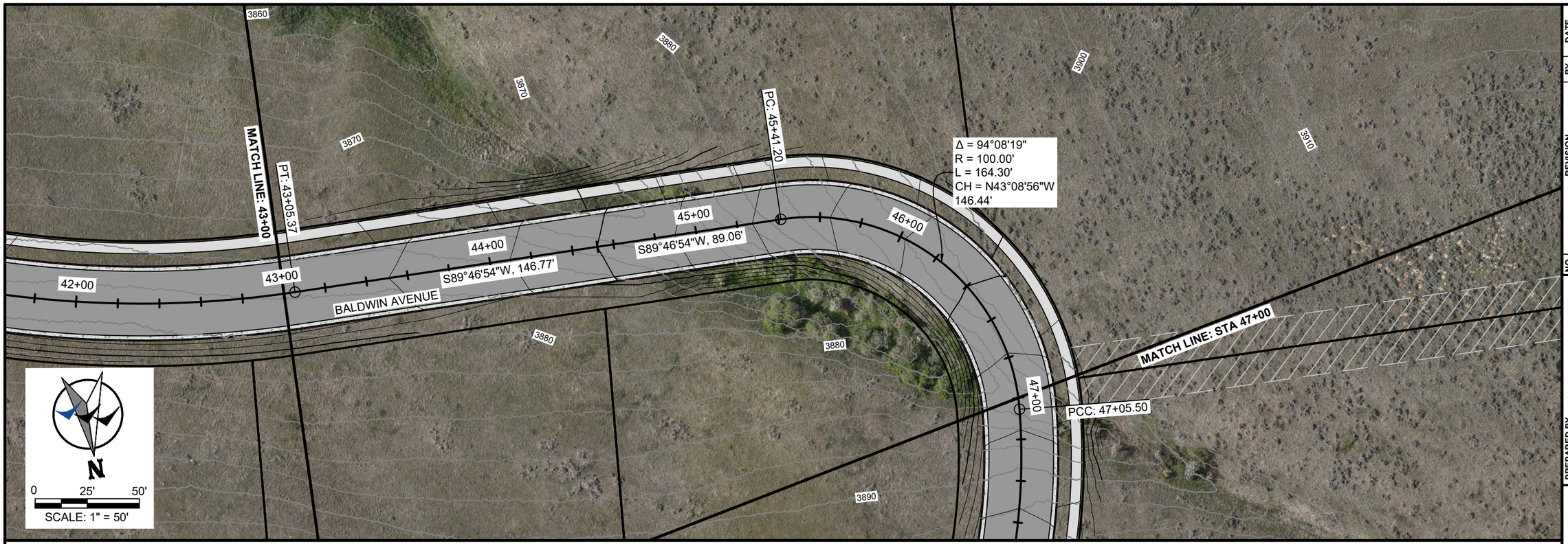

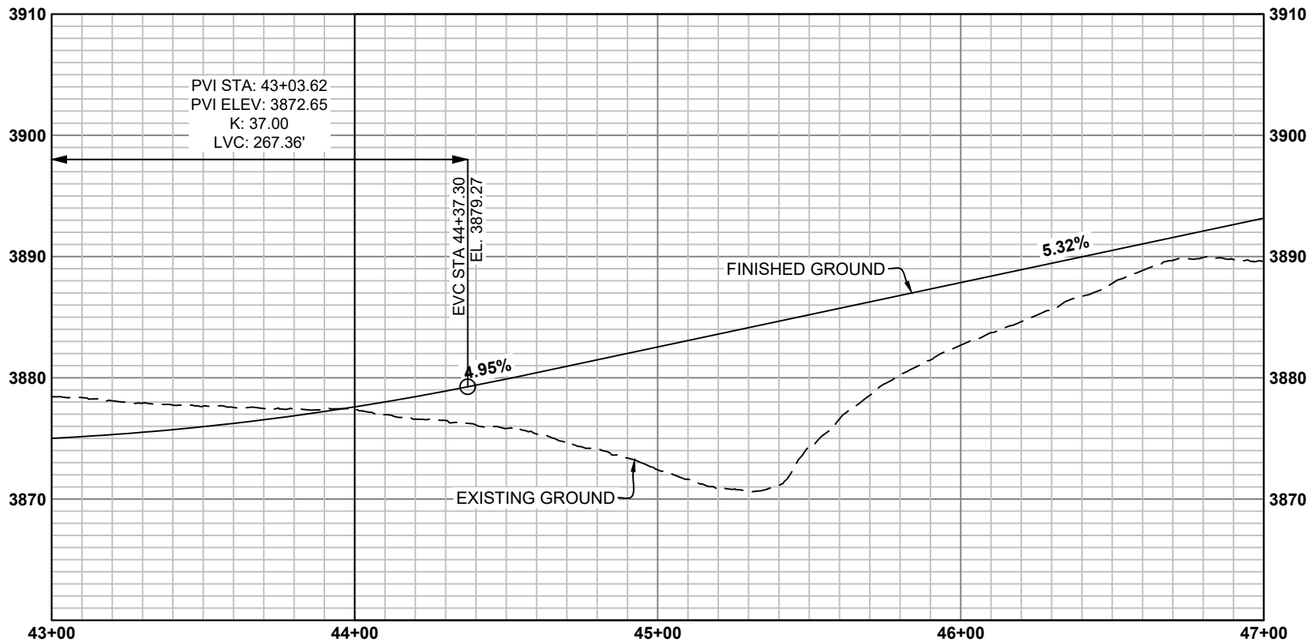

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NO.	REVISION	BY	DATE

PROJECT NO. 2023-137

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

BALDWIN AVENUE - PLAN AND PROFILE

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET
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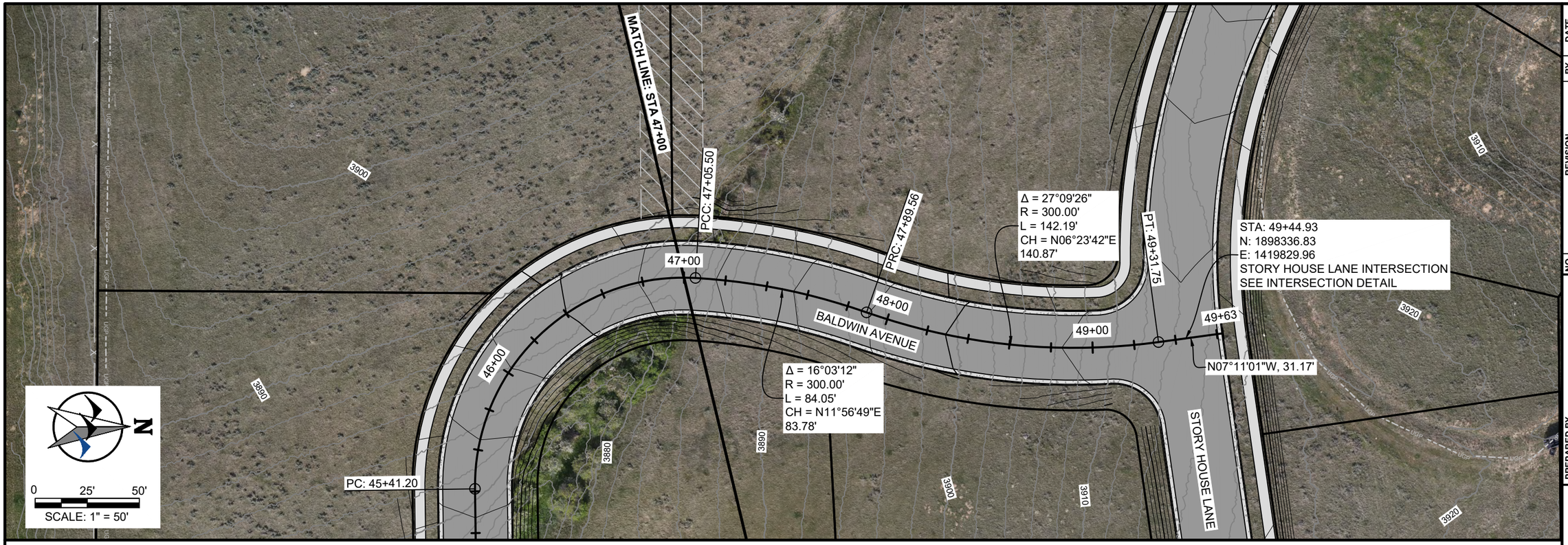

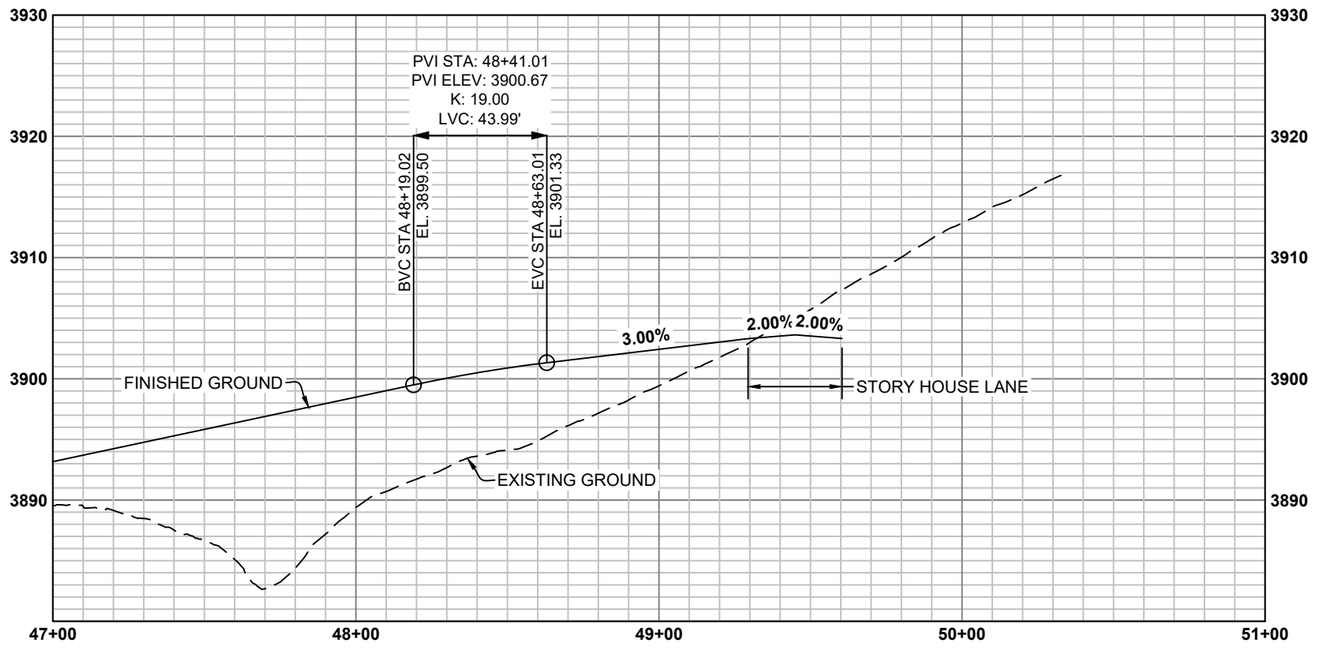

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STORY HOUSE VILLAGE PUD - PHASE 1

BALDWIN AVENUE - PLAN AND PROFILE

SHERIDAN COUNTY, WYOMING

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SHEET
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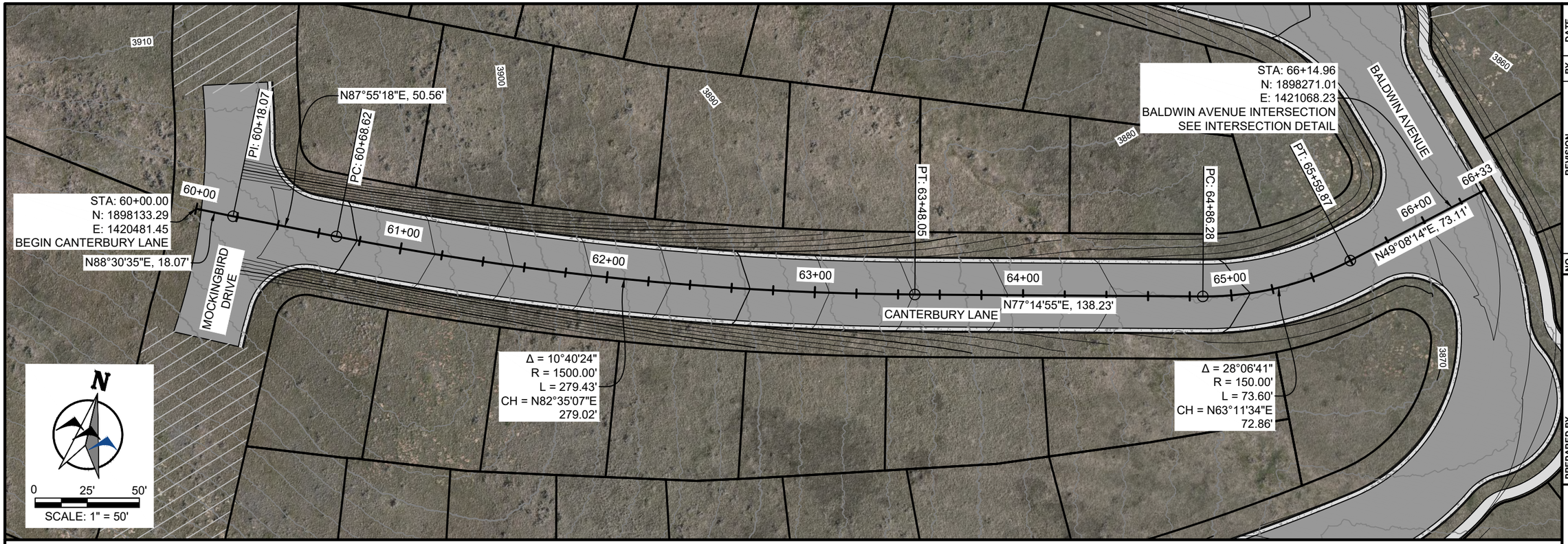

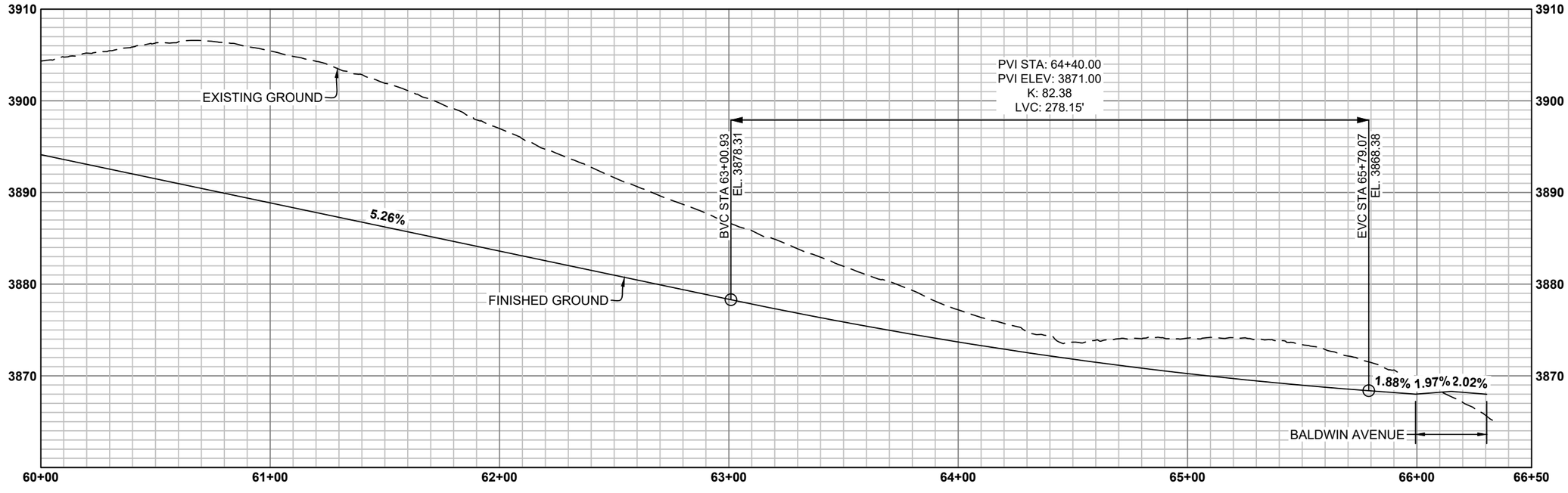

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STORY HOUSE VILLAGE PUD - PHASE 1

CANTERBURY LN & MOCKINGBIRD DR - PLAN AND PROFILE

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
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DATE: 12/20/2023

SHEET
19

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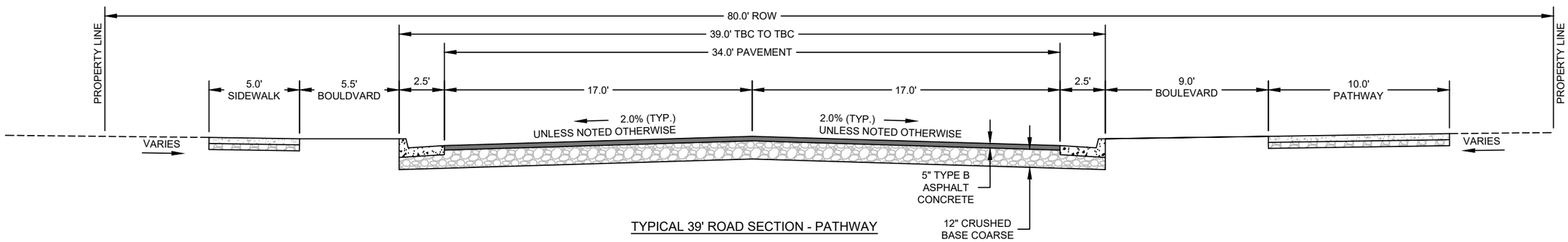
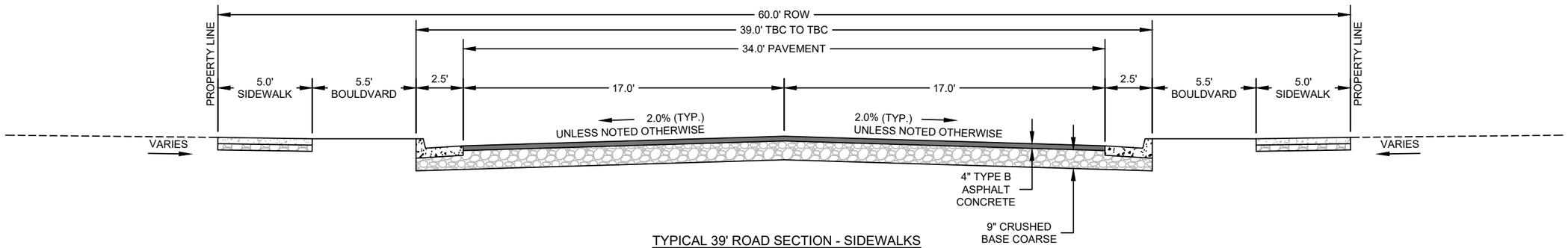


TYPICAL 39' ROAD SECTION - PATHWAY

NOT TO SCALE

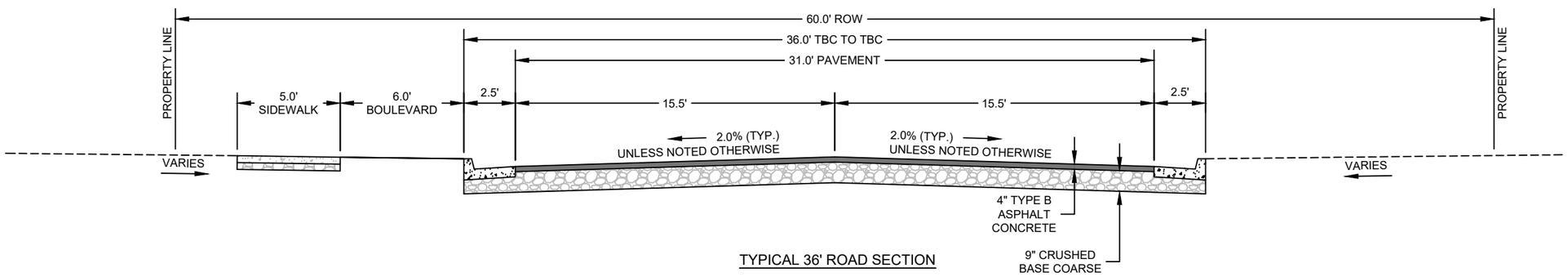
- STORY HOUSE LANE - STA:10+00 TO 15+30.91



TYPICAL 39' ROAD SECTION - SIDEWALKS

NOT TO SCALE

- STORY HOUSE LANE - STA:15+30.91 TO 17+00



TYPICAL 36' ROAD SECTION

NOT TO SCALE

- STORY HOUSE LANE - STA:17+50 TO 30+00
- BALDWIN AVENUE - ENTIRE LENGTH
- MOCKINGBIRD DRIVE - ENTIRE LENGTH
- CANTERBURY LANE - ENTIRE LENGTH

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STORY HOUSE VILLAGE PUD - PHASE 1

TYPICAL ROAD SECTIONS

SHERIDAN COUNTY, WYOMING

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DATE: 12/20/2023

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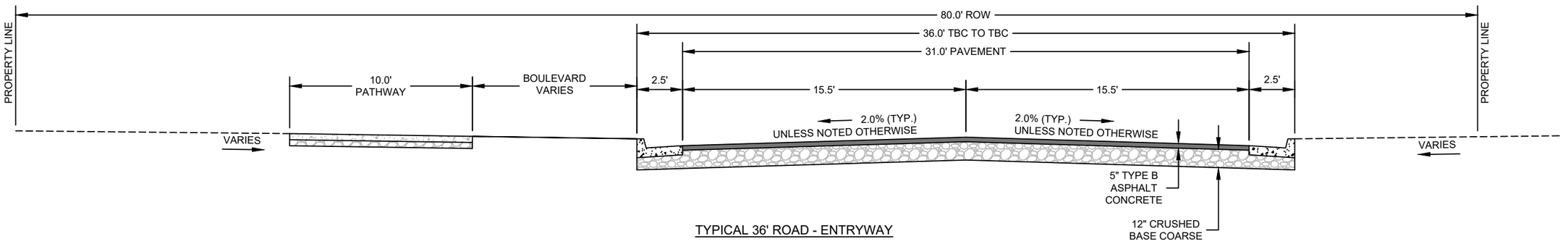
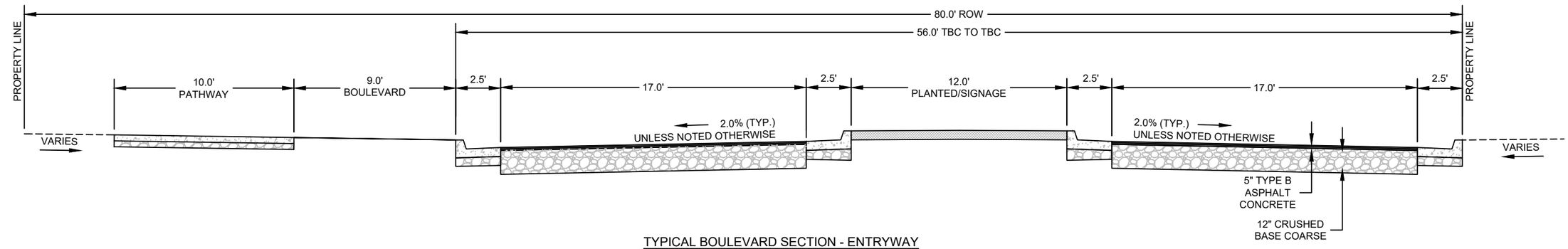


TYPICAL 36' ROAD - ENTRYWAY

NOT TO SCALE

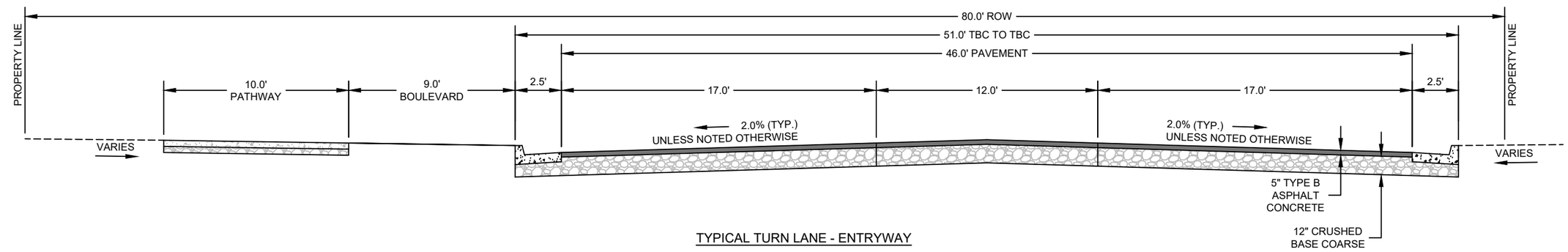
- STORY HOUSE VILLAGE - STA:1+20 TO 2+50



TYPICAL BOULEVARD SECTION - ENTRYWAY

NOT TO SCALE

- STORY HOUSE VILLAGE - STA:2+50 TO 4+00



TYPICAL TURN LANE - ENTRYWAY

NOT TO SCALE

- STORY HOUSE VILLAGE - STA:4+00 TO 9+29.21

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STORY HOUSE VILLAGE PUD - PHASE 1

TYPICAL ROAD SECTIONS

SHERIDAN COUNTY, WYOMING

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CHECKED BY:	JBG
DATE:	12/20/2023

SHEET
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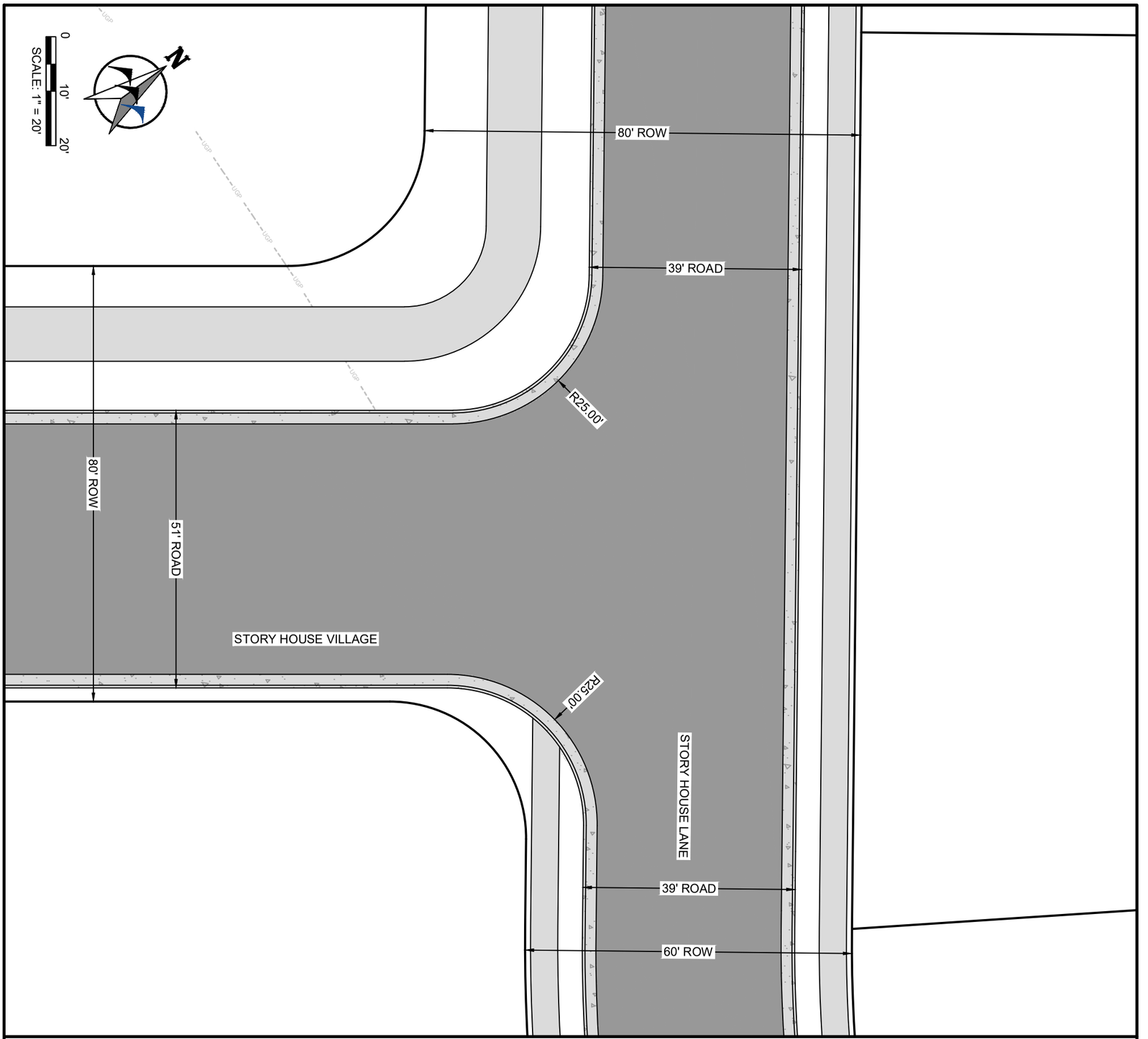

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

INTERSECTION DETAIL SHEET

SHERIDAN COUNTY, WYOMING

SHEET 23

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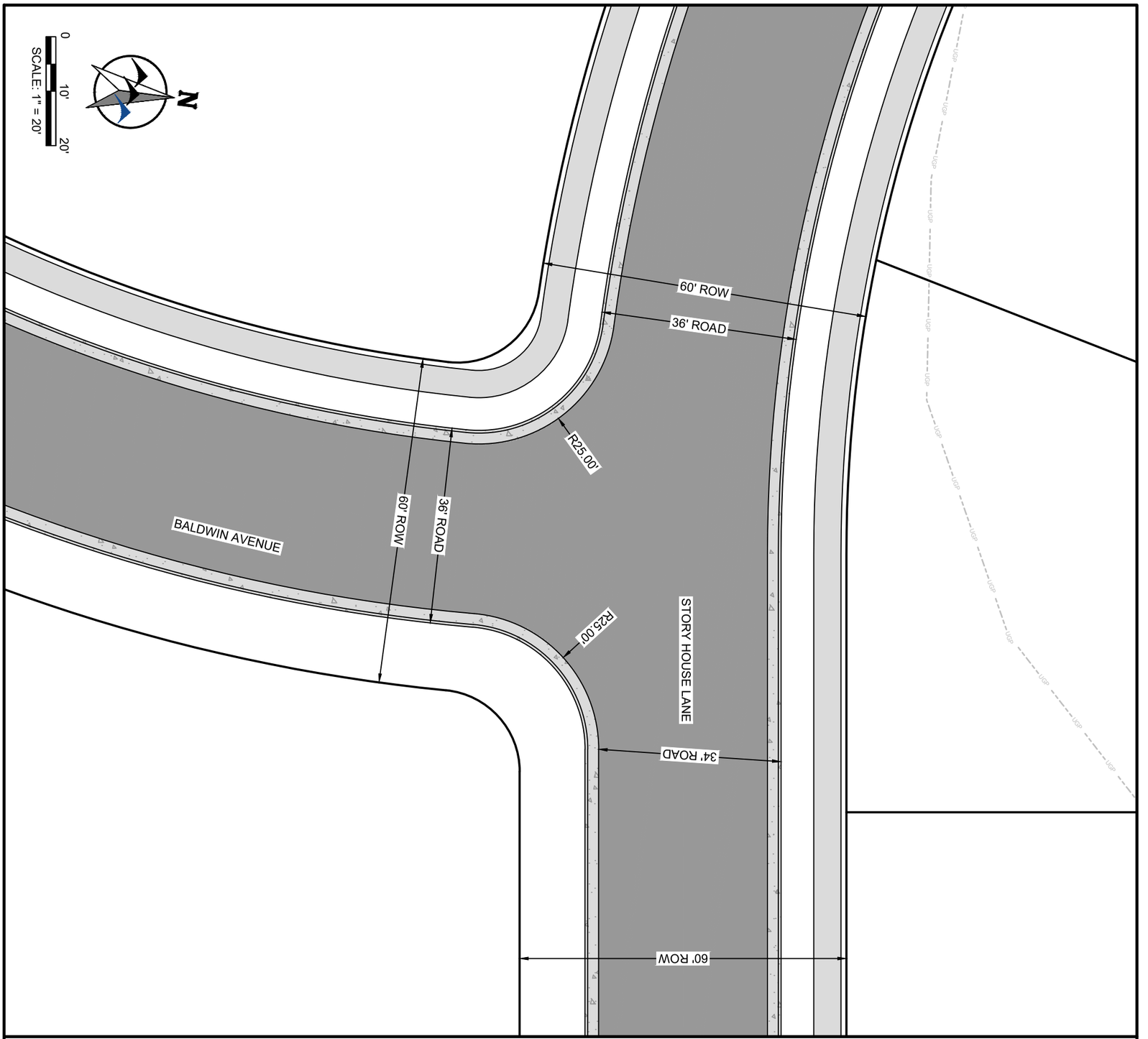
PROJECT NO. 2023-137



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DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET 24

STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

INTERSECTION DETAIL SHEET

SHERIDAN COUNTY, WYOMING

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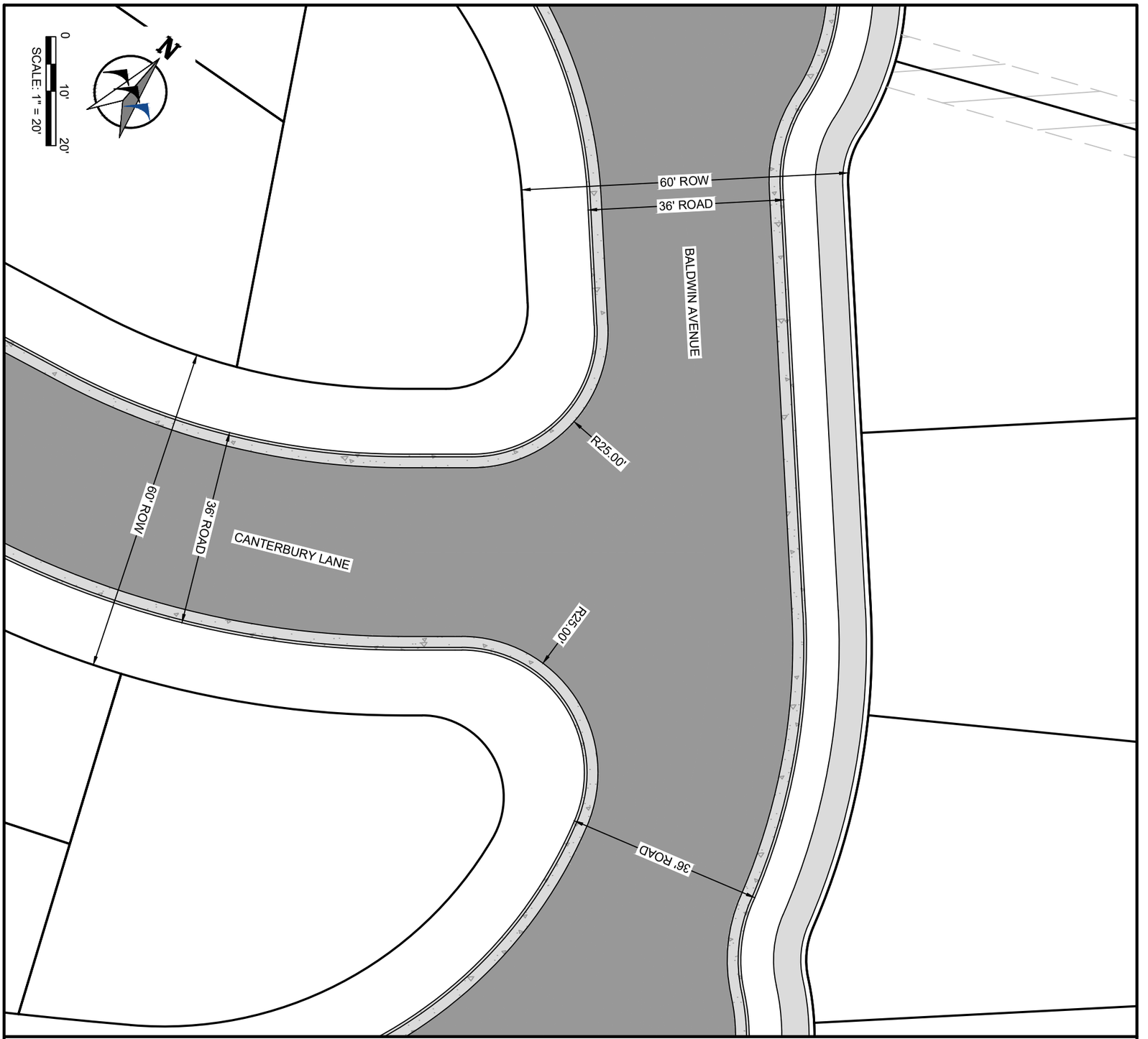

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SHEET 25

DESIGNED BY: SER
DRAWN BY: CIG
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DATE: 12/20/2023

STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

INTERSECTION DETAIL SHEET

SHERIDAN COUNTY, WYOMING

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PROJECT NO. 2023-137

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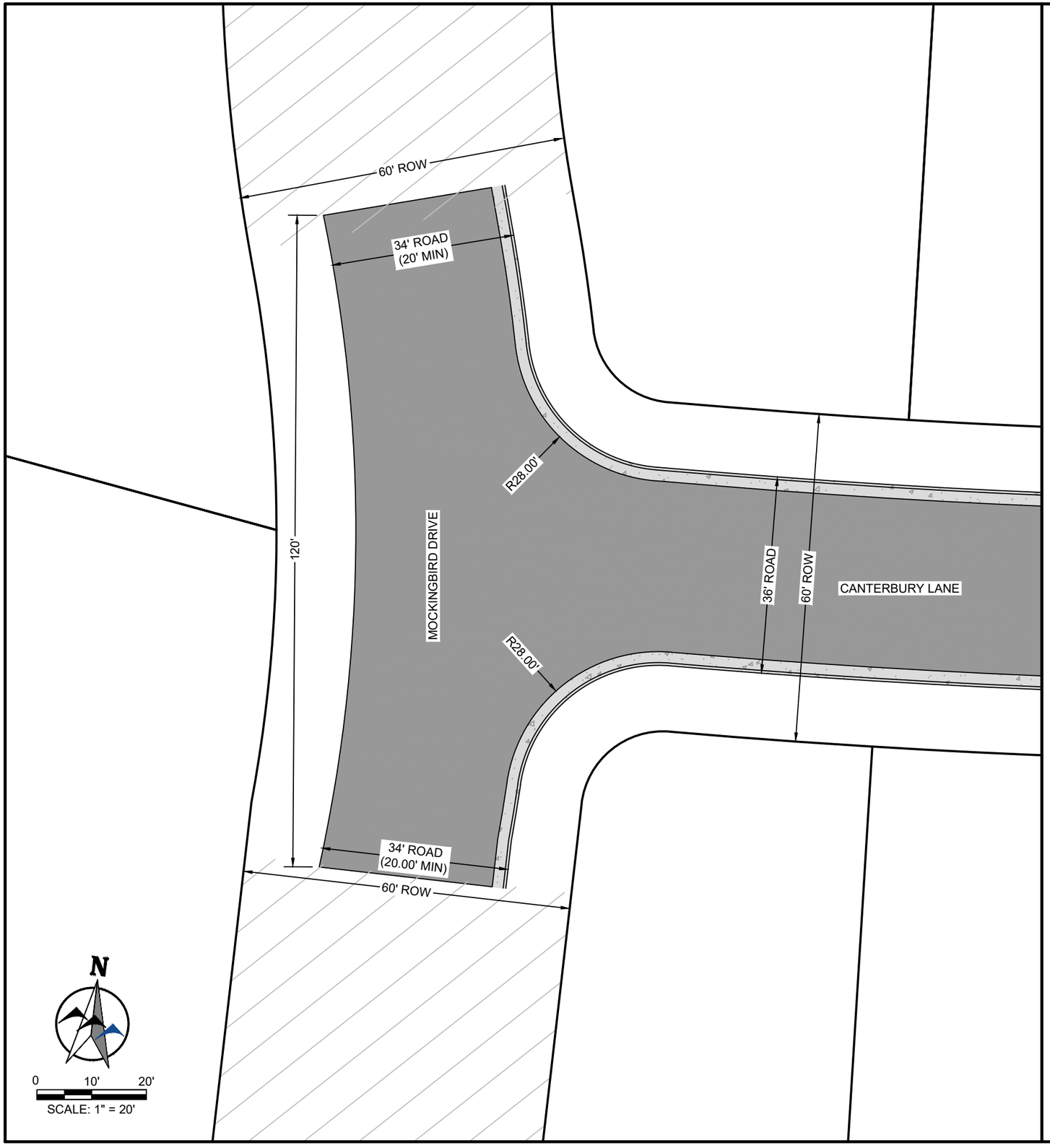

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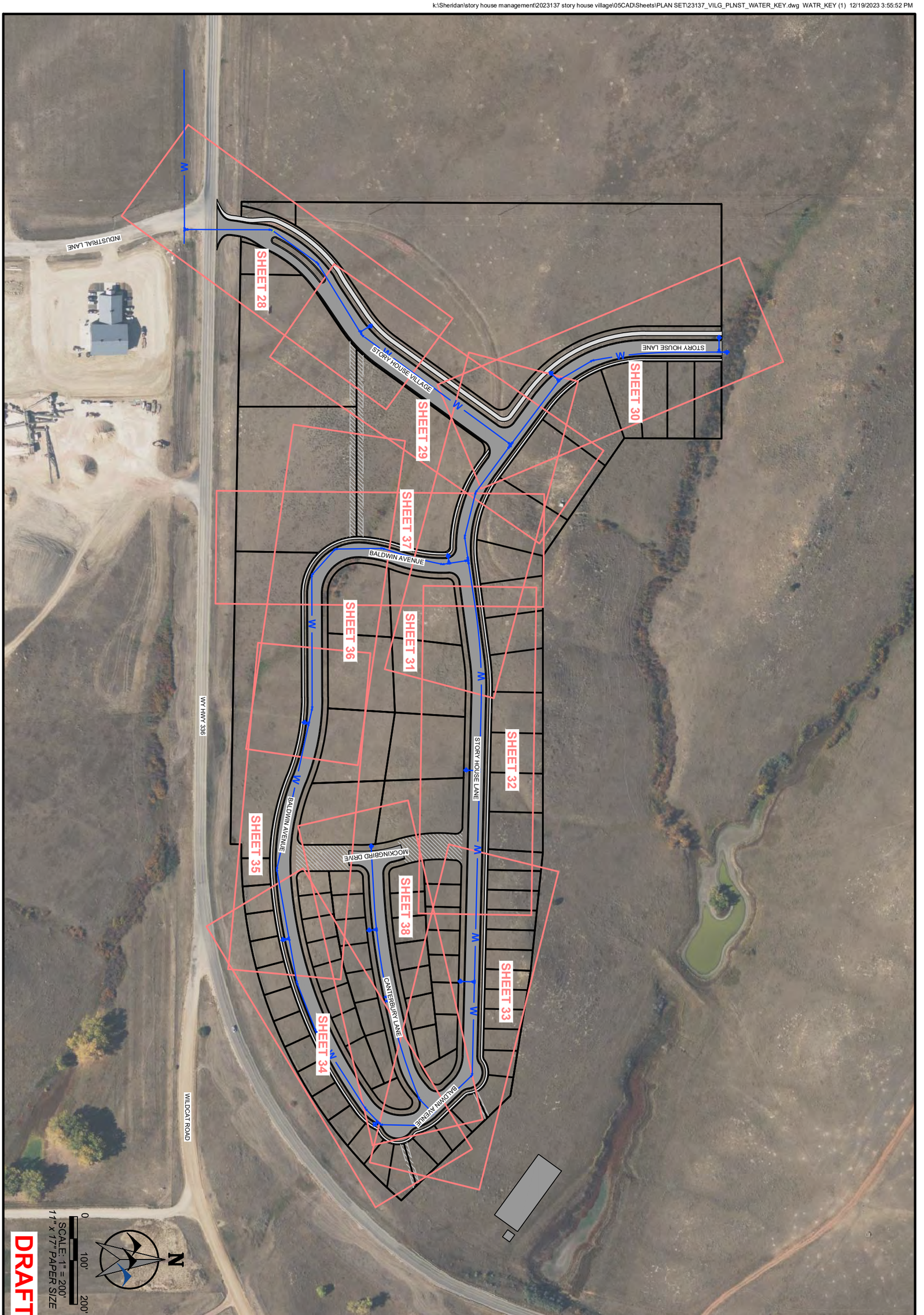
STORY HOUSE VILLAGE PUD - PHASE 1

INTERSECTION DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: *SER*
DRAWN BY: *CIG*
CHECKED BY: *JBG*
DATE: *12/20/2023*

SHEET
26



STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

WATER KEY SHEET

SHERIDAN COUNTY, WYOMING

SHEET 27

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

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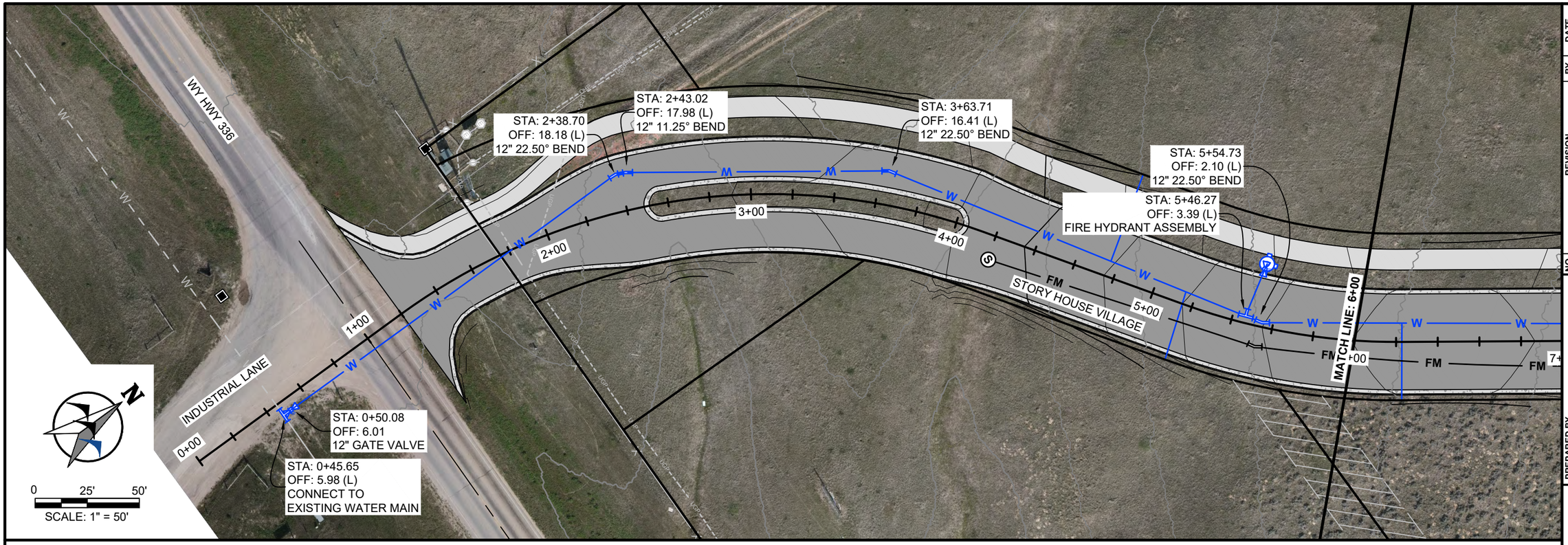
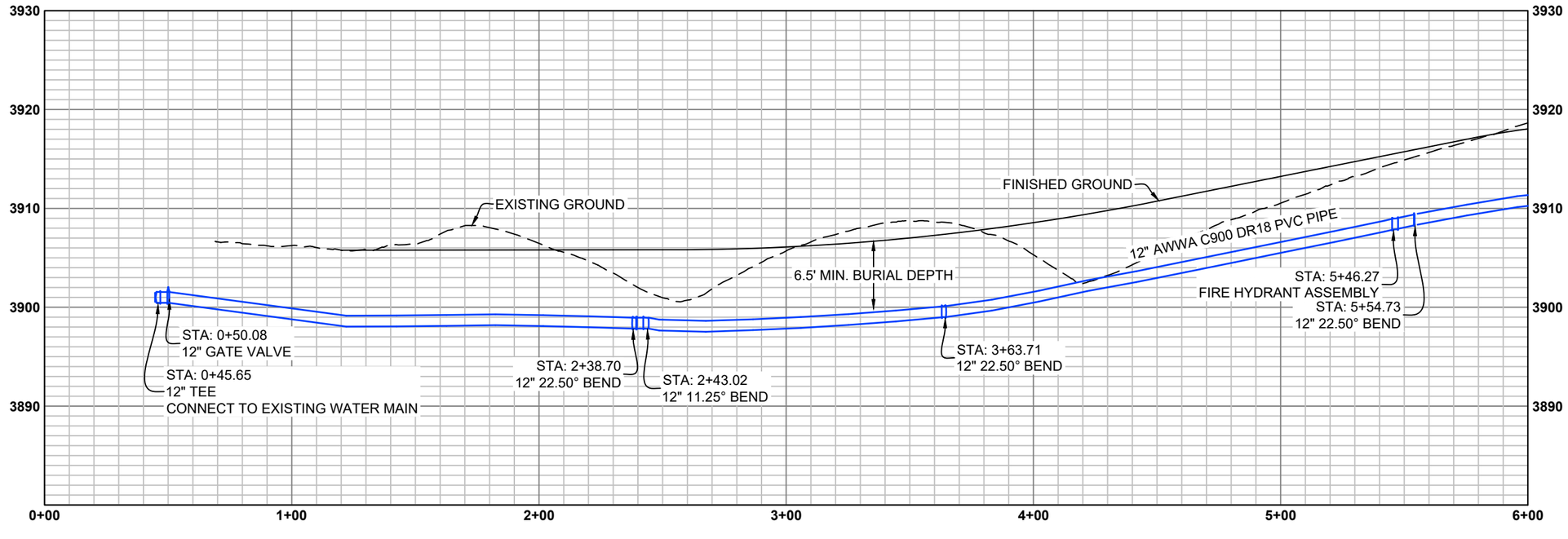
PROJECT NO. 2023-137





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WATER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

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DATE: 12/20/2023

SHEET
28

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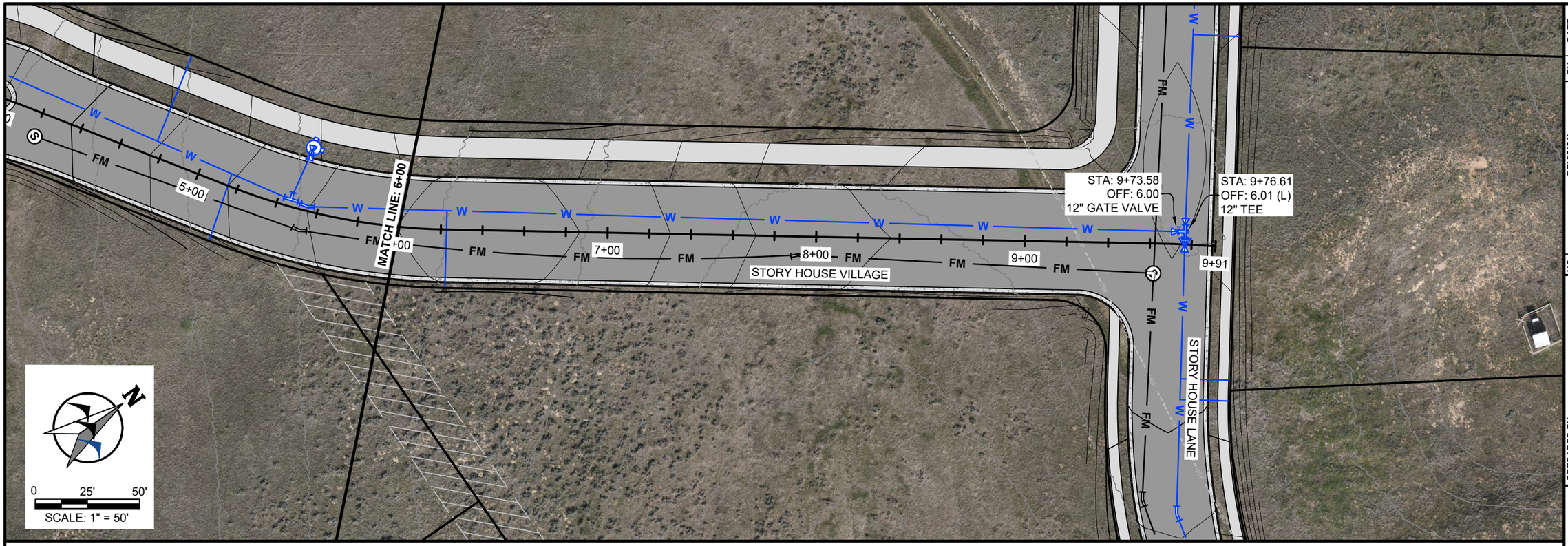

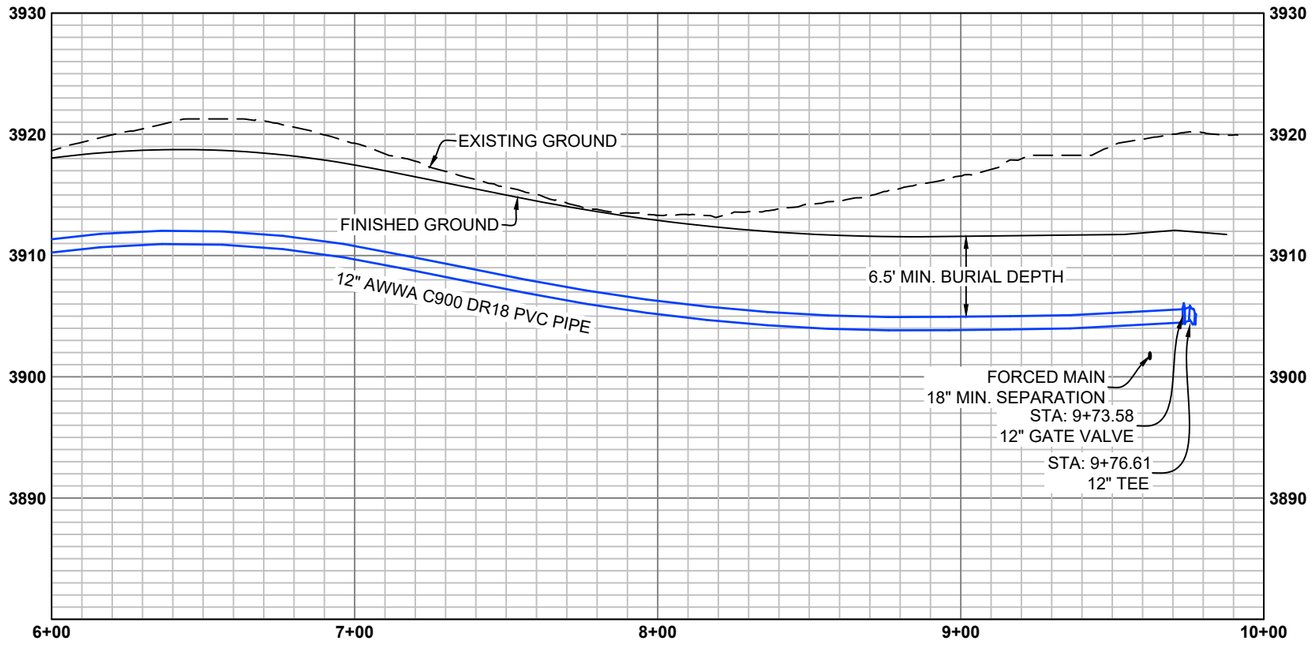

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WATER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

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SHEET
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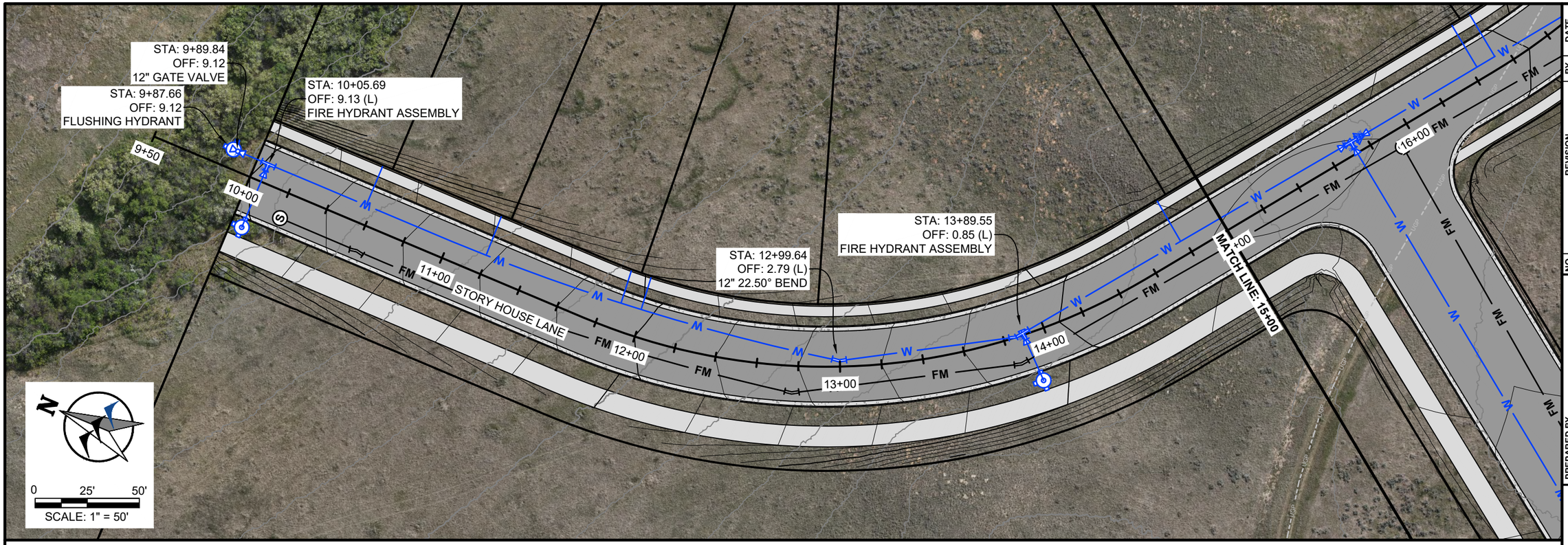

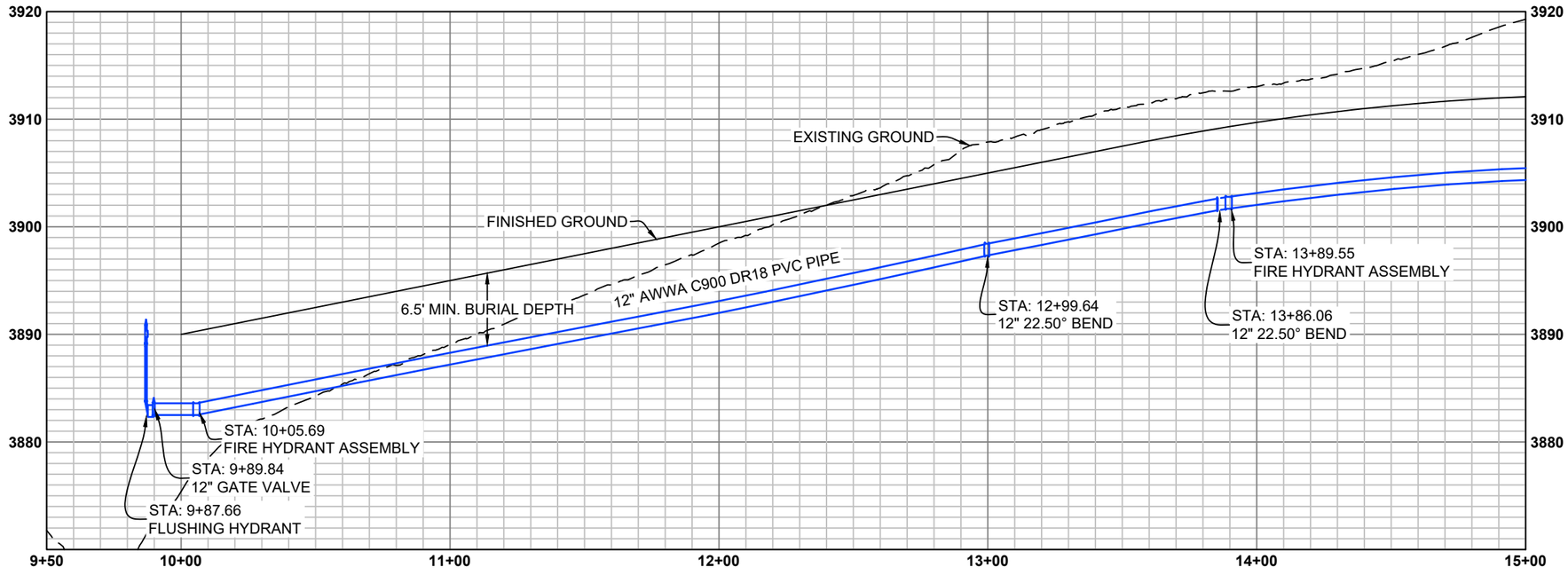

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WATER PLAN AND PROFILE SHEET

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SHEET
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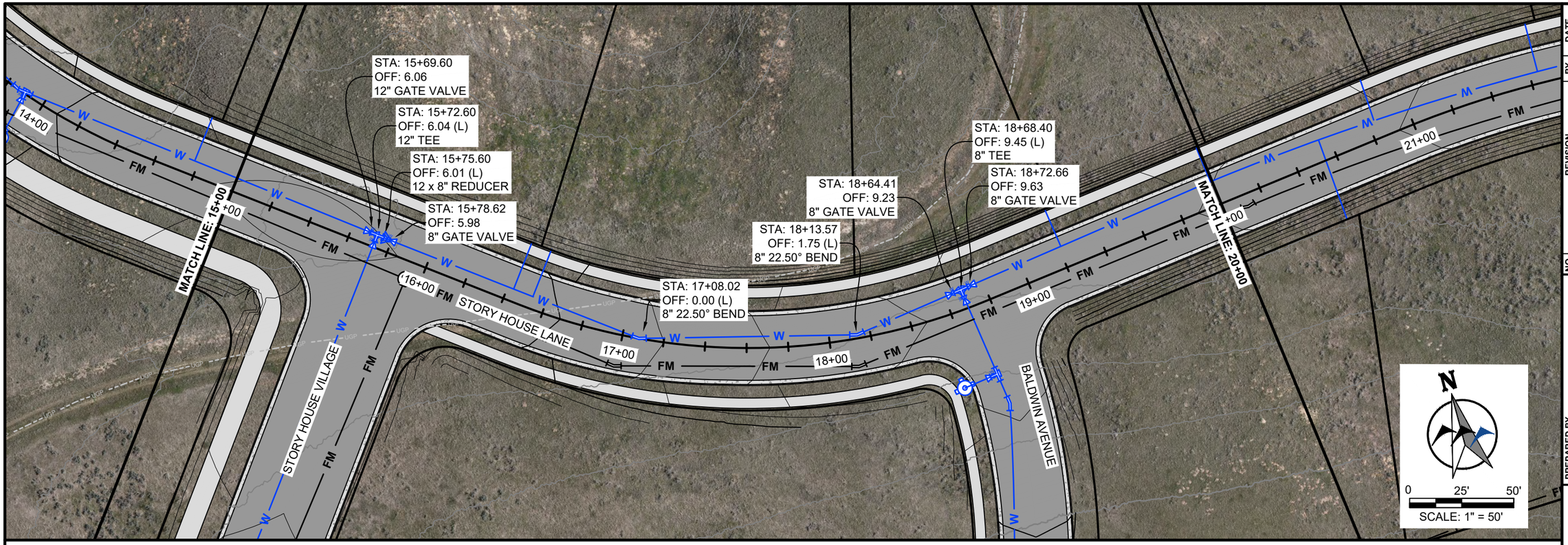

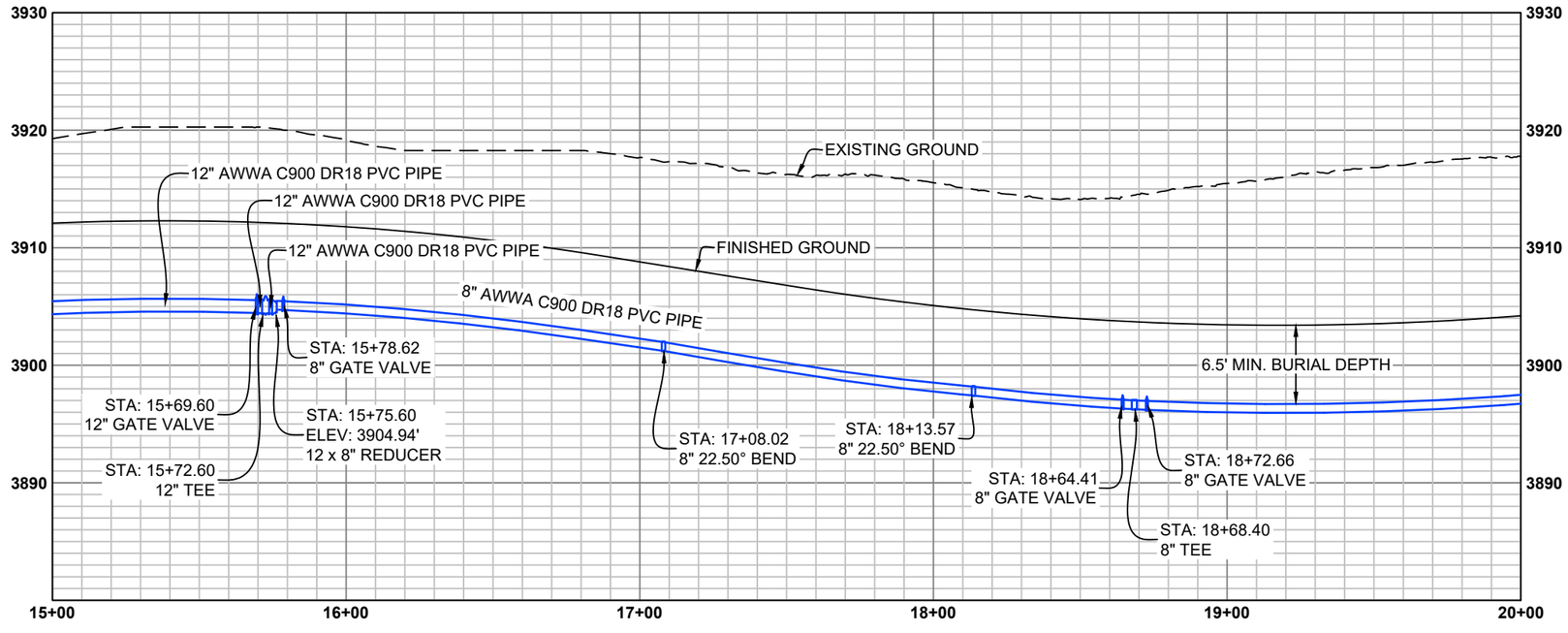

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WATER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

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SHEET
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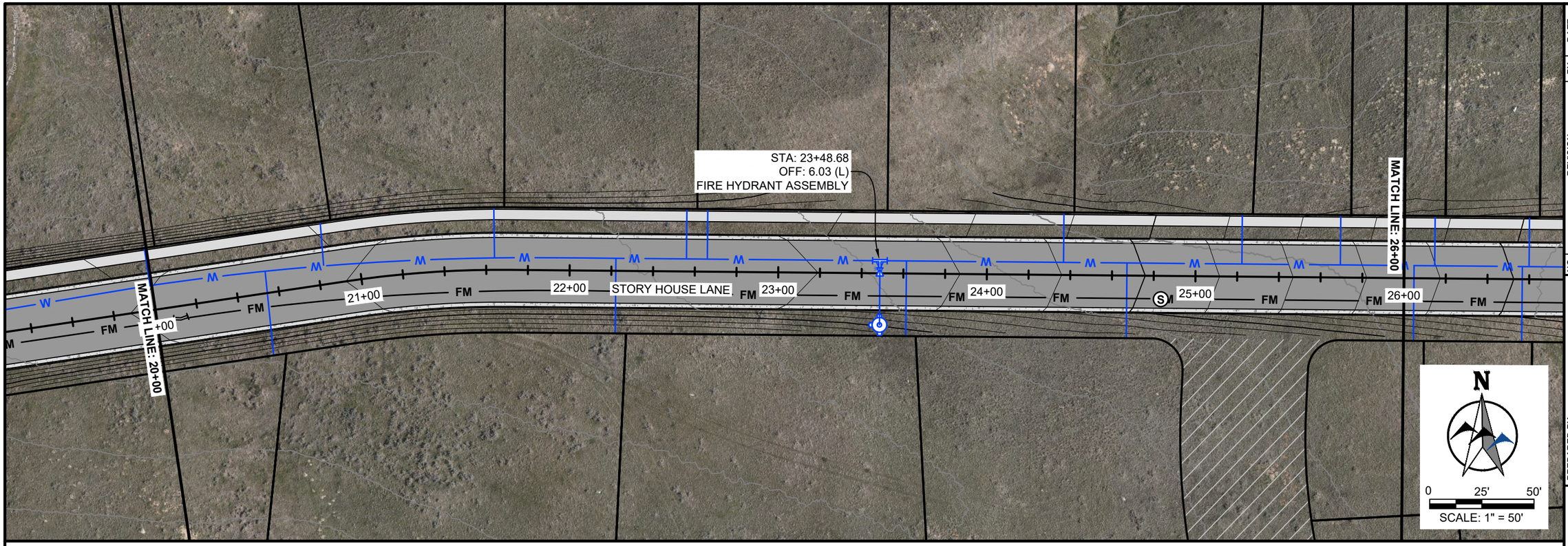

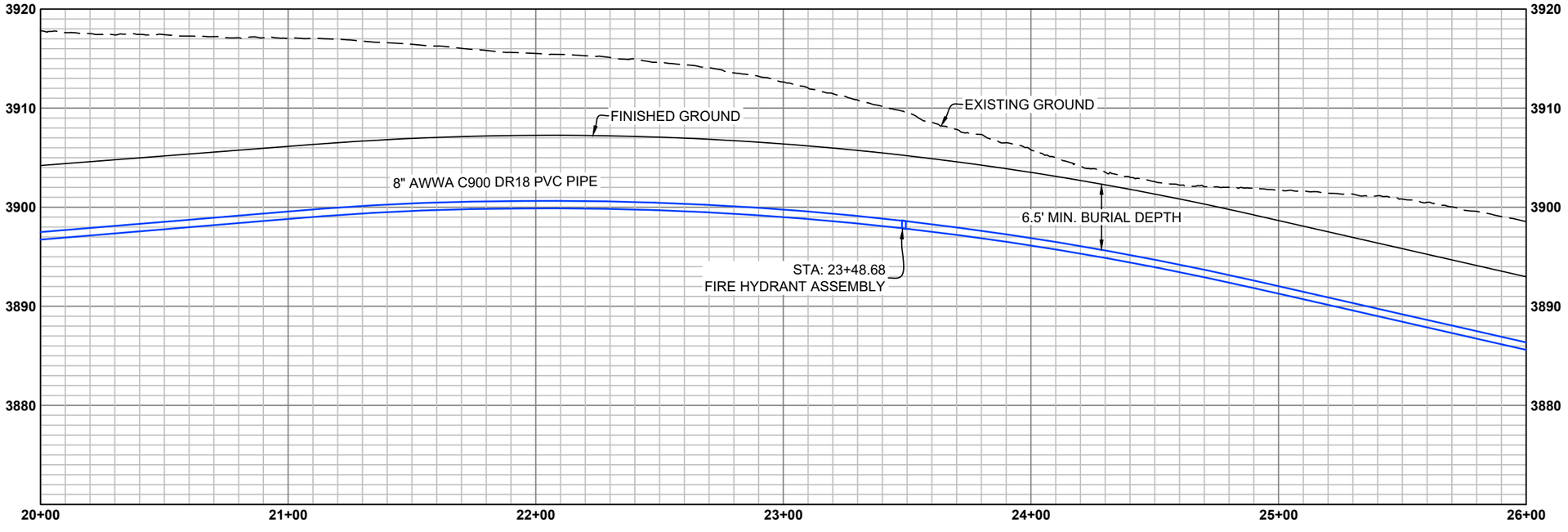

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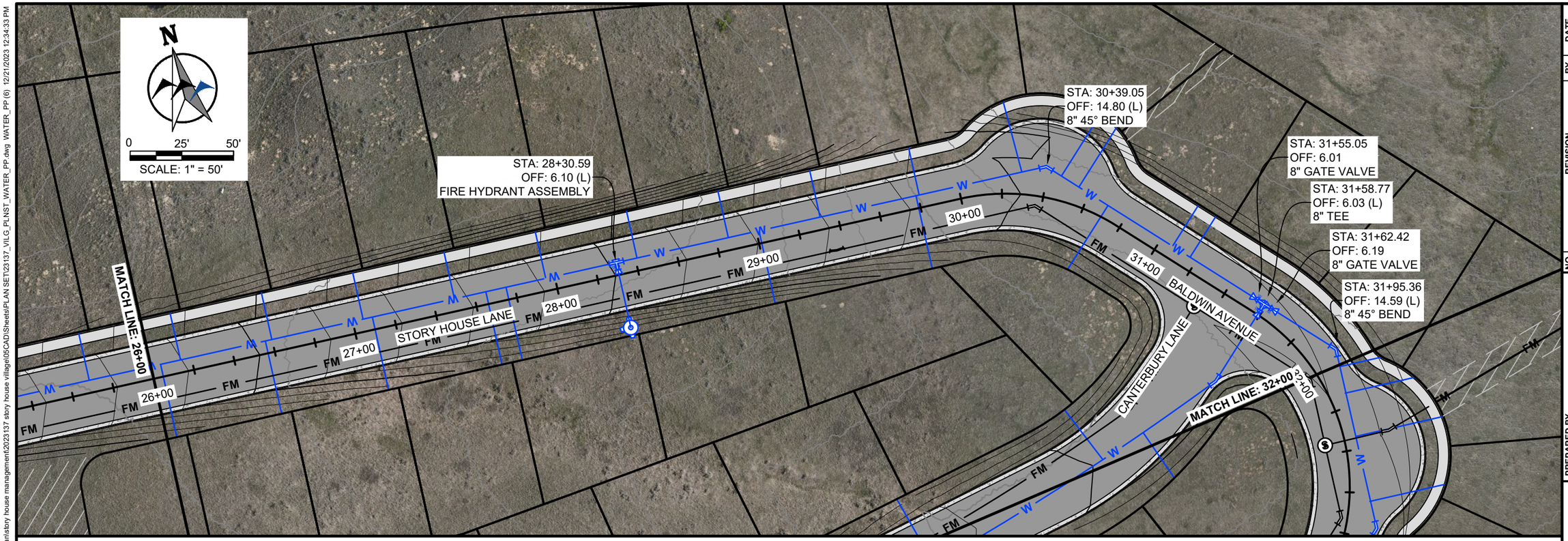

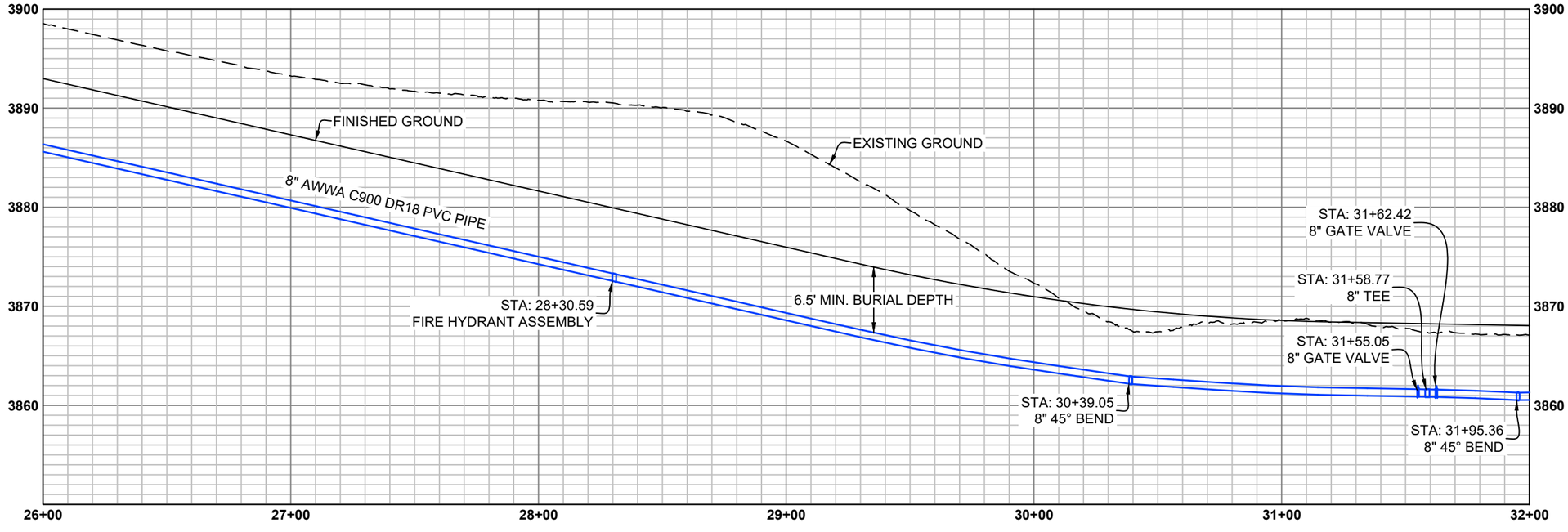

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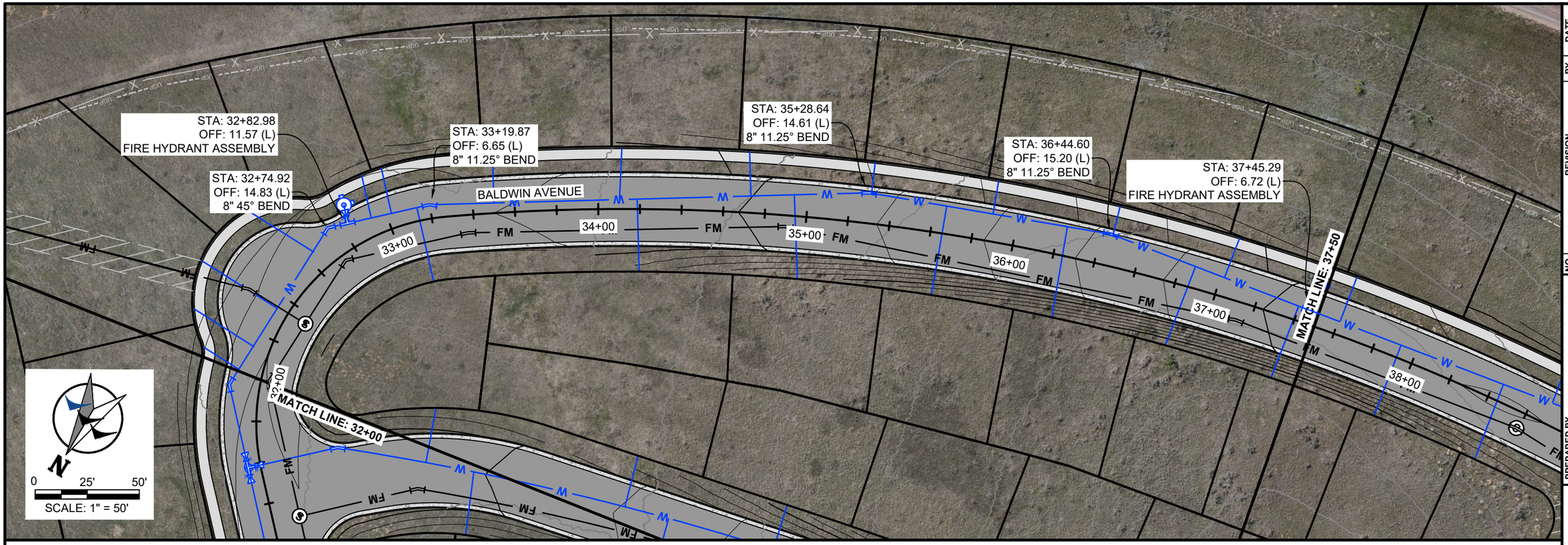

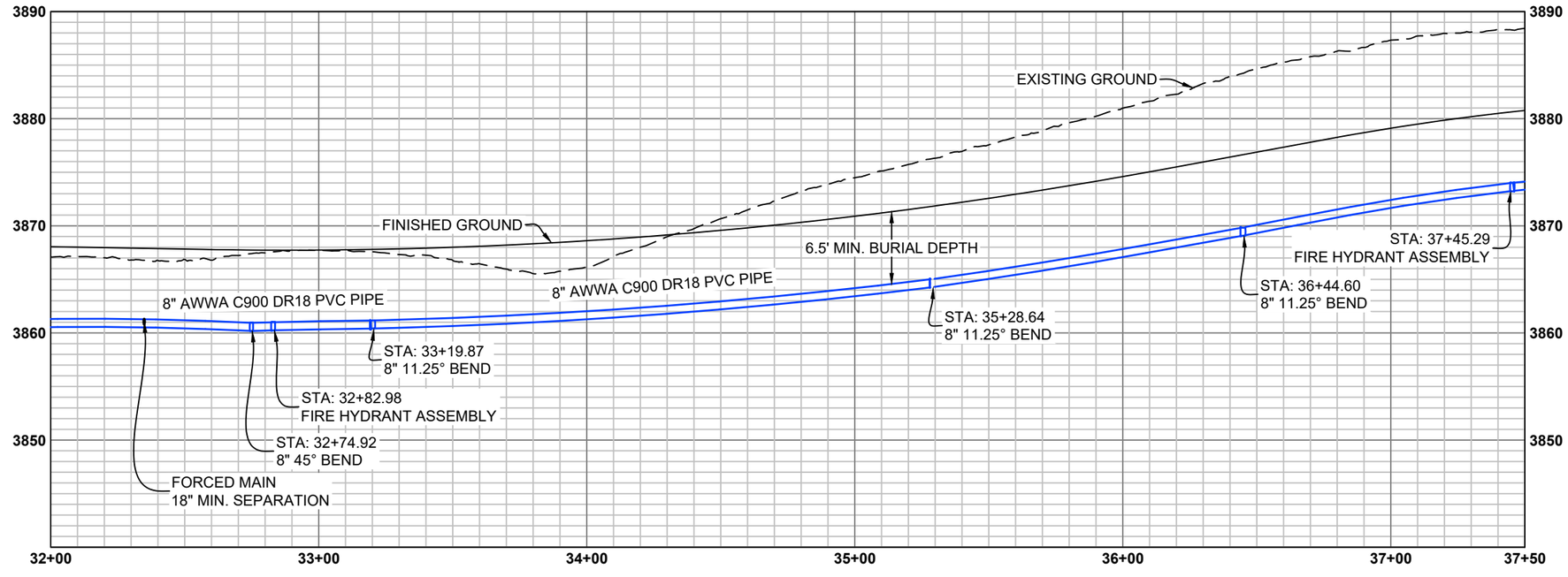

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PROJECT NO. 2023-137

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

WATER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET
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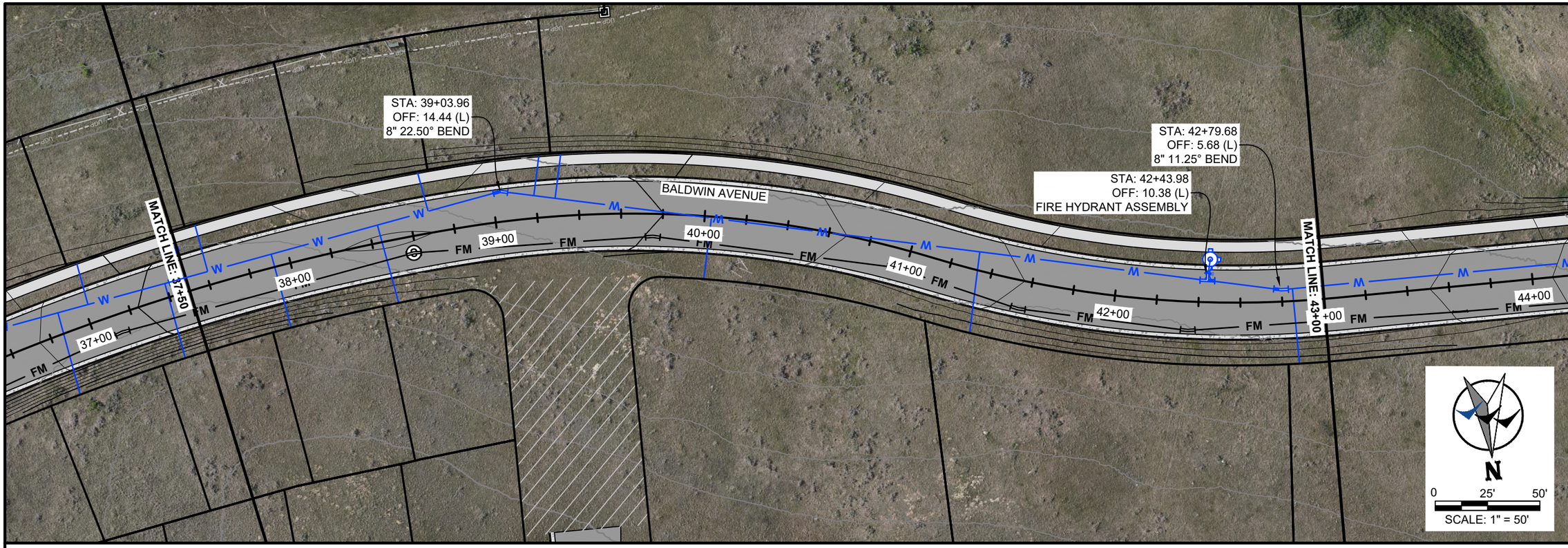

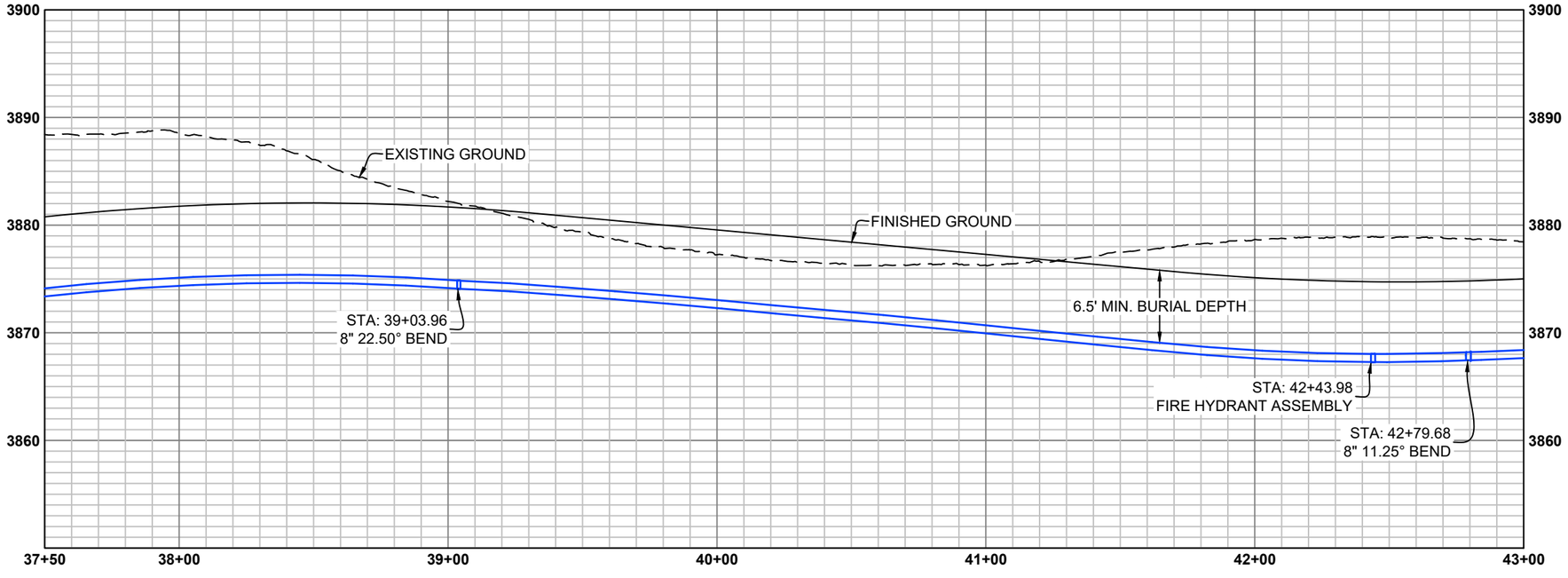

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SHEET
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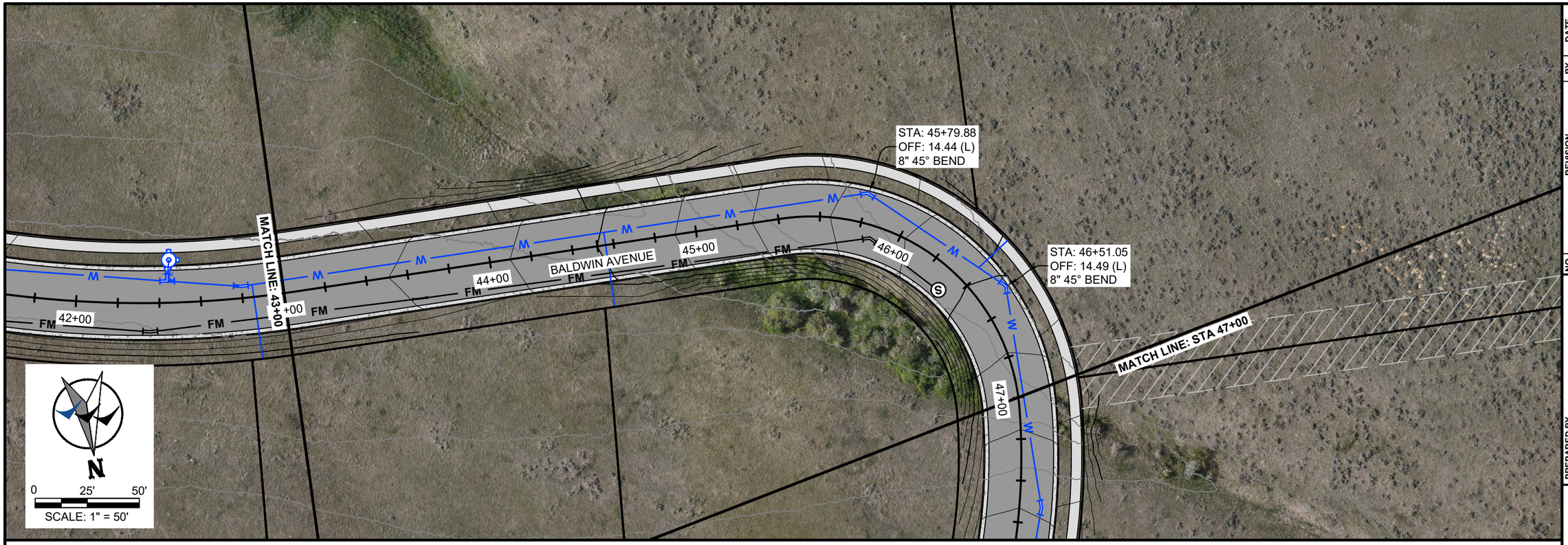

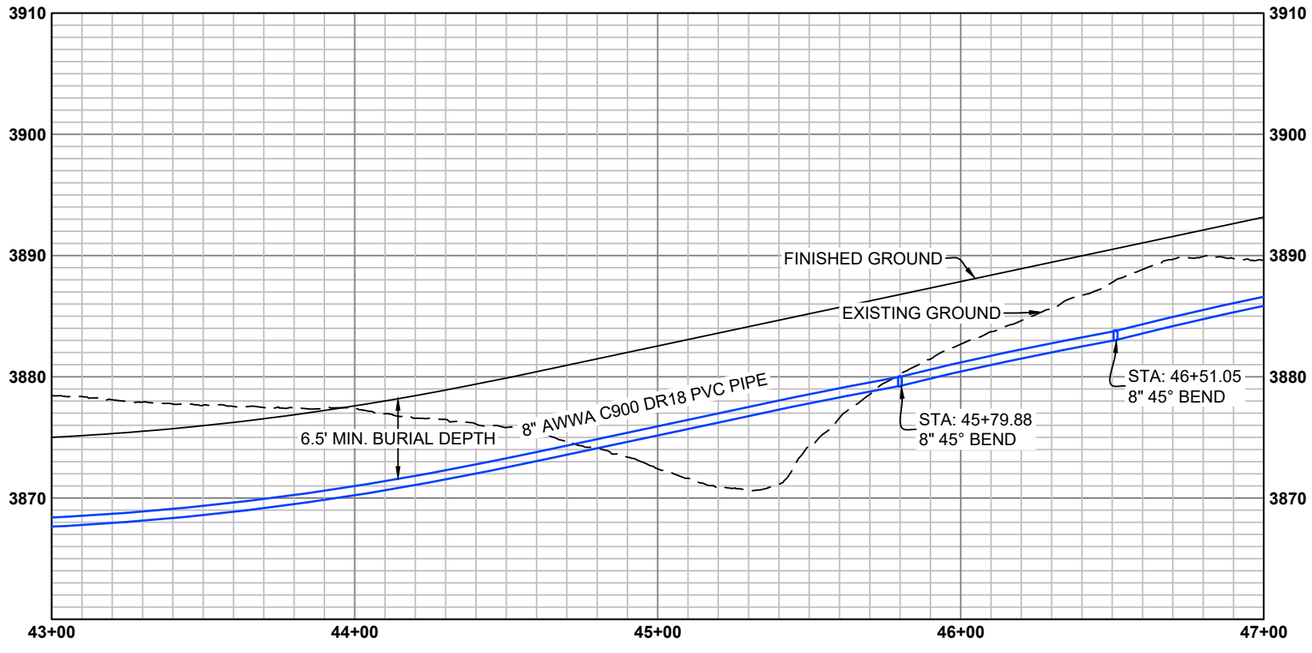

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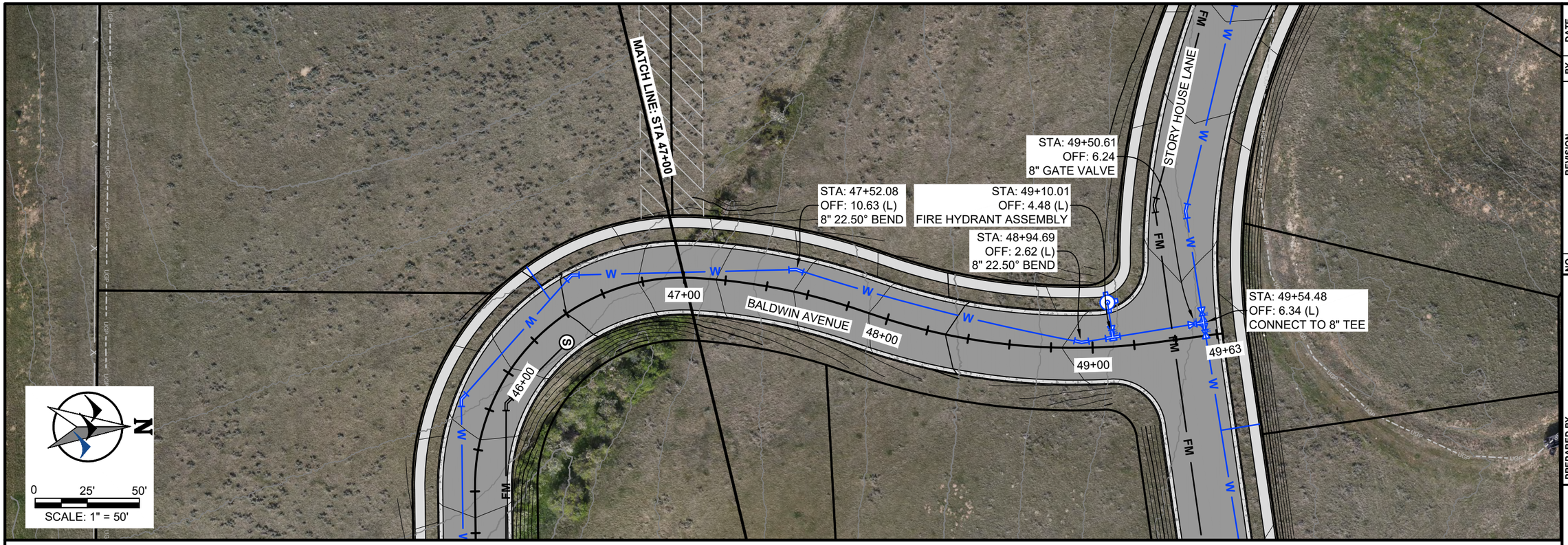

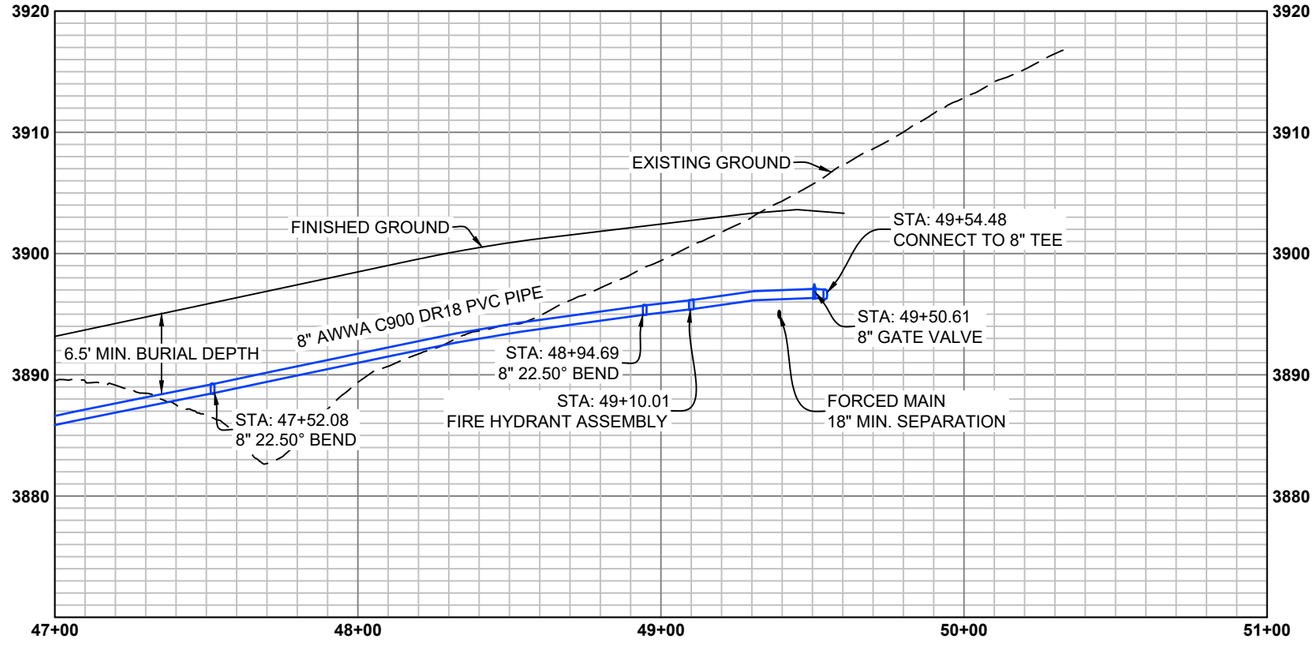

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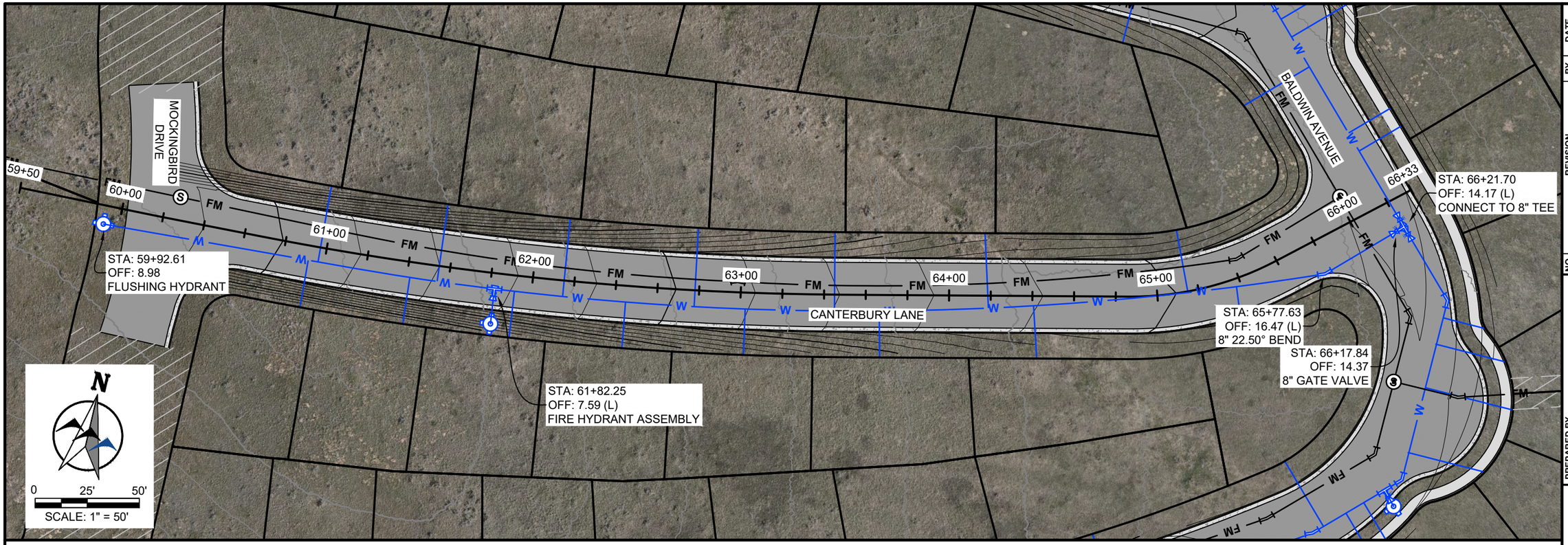

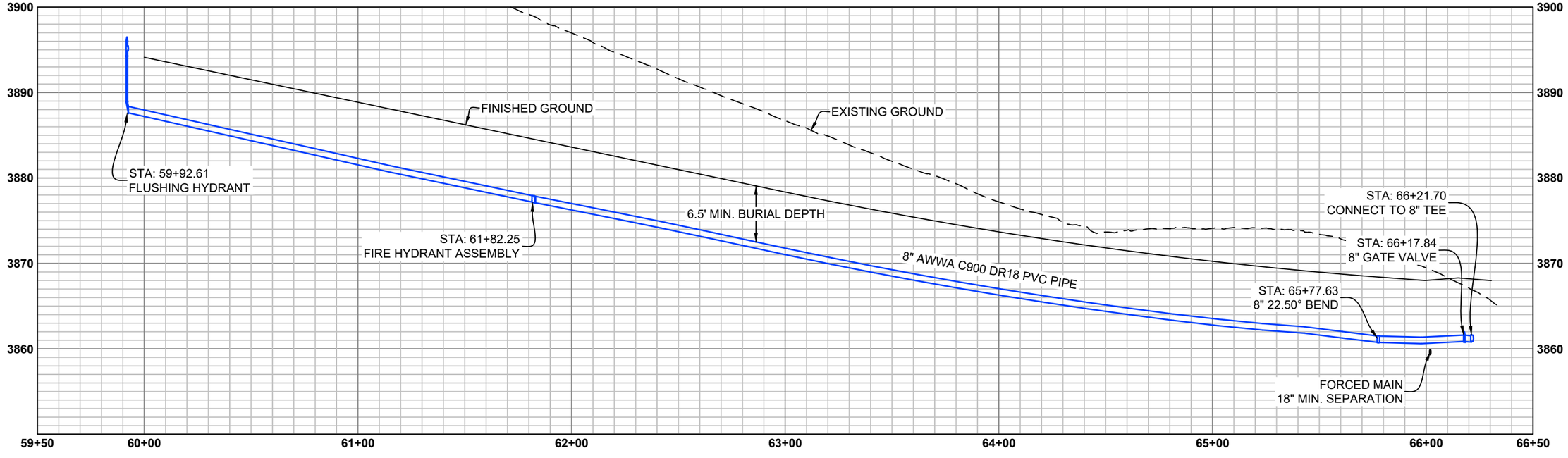

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SHEET
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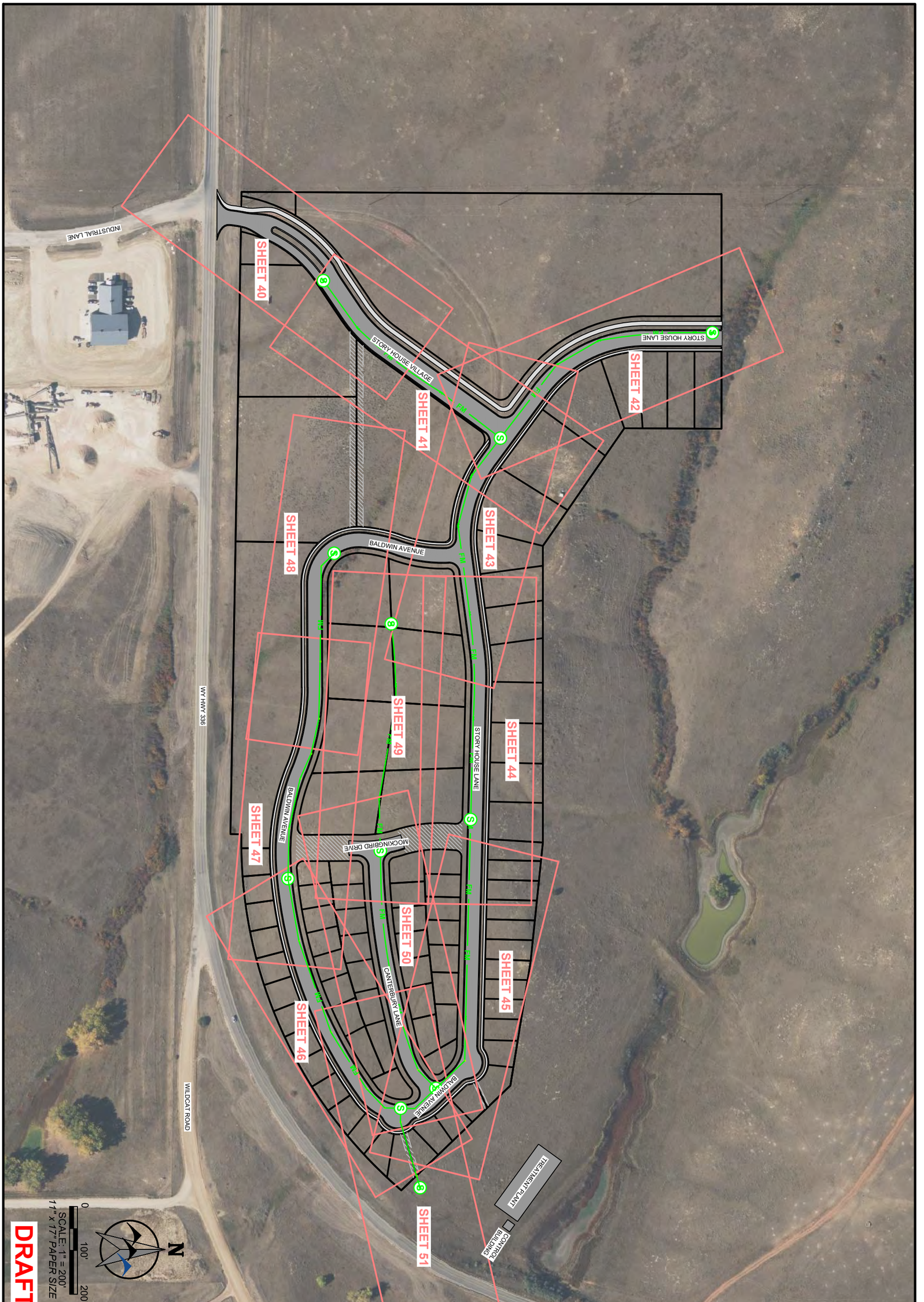

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STORY HOUSE VILLAGE PUD - PHASE 1

SANITARY SEWER KEY SHEET

SHERIDAN COUNTY, WYOMING

SHEET 39

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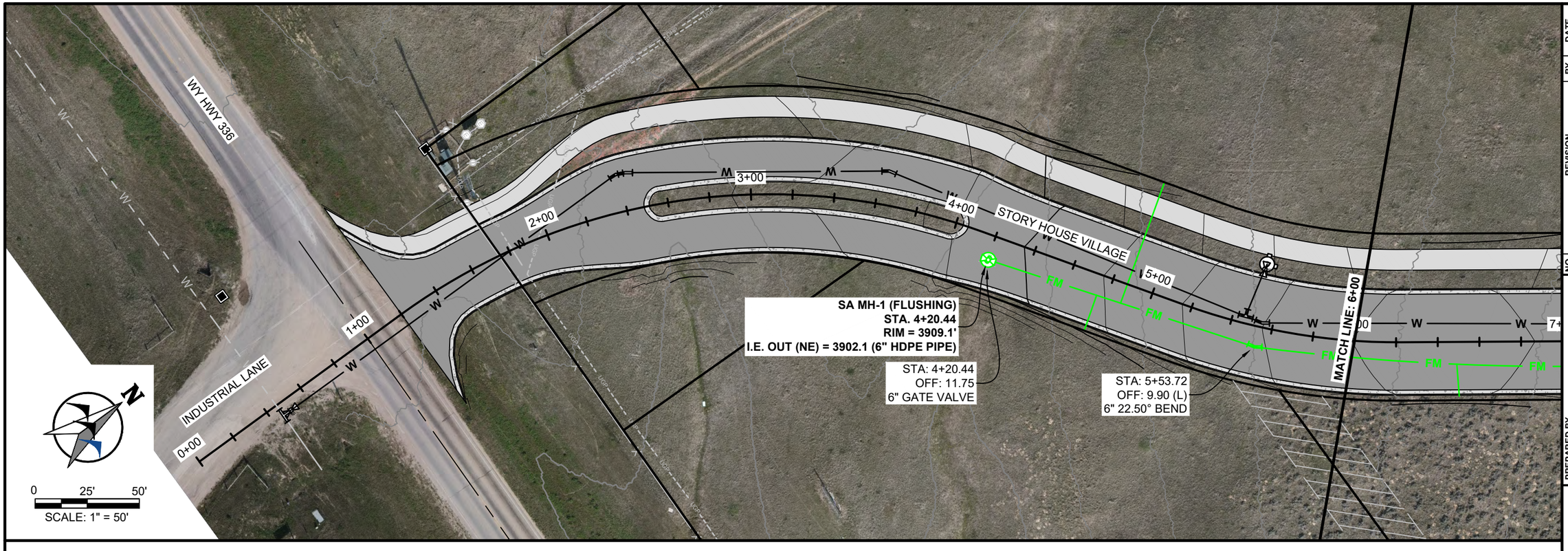

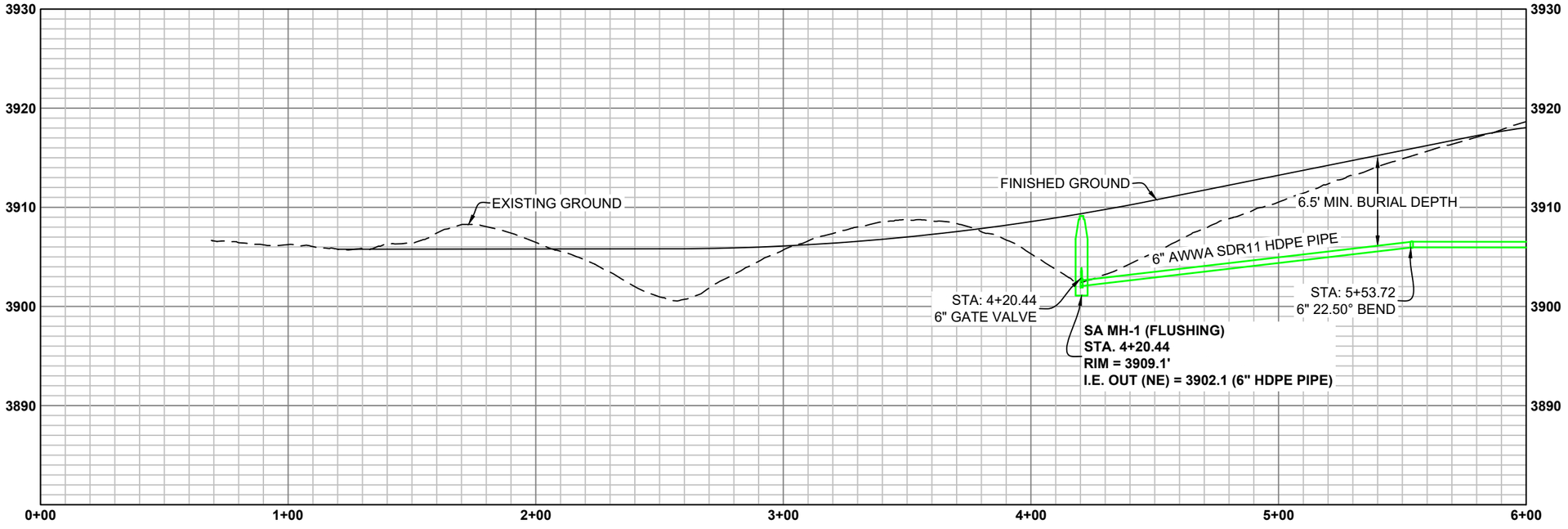

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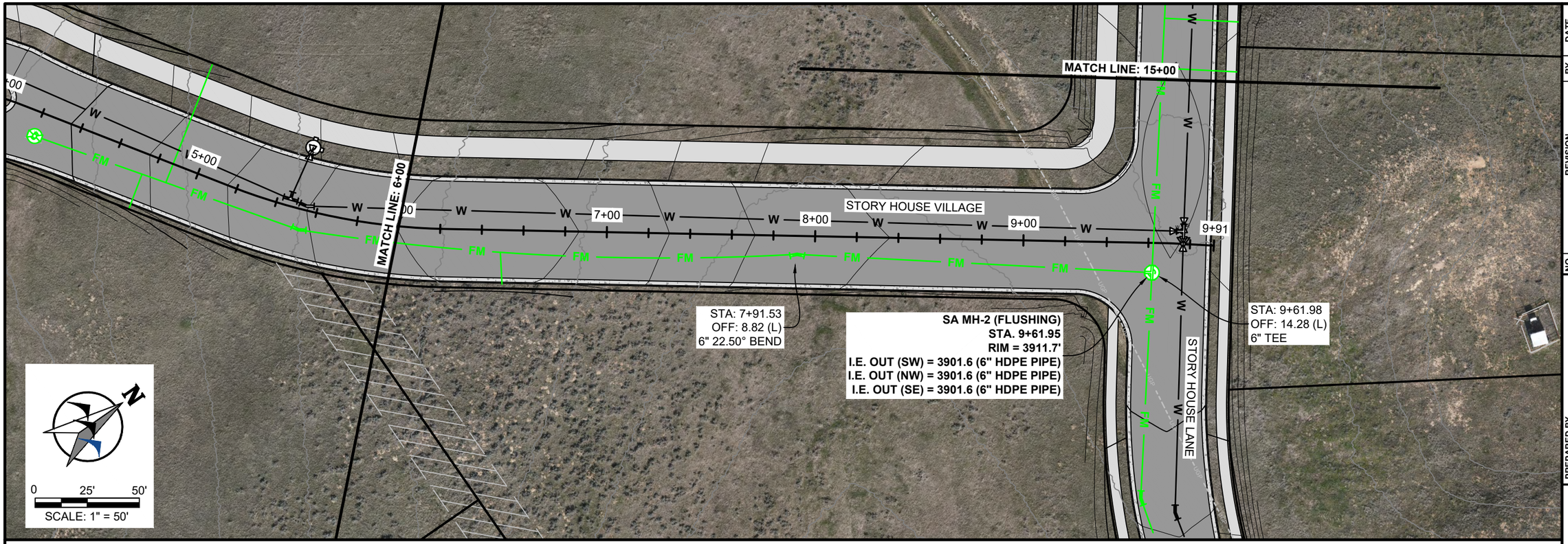

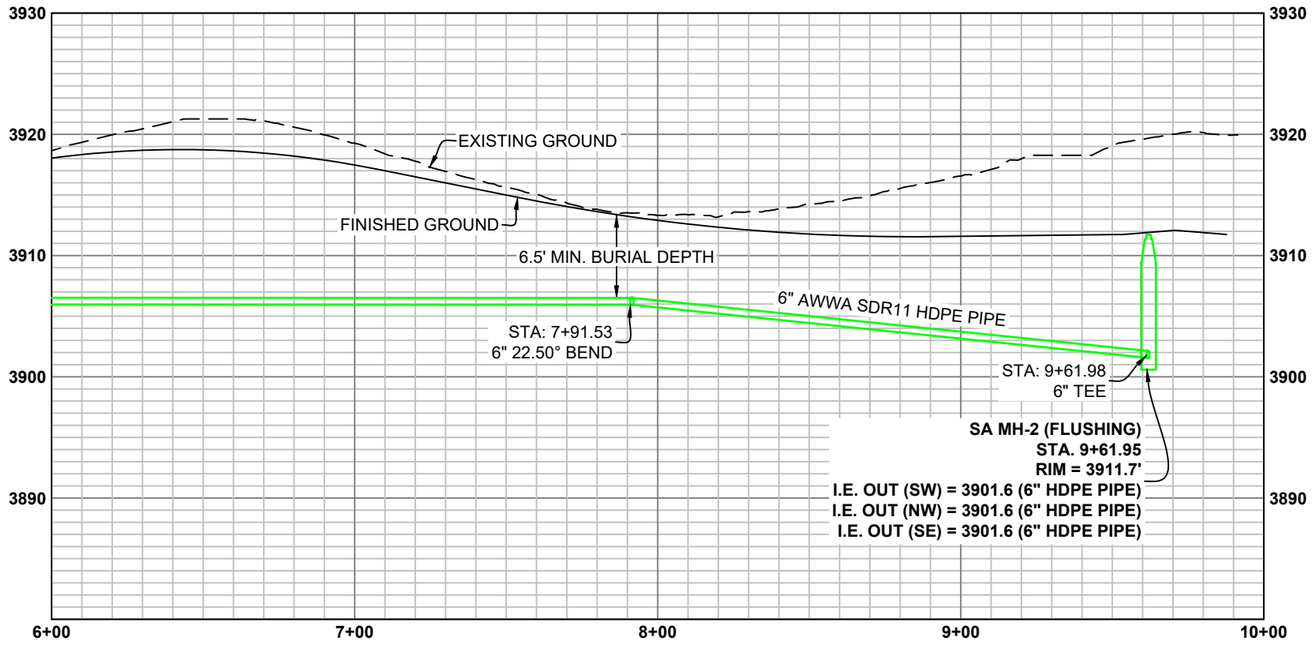

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SHEET
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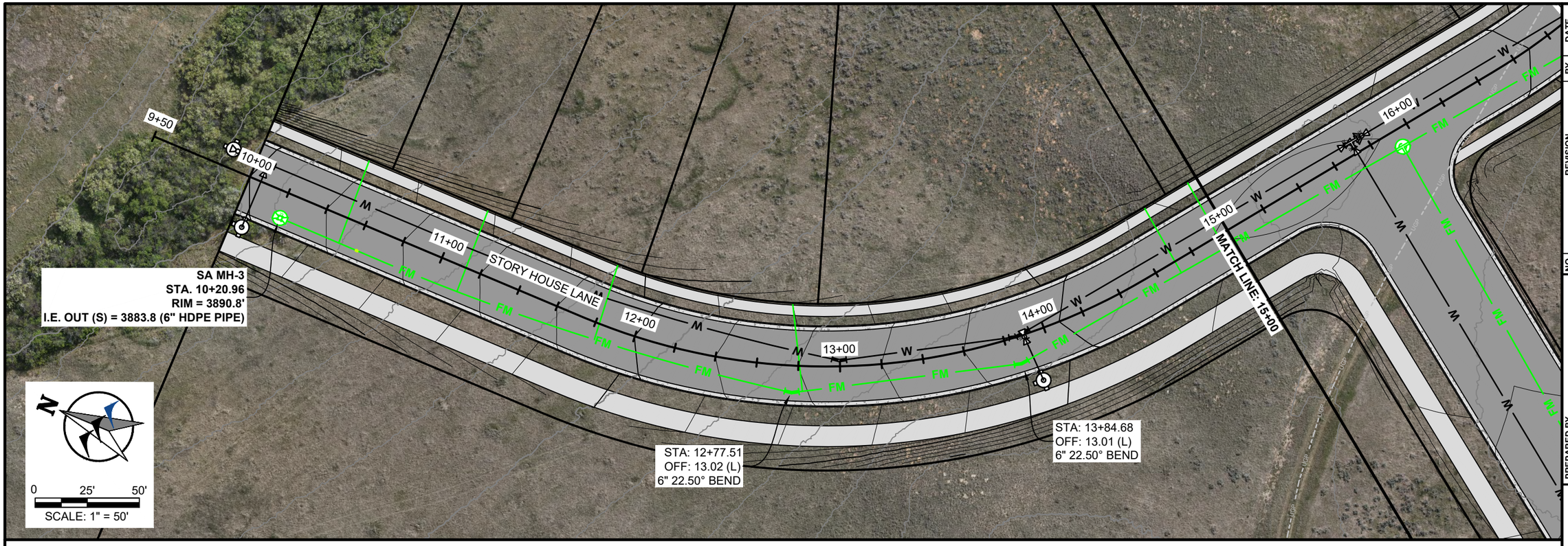

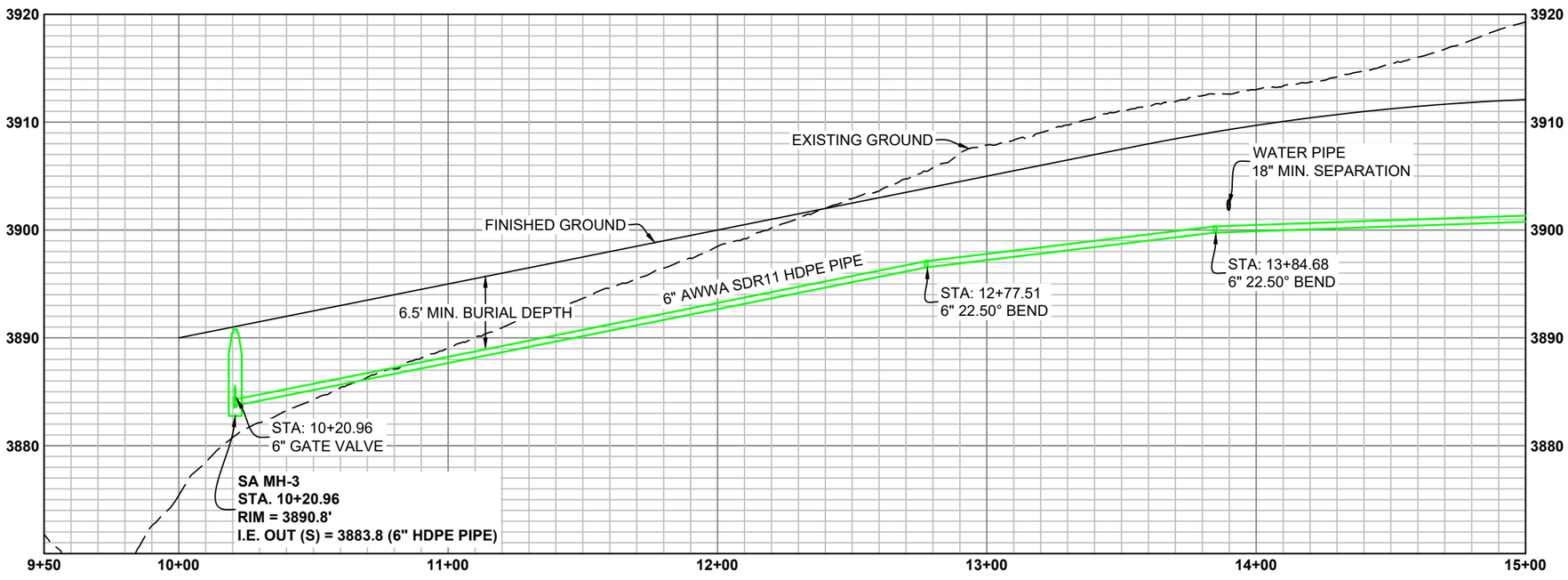

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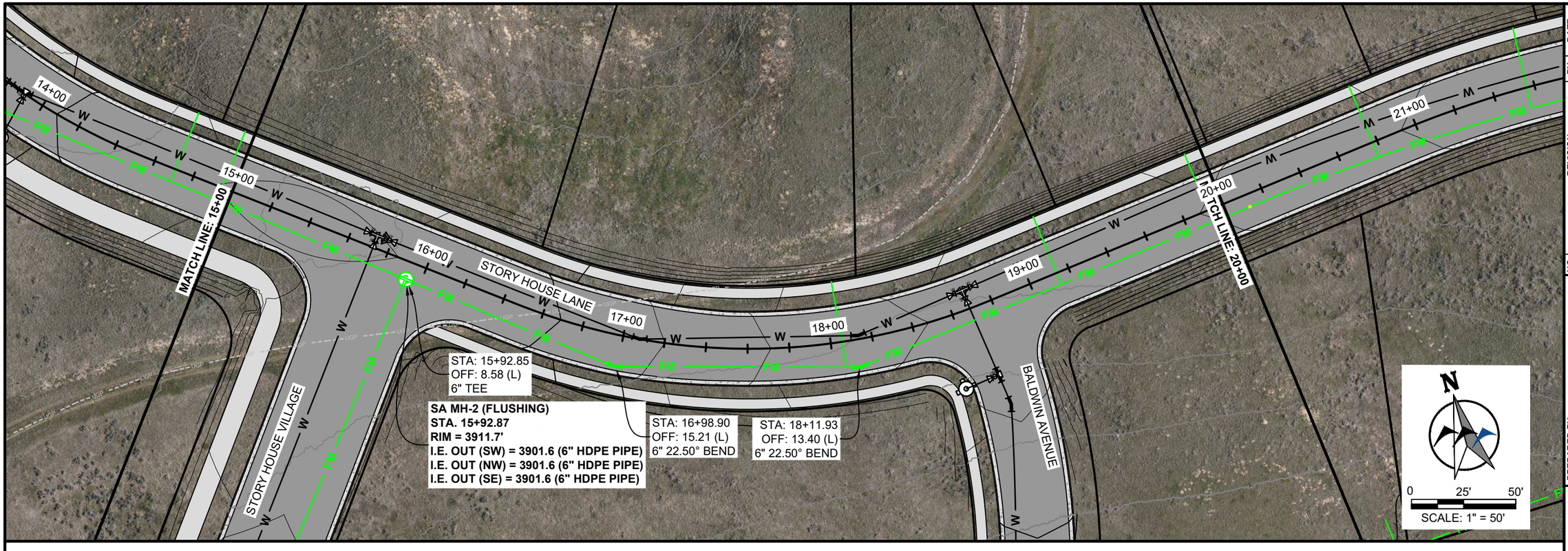

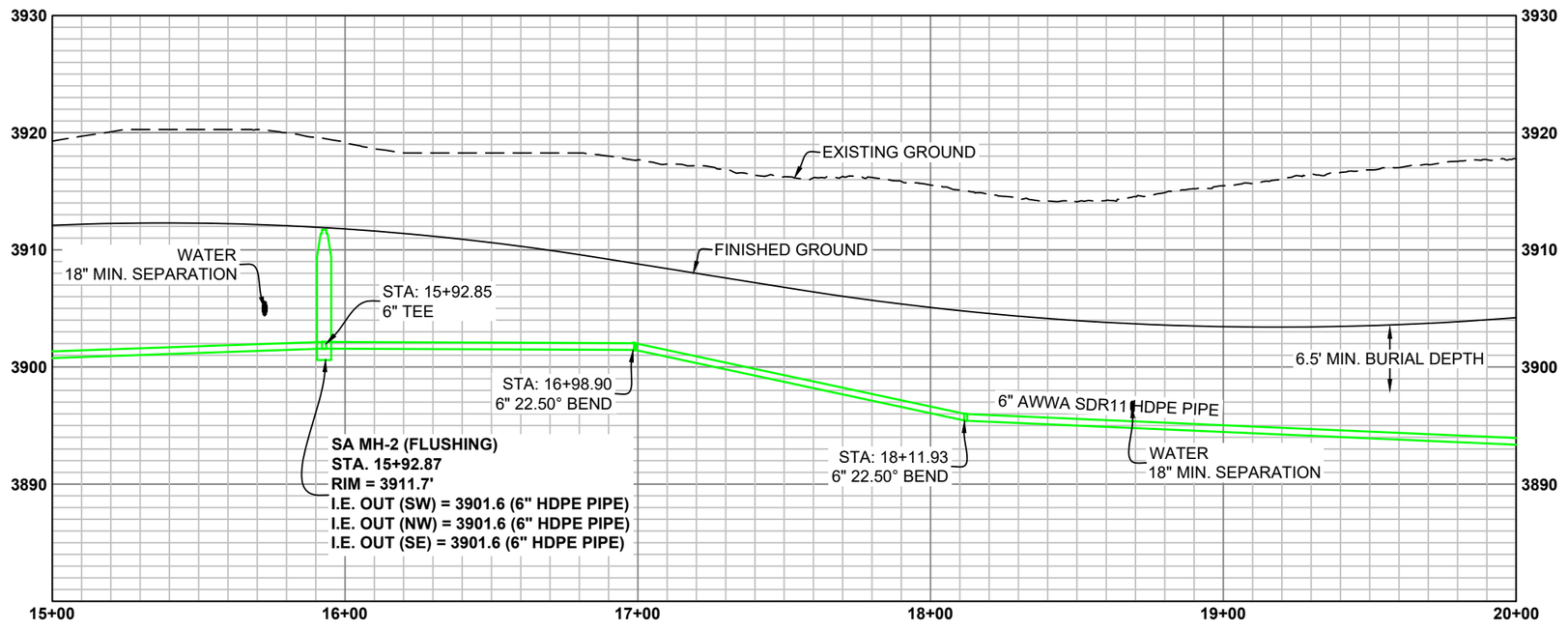

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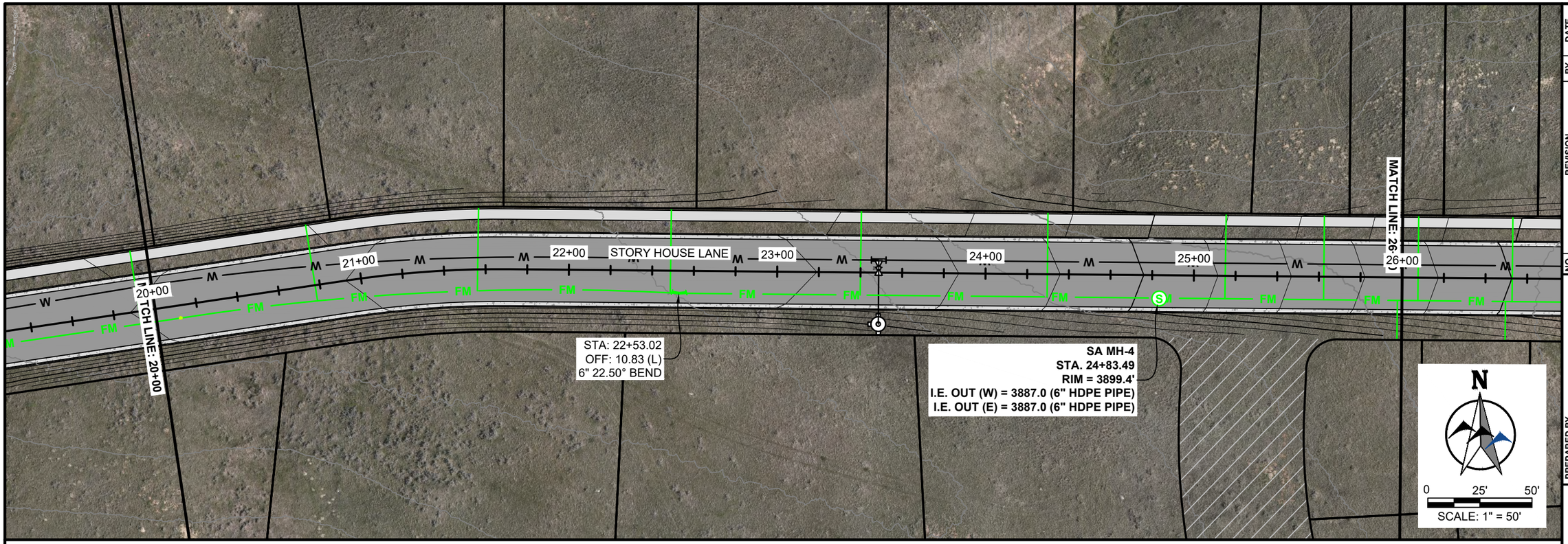

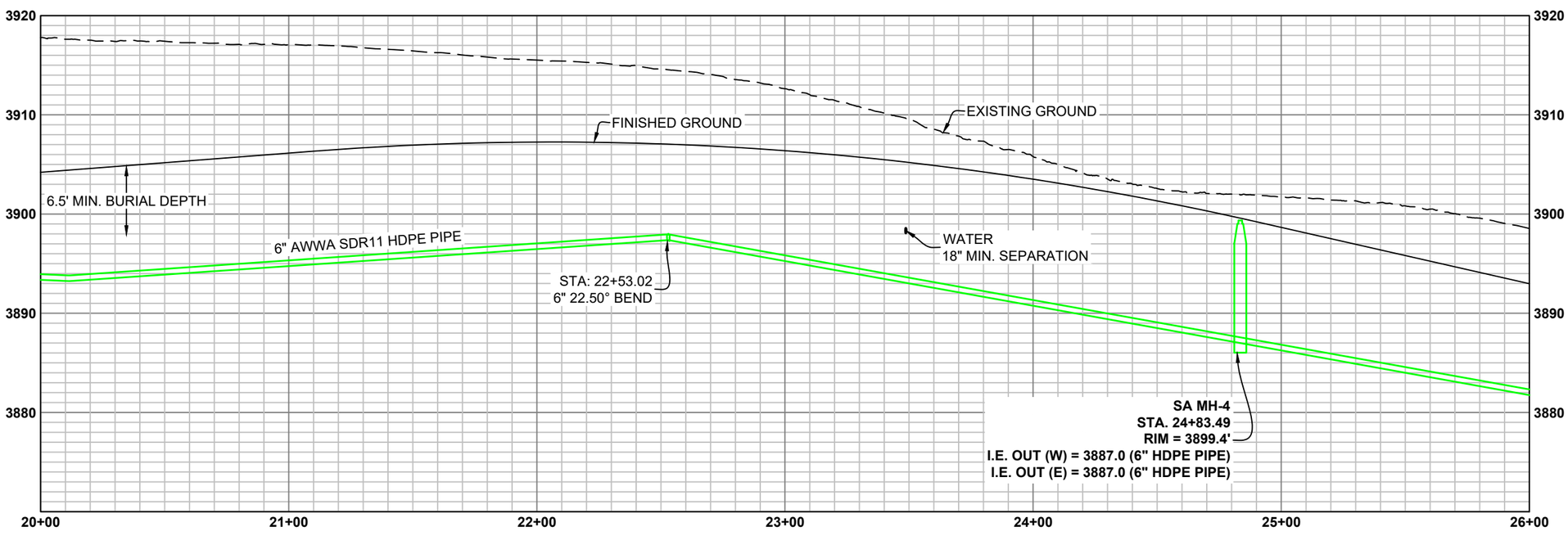

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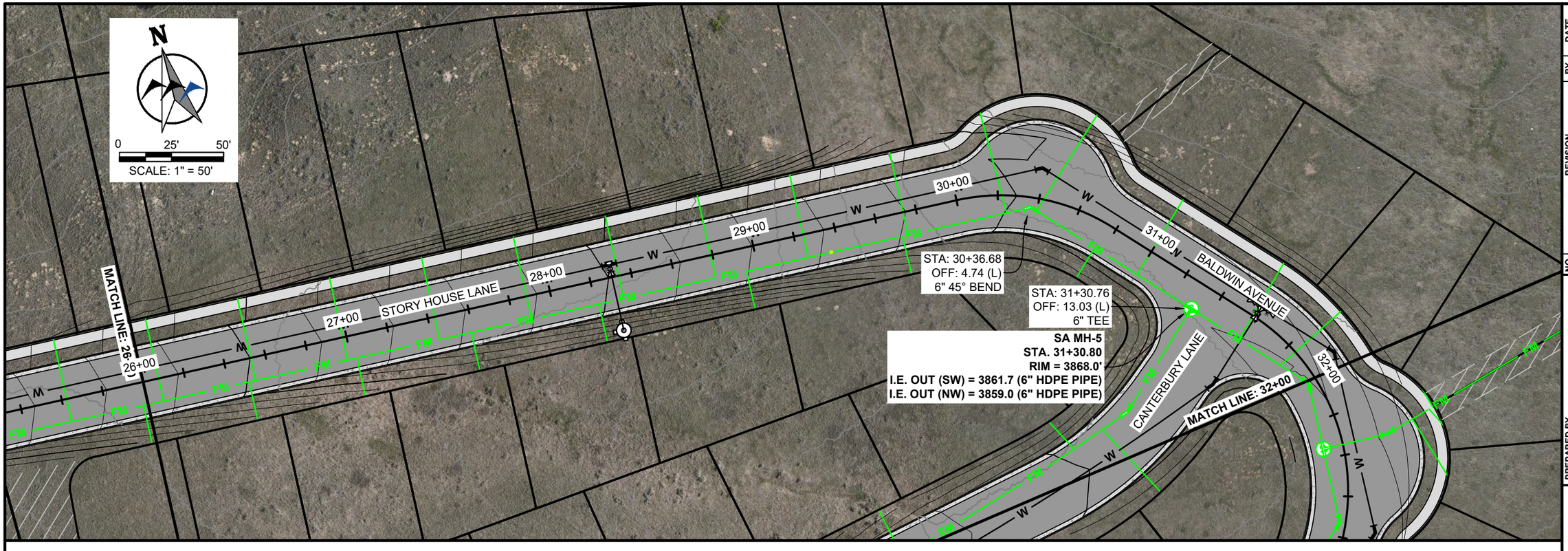

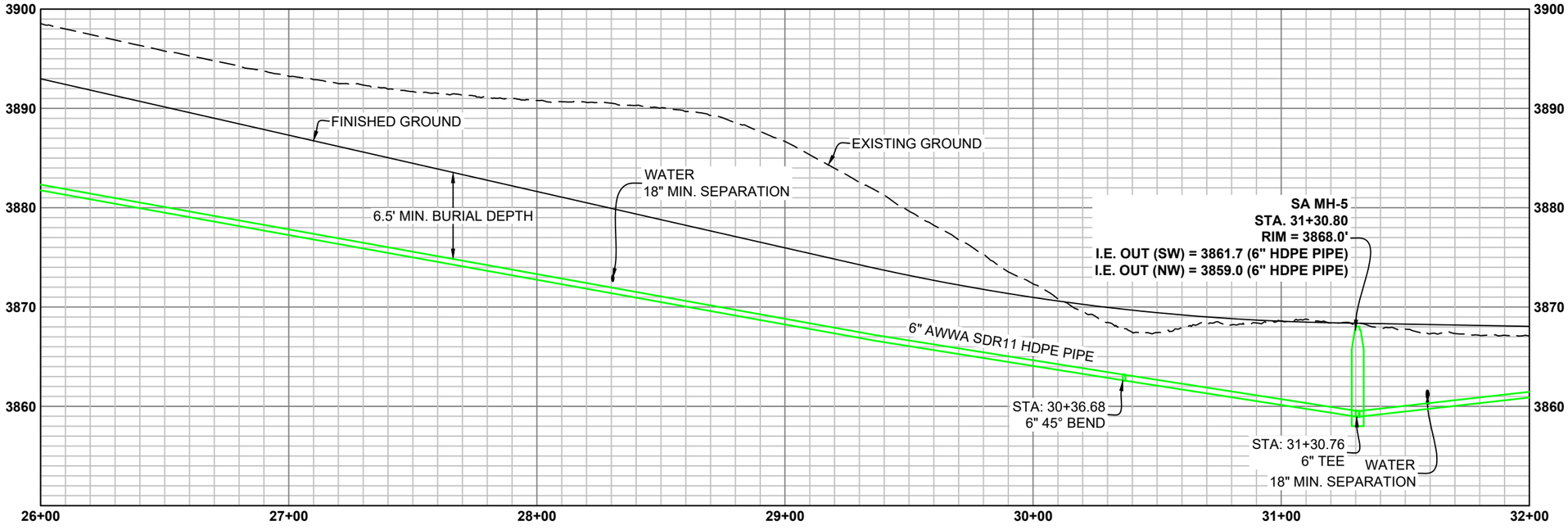

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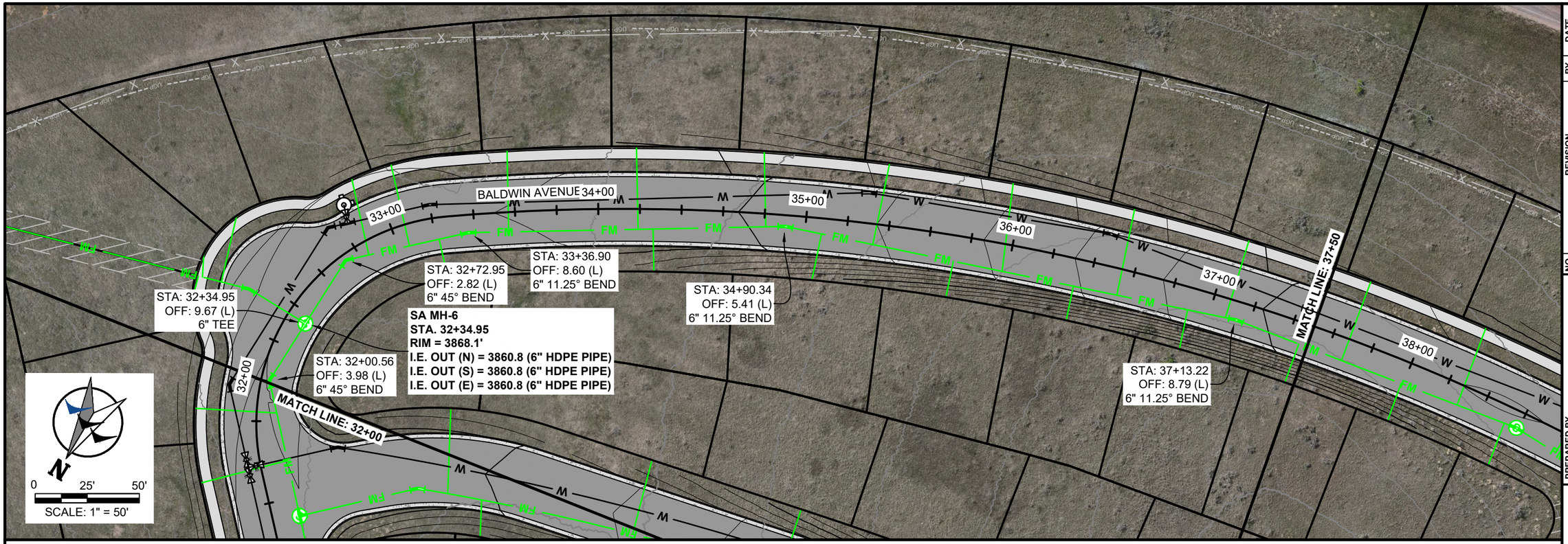

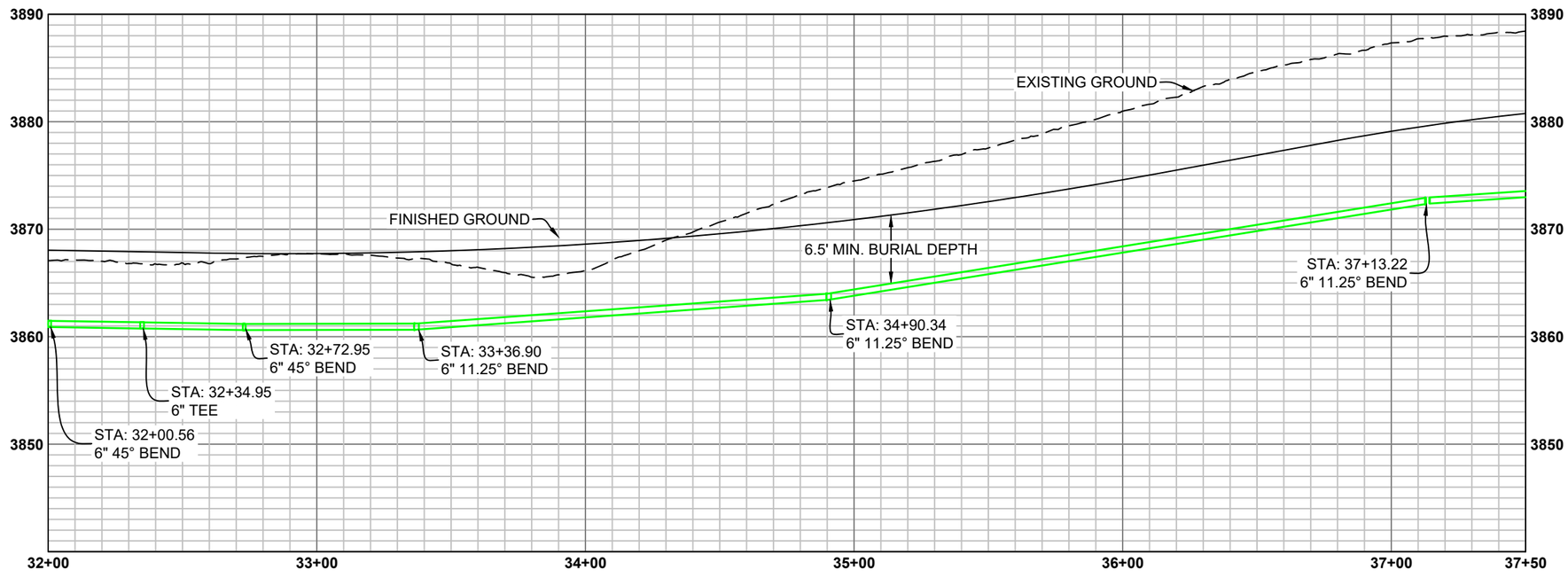

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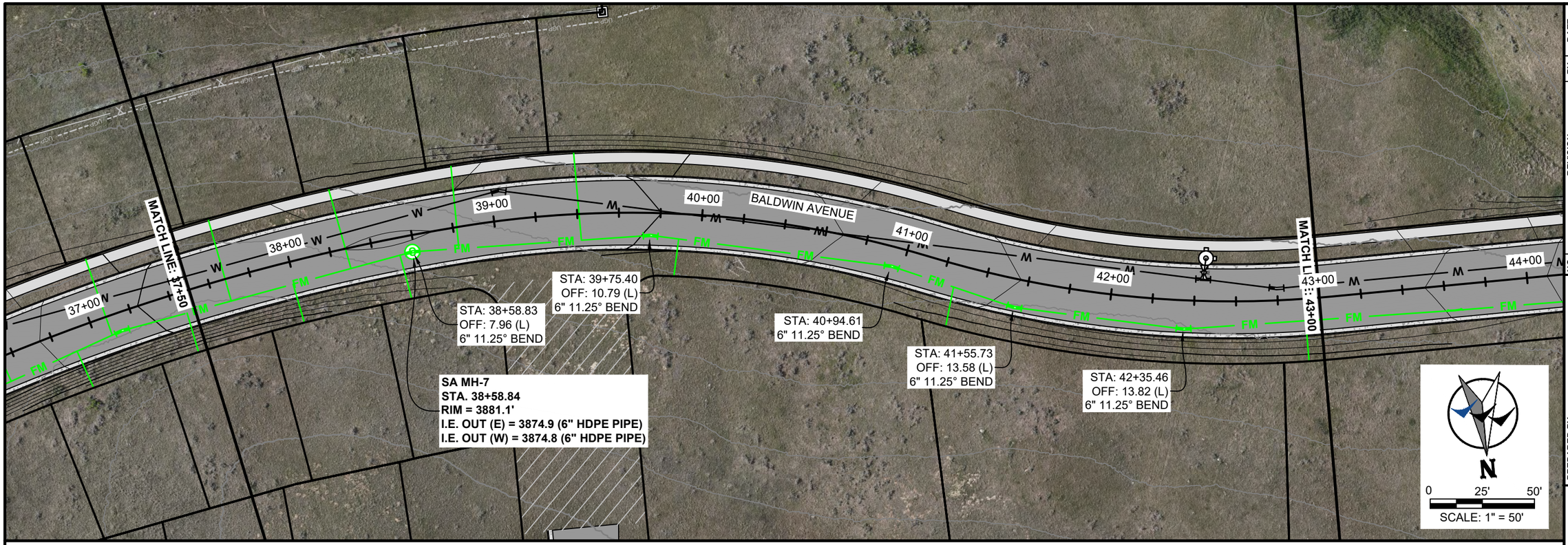

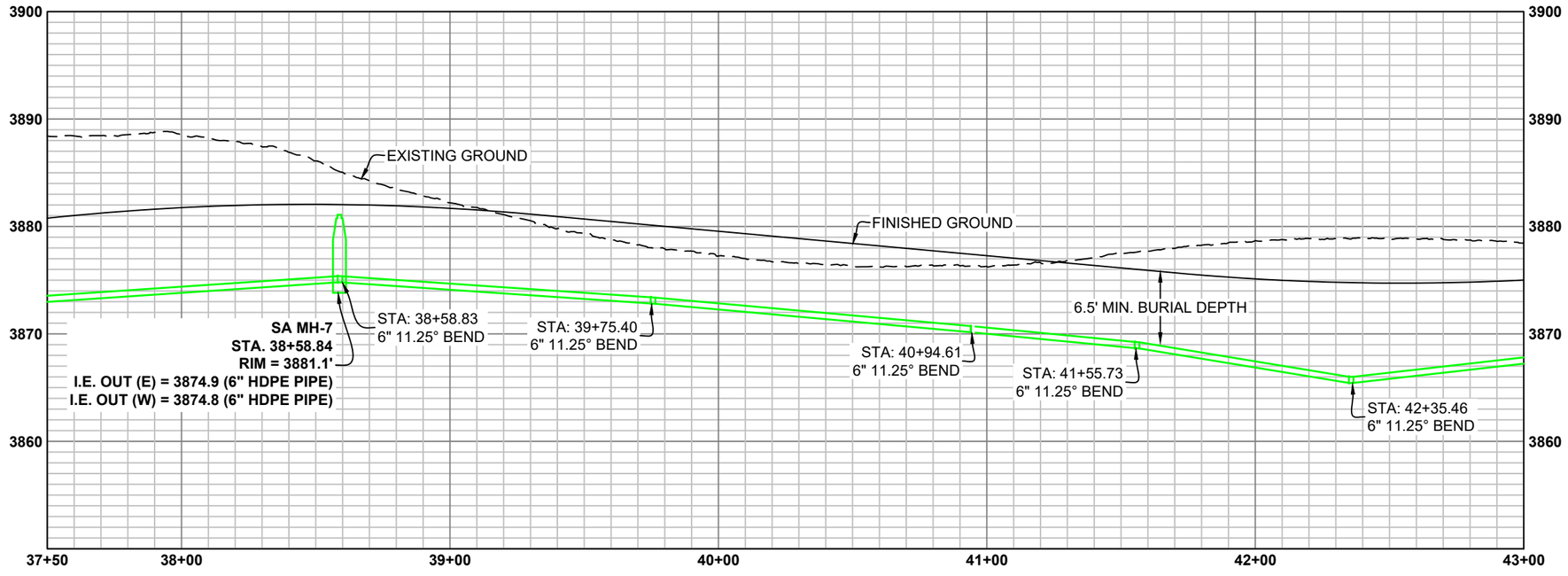

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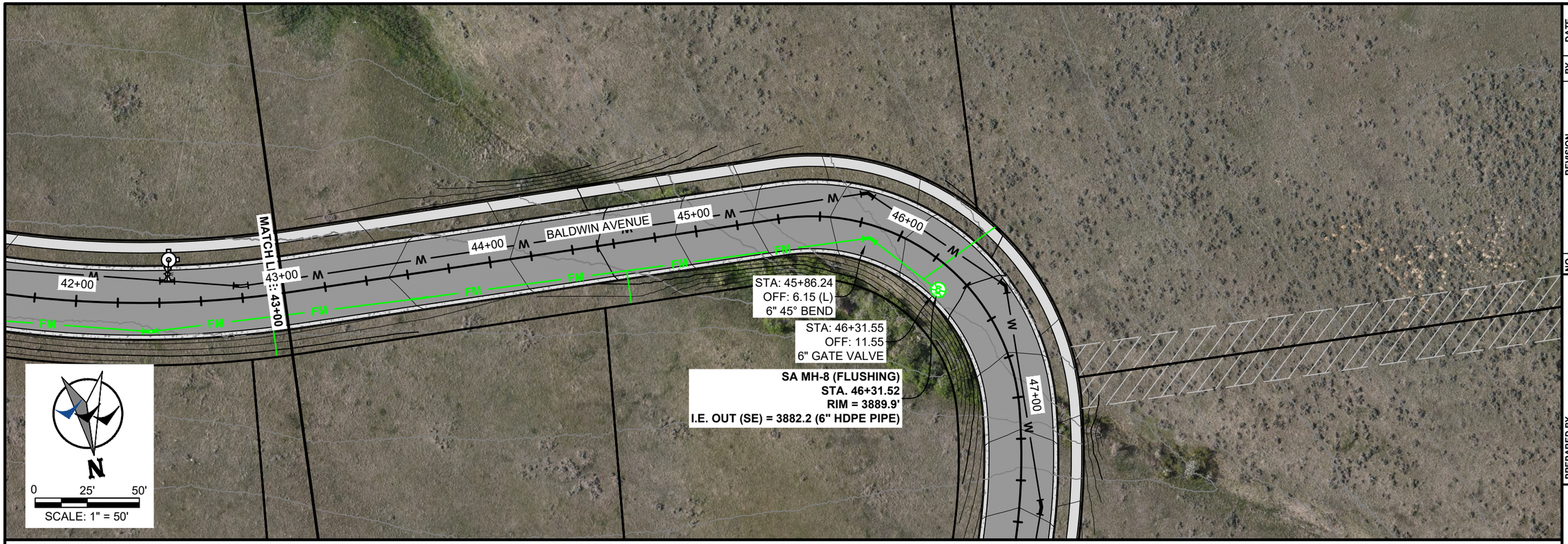

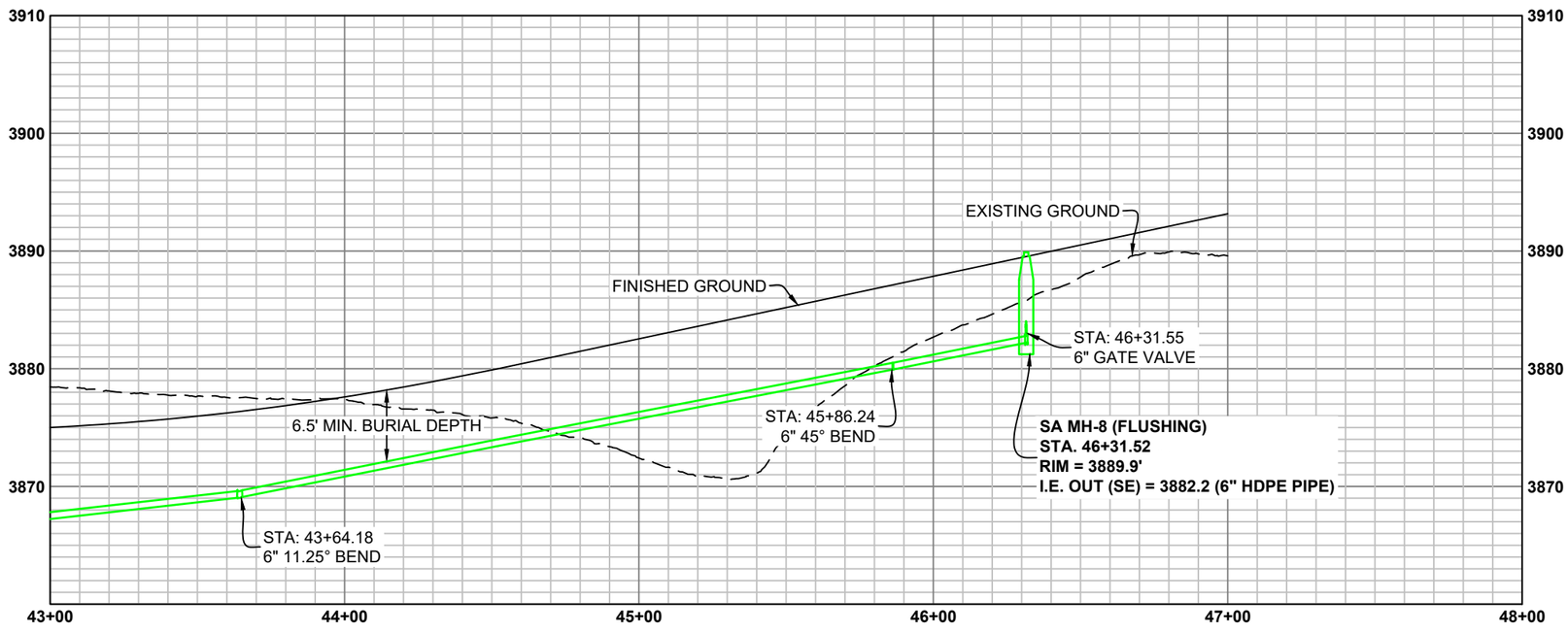

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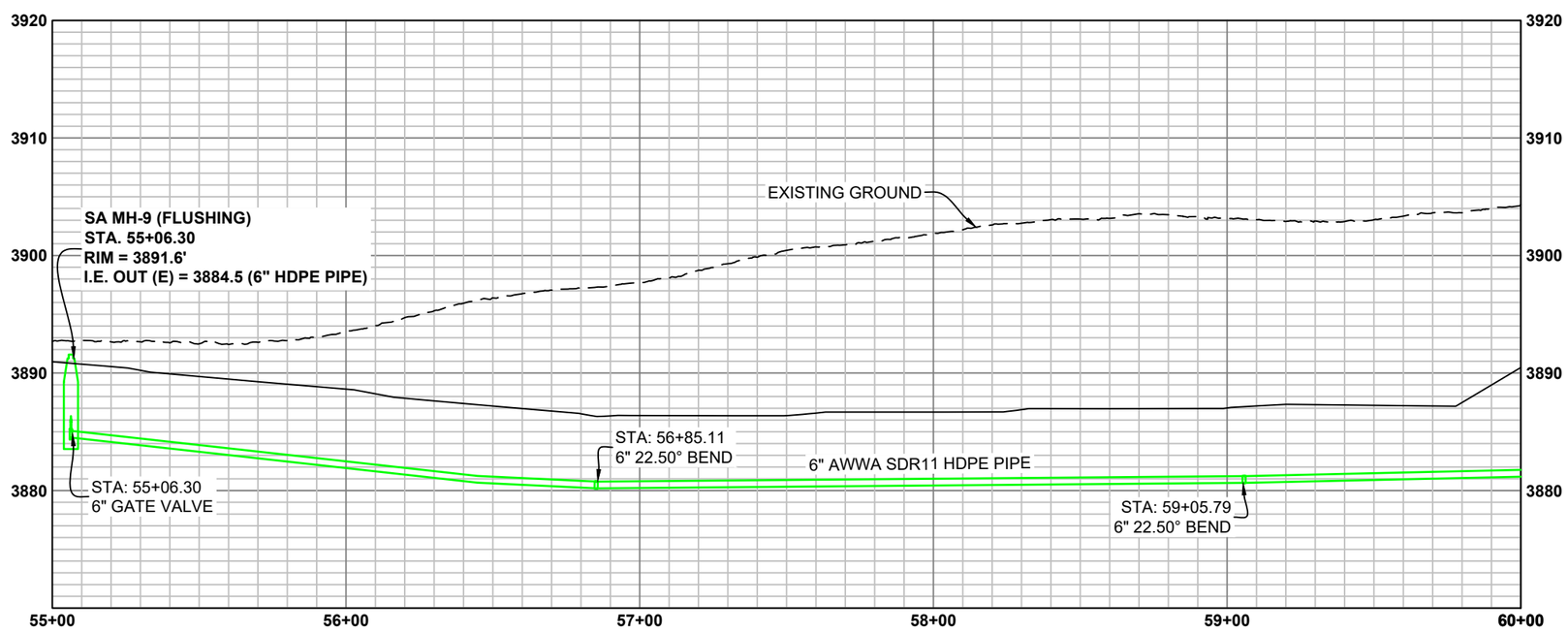

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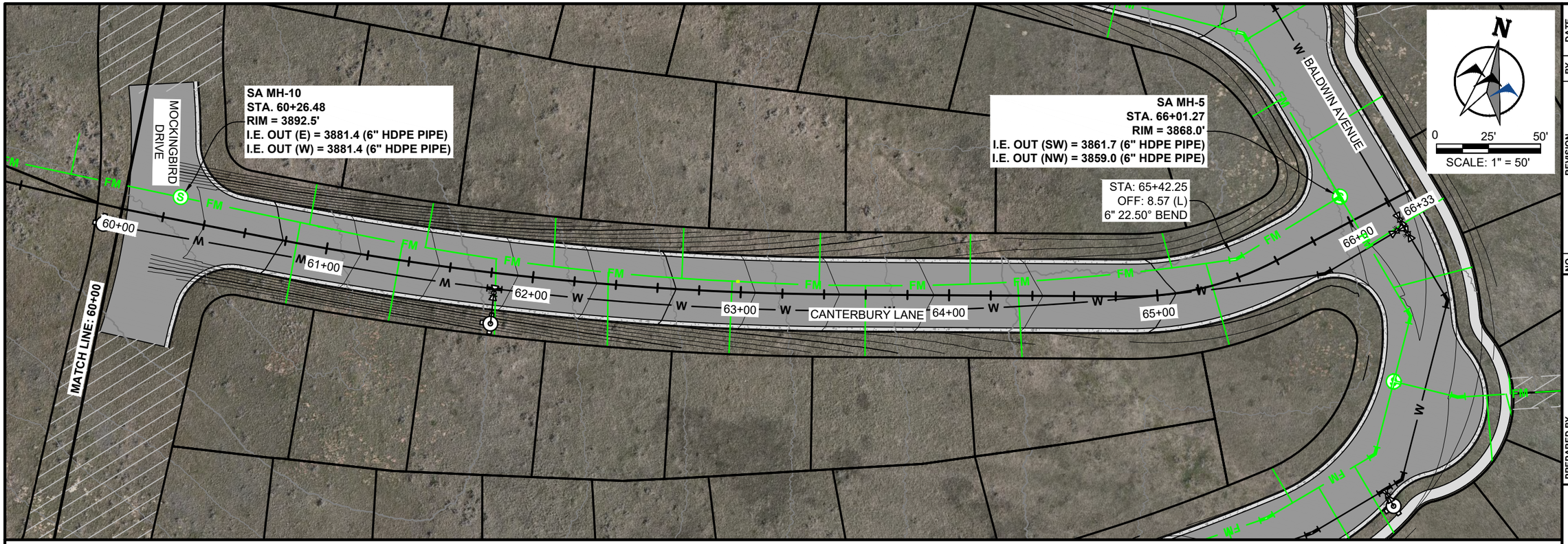

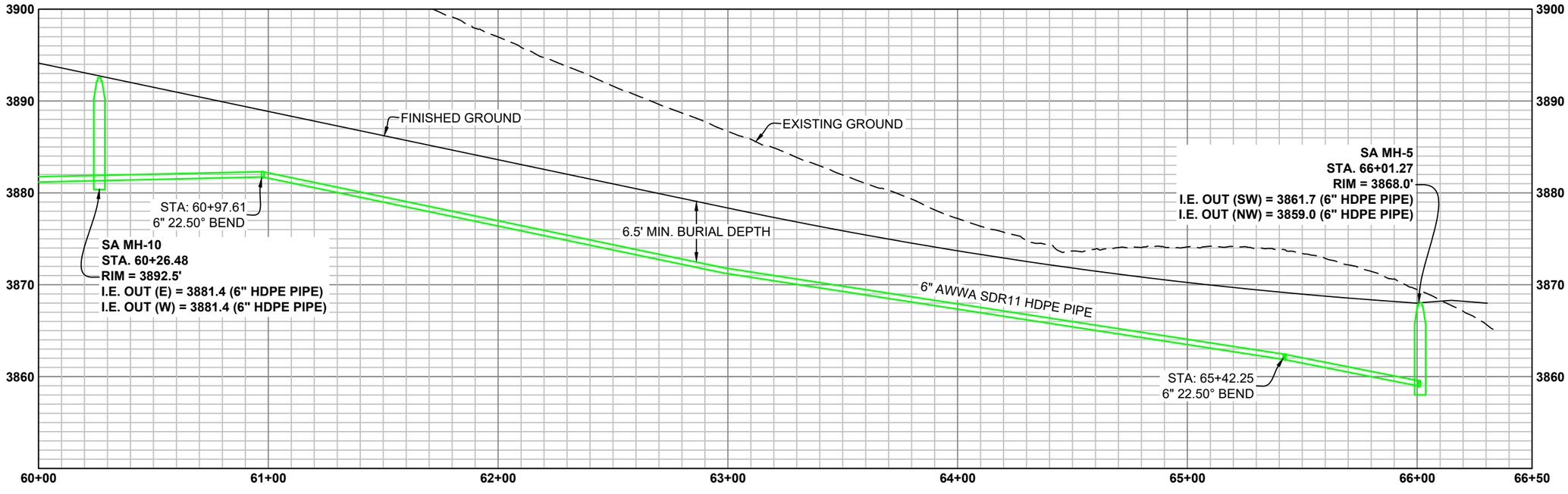

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NO.	REVISION	BY	DATE

PROJECT NO. 2023-137

PREPARED BY
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1849 TERRA AVE.
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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

SANITARY SEWER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET
50

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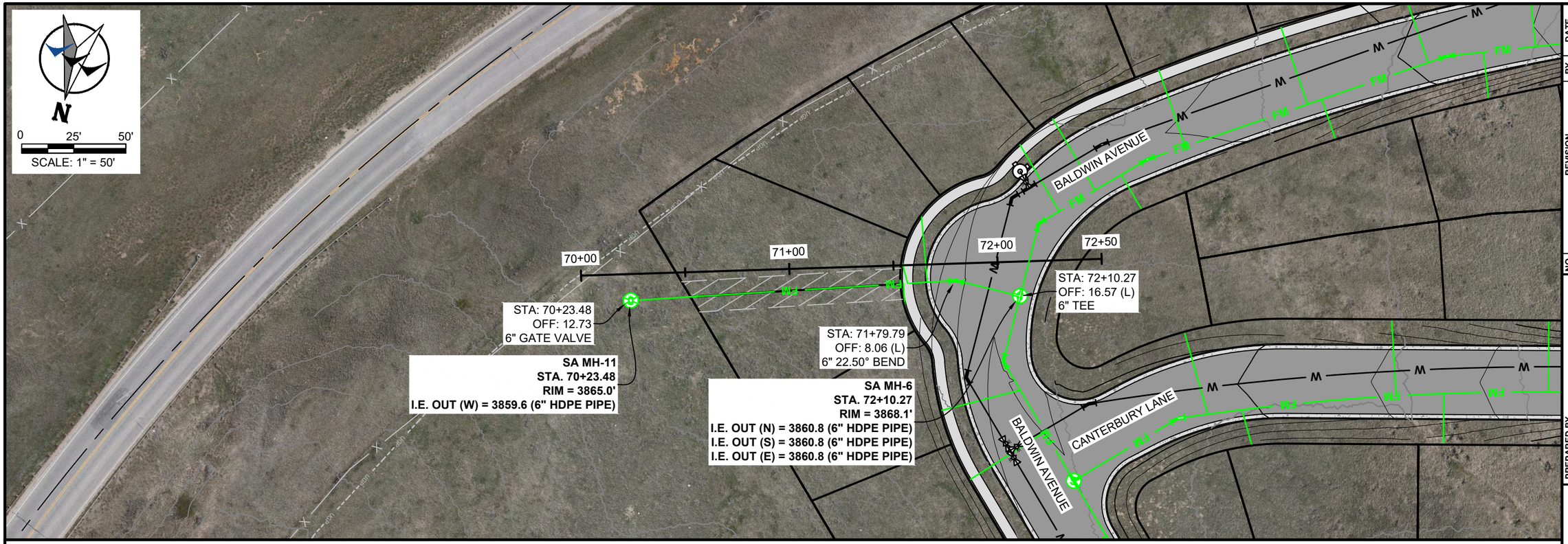

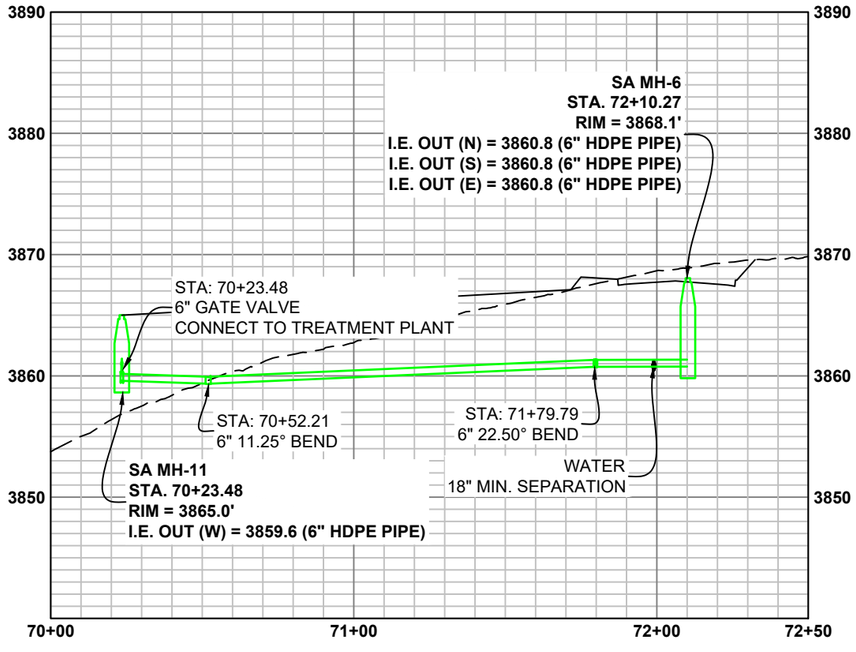

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

SANITARY SEWER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: *SER*
DRAWN BY: *CIG*
CHECKED BY: *JBG*
DATE: *12/20/2023*

SHEET
51

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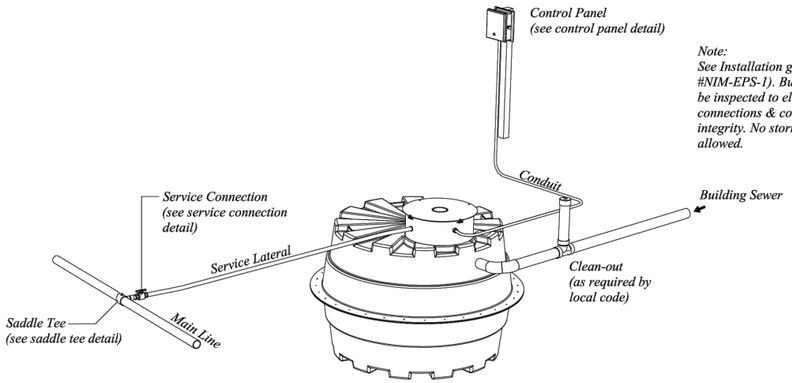
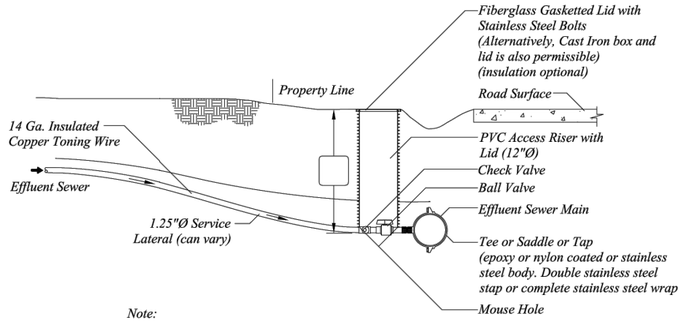


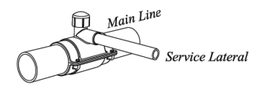
Note:
See Installation guide (document #NIM-EPS-1). Building sewer should be inspected to eliminate illegal connections & confirm pipe & fitting integrity. No storm sewer connections allowed.

Typical Prelos Isometric View

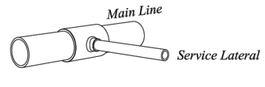


Note:
All service laterals from the effluent sewer main to the property line shall be pressure tested prior to any backfilling. Typically tested with air compressor with ≈ zero loss at 60 seconds. Typically installed below frost depth. Access risers shall not be located in vehiculer traffic areas. Alternative HDPE valve box as an option for warmer climates.

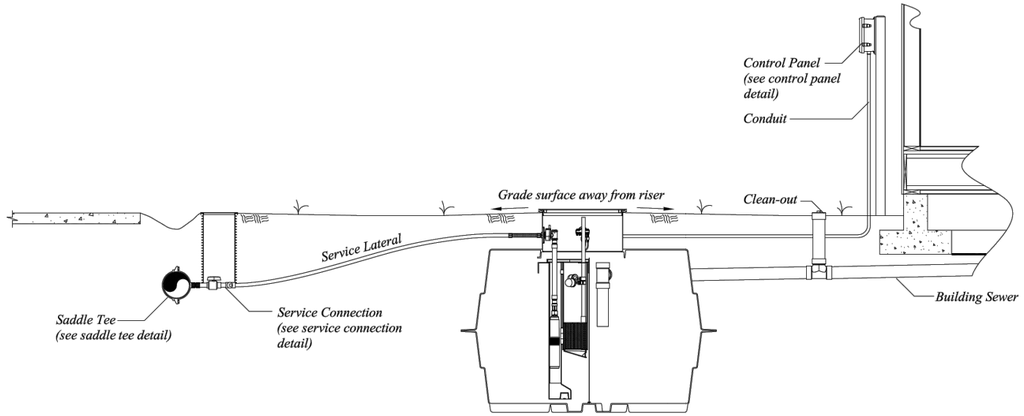
Effluent Sewer Service Connection Detail



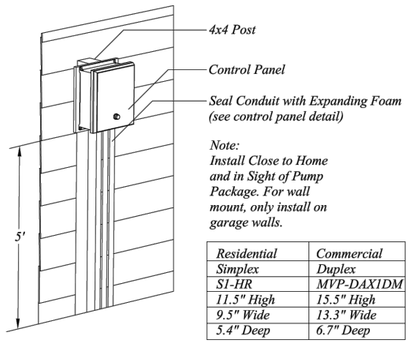
HDPE Self-Tapping Saddle



Tee Saddle Detail



Typical Prelos Processor Detail



Note:
Install Close to Home and in Sight of Pump Package. For wall mount, only install on garage walls.

Residential	Commercial
Simplex	Duplex
SI-HR	MVP-DAX1DM
11.5" High	15.5" High
9.5" Wide	13.3" Wide
5.4" Deep	6.7" Deep

Control Panel Detail
(Wall or 4x4 Post Mount)

Orenco SYSTEMS

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Disclaimer: This Proposed System Configuration Drawing is provided solely as a design aid and illustrates one possible configuration of a system that would comply with Orenco's design criteria for the requirements and/or specifications that have been communicated to Orenco (based on third-party standards testing protocols and performance reports, as applicable). Design decisions, including the actual layout and configuration of the system and its viability for the project, are at the sole discretion of the systems's designer.

Project: Prelos Sewer Details	Drawn By: BAS / CSJ	Scale: 1" = 3'	
	Reviewed By: PF	Sheet: 1 OF 1	
Description: LOS Details Sheet 1	File Name: LOS DTL 1.DWG	Rev: 2.0	Date: 5/27/2021

NO.	REVISION	BY	DATE

PROJECT NO. 2023-137

PREPARED BY
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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

ORENCO DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET
52

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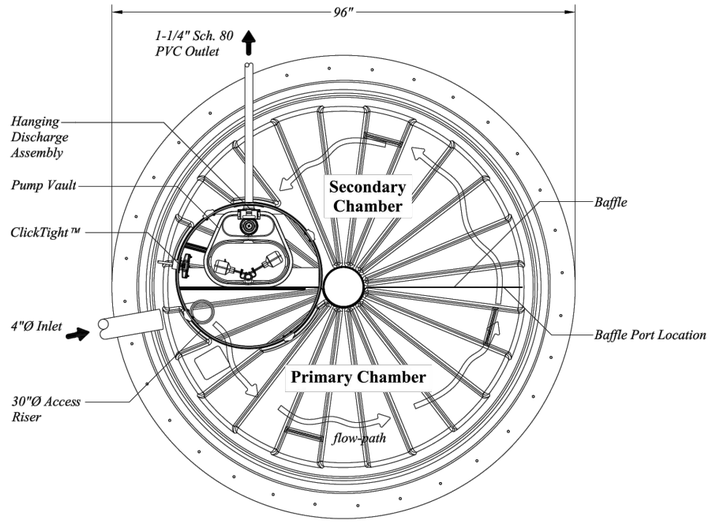
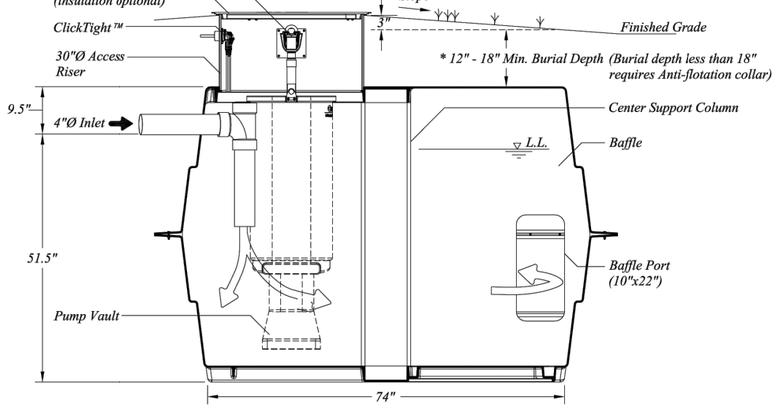


M1000 Tank Top Detail

Scale: 1" = 1.5'



M1000 Tank Side Detail

Scale: 1" = 1.5'

Inside Height Inches	Total Gallons
60	1217
54	1124
48	1006
42	881
36	744
30	601
24	460
18	324
12	200
6	83
0	0

General Notes:

Tank Volumes: *Total Volume: 1223 gal±*
Operating Volume: 1006 gal± @ 48"
Unit volume at typical Operating Depth : 20 gal./in.±

Loads: *Top = 500 psf minimum*
Lateral Load = 62.4 pcf, EFP
Concentrated Wheel Load = 2500 lb.
The septic tank shall be capable of withstanding long-term hydrostatic loading, in addition to the soil loading, due to a water table maintained at ground surface.
*Soil Bearing = 1000 psf (*re-evaluate support base if soil bearing is less or unequal*)*

Method of calcuations:
1. Tanks shall be analyzed using strength design methods and finite element analysis for buried structures.
2. Calculations shall address the following:
- *strength*
- *buckling*
- *deflection of 0.5 - 1% of the tank diameter, based on service load (including long-term deflection lag)*
- *buoyancy*

3. Performance testing shall include vacuum testing followed by a hydrostatic test.

Material: *Resin: polydicyclopentadiene*

The properties listed here along with the minimum thickness as shown in the details are considered design minimums that must be maintained during the manufacturing of the tanks. The primary strength properties are listed below:

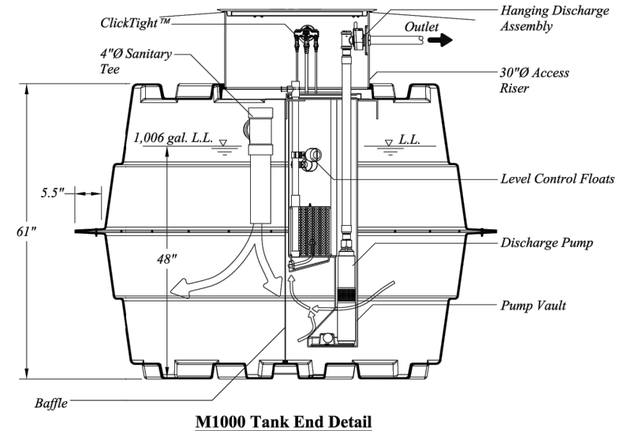
Property	DCPD	Property	DCPD
Flexural modulus E_f	274,000 psi	Compressive strength F_c	9,200 psi
Tensile strength F_t	6,700 psi	Shear In-Plane F_s	7,180 psi
Flexural strength F_b	10,500 psi	Flexural Rigidity	585 psi

Poisson ratio = 0.400 (Any permanent metal part shall be 300 series stainless steel.)

Installation: *Installation, bedding, compaction, etc., shall be in "strict" compliance with the manufacturers standards and state or local rules and or guidelines. All tanks shall be set level on a minimum 4 inch thick compacted sand or approved granular bedding overlying a firm uniform base. The base shall be stable and uniform in order to ensure equal bearing across the tank bottom. Installations with 18 inches or less of ground cover may require additional buoyancy considerations as described in the manufacturers instructions. A minimum cover of 12 inches is required over the tank in areas subject to occasional light wheel loads. Refer to installation instructions*
Document NIM-LOS-1.

Test: *Tanks shall be tested and certified watertight per manufacturers recommendations and or any prevailing rules or guidelines, whichever is more restrictive.*

Tank Markings: *Place marking on the upper most surface over the outlet.*
Nominal Liquid capacity: 1000 gal. ±
Max burial depth: 5ft.
Max traffic (wheel): 2500 lbs.
Date manufactured:
Permit no.:



M1000 Tank End Detail

Scale: 1" = 1.5'

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Prelos 1000 Processor with Pump Discscharge	Drawn By: BAS / CSJ	Scale: 1" = 1.5'	
	Reviewed By: TB	Sheet: 1 OF 1	
DESIGN AID	File Name: NDW-TD-LOS-100-1.DWG	Rev: 3.1	Date: 4/13/2022

NO.	REVISION	BY	DATE

PROJECT NO. 2023-137

PREPARED BY
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www.wwcengineering.com

STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

ORENCO DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET 53

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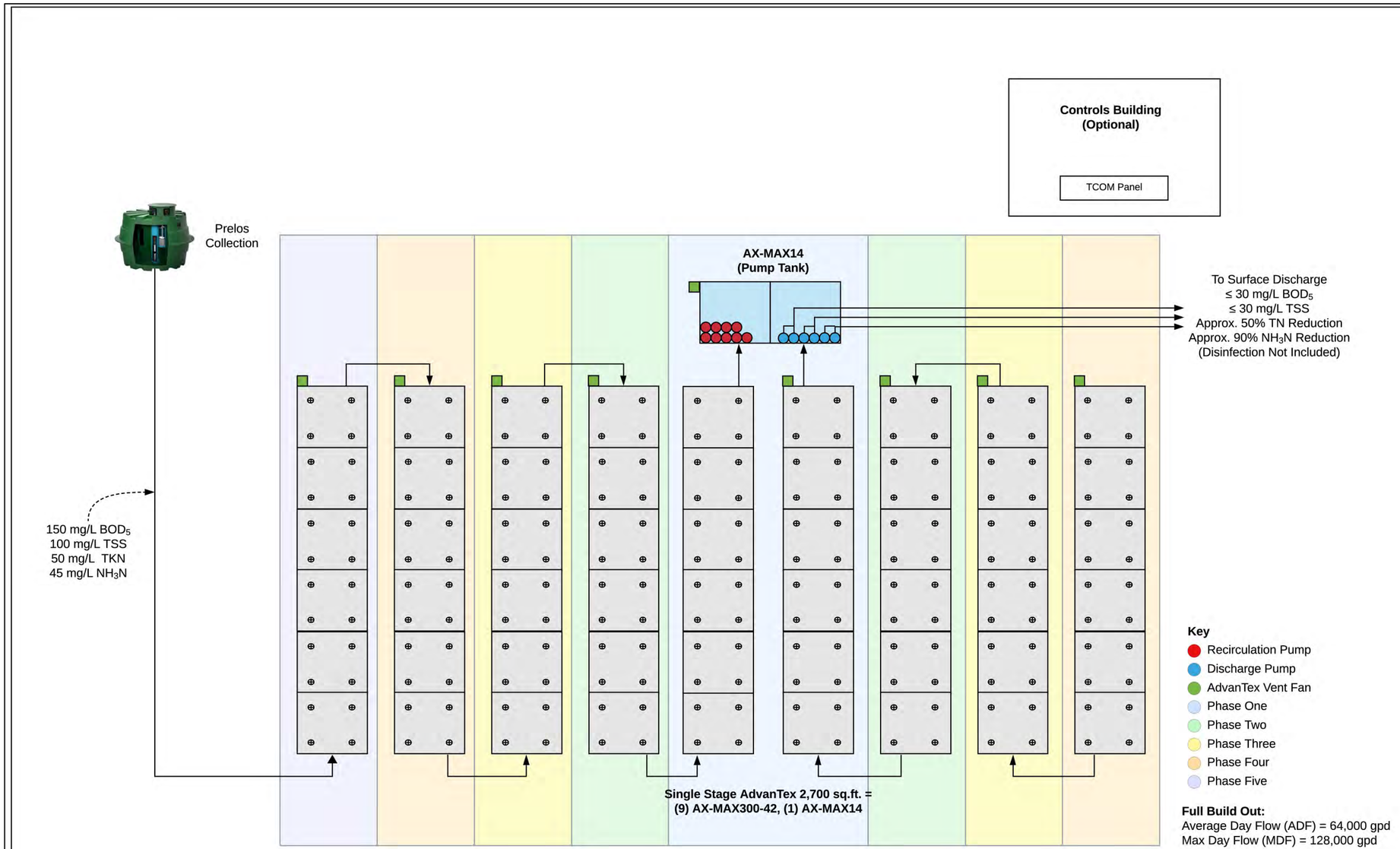

Key

- Recirculation Pump
- Discharge Pump
- AdvanTex Vent Fan
- Phase One
- Phase Two
- Phase Three
- Phase Four
- Phase Five

Full Build Out:
Average Day Flow (ADF) = 64,000 gpd
Max Day Flow (MDF) = 128,000 gpd

Phase One - up to 15,000 gpd (ADF)
Phase Two - up to 30,000 gpd (ADF)
Phase Three - up to 45,000 gpd (ADF)
Phase Four - up to 60, 000 gpd (ADF)
Phase Five - up to 67,500 gpd (ADF)

Project Name:
Story House - Prelos & AX

Created by:
JT (12/05/23)

Process Diagram

This Proposed System Configuration Drawing is provided solely as a design aid and illustrates one possible configuration of a system that would comply with Orenco's design criteria for the requirements and/or specifications that have been communicated to Orenco (based on third-party standards testing protocols and performance reports, as applicable). Design decisions, including the actual layout and configuration of the system and its viability for the project, are at the sole discretion of the system's designer.

Orenco WATER

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STORY HOUSE VILLAGE PUD - PHASE 1
ORENCO DETAIL SHEET
SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

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54

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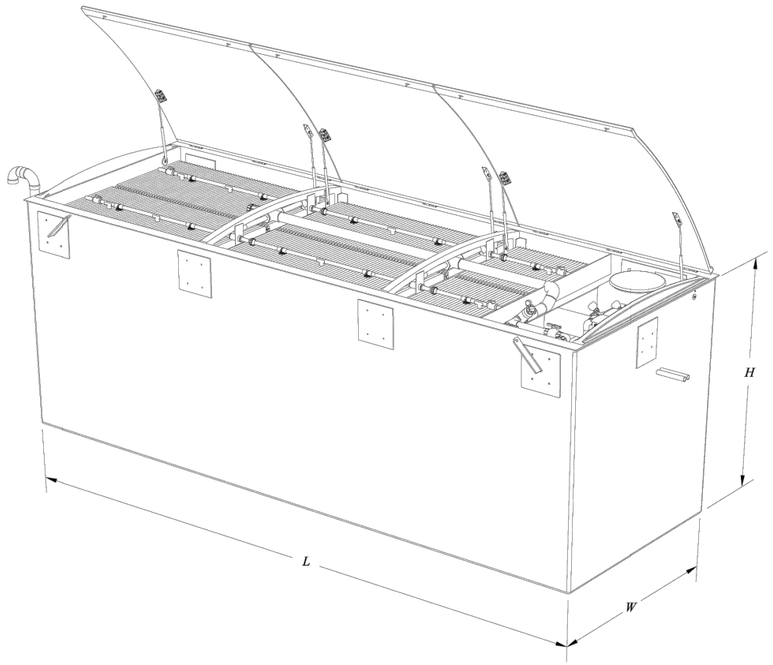
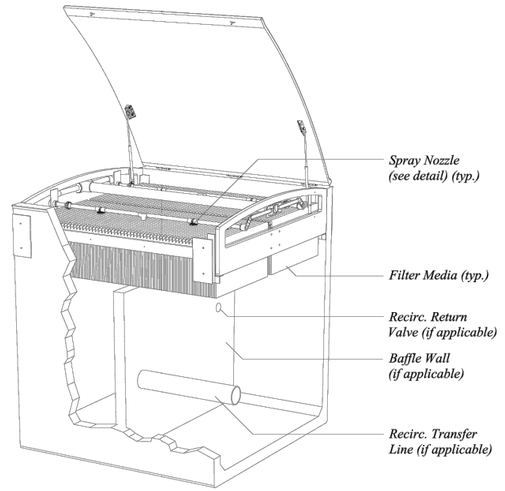


Iso View AX-Max 125-21
Not To Scale



AX-Max Section Iso Detail
Not To Scale

Standard Models	Basic Dimensions L	W	H	Est. Weight
AX-Max075-14	14'	7'-7"	8'	4,000
AX-Max100-14	14'	7'-7"	8'	3,800
AX-Max125-21	21'	7'-7"	8'	6,000
AX-Max150-21	21'	7'-7"	8'	5,800
AX-Max175-28	28'	7'-7"	8'	8,000
AX-Max200-28	28'	7'-7"	8'	7,800
AX-Max225-35	35'	7'-7"	8'	10,000
AX-Max250-35	35'	7'-7"	8'	9,800
AX-Max275-42	42'	7'-7"	8'	12,000
AX-Max300-42	42'	7'-7"	8'	11,800

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PRODUCT CONFIGURATION DRAWINGS

Orenco Systems® Incorporated
Changing the Way the World Does Wastewater®

Drawn By: *CHRIS JORDAN*
Drawn For:

Drawing Number: D3

Scale: *AS SHOWN*
Sheet: *1 OF 1*
Rev: *1.0* Date: *5/31/2012*

NO.	REVISION	BY	DATE

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www.wwcengineering.com

PROJECT NO. 2023-137

STORY HOUSE PROPERTY COMPANY, LLC
STORY HOUSE VILLAGE PUD - PHASE 1
ORENCO DETAIL SHEET
SHERIDAN COUNTY, WYOMING

DESIGNED BY: *SER*
DRAWN BY: *CIG*
CHECKED BY: *JBG*
DATE: *12/20/2023*

SHEET
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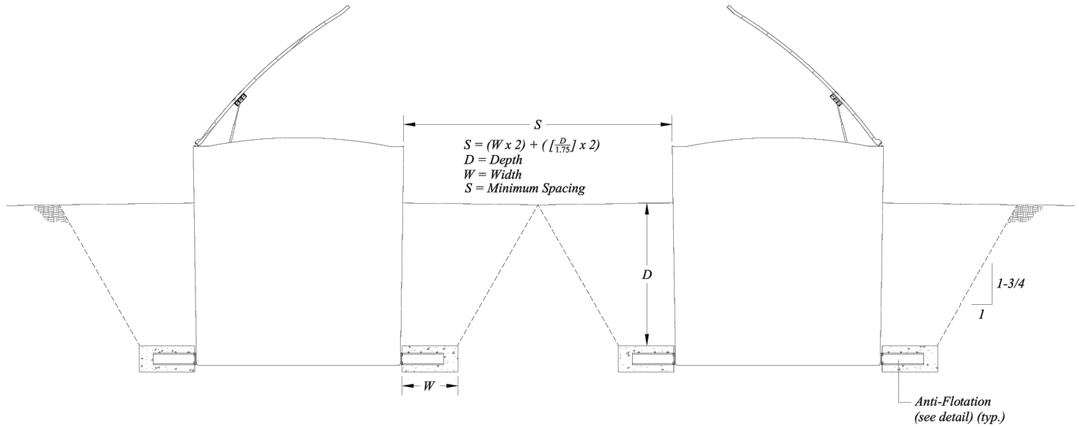

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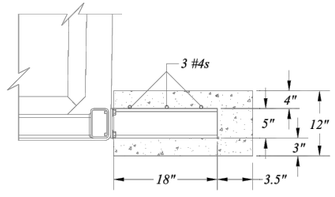
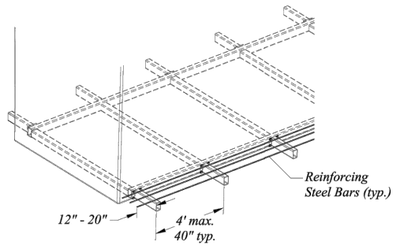


Anti-Flotation Detail
Not To Scale



Anti-Flotation Framework Detail
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Drawn For:

Drawing Number: D2

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Sheet: 1 OF 1
Rev: 1.0 Date: 5/30/2012

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SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
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CHECKED BY: JBG
DATE: 12/20/2023

SHEET
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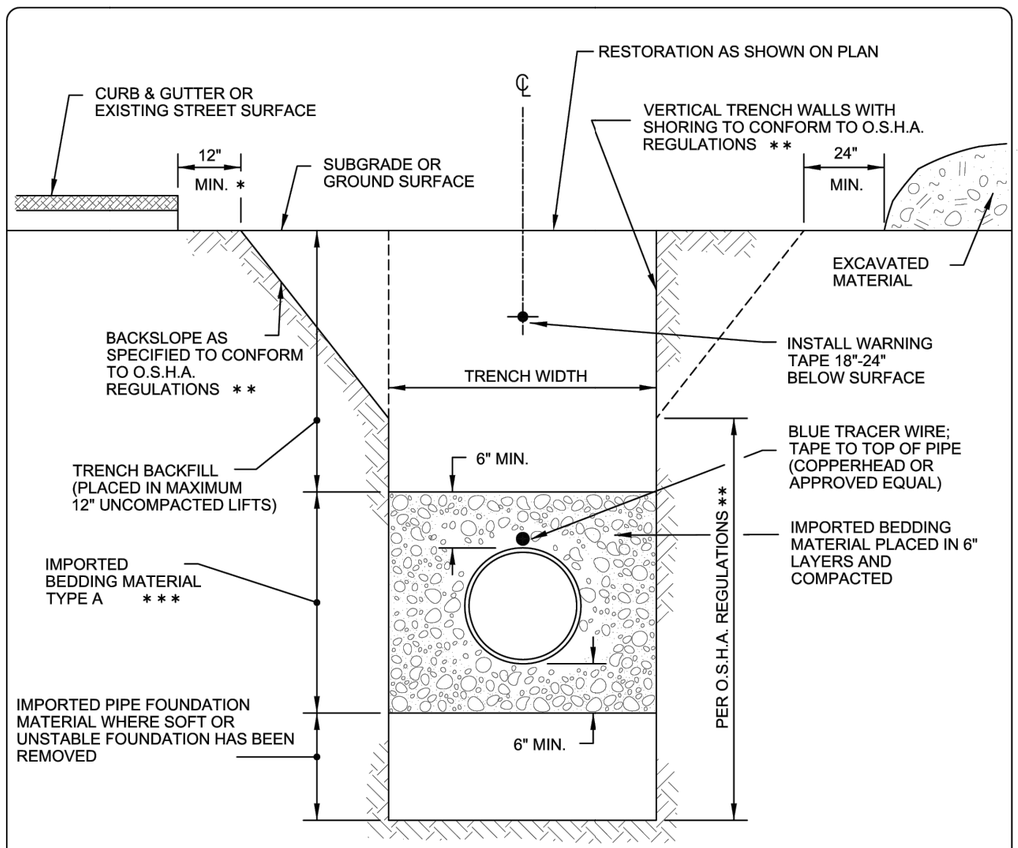


NOTES:

* WHERE TRENCH PASSES THROUGH EXISTING PAVEMENT, THE PAVEMENT SHALL BE CUT ALONG A NEAT, VERTICAL LINE A MIN. OF 12" FROM THE EDGE OF THE TRENCH OPENING. WHERE NEAT LINE IS LESS THAN 3' FROM EDGE OF EXISTING PAVEMENT OR CURB & GUTTER SECTION, REMOVE AND REPLACE ENTIRE PAVEMENT SECTION BETWEEN TRENCH AND EDGE OF PAVEMENT OR CURB & GUTTER SECTION.

** SEE O.S.H.A. SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION, SECTION 1926.652. TRENCH WALLS SHALL BE IN COMPLIANCE WITH THE CURRENT O.S.H.A. REQUIREMENTS.

*** SEE SPECIFICATIONS (SECTION 02221).

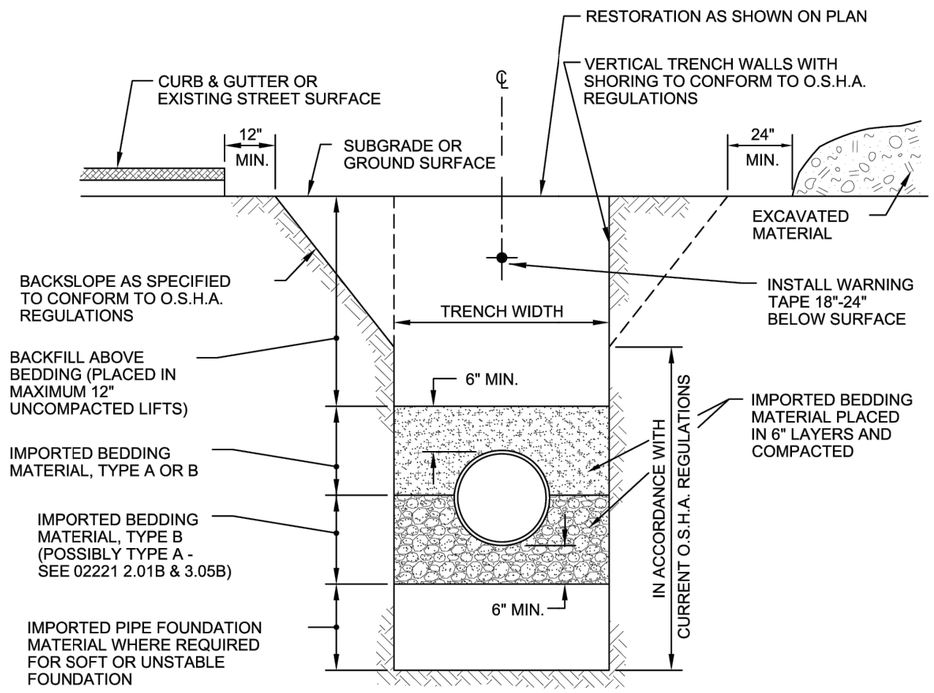
NOT TO SCALE

TYPICAL WATER
MAIN TRENCH DETAIL

DWG. NO. 02221-2.01Ba

CITY of SHERIDAN

NOVEMBER 2015



NOTES:

1. THE TRENCH BOTTOM SHALL BE FREE FROM LARGE STONES, DIRT CLODS, AND ANY FROZEN MATERIAL PRIOR TO PLACING PIPE.
2. BELL HOLES SHALL BE PROVIDED TO ENSURE A UNIFORMLY SUPPORTED PIPE.
3. PIPE BEDDING SHALL BE PER SPECIFICATIONS (02221).
4. ROLLING EQUIPMENT MAY BE USED WHEN 18" OF FILL HAS BEEN PLACED ABOVE THE PIPE.
5. COMPLY W/ ALL CURRENT O.S.H.A. REGULATIONS FOR TRENCH EXCAVATION.
6. WHERE TRENCH PASSES THROUGH EXISTING PAVEMENT, THE PAVEMENT SHALL BE CUT ALONG A NEAT, VERTICAL LINE A MIN. OF 12" FROM THE EDGE OF THE TRENCH OPENING. WHERE NEAT LINE IS LESS THAN 3' FROM EDGE OF EXISTING PAVEMENT OR CURB & GUTTER SECTION, REMOVE AND REPLACE ENTIRE PAVEMENT SECTION BETWEEN TRENCH AND EDGE OF PAVEMENT OR CURB & GUTTER SECTION.

NOT TO SCALE

TYPICAL SANITARY SEWER
TRENCH DETAIL

DWG. NO. 02221-2.01Bb

CITY of SHERIDAN

NOVEMBER 2015

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET
57

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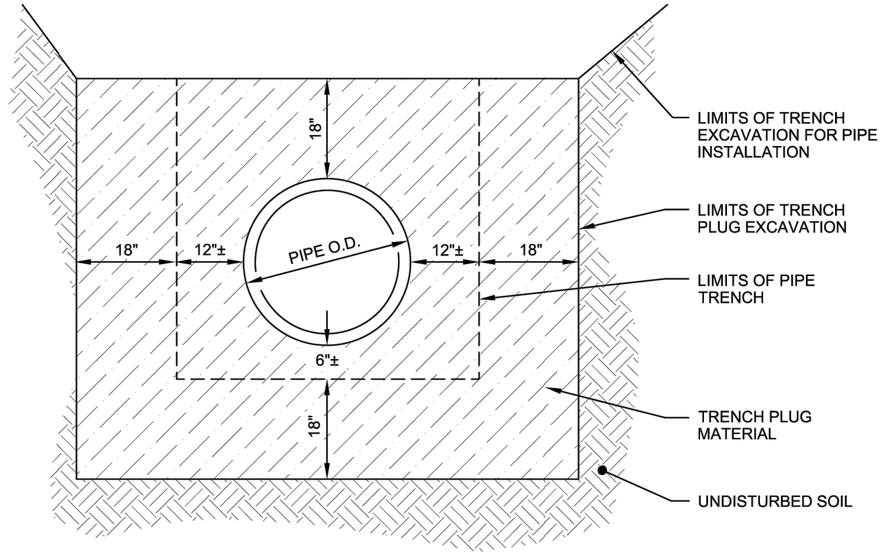


NOTES:

1. TRENCH PLUG SHALL BE 4 FEET LONG (MIN.) AND INSTALLED AT 200 FOOT INTERVALS, UNLESS REQUESTED OTHERWISE BY THE ENGINEER.
2. TRENCH PLUG MATERIAL IS TO COMPLY WITH SPECIFICATION 02221 2.01E.
3. TRENCH PLUG MATERIAL IS TO BE PLACED AT A MIN. OF 95% MAX. DRY DENSITY (ASTM D698) AT 1% - 3% ABOVE OPTIMUM MOISTURE.

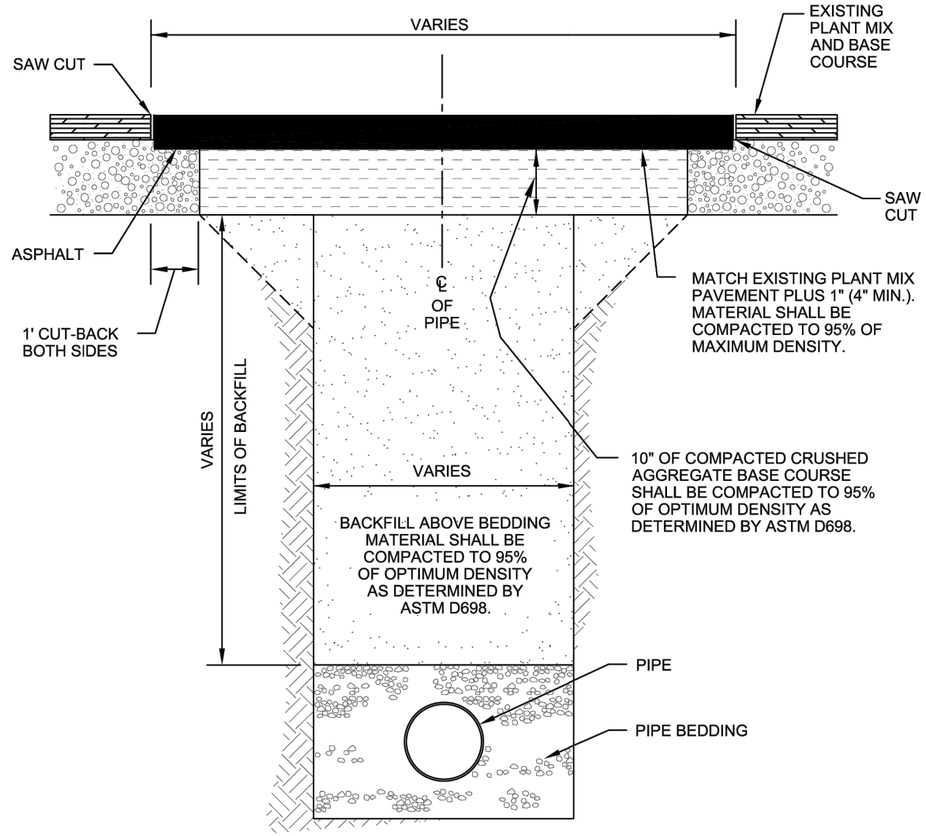
NOT TO SCALE

TRENCH PLUG DETAIL

DWG. NO. 02221-2.01E

CITY of SHERIDAN

NOVEMBER 2015



NOTE: THIS RESTORATION WILL BE REQUIRED ON ALL PRIVATE ROADWAYS, COUNTY ROADS, CITY STREETS, PARKING AREAS, AND STATE HIGHWAYS WITH AN EXISTING ASPHALT SURFACE.

NOT TO SCALE

RESTORATION - ASPHALT PAVEMENT DETAIL

DWG. NO. 02221-3.09C

CITY of SHERIDAN

NOVEMBER 2015

NO.	REVISION	BY	DATE

PROJECT NO. 2023-137

PREPARED BY
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1849 TERRA AVE.
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(307) 672-0761
www.wwcengineering.com

STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET 58

DRAFT

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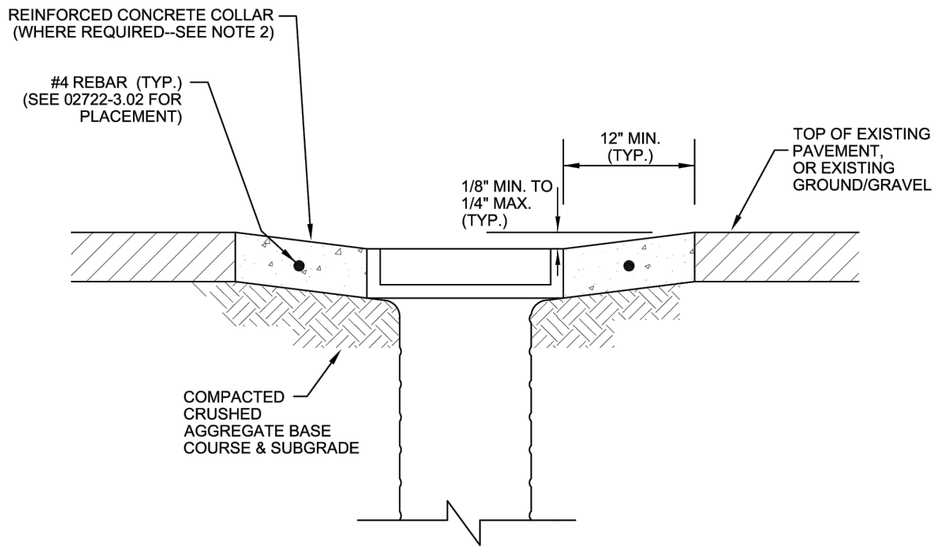


NOTES:

1. ADJUST WATER VALVE BOXES UPWARD OR DOWNWARD AS REQUIRED.
2. WHERE REQUIRED, CONCRETE COLLAR TO BE PLACED AS SHOWN AND AS PER DWG. NO. 02722-3.02. SEE STANDARD SPECIFICATION SECTION 02570 FOR GUIDELINES ON CONCRETE COLLAR REQUIREMENTS.
3. NO ADDITIONAL PAYMENT SHALL BE MADE FOR ADJUSTMENT OF NEW VALVE BOXES TO FINAL GRADE.

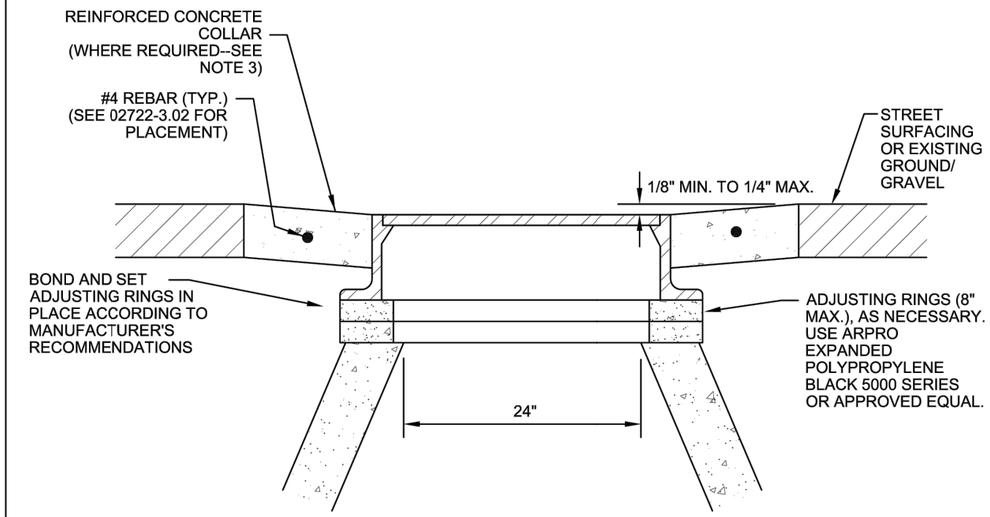
NOT TO SCALE

WATER VALVE BOX
ADJUSTMENT DETAIL

DWG. NO. 02570-3.01a

CITY of SHERIDAN

NOVEMBER 2015



NOTES:

1. ADJUST MANHOLES UPWARD WITH ADJUSTING RINGS UNDER FRAMES. CONCRETE ADJUSTING RINGS SHALL NOT BE USED.
2. ADJUST MANHOLES DOWNWARD BY REMOVING CONE AND BARREL SECTIONS, AS NECESSARY, AND REPLACING WITH SECTIONS OF HEIGHT REQUIRED TO MATCH GRADE.
3. CONCRETE COLLAR TO BE PLACED AS SHOWN AND AS PER DWG. NO. 02722-3.02 WHERE REQUIRED. SEE STANDARD SPECIFICATION SECTIONS 02570 AND 02722 FOR GUIDANCE ON CONCRETE COLLAR REQUIREMENTS.
4. NO ADDITIONAL PAYMENT SHALL BE MADE FOR ADJUSTMENT OF NEW MANHOLES TO FINAL GRADE.
5. SLOPE MANHOLE FRAMES AS REQUIRED TO MATCH SLOPE OF STREET.
6. DO NOT GROUT SMOOTH INTERNALLY.

NOT TO SCALE

MANHOLE ADJUSTMENT
DETAIL

DWG. NO. 02570-3.01b

CITY of SHERIDAN

NOVEMBER 2015

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
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DATE: 12/20/2023

SHEET
59

DRAFT

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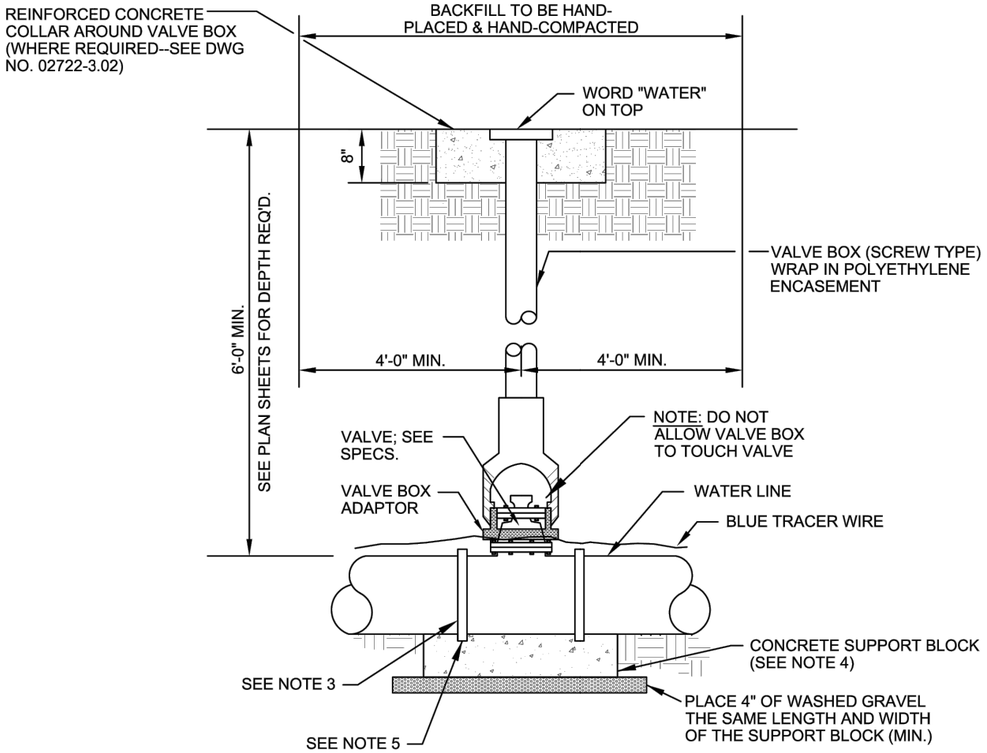


NOTES:

1. ALL BOLTS, NUTS & WASHERS ARE TO BE SERIES 300 STAINLESS STEEL.
2. ON GRAVELLED OR DIRT ROADS, OR WHERE REQUIRED AS A CORRECTIVE MEASURE, TOP OF VALVE BOX SHALL BE PLACED IN REINFORCED CONCRETE COLLAR. SEE DRAWINGS NO. 02570-3.01a AND 02722-3.02 FOR DETAILS.
3. ALL VALVES ARE TO BE RESTRAINED TO PIPE.
4. CONCRETE SUPPORT BLOCKS MAY BE PRE-CAST OR POURED IN PLACE; SUPPORT BLOCKS SHALL BE CONSTRUCTED OF 4000 PSI CONCRETE (MIN.); FOR VALVES 12" AND SMALLER, SUPPORT BLOCKS SHALL BE 18" X 18" X 6" IN SIZE; FOR VALVES LARGER THAN 12", SUPPORT BLOCK DIMENSIONS SHALL BE DETERMINED BY THE ENGINEER.
5. IF CONCRETE SUPPORT BLOCKS ARE POURED IN PLACE, THEY SHALL BE FORMED; USE POLYETHYLENE TO SEPARATE FITTING FROM THE CONCRETE.

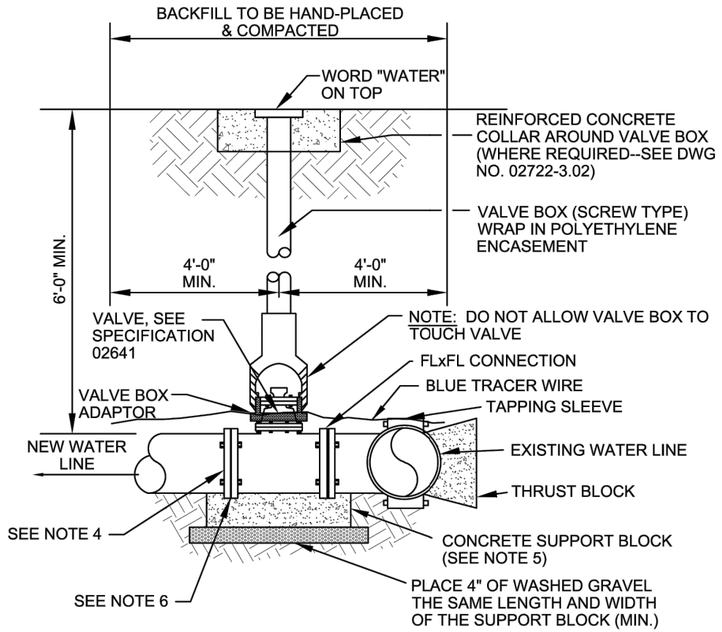
NOT TO SCALE

WATER LINE VALVE AND BOX DETAIL

DWG. NO. 02641-2.01B

CITY of SHERIDAN

NOVEMBER 2015



NOTES:

1. ALL BOLTS, NUTS & WASHERS ARE TO BE SERIES 300 STAINLESS STEEL.
2. BEGIN TRACER WIRE BY WRAPPING AROUND EXISTING WATER LINE.
3. ON GRAVELLED OR DIRT ROADS, OR WHERE REQUIRED AS A CORRECTIVE MEASURE, TOP OF VALVE BOX SHALL BE PLACED IN REINFORCED CONCRETE COLLAR. SEE DRAWINGS NO. 02570-3.01a AND 02722-3.02 FOR DETAILS.
4. ALL VALVES ARE TO BE RESTRAINED TO PIPE.
5. CONCRETE SUPPORT BLOCKS MAY BE PRE-CAST OR POURED IN PLACE; SUPPORT BLOCKS SHALL BE CONSTRUCTED OF 4000 PSI CONCRETE (MIN.); FOR VALVES 12" AND SMALLER, SUPPORT BLOCKS SHALL BE 18" X 18" X 6" IN SIZE; FOR VALVES LARGER THAN 12", SUPPORT BLOCK DIMENSIONS SHALL BE DETERMINED BY THE ENGINEER.
6. IF CONCRETE SUPPORT BLOCKS ARE POURED IN PLACE, THEY SHALL BE FORMED; USE POLYETHYLENE TO SEPARATE FITTING FROM THE CONCRETE.

NOT TO SCALE

TAPPING SLEEVE AND VALVE CONNECTION TO EXISTING WATER LINE DETAIL

DWG. NO. 02641-2.01D

CITY of SHERIDAN

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STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

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SHEET 60

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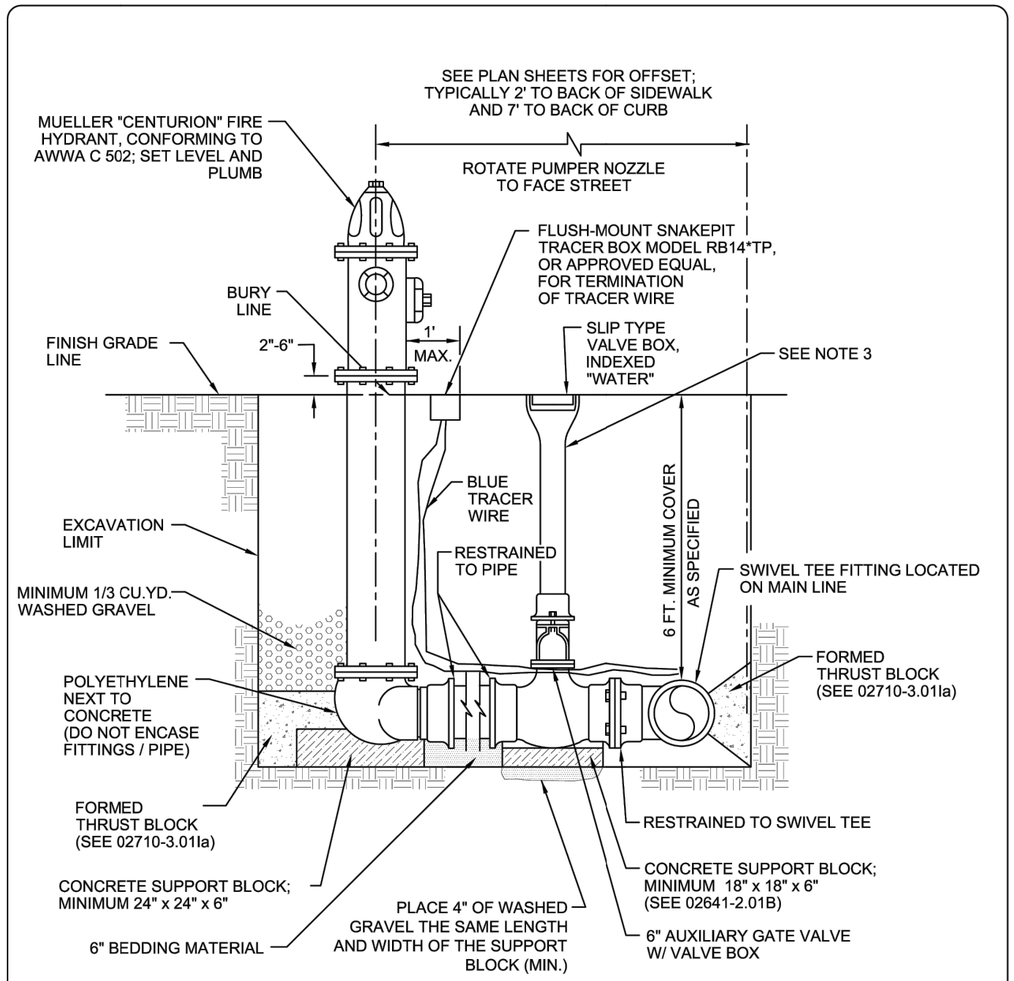


NOTES:

1. 6 FT. COVER IS A MINIMUM. THIS MAY BE GREATER IN SOME AREAS. SEE PLANS.
2. PIPE USED ON HYDRANT ASSEMBLY PER 02710. THRUST BLOCKING SHALL BE PER SPECIFICATIONS AND DETAILS. HYDRANT WEEP HOLES SHALL REMAIN UNOBSTRUCTED.
3. WRAP VALVE BOX IN POLYETHYLENE ENCASEMENT PER DETAIL 13944D.

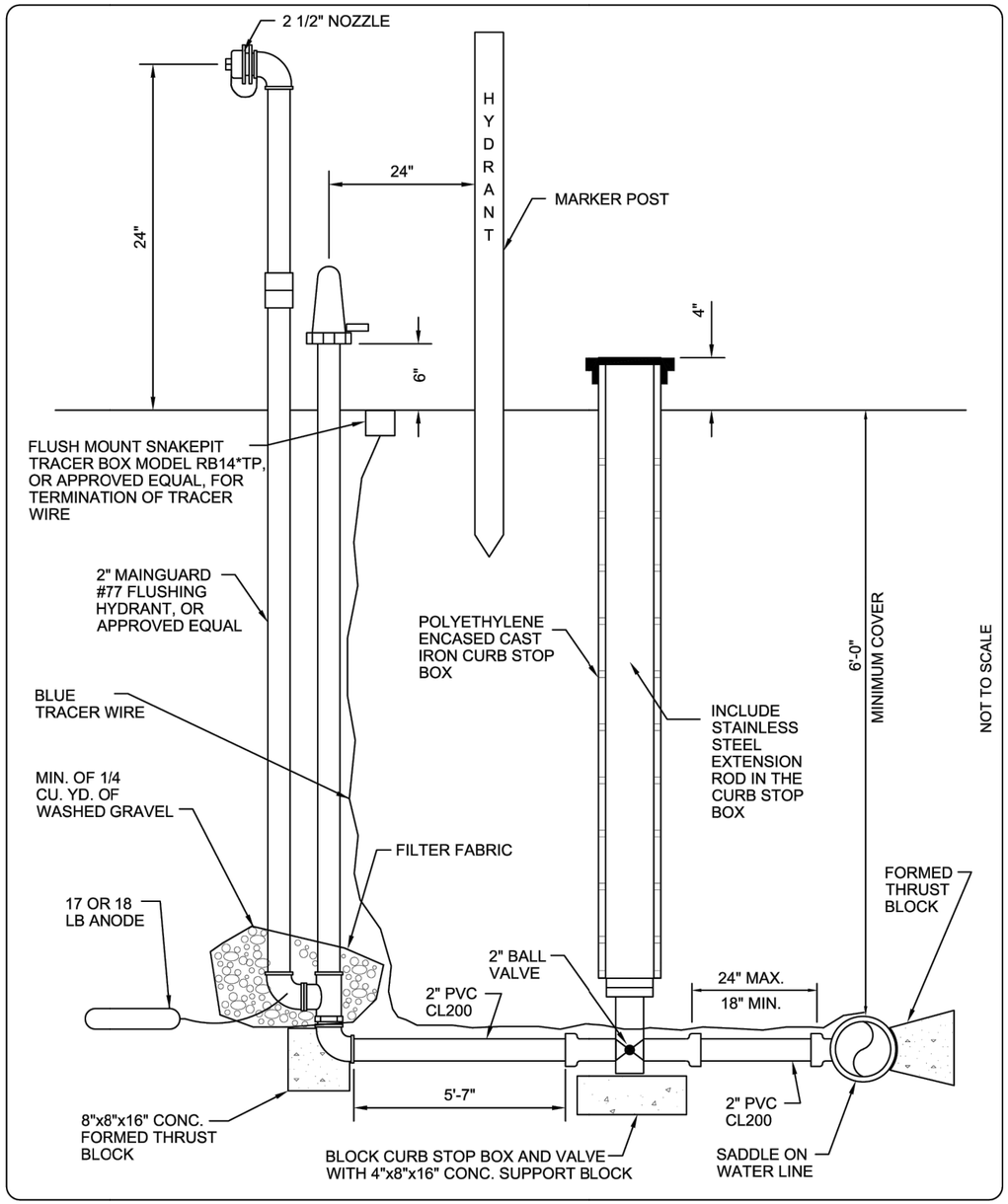
NOT TO SCALE

FIRE HYDRANT INSTALLATION DETAIL

DWG. NO. 02644-2.01

CITY of SHERIDAN

NOVEMBER 2015



FLUSHING HYDRANT ASSEMBLY DETAIL

DWG. NO. 02644-2.02

CITY of SHERIDAN

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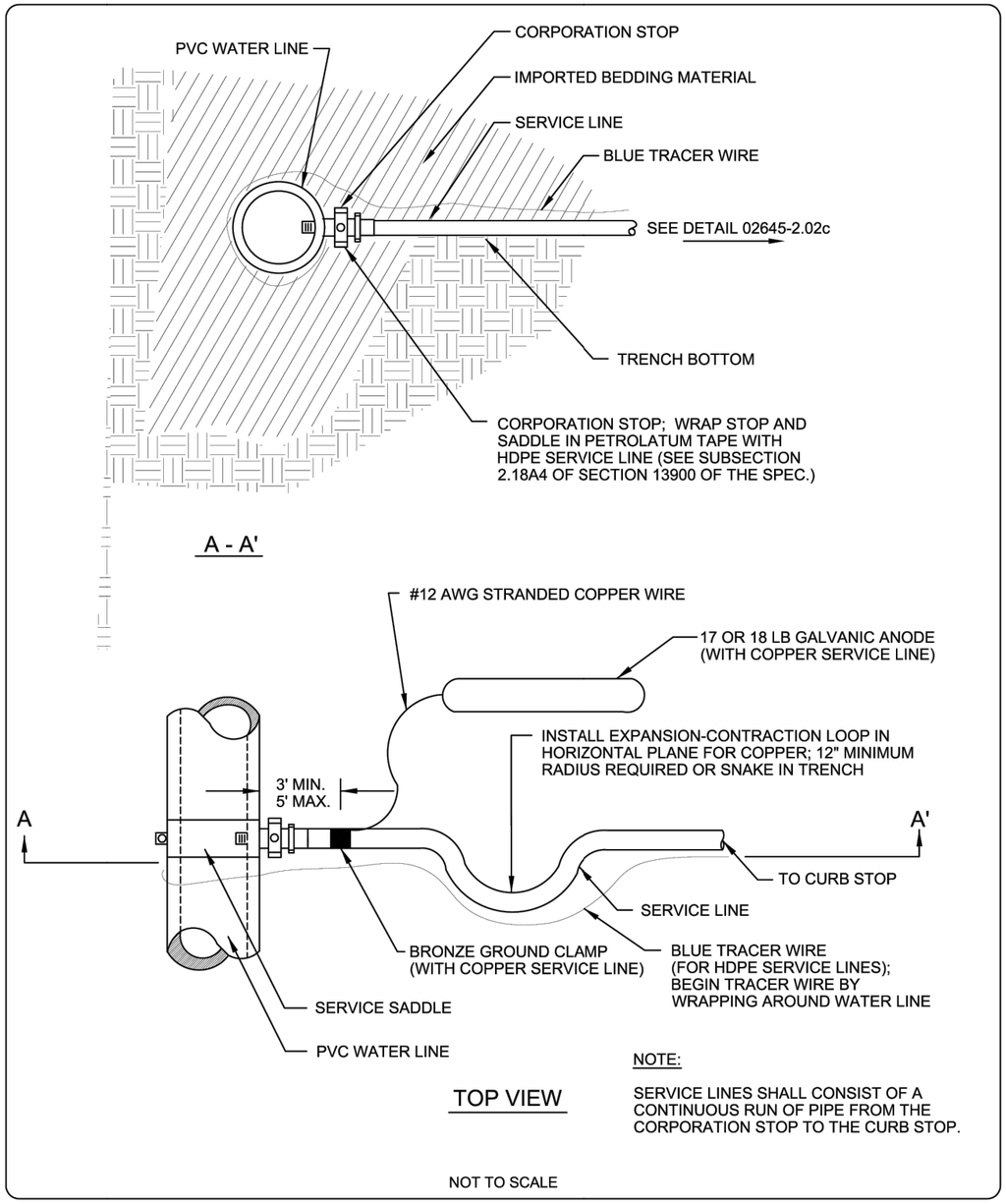

PVC WATER LINE
SERVICE DETAIL

DWG. NO. 02645-2.02b

CITY of SHERIDAN

NOVEMBER 2015

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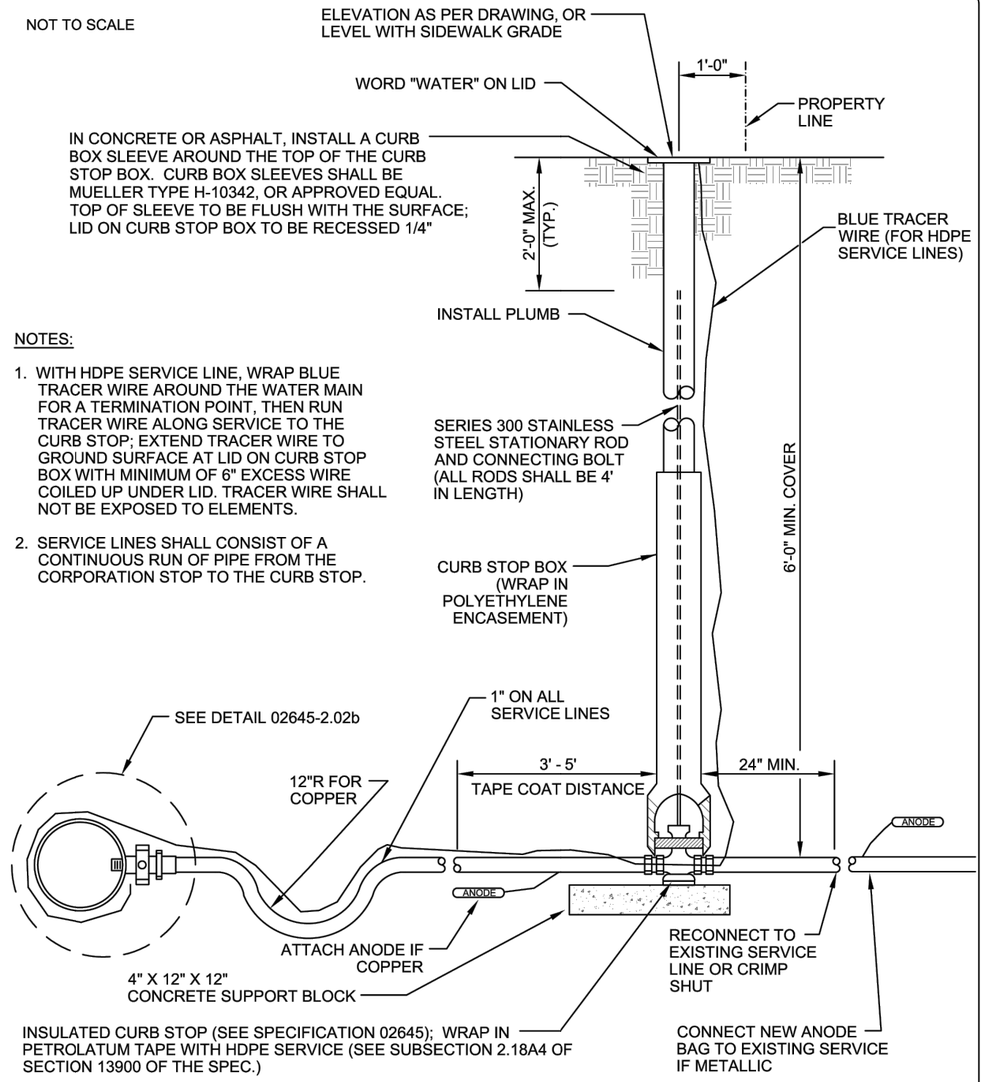

WATER LINE SERVICE
CONNECTION DETAIL

DWG. NO. 02645-2.02c

CITY of SHERIDAN

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DATE: 12/20/2023

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62

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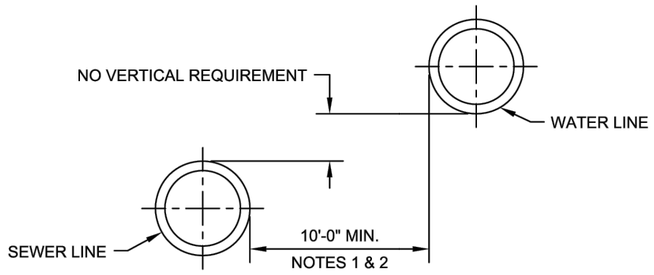
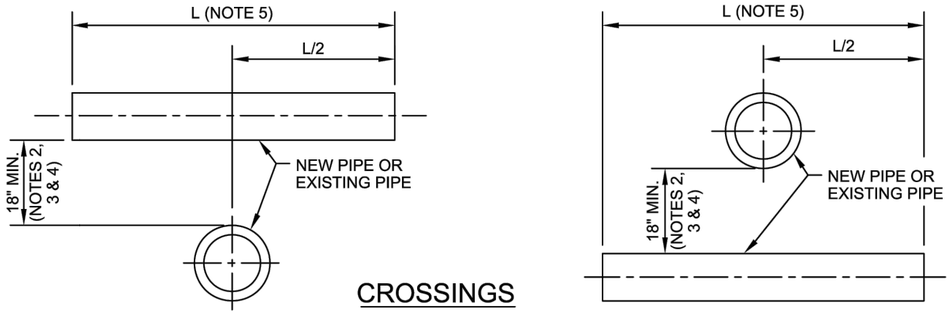


PARALLEL ARRANGEMENT



CROSSINGS

(NOTE 5)

NOTES:

1. WHERE THE 10 FOOT HORIZONTAL SEPARATION CANNOT BE MAINTAINED, THIS SEPARATION MAY BE REDUCED TO 5 FEET, PROVIDED THE BOTTOM OF THE WATER LINE IS AT LEAST 18 INCHES HIGHER THAN THE TOP OF THE SEWER LINE. WHERE THE REQUIREMENTS FOR THE BOTTOM OF THE WATER LINE TO BE AT LEAST 18 INCHES HIGHER THAN THE TOP OF THE SEWER LINE CANNOT BE MET, SEE THE SPECIFICATIONS.
2. NO EXCEPTION TO THE MINIMUM HORIZONTAL OR VERTICAL SEPARATION REQUIREMENTS ARE PERMITTED WHEN THE SEWAGE-CARRYING PIPE IS A FORCE MAIN.
3. AT CROSSINGS, ONE FULL LENGTH OF WATER LINE PIPE SHALL BE LOCATED SO THAT BOTH JOINTS WILL BE AS FAR FROM THE SEWER LINE AS POSSIBLE.
4. LESS THAN 18 INCHES OF SEPARATION IS PERMITTED WHEN THE GRAVITY SEWER LINE AT THE CROSSING IS MADE FROM A SINGLE 20-FOOT LENGTH OF PIPE, THE CROSSING ANGLE IS 90 DEGREES, AND THE SEWER PIPE PASSES A PRESSURE TEST (SEE SPECIFICATIONS).
5. "L" IS A STANDARD LENGTH OF PIPE AS SUPPLIED BY A PIPE MANUFACTURER.
6. ADEQUATE STRUCTURAL SUPPORT (FLOWABLE FILL) FOR PIPES AT CROSSINGS SHALL BE PROVIDED.
7. WHEN THE REQUIRED HORIZONTAL AND / OR VERTICAL SEPARATIONS BETWEEN WATER LINES AND SEWER LINES CANNOT BE MET, THE SEWER MAY BE ENCASED IN ONE FOOT OF FLOWABLE FILL (SEE SPECIFICATIONS).

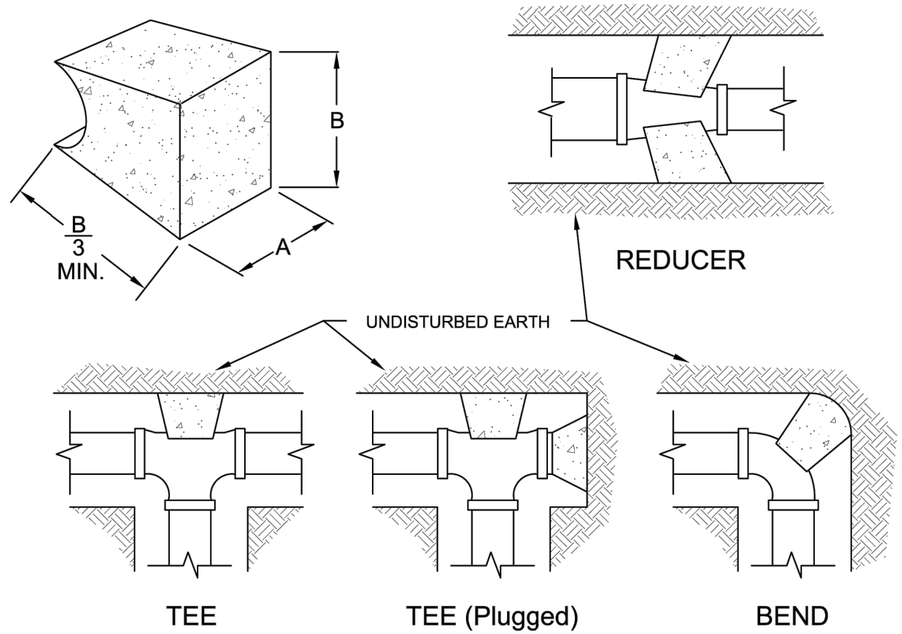
NOT TO SCALE

WATER AND SEWER LINE SEPARATION DETAIL

DWG. NO. 02710-3.01H

CITY of SHERIDAN

NOVEMBER 2015



DIMENSIONS FOR THRUST BLOCKING

FITTING SIZES	TEES & PLUGS		90° BENDS		45° BENDS & WYES		REDUCERS & 22 1/2° BENDS	
	A	B	A	B	A	B	A	B
4"	1'-7"	1'-2"	1'-9"	1'-6"	1'-8"	0'-10"	1'-7"	0'-6"
6"	2'-0"	1'-11"	2'-5"	2'-2"	1'-10"	1'-7"	1'-9"	0'-10"
8"	2'-8"	2'-6"	3'-2"	3'-0"	2'-5"	2'-1"	1'-9"	1'-6"
10"	3'-4"	3'-3"	4'-0"	3'-10"	3'-0"	2'-9"	2'-2"	1'-11"
12"	4'-0"	3'-10"	4'-8"	4'-8"	3'-8"	3'-3"	2'-7"	2'-3"
14"	5'-5"	3'-10"	6'-6"	4'-11"	4'-9"	3'-5"	3'-5"	2'-5"
16"	6'-0"	5'-0"	6'-0"	5'-0"	6'-0"	4'-0"	4'-6"	3'-0"

NOTES:

1. THIS TABLE IS BASED ON 150 PSI WATER MAIN PRESSURE AND 2000 PSF SOIL BEARING PRESSURE.
2. USE POLYETHYLENE TO SEPARATE FITTINGS FROM THE CONCRETE.
3. FOR PLUGS, PLACE A HEAVY, METAL RING ON TOP OF PLUG FOR FUTURE REMOVAL OF THE THRUST BLOCK.
4. ALL THRUST BLOCKS SHALL BE FORMED AND POURED AGAINST UNDISTURBED SOIL; CONCRETE SHALL BE CLASS "B".

NOT TO SCALE

THRUST BLOCKING FOR WATER LINE FITTINGS DETAIL

DWG. NO. 02710-3.01Ia

CITY of SHERIDAN

NOVEMBER 2015

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
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DATE: 12/20/2023

SHEET 63

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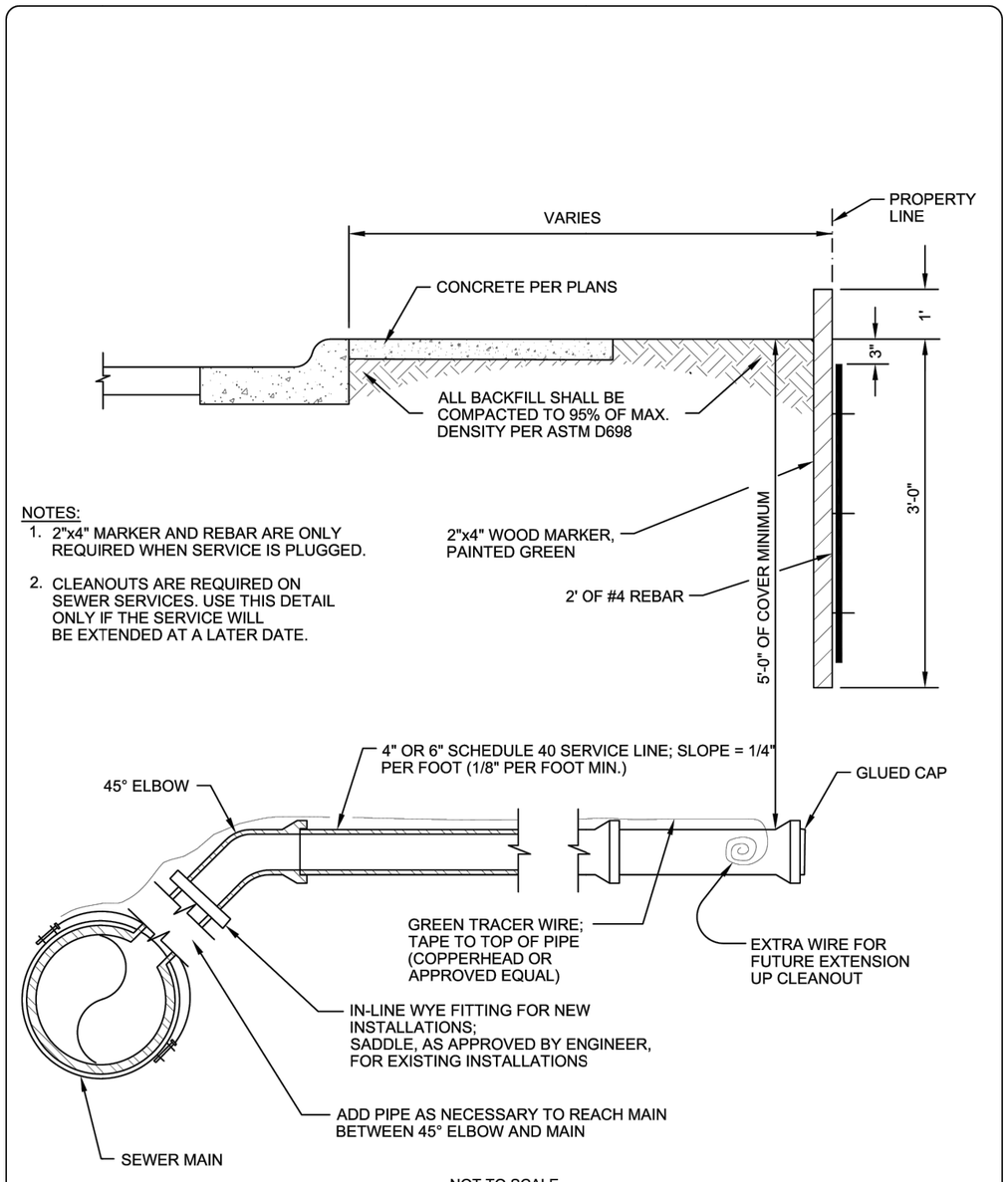

NOTES:

1. 2"x4" MARKER AND REBAR ARE ONLY REQUIRED WHEN SERVICE IS PLUGGED.
2. CLEANOUTS ARE REQUIRED ON SEWER SERVICES. USE THIS DETAIL ONLY IF THE SERVICE WILL BE EXTENDED AT A LATER DATE.

NOT TO SCALE

SANITARY SEWER SERVICE LINE DETAIL (NEW CONSTRUCTION ONLY)

DWG. NO. 02712-2.01Da

CITY of SHERIDAN

NOVEMBER 2015

NOTES:

1. PVC REPLACEMENT SLEEVES SHALL BE REQUIRED WHEN NEW OR EXISTING SANITARY SEWER PIPE IS DAMAGED DURING CONSTRUCTION.
2. SEE SANITARY SEWER TRENCH DETAIL FOR BACKFILL AND COMPACTION REQUIREMENTS.
3. NO SEPARATE PAYMENT SHALL BE MADE FOR WORK OR MATERIALS REQUIRED TO ACCOMPLISH BRIDGING IN ACCORDANCE WITH THE DETAIL.

NOT TO SCALE

BRIDGING AT SANITARY SEWER CROSSING DETAIL

DWG. NO. 02712-3.01 I

CITY of SHERIDAN

NOVEMBER 2015

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SHEET 64

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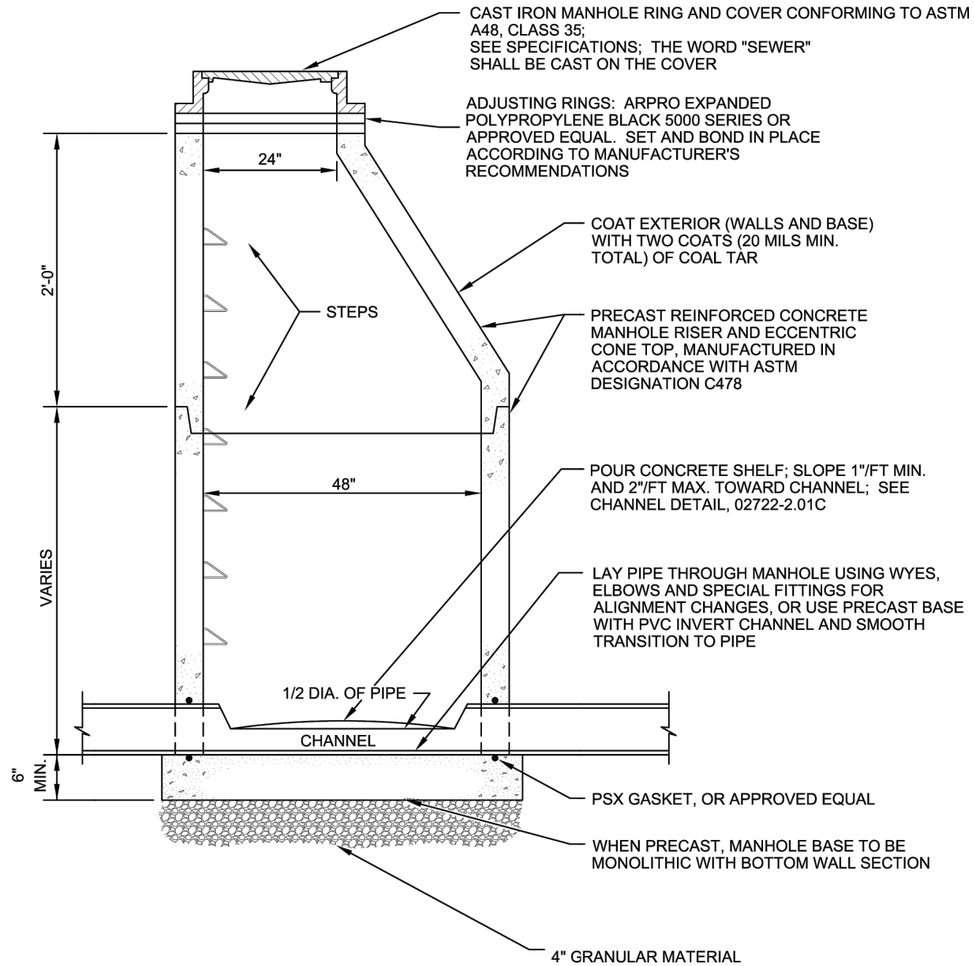


NOTES:

1. PROVIDE AND INSTALL NOT MORE THAN 8" OF ADJUSTING RINGS FOR EACH MANHOLE. ADJUST RINGS AND COVER TO GRADE ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
2. ALL JOINTS BETWEEN MANHOLE SECTIONS SHALL BE RUBBER-NEK OR EQUAL.
3. HAND-COMPACT AROUND MANHOLE FOR FULL DEPTH OF BACKFILL. COMPACTION TESTING SHALL BE IN COMPLIANCE WITH SECTION 02221 - 1.03.
4. ALL PENETRATIONS TO BE WATER-TIGHT.

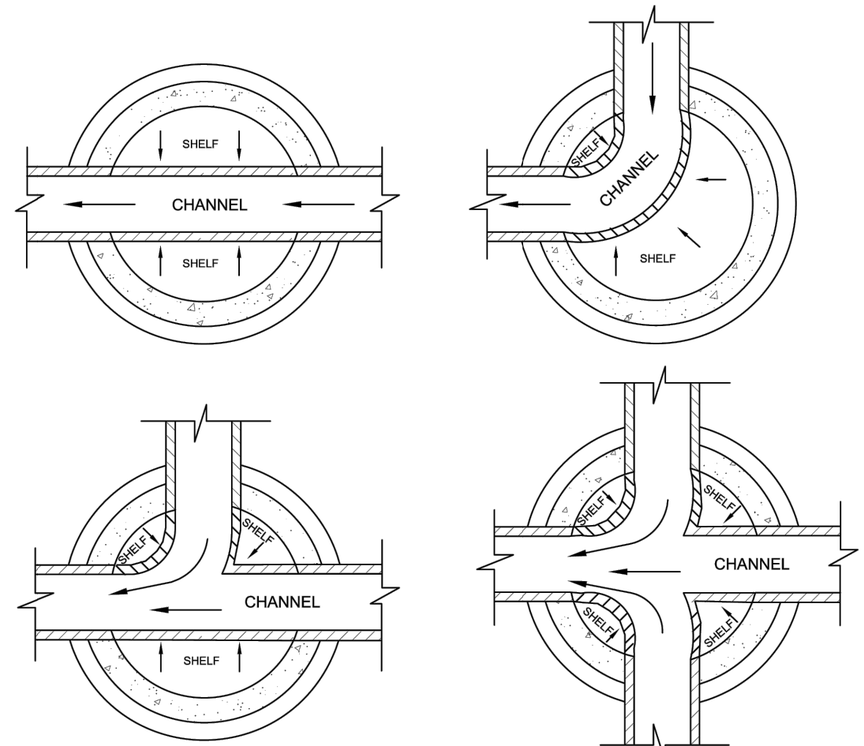
NOT TO SCALE

ECCENTRIC CONE SANITARY SEWER MANHOLE DETAIL

DWG. NO. 02722-2.01a

CITY of SHERIDAN

NOVEMBER 2015



NOTES:

1. SLOPE ALL SHELVES TO CHANNEL AT 1" PER FOOT, MINIMUM, AND 2" PER FOOT, MAXIMUM.
2. SEE PLAN-PROFILE SHEETS FOR SLOPE OF CHANNEL AND DIRECTION OF FLOW.
3. ENTIRE CHANNEL SHALL BE PVC.
4. WHEN CASTING PVC CHANNEL INTO A CAST-IN-PLACE BASE, PIPE SHALL BE CUT OFF AT SPRINGLINE AFTER PAVING ABOVE MANHOLE IS COMPLETE.

NOT TO SCALE

TYPICAL MANHOLE CHANNEL DETAILS

DWG. NO. 02722-2.01c

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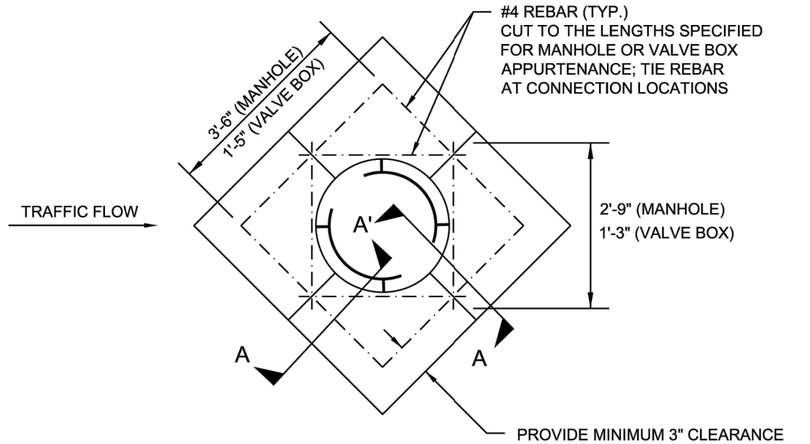
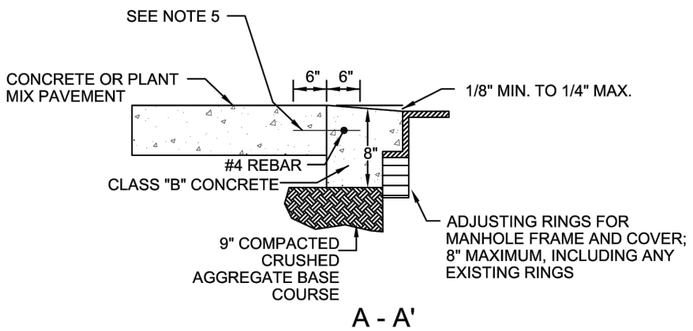


NOTES:

1. SEE SPECIFICATION SECTIONS 02570 AND 02722 FOR GUIDANCE ON WHERE CONCRETE COLLARS ARE REQUIRED
2. LOCATE CONCRETE COLLAR AS SHOWN IN RELATION TO TRAFFIC FLOW (IF POSSIBLE).
3. CONCRETE COLLAR FOR MANHOLES SHALL BE 4' X 4'.
4. CONCRETE COLLAR FOR VALVE BOXES SHALL BE SIZED TO ALLOW A MINIMUM 1' FROM THE EDGE OF VALVE BOX TO THE EDGE OF COLLAR. E.G. A COLLAR FOR A 6" DIAMETER VALVE BOX SHALL BE 2.5' X 2.5'.
5. IF PLACED IN CONCRETE PAVEMENT (AS A CORRECTIVE MEASURE), COLLARS SHALL BE TIED TO THE PAVEMENT USING 1' LENGTH #4 REBAR SPACED AT 1' CENTERS; REBAR SHALL BE CENTERED WITHIN THE ADJACENT PAVEMENT SLAB AND EMBEDDED TO A DEPTH OF 6"; ANCHOR REBAR WITHIN ADJACENT PAVEMENT USING EPOXY ADHESIVE, AS APPROVED BY THE ENGINEER.

MANHOLE / VALVE BOX COLLAR



A - A'

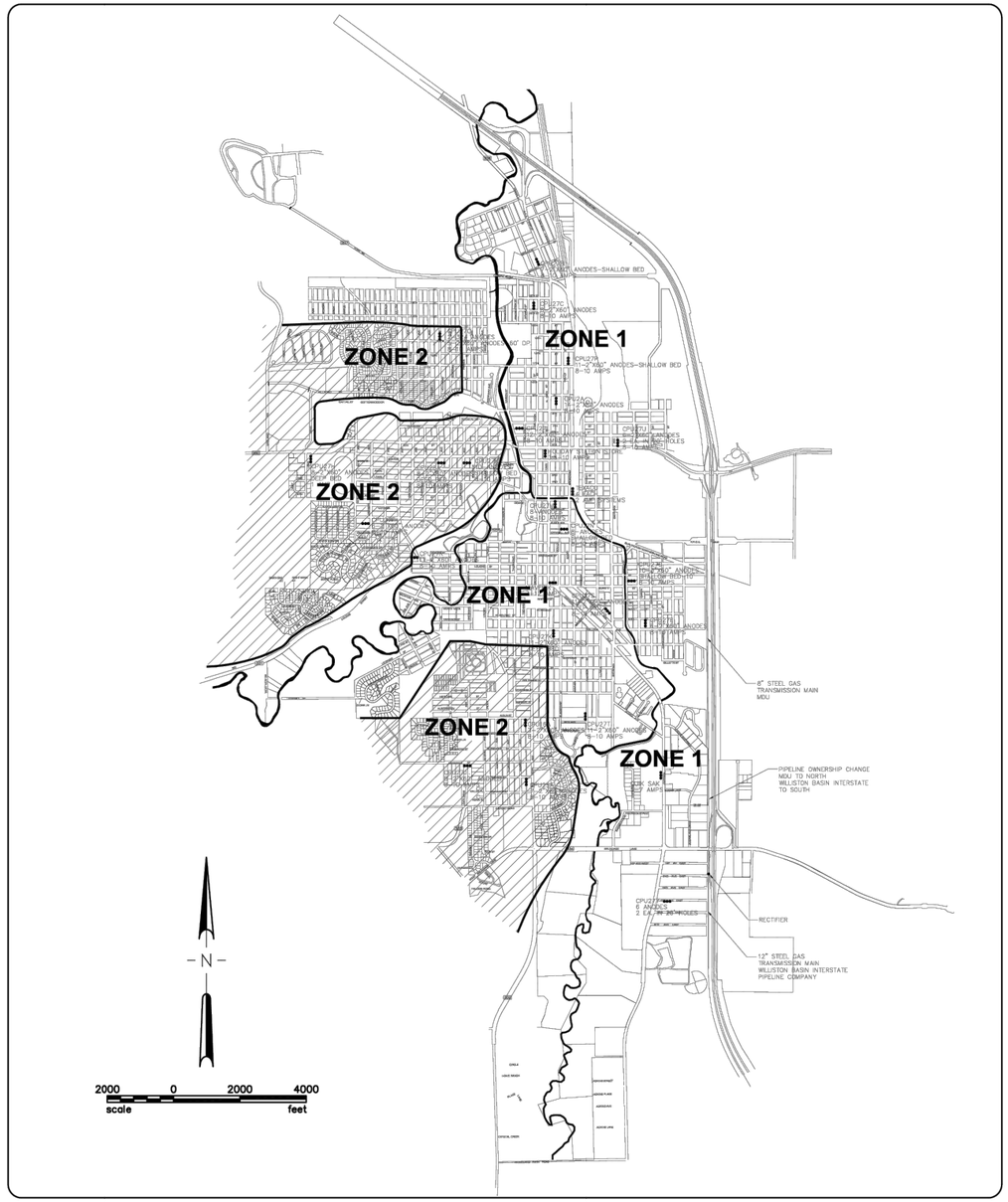
NOT TO SCALE

MANHOLE / VALVE BOX
CONCRETE COLLAR DETAIL

DWG. NO. 02722-3.02

CITY of SHERIDAN

NOVEMBER 2015



SOIL CORROSION ZONES /
SELECTION OF ANODE TYPE

DWG. NO. 13900

CITY of SHERIDAN

NOVEMBER 2015

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SHEET
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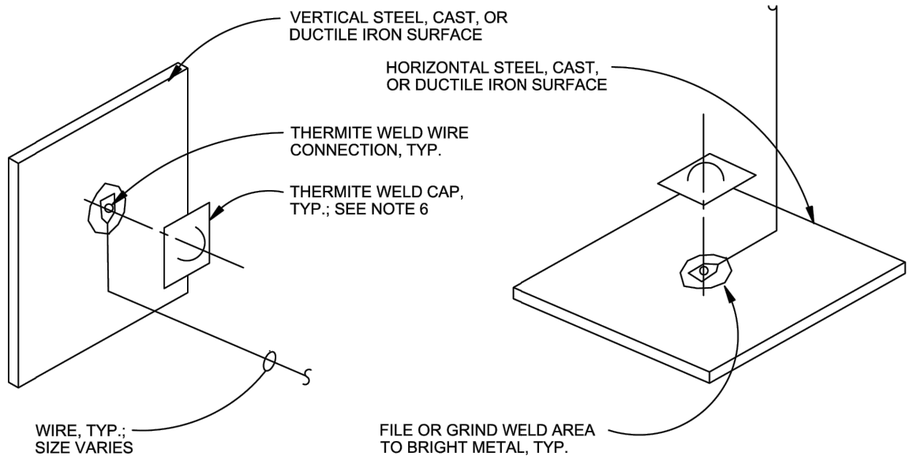

NOTES:

1. COPPER SLEEVE REQUIRED FOR THERMITE WELDING OF #10 AWG AND SMALLER WIRE.
2. USE COPPER SLEEVE FOR THERMITE WELDING OF #4 AND #2 AWG JOINT BONDING WIRES.
3. WELDER AND CARTRIDGE SIZE VARIES ACCORDING TO SURFACE SHAPE, MATERIAL, AND HORIZONTAL OR VERTICAL SURFACE. CONSULT WELDER MANUFACTURER FOR RECOMMENDED WELDER AND CARTRIDGE.
4. FOR MULTIPLE WIRE CONNECTIONS TO PIPE, SEPARATE THERMITE WELD WIRE CONNECTIONS BY ONE PIPE DIAMETER MINIMUM, 2'-0" MAXIMUM.
5. USE 15 GRAM MAXIMUM SIZE WELD CARTRIDGES FOR CONNECTIONS TO PETROLEUM AND NATURAL GAS PIPELINES OR STRUCTURES. WIRE CONNECTIONS SHALL BE AS SPECIFIED AND APPROVED BY THE OWNER.
6. COAT COMPLETED THERMITE WELD CONNECTIONS WITH ROYSTON PREFABRICATED HANDYCAP II AND 747 PRIMER.

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WIRE CONNECTION FOR VERTICAL AND HORIZONTAL SURFACES DETAIL

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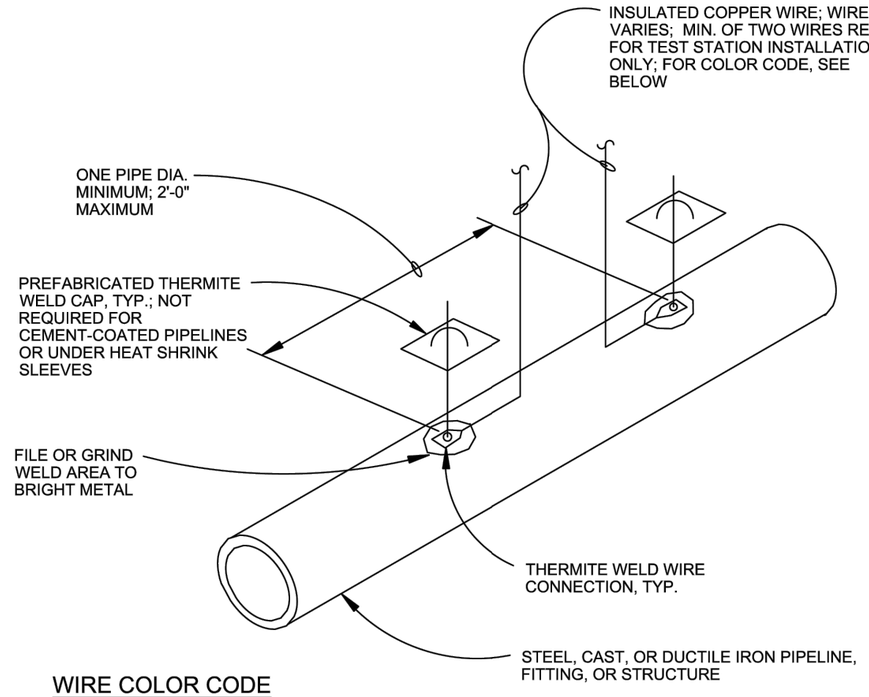

WIRE COLOR CODE

1. PIPELINE TEST WIRES:
   WATER - BLUE
   FOREIGN PIPELINES - WHITE, OR AS REQUESTED BY FOREIGN PIPELINE COMPANY
   CURRENT TEST SPAN WIRES - UPSTREAM SIDE, MARK W/ RED TAPE
2. UNPROTECTED PIPELINE - BLACK
3. CASINGS - ORANGE
4. ANODE LEADS - BLACK
5. REFERENCE ELECTRODE WIRES - YELLOW
6. TRACER WIRES - BLUE

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PIPELINE WIRE CONNECTION DETAIL

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

SHERIDAN COUNTY, WYOMING

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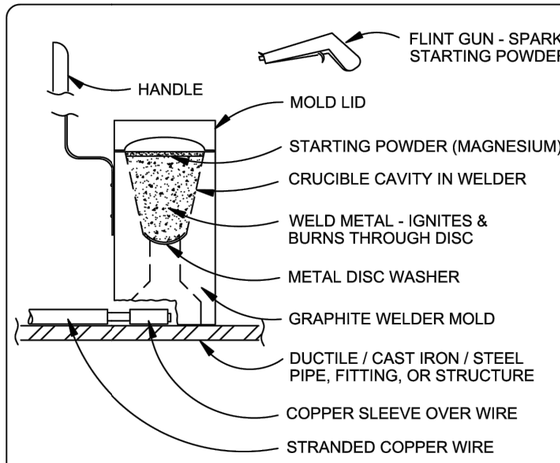
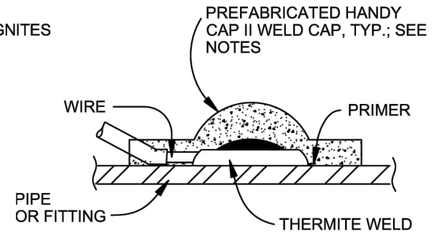


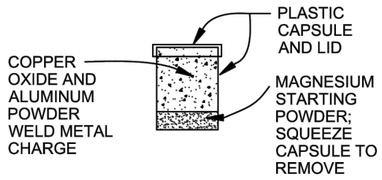
THERMITE WELD

USE CAST IRON CHARGES FOR DUCTILE IRON AND CAST IRON PIPE OR FITTINGS; USE STEEL CHARGES FOR STEEL PIPE OR FITTINGS



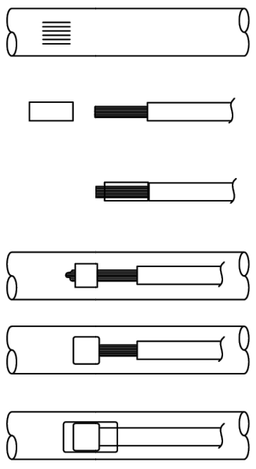
PREFABRICATED WELD CAP

(WIRE BRAZED TO STRUCTURE, TYP.)



WELD METAL CAPSULE

(TYPE AND SIZE VARY)



STEP 1 FILE STRUCTURE CONNECTION AREA (2"x2") TO BARE, BRIGHT, SHINY METAL & CLEAN. ALL WIRE WELDS SHALL BE A MINIMUM OF ONE PIPE DIAMETER APART, UP TO A MAXIMUM OF 2 FEET SEPARATION DISTANCE.

STEP 2 STRIP INSULATION FROM WIRE. ATTACH COPPER SLEEVE (REQUIRED ON No. 10 AWG WIRE & SMALLER & No. 2 & No. 4 AWG JOINT BOND WIRES, AS SPECIFIED).

STEP 3 ATTACH COPPER SLEEVE TO WIRE WITH CORRECT HAMMER DIE OR CRIMP TOOL. FACTORY SLEEVES SHALL BE ANGLED AND FIELD-MADE BONDS SHALL HAVE WIRE EXTEND 1/4" PAST SLEEVE SO WIRE IS EXPOSED TO THERMITE WELD.

STEP 4 PLACE WASHER IN BOTTOM OF MOLD AND FILL CRUCIBLE W/ POWDER; CLOSE LID, HOLD MOLD FIRMLY W/ OPENING AWAY FROM OPERATOR & IGNITE W/ FLINT GUN.

STEP 5 REMOVE SLAG FROM CONNECTION; VISUALLY INSPECT & TAP WELD FOR SOUNDNESS W/ HAMMER. REPLACE ALL POORLY-FORMED, UNSIGHTLY, OR DEFECTIVE WELDS.

STEP 6 CLEAN & COAT CONNECTION & EXPOSED STRUCTURE SURFACE W/ SPECIFIED PREFABRICATED WELD CAP, HEAT SHRINK SLEEVE, OR PIPE COATING. REPAIR COATING PER COATING MANUFACTURER'S RECOMMENDATION.

GENERAL EXOTHERMIC WELD PROCEDURES

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THERMITE WELD AND WIRE CONNECTION DETAIL

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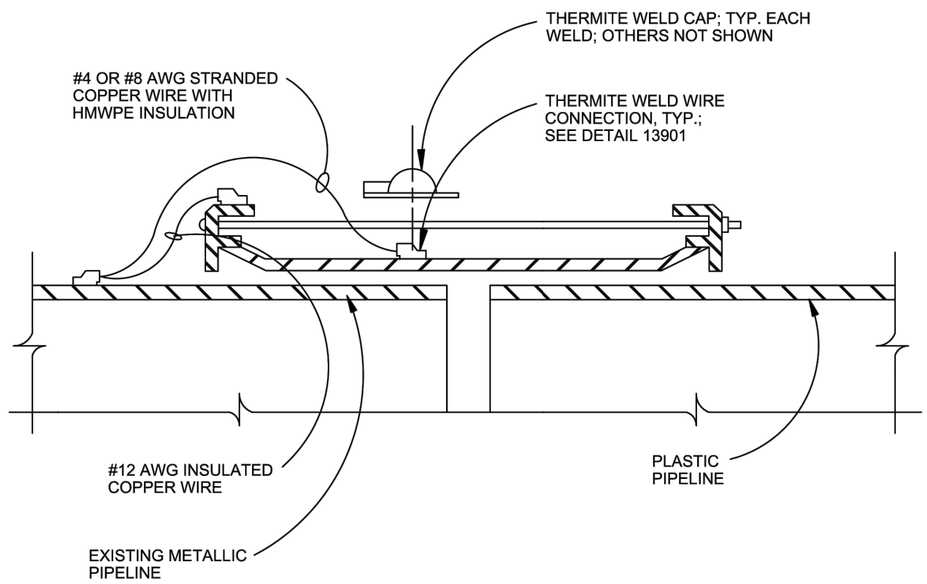

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BONDING OF FLEXIBLE COUPLING AT CONNECTION TO PLASTIC PIPE DETAIL

DWG. NO. 13910

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

SHERIDAN COUNTY, WYOMING

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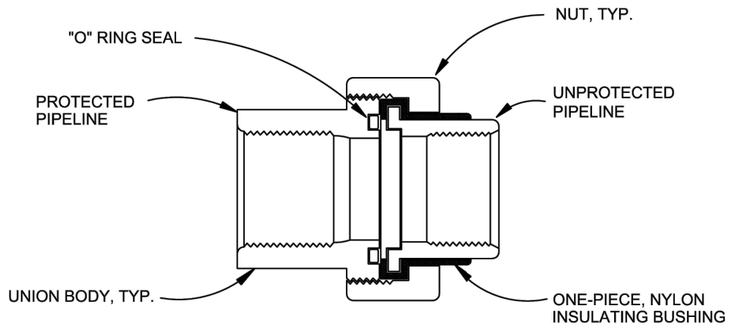

NOTES:

1. "O" RING TYPE INSULATING UNION SHOWN. OTHER TYPES (BRASS INSULATED CURB BALL VALVES, STRAIGHT COUPLINGS, CORPORATION BALL VALVES, METER COUPLINGS, ETC.) SIMILAR.

2. INSULATING O-RING AND NYLON INSULATOR BUSHING SHALL BE MOLDED & BONDED TO THE UNION BODY BY MANUFACTURER.

3. ABOVE-GRADE IRON PIPE SHALL HAVE GALVANIZED OR COATED STEEL BODIES; UNIONS IN BURIED OR CORROSIVE AREAS SHALL BE COATED.

4. COPPER LINE INSULATORS SHALL HAVE BRASS UNION BODY WITH INSULATORS FORMED AND MOLDED INTO BRASS BODY.

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INSULATING UNIONS AND / OR
COPPER SERVICE INSULATORS DETAIL

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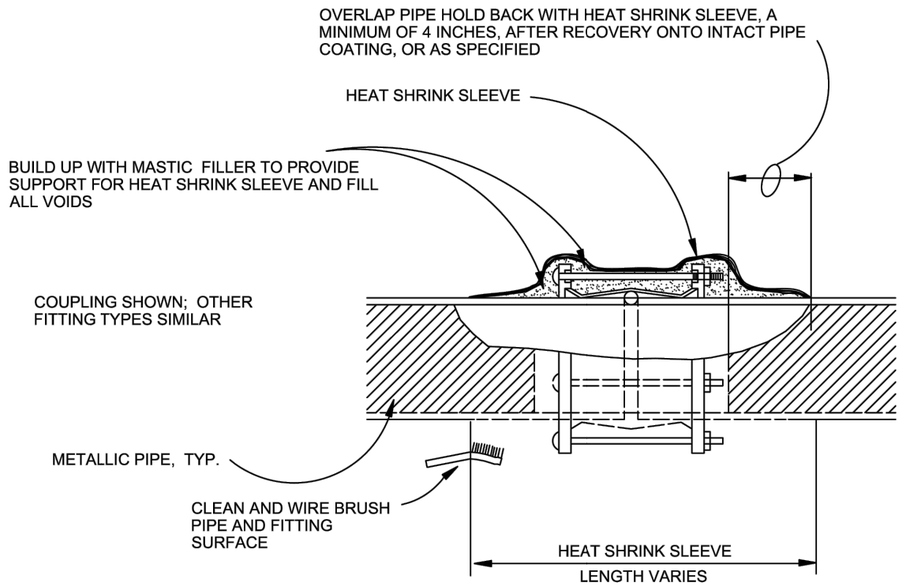

NOTES:

1. MASTIC FILLER AND SLEEVE SHALL BE AS RECOMMENDED BY HEAT SHRINK MANUFACTURER FOR EACH PIPE AND JOINT TYPE.

2. CLEAN AND ROUGHEN FITTING AND PIPE SURFACE WITH WIRE BRUSH AND APPLY MASTIC FILLER AND HEAT SHRINK SLEEVE PER HEAT SHRINK SLEEVE MANUFACTURER'S DIRECTIONS.

3. JOINT BOND WIRES / STRAPS, ANODE & TEST LEADS (NOT SHOWN) SHALL BE COMPLETELY ENCASED UNDER THE HEAT SHRINK SLEEVE COATING.

4. HEAT SHRINK SLEEVE JOINT COATING SHALL COMPLETELY ENCASE PIPE HOLD BACK, JOINT, AND EXTEND A MINIMUM 4" ONTO INTACT PIPE COATING. MASTIC FILLER SHALL PROVIDE SMOOTH TRANSITION AT ALL EDGES AND STEP-DOWNS AND FILL ALL VOIDS.

5. CORROSION PROTECTION IS SHOWN FOR FLEXIBLE COUPLING JOINT TYPE; PROTECTION OF OTHER JOINT AND FITTING TYPES SIMILAR.

6. COUPLING SHOWN; OTHER FITTING TYPES SIMILAR.

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HEAT SHRINK SLEEVE FOR FLEXIBLE
COUPLINGS OR FITTINGS DETAIL

DWG. NO. 13918

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

SHERIDAN COUNTY, WYOMING

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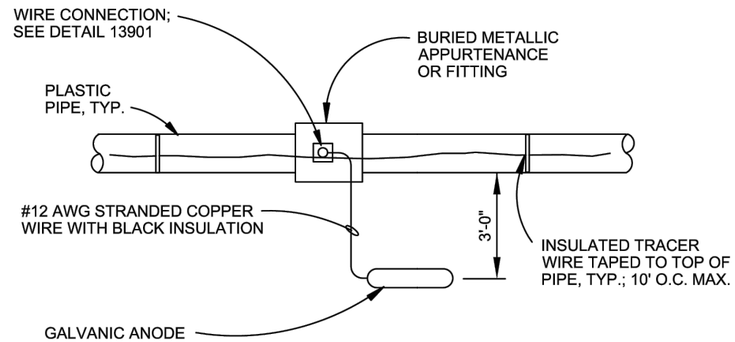

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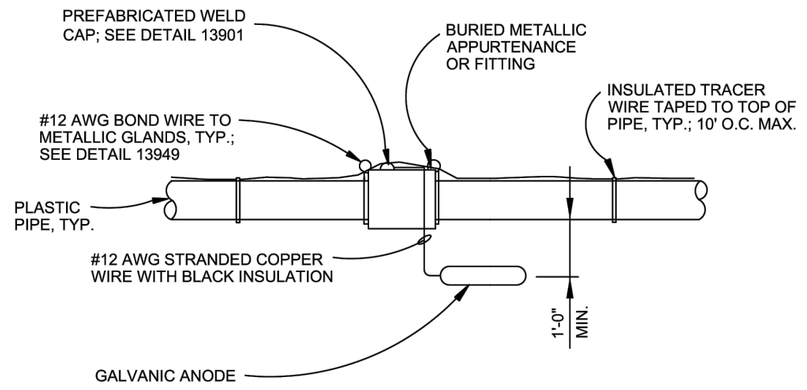

ELEVATION

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GALVANIC ANODE INSTALLATION AT BURIED METALLIC FITTINGS DETAIL

DWG. NO. 13940

CITY of SHERIDAN

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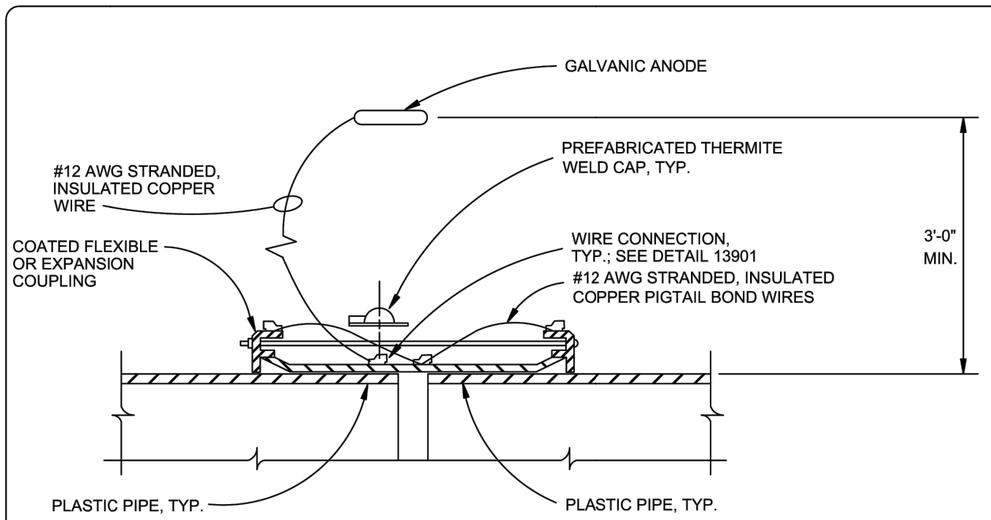
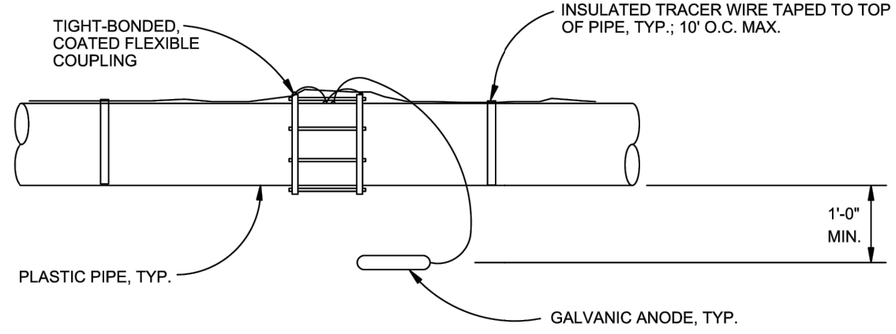


SECTION

NOTE:

PROVIDE NUMBER & SIZE OF ANODES AS SPECIFIED. MINIMUM SHALL BE 1 ANODE.



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CORROSION PROTECTION FOR FLEXIBLE COUPLING ON PLASTIC PIPE DETAIL

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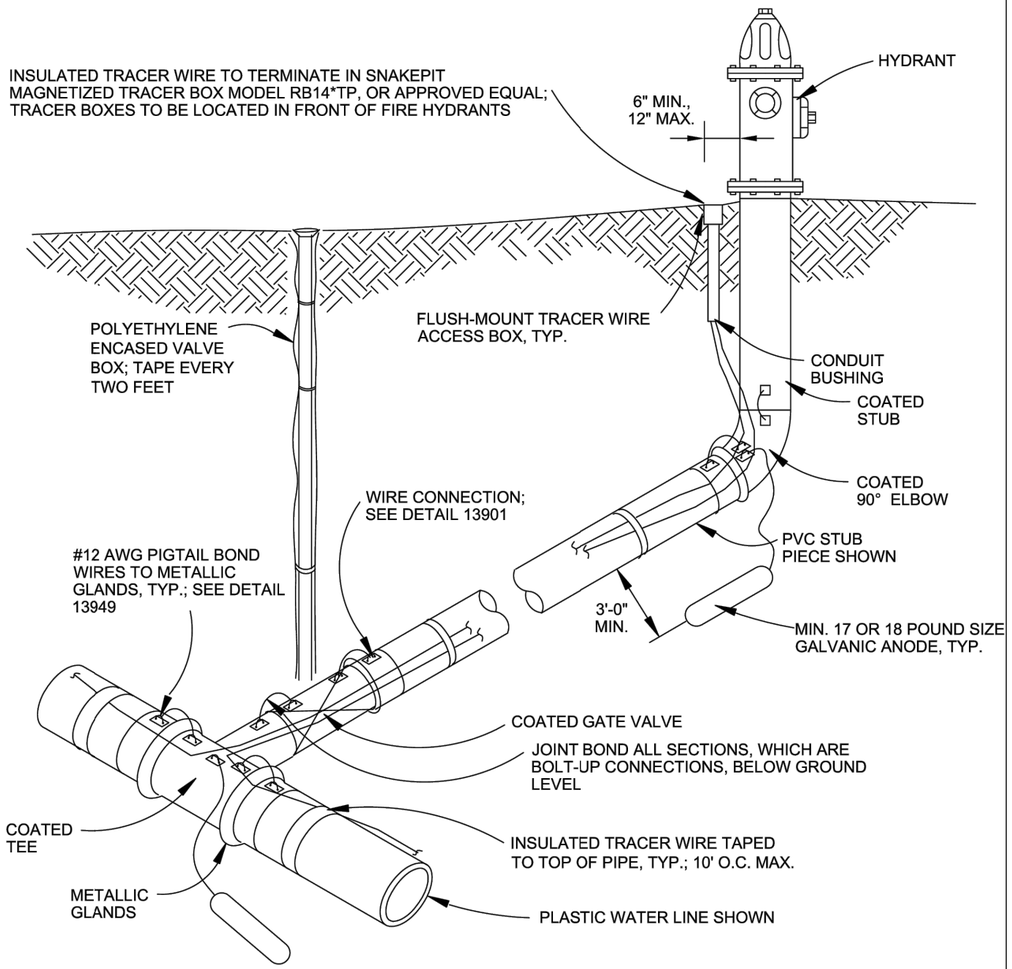

NOTES:

1. INSTALL GALVANIC ANODE 1'-0" BELOW PIPELINE, FITTING, OR VALVE INVERT ELEVATION.
2. INSTALL MINIMUM NUMBER AND SIZE OF GALVANIC ANODES SPECIFIED; MINIMUM OF ONE PER EACH METALLIC FITTING OR TWO TOTAL ASSEMBLY.

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GALVANIC ANODE INSTALLATION AT HYDRANT ASSEMBLIES W/ PVC STUB DETAIL

DWG. NO. 13944P

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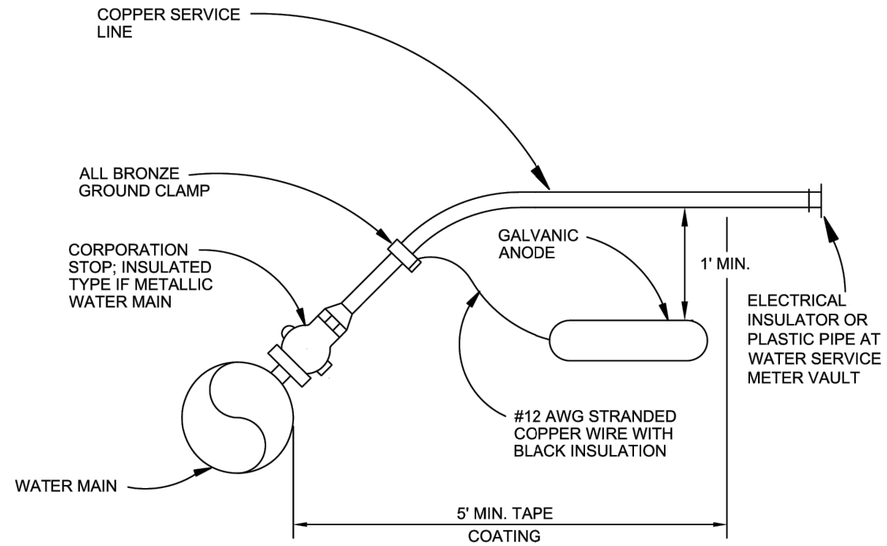

COAT ONLY IF WATER MAIN IS METALLIC PIPE; COATING IS NOT REQUIRED IF WATER MAIN IS PLASTIC PIPE

NOTES:

1. INSTALL ANODE 3'-5' FROM PIPE AND 1'-0" BELOW PIPE INVERT ELEVATION. TAPE COAT SERVICE LINE FROM METALLIC WATER MAIN, MIN. 5', OR AS SPECIFIED. APPLY TAPE COATING PER SPECIFICATION.
2. ACTUAL ORIENTATION OF SERVICE LINE IS IN THE HORIZONTAL PLANE.
3. WITH HDPE SERVICE LINE, WRAP CORPORATION STOP WITH PETROLATUM TAPE.

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ANODE WIRE CONNECTION TO COPPER SERVICE LINE DETAIL

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SHERIDAN COUNTY, WYOMING

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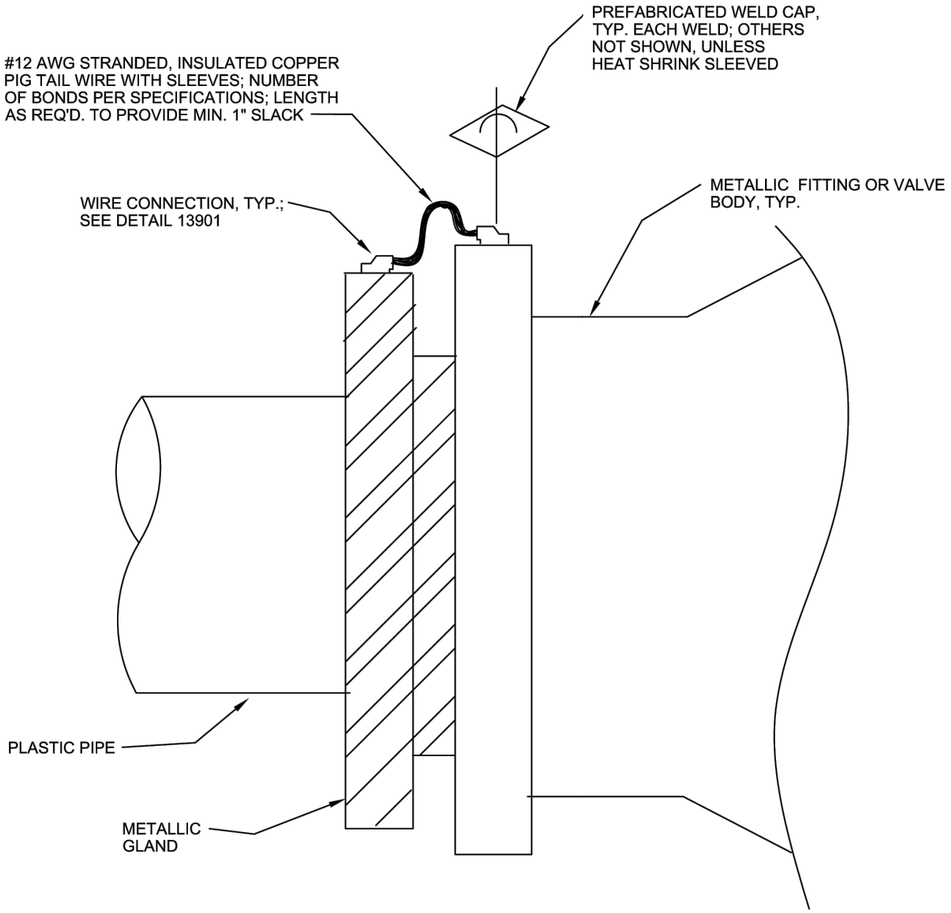

NOTES:

1. BOND PLASTIC PIPE METALLIC GLANDS TO METALLIC FITTING BODY.

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METALLIC FITTING GLANDS DETAIL

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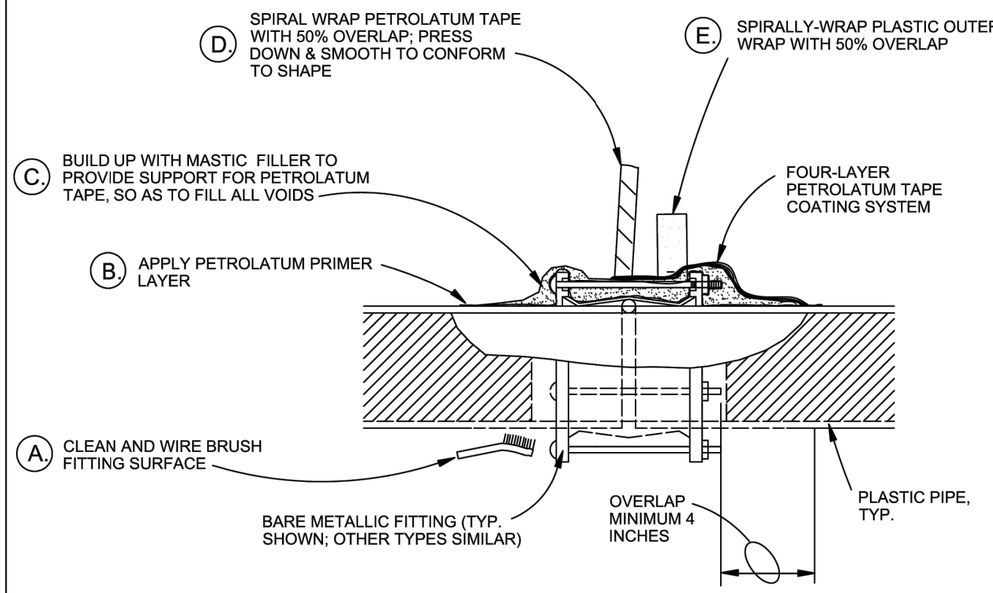

NOTES:

1. PRIMER, MASTIC FILLER, TAPE, AND OUTER WRAP AS RECOMMENDED BY TAPE MANUFACTURER FOR EACH FITTING TYPE AND ENVIRONMENT.

2. CLEAN AND ROUGHEN FITTING SURFACE WITH WIRE BRUSH AND APPLY PETROLATUM PRIMER LAYER, MASTIC FILLER, PETROLATUM TAPE, AND PLASTIC OUTER WRAP, PER MANUFACTURER'S DIRECTIONS.

3. JOINT BOND WIRES, ANODE & TEST LEADS (NOT SHOWN) SHALL BE COATED WITH HANDYCAP & THEN ENCASED UNDER PETROLATUM TAPE COATING.

4. PRIMER AND MASTIC FILLER SHALL PROVIDE SMOOTH TRANSITION AT ALL EDGES AND STEP-DOWNS AND FILL ALL VOIDS.

5. PETROLATUM TAPE COATING SHALL COMPLETELY ENCASE BARE METALLIC FITTING & EXTEND A MIN. 4" ONTO PLASTIC PIPE SURFACE.

6. FOUR-LAYER SYSTEM WITH PROTECTIVE WRAP FOR BURIED CONDITIONS AND THREE-LAYER SYSTEM FOR ABOVE-GRADE APPLICATIONS.

7. CORROSION PROTECTION IS SHOWN FOR FLEXIBLE COUPLING JOINT TYPE. PROTECTION OF OTHER BARE OR COPPER METALLIC FITTING TYPES SIMILAR.

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PETROLATUM TAPE COATING FOR BARE METALLIC COUPLINGS & FITTINGS DETAIL

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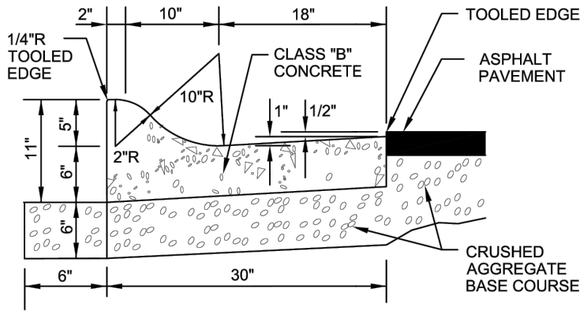
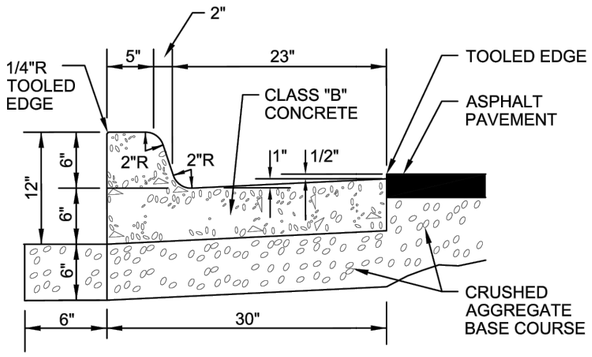


TYPE "A"



TYPE "B"

NOTES:

1. PREFORMED EXPANSION JOINT FILLER, CONFORMING TO THE CROSS SECTION OF THE CURB AND GUTTER, SHALL BE INSTALLED AT ALL JOINTS BETWEEN EXISTING CONCRETE, INLETS, MANHOLES AND OPPOSITE TO EXISTING EXPANSION JOINTS, AND AT NOT MORE THAN 150 FOOT INTERVALS.
2. PROVIDE 1" DIA. X 14" SMOOTH DOWEL BAR IN EXPANSION JOINT LOCATIONS; SMOOTH DOWEL BARS ACROSS EXPANSION JOINTS SHALL BE PROVIDED WITH EXPANSION CAPS AND COATED WITH GREASE.
3. SEE DWG. NO. 03020-2.01b FOR CURB & GUTTER WITH CONCRETE PAVEMENT DETAIL.

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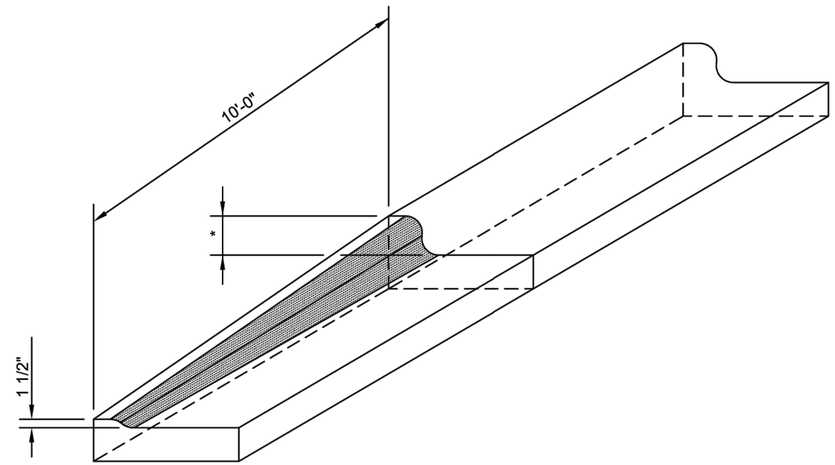
CURB & GUTTER DETAIL

DWG. NO. 03020-2.01a

CITY of SHERIDAN

NOVEMBER 2015



* 5" FOR TYPE A CURB;
6" FOR TYPE B CURB

NOT TO SCALE

CURB & GUTTER
TAPER DETAIL

DWG. NO. 03020-3.01a

CITY of SHERIDAN

NOVEMBER 2015

NO.	REVISION	BY	DATE

PROJECT NO. 2023-137

PREPARED BY
WWC ENGINEERING
1849 TERRA AVE.
SHERIDAN, WY 82801
(307) 672-0761
www.wwcengineering.com

STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

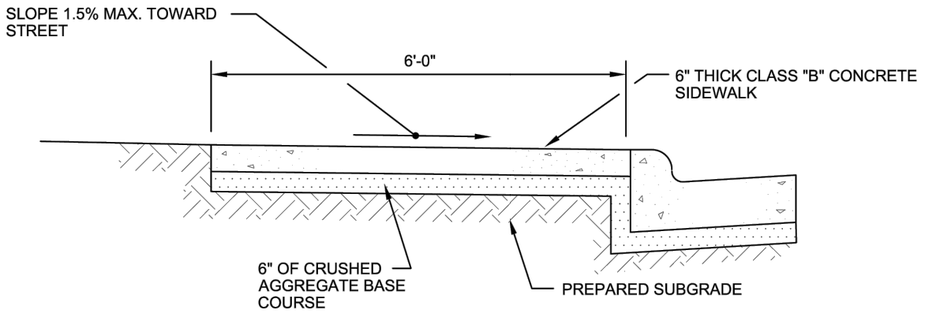
DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET
73

DRAFT



NOTE:

PREFORMED EXPANSION JOINT FILLER SHALL BE INSTALLED FOR THE FULL THICKNESS OF THE SIDEWALK AND SHALL BE USED AT ALL JOINTS BETWEEN EXISTING CONCRETE, INLETS, MANHOLES AND OPPOSITE TO EXISTING EXPANSION JOINTS, AND AT NOT MORE THAN 150 FOOT INTERVALS. CONTRACTION JOINTS SHALL BE SPACED AT INTERVALS NOT EXCEEDING WIDTH OF SIDEWALK PLACED.

ALL SIDEWALK SHALL BE ADA COMPLIANT.

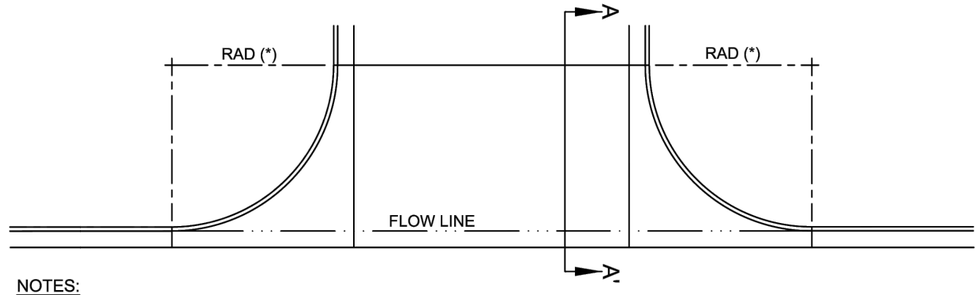
NOT TO SCALE

CONCRETE SIDEWALK - COMMERCIAL SECTION DETAIL

DWG. NO. 03030-3.01a

CITY of SHERIDAN

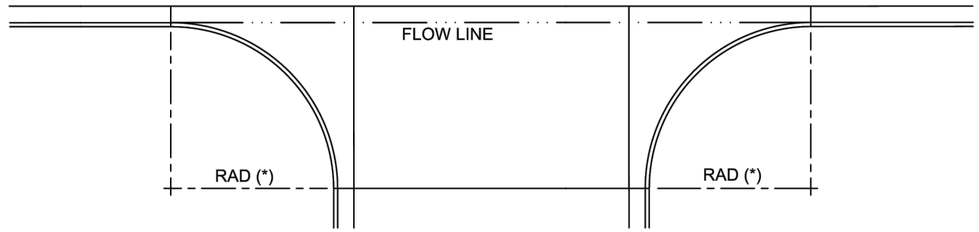
NOVEMBER 2015



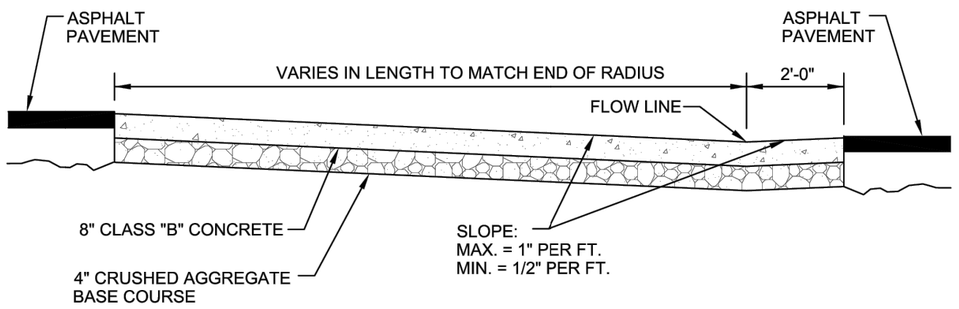
NOTES:

(*) RADIUS SHALL BE 15 FEET FOR RESIDENTIAL STREETS AND 25 FEET FOR COLLECTOR STREETS - MEASURED TO BACK OF CURB.

FLOW LINES OF CURB & GUTTER, DOUBLE GUTTER, AND FILLETS SHALL BE WARPED TO MEET FLOW LINES OF GUTTERS.



PLAN



A - A'

NOT TO SCALE

STREET INTERSECTION DETAIL

DWG. NO. 03030-3.01c

CITY of SHERIDAN

NOVEMBER 2015

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET 74

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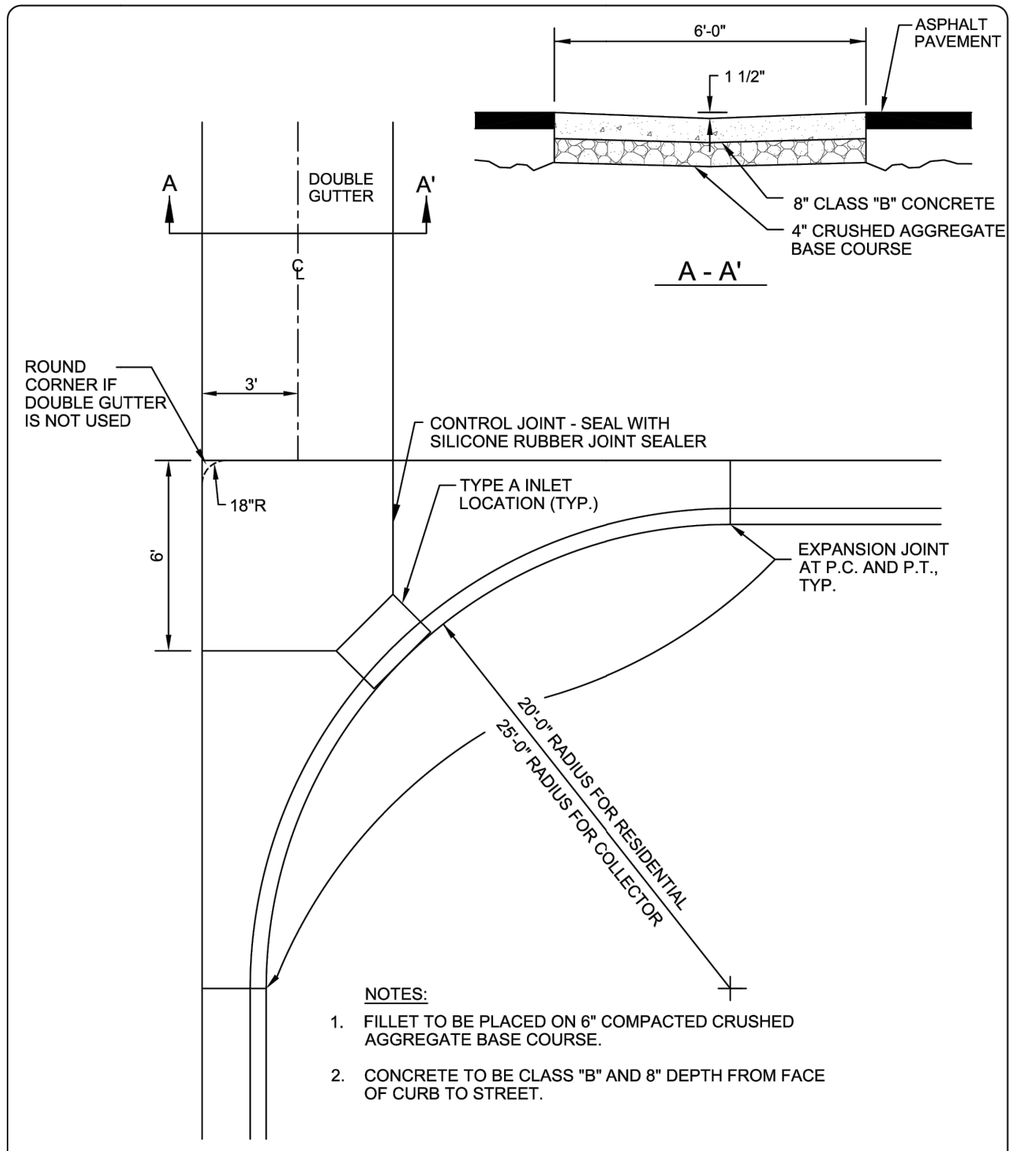


NOTES:

1. FILLET TO BE PLACED ON 6" COMPACTED CRUSHED AGGREGATE BASE COURSE.
2. CONCRETE TO BE CLASS "B" AND 8" DEPTH FROM FACE OF CURB TO STREET.

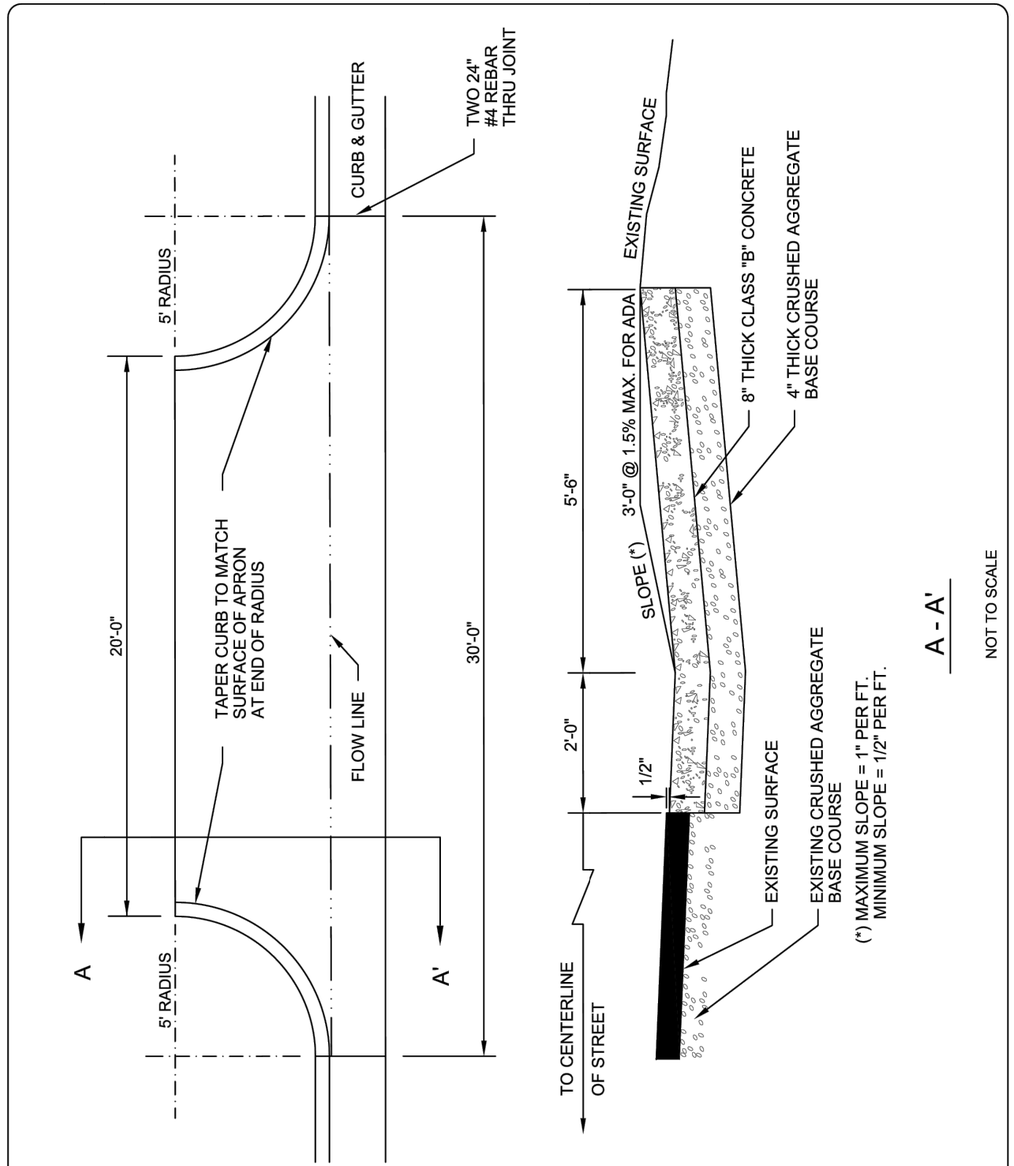
NOT TO SCALE

STANDARD FILLET DETAIL

DWG. NO. 03030-3.01e

CITY of SHERIDAN

NOVEMBER 2015



A - A'

NOT TO SCALE

COMMERCIAL AND ALLEY APPROACH DETAIL

DWG. NO. 03030-3.01d

CITY of SHERIDAN

NOVEMBER 2015

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET 75

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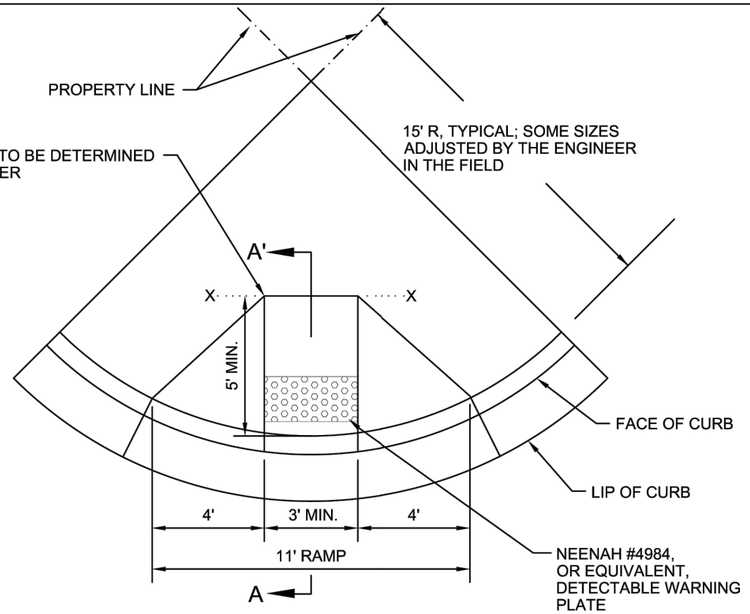
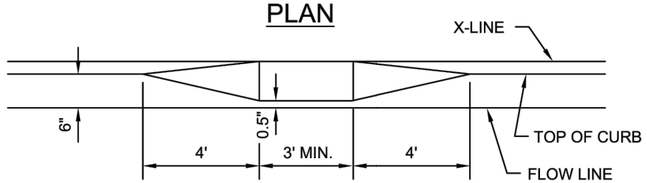
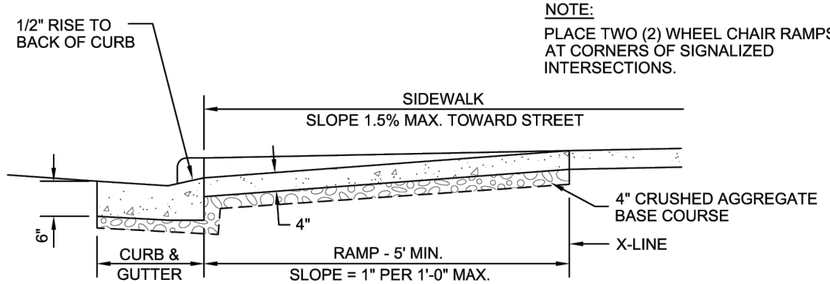


PLAN



RAMP - FRONT

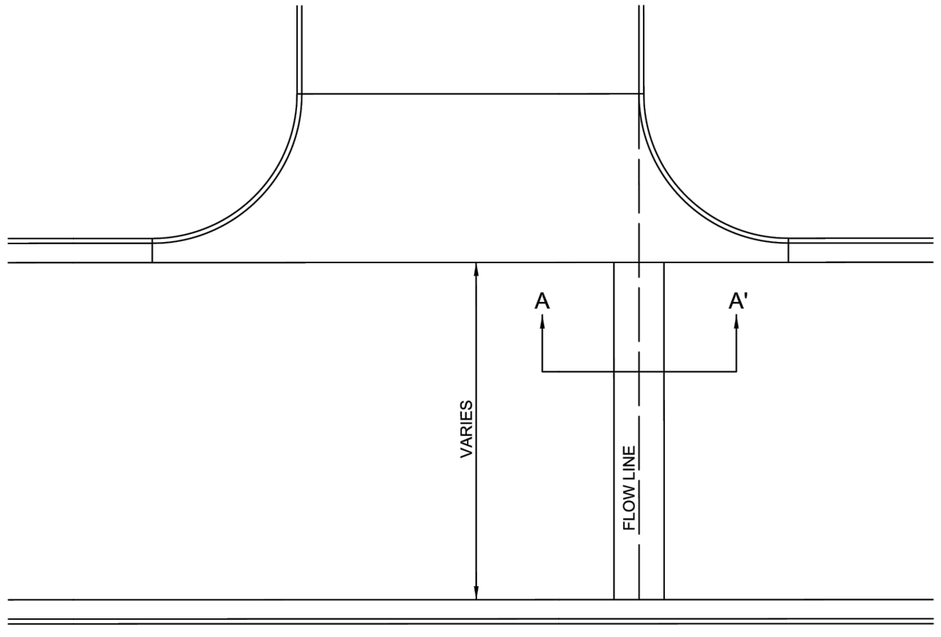
NOTE:
PLACE TWO (2) WHEEL CHAIR RAMPS AT CORNERS OF SIGNALIZED INTERSECTIONS.

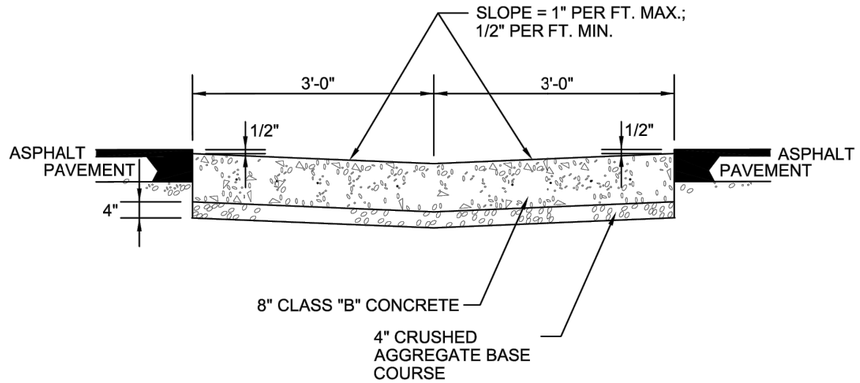


A - A'

NOT TO SCALE

PEDESTRIAN ADA RAMP DETAIL	DWG. NO. 03030-3.01h
	CITY of SHERIDAN
	NOVEMBER 2015





A - A'

NOTE:

1. SEE DWG. NO. 03020-2.01b FOR DOUBLE GUTTER WITH CONCRETE PAVEMENT DETAIL.

NOT TO SCALE

DOUBLE GUTTER DETAIL	DWG. NO. 03030-3.01i
	CITY of SHERIDAN
	NOVEMBER 2015

NO.	REVISION	BY	DATE

PROJECT NO. 2023-137

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: *SER*
DRAWN BY: *CIG*
CHECKED BY: *JBG*
DATE: *12/20/2023*

SHEET
76

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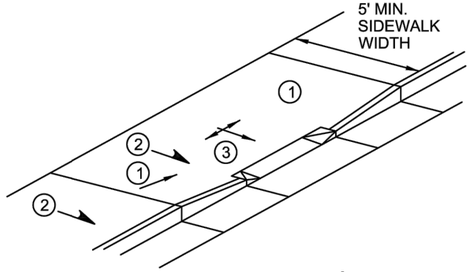
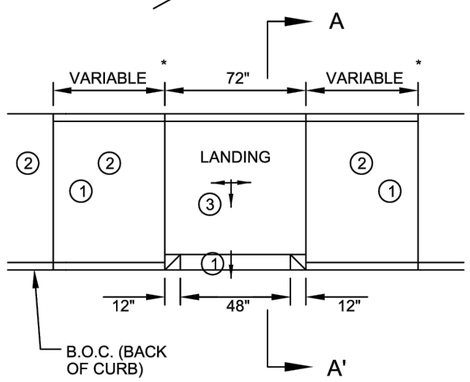
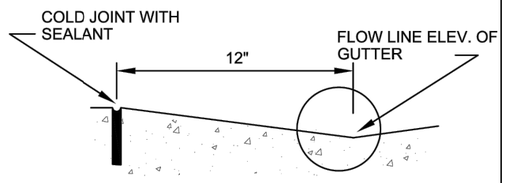


NOTES:

1. RAMP SLOPE - RAMP SLOPE SHALL GENERALLY BE 1:12. RAMP SLOPE SHALL NOT EXCEED 1:12.
2. CROSS SLOPE - POSITIVE DRAINAGE SHALL BE PROVIDED BY SLOPING SIDEWALK AND/OR RAMP TOWARD STREET AT 1:5%; CROSS-SLOPE SHALL NOT EXCEED 1.5%.
3. LANDING SLOPE - LANDING SLOPE SHALL NOT EXCEED 1.5% IN ANY DIRECTION. POSITIVE DRAINAGE SHALL BE PROVIDED TOWARD THE STREET AS SHOWN BY SINGLE-TIP ARROW. LANDING CAN BE SLOPED IN EITHER DIRECTION TO A MAX. OF 1.5% AS SHOWN BY DOUBLE- TIP ARROW.



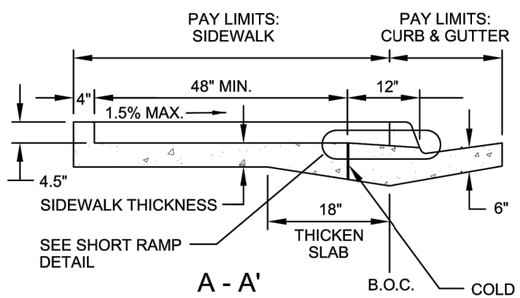


* VARIABLE LENGTH BASED ON RUNNING SLOPE OF SIDEWALK. FOR FLAT CONDITIONS AND CURB HEIGHT = 6":
ELEV. OF FLOW LINE = 0"
ELEV. OF LANDING = 1.5"
RISE OF PARALLEL RAMPS = 4.5"
VARIABLE DIMENSION = 4.5'

PLAN VIEW

THIS DETAIL PROVIDES AN ELEVATED LANDING TO REDUCE ICE, SNOW, GRAVEL AND WATER FROM ACCUMULATING IN THE LANDING. THE LANDING IS ELEVATED 1.5" ABOVE THE GUTTER FLOW LINE. THIS DETAIL CAN ONLY BE USED WITH 5 FT. OR WIDER SIDEWALKS SO THAT THE LANDING IS WIDE ENOUGH FOR WHEEL CHAIR TURNING MOVEMENTS.

SHORT RAMP DETAIL



A - A'

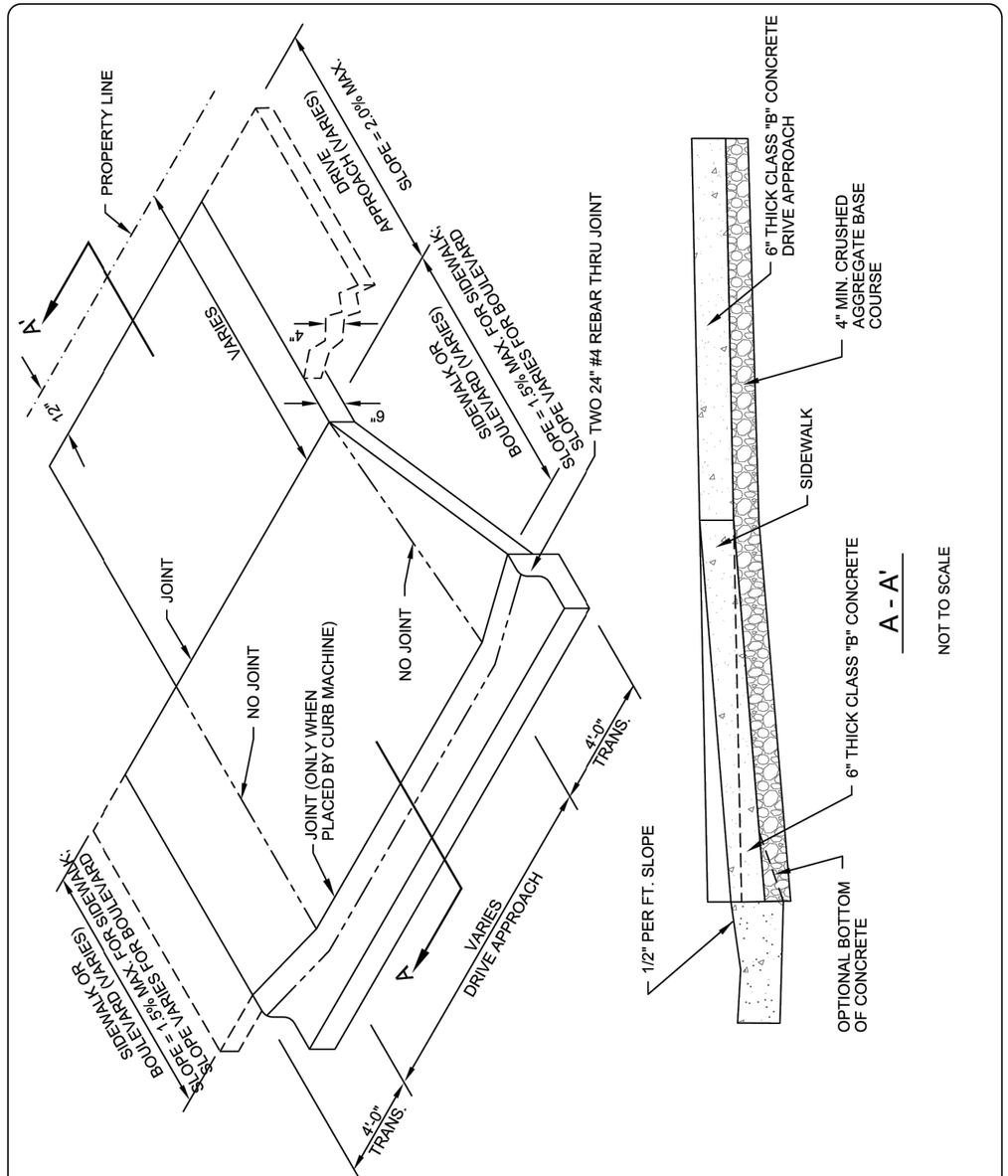
NOT TO SCALE

ADA RAMP IN
SIDEWALK DETAIL

DWG. NO. 03030-3.01j

CITY of SHERIDAN

NOVEMBER 2015



A - A'

NOT TO SCALE

RESIDENTIAL APPROACH DETAIL
(WITH CONCRETE DRIVEWAY AND FLARE SECTIONS)

DWG. NO. 03030-3.01f

CITY of SHERIDAN

NOVEMBER 2015

PREPARED BY
WWC ENGINEERING
1849 TERRA AVE.
SHERIDAN, WY 82801
(307) 672-0761
www.wwcengineering.com

NO.	REVISION	BY	DATE

PROJECT NO. 2023-137

STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CJG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET
77

DRAFT

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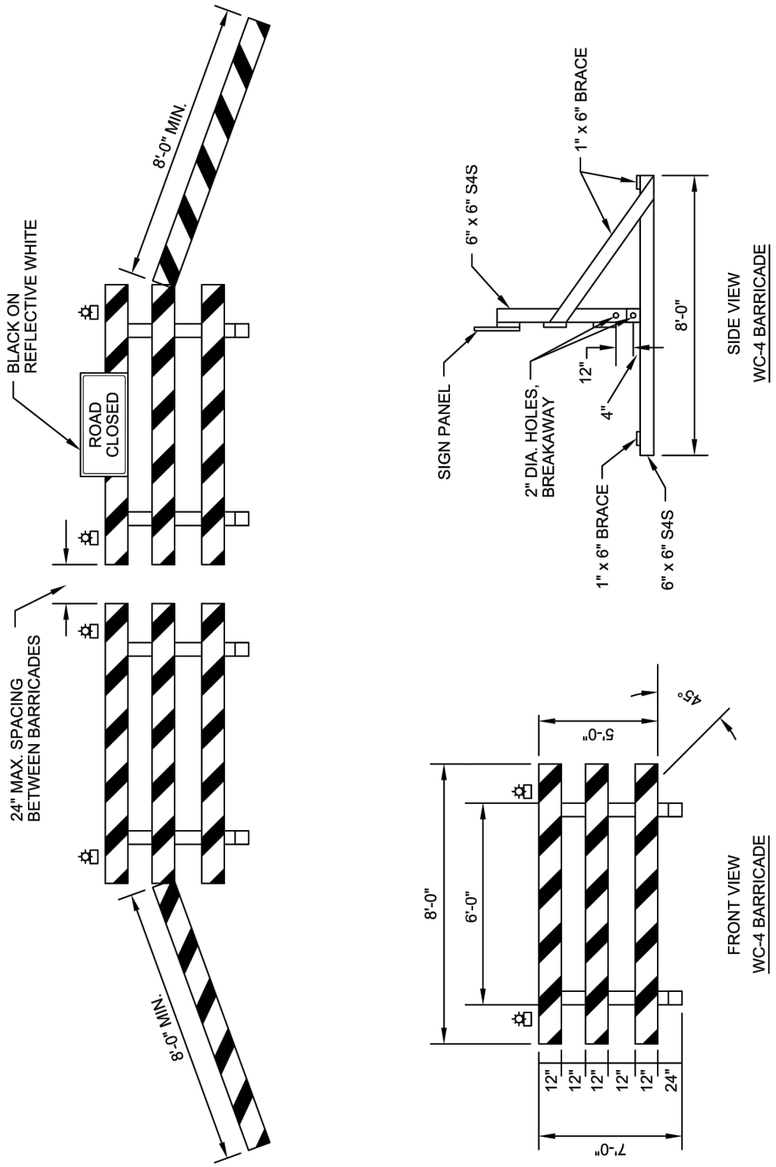

TYPICAL STREET CLOSURE AND BARRICADE SETUP DETAIL

DWG. NO. 02060-4

CITY of SHERIDAN

NOVEMBER 2015

GENERAL NOTES FOR PLACEMENT AND USAGE OF CONSTRUCTION TRAFFIC CONTROL DEVICES

1. WORK ACTIVITY ON OR ADJACENT TO THE TRAVELED WAY THAT MAY AFFECT THE TRAVELING PUBLIC OR WORKERS SHALL NOT COMMENCE UNTIL ALL NECESSARY CONSTRUCTION TRAFFIC CONTROL DEVICES ARE IN PLACE AND APPROVED BY THE ENGINEER. (CONSTRUCTION TRAFFIC CONTROL DEVICES SHALL INCLUDE SIGNS, BARRICADES, CHANNELIZING DEVICES, STRIPING, ETC.)
2. ALL SIGNS SHALL BE STAND-MOUNTED AND KEPT CLEAN, LEGIBLE AND MAINTAIN REFLECTIVITY.
3. FLASHERS SHALL BE INSTALLED AND IN WORKING ORDER ON ALL WC-4S AND BARRELS.
4. ONLY TWO BLOCKS SHALL BE CLOSED AT A TIME UNLESS APPROVED BY THE CITY OF SHERIDAN
5. ALL CONSTRUCTION SITES SHOULD BE CHECKED PERIODICALLY, DAY AND NIGHT, TO ENSURE ADEQUATE TRAFFIC CONTROL.
6. ALL CONSTRUCTION TRAFFIC CONTROL DEVICE SPACING IS APPROXIMATE AND SHOULD BE ADJUSTED TO FIT FIELD CONDITIONS. ROADWAY CONDITIONS, OBSTACLES, GEOMETRICS AND PERMANENT SIGNING SHOULD BE CONSIDERED IN PLACEMENT OF CONSTRUCTION SIGNS AND / OR FLAGGERS, TO PROVIDE MAXIMUM VISIBILITY OF WARNING DEVICES TO ONCOMING MOTORISTS.
7. ADDITIONAL CONSTRUCTION TRAFFIC CONTROL DEVICES MAY BE ADDED AS CONDITIONS WARRANT.
8. ALL CONSTRUCTION TRAFFIC CONTROL DEVICES REQUIRED FOR THE CONSTRUCTION PROJECT SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. REPLACEMENT DEVICES SHALL BE AVAILABLE AS REQUIRED. DEVICES SHALL BE MAINTAINED IN A STATE OF GOOD REPAIR BY THE CONTRACTOR.
9. ALL CONSTRUCTION TRAFFIC CONTROL DEVICES REQUIRED, INCLUDING ALL POSTS AND SIGNS, SHALL COMPLY WITH ALL REQUIREMENTS OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
10. EXISTING TRAFFIC CONTROL DEVICES CONFLICTING WITH THESE TRAFFIC CONTROL PLANS SHALL BE COVERED OR REMOVED AS DIRECTED BY THE ENGINEER AND RETURNED TO THEIR PREVIOUS LOCATIONS AS NEEDED. (NOT A PAY ITEM; SUBSIDIARY TO OTHER CONTRACT ITEMS.)
11. CONSTRUCTION TRAFFIC CONTROL DEVICES SHALL BE REMOVED OR COVERED WHEN NOT NEEDED.
12. PORTABLE SIGN SUPPORTS AND BARRICADES TURNED AWAY FROM THE ROADWAY AND NOT REMOVED AT LEAST 30 FEET FROM THE EDGE OF THE TRAVELED WAY SHALL HAVE A TYPE II OBJECT MARKER VISIBLE TO ALL APPROACHING TRAFFIC.
13. WHEN CONSTRUCTION CEASES DURING THE WINTER, ANY CONSTRUCTION TRAFFIC CONTROL DEVICES, INCLUDING POSTS UNNEEDED AT THIS TIME, SHALL BE REMOVED. REQUIRED DEVICES SHALL BE MAINTAINED THROUGHOUT THE WINTER.
14. ALL CONSTRUCTION MATERIALS AND EQUIPMENT SHALL BE STORED IN AREAS AS FAR FROM THE USABLE TRAVELED WAY AS POSSIBLE (30 FEET MINIMUM).
15. ADDITIONAL WARNING LIGHTS MAY BE REQUIRED ON CONSTRUCTION TRAFFIC CONTROL DEVICES FOR ADDITIONAL EMPHASIS AT NIGHT. ONLY STEADY BURN WARNING LIGHTS SHALL BE USED ON TAPERS. DRUMS WITH ARROWS SHALL BE USED ON TAPERS, AND DRUMS WITHOUT ARROWS SHALL BE USED ON TANGENTS. SIGNS AND CHANNELIZING DEVICES SHALL BE REFLECTORIZED WHEN USED AT NIGHT.
16. ADDITIONAL FLAGGERS MAY BE UTILIZED AT THE DISCRETION OF THE CONTRACTOR. ADDITIONAL WARNING SIGNS FOR THE FLAGGERS SHALL THEN BE INSTALLED. LIGHTING SHALL BE PROVIDED IF FLAGGERS ARE UTILIZED DURING HOURS OF DARKNESS.
17. ALL DRUMS USED FOR TEMPORARY TRAFFIC CONTROL SHALL BE PLASTIC AND MEET ALL REQUIREMENTS OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
18. IN URBAN AREAS, PEDESTRIAN SAFETY AND MOVEMENTS SHALL BE CONSIDERED WHEN PLACING TRAFFIC CONTROL DEVICES.
19. THE ENGINEER RESERVES THE RIGHT TO ADD, DELETE OR MODIFY ANY CONSTRUCTION TRAFFIC CONTROL DEVICE OR SETUPS AS REQUIRED TO COMPLY WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND TO PROVIDE FOR THE SAFETY OF TRAVELING MOTORISTS OR PEDESTRIANS.
20. ANY ADDITIONS OR MODIFICATIONS TO TRAFFIC CONTROL WILL BE CONSIDERED SUBSIDIARY TO THE BID ITEM.

TRAFFIC CONTROL GENERAL NOTES

DWG. NO. 02060-5

CITY of SHERIDAN

NOVEMBER 2015

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PROJECT NO. 2023-137

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STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET 78

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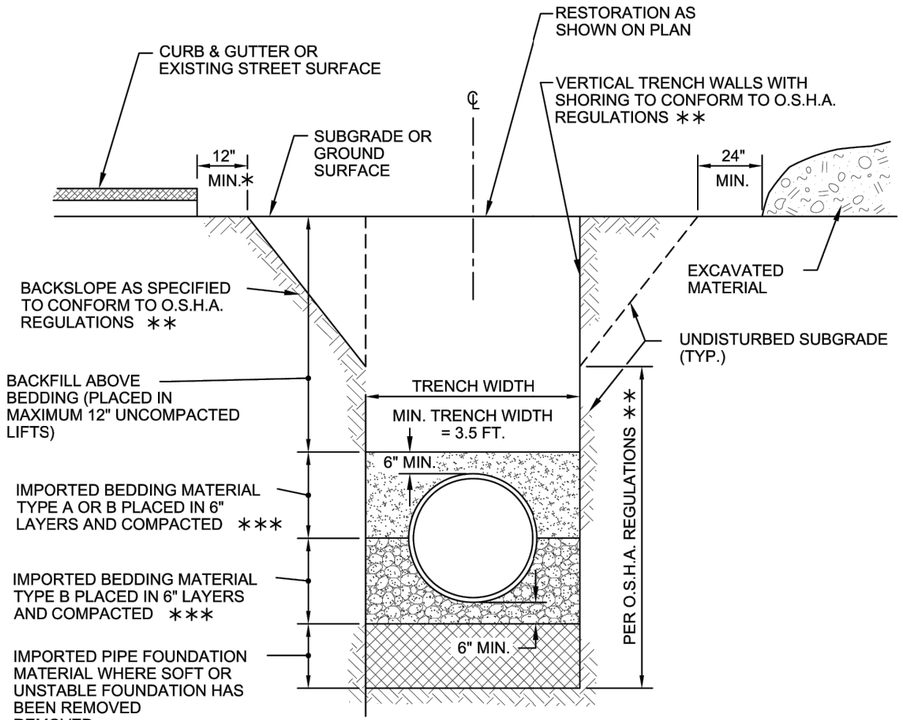


NOTES:

* WHERE TRENCH PASSES THROUGH EXISTING PAVEMENT, THE PAVEMENT SHALL BE CUT ALONG A NEAT, VERTICAL LINE A MIN. OF 12" FROM THE EDGE OF THE TRENCH OPENING. WHERE NEAT LINE IS LESS THAN 3' FROM EDGE OF EXISTING PAVEMENT OR CURB & GUTTER SECTION, REMOVE AND REPLACE ENTIRE PAVEMENT SECTION BETWEEN TRENCH AND EDGE OF PAVEMENT OR CURB & GUTTER SECTION.

** SEE O.S.H.A. SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION, SECTION 1926.652. TRENCH WALLS SHALL BE IN COMPLIANCE WITH THE CURRENT O.S.H.A. REQUIREMENTS.

*** NATIVE BEDDING MATERIAL MAY BE USED FOR RCP STORM DRAINS, IF ALLOWED BY THE SPECIAL PROVISIONS. TYPE A BEDDING MAY POSSIBLY BE USED (SEE 02221 2.01B & 3.05B).

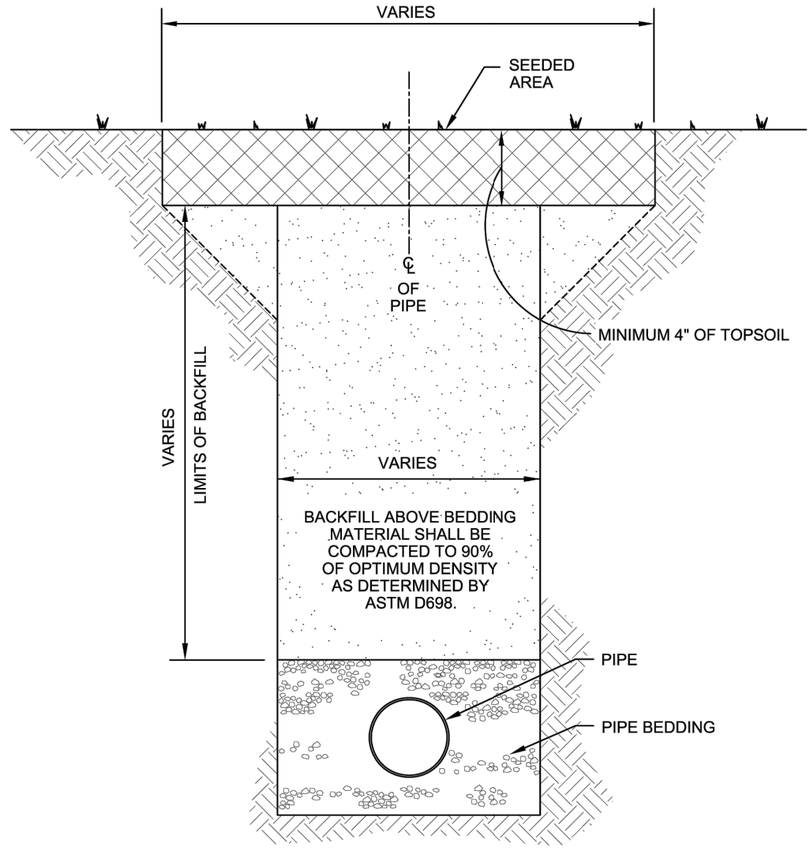
NOT TO SCALE

TYPICAL STORM DRAIN
TRENCH DETAIL

DWG. NO. 02221-2.01Bc

CITY of SHERIDAN

NOVEMBER 2015



FOR REQUIREMENTS OF SEED MIXTURE
AND APPLICATION SEE SPECIFICATION 02480.

NOTES:

1. THIS RESTORATION WILL BE REQUIRED ON ALL DISTURBED AREAS THAT WILL NOT BE COVERED WITH SOD OR OTHER SURFACING.
2. ROCKS LARGER THAN 2" CANNOT BE PLACED WITHIN TOPSOIL.

NOT TO SCALE

RESTORATION -
OPEN AREAS DETAIL

DWG. NO. 02221-3.09A

CITY of SHERIDAN

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DETAIL SHEET

SHERIDAN COUNTY, WYOMING

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DATE: 12/20/2023

SHEET
79

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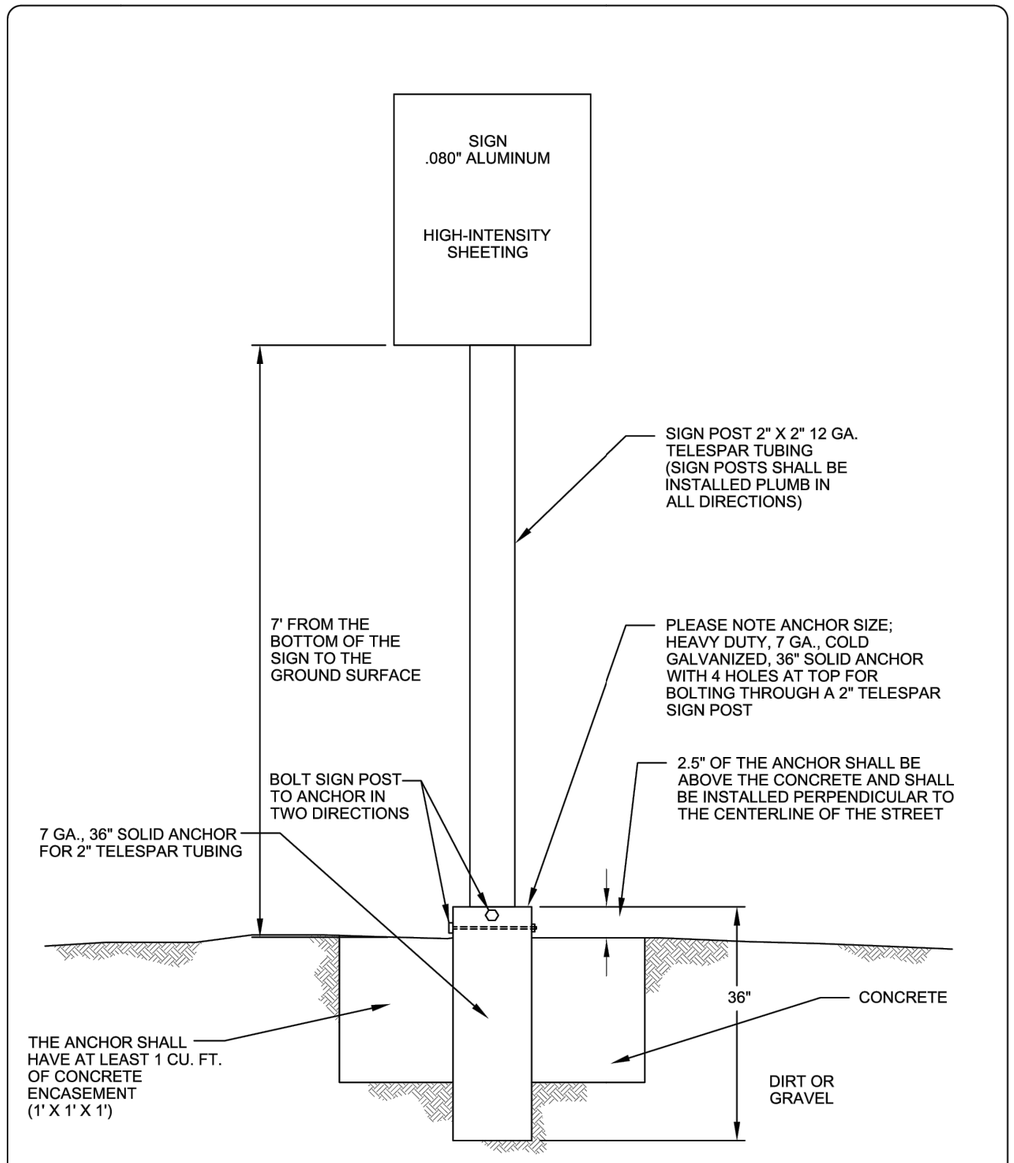


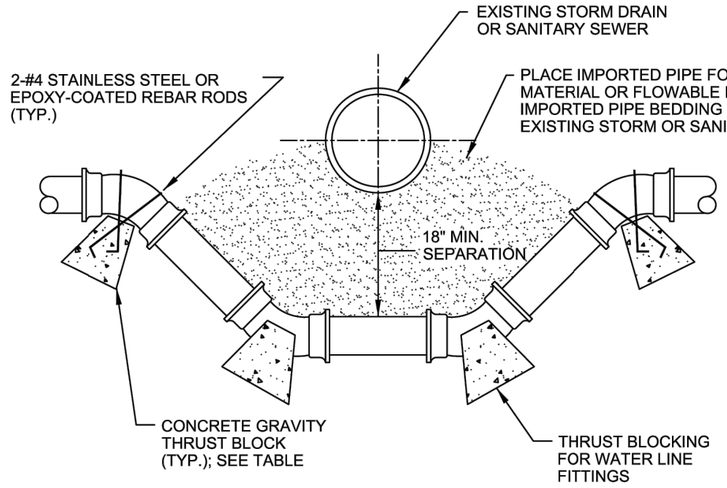
NOT TO SCALE

SIGN INSTALLATION DETAIL

DWG. NO. 02605-3.01c

CITY of SHERIDAN

NOVEMBER 2015



GRAVITY THRUST BLOCK - CY
BASED ON 150 PSI MAIN PRESSURE

PIPE SIZE	45° BEND	22 1/2° BEND
6"	1.0	0.5
8"	1.5	0.6
10"	2.0	0.8
12"	3.0	1.0

NOTE: USE POLYETHYLENE TO SEPARATE FITTINGS FROM THE CONCRETE.

NOT TO SCALE

THRUST BLOCKING FOR WATER LINE FITTINGS DETAIL

DWG. NO. 02710-3.01lb

CITY of SHERIDAN

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SHEET
80

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Arterial	Dimension Reference	Local			Collector			Arterial		
		Resi-dential	Com-mercial	Indus-trial	Resi-dential	Com-mercial	Indus-trial	Resi-dential	Com-mercial	Indus-trial
Width[1]	W									
Minimum		12	20	20	12	20	20	15	15	20
Maximum		32[2]	40	40	30	40	40	36	40	40
Right-turn Radius	R									
Minimum		0	5	10	0	15	25	0	25	30
Maximum[3]		0	10	20	0	50	50	0	50	50
Minimum Spacing[4]										
From Property Line	P	0	R	R	0	R	R	R	R	R
From Street Corner	C	20	40	40	50	50	50	NA	NA	NA
Between Driveways	S	10[5]	25	25	35	50	50	NA	NA	NA
Angle[6]	A	45°	70°	70°	45°	70°	70°			

[1]The minimum width of commercial driveways is intended to apply to one-way operation. In high pedestrian activity areas, such as in a central business district or in the same block with an auditorium, school, or library, the maximum basic width should be 30 feet. The width shown applies to rural routes and most City streets including neighborhood business, residential, and industrial streets. The width is intended to be measured along the right-of-way line, in most instances, at the inner limit of a curbed radius or between the line of the radius and the near edge of a curbed island at least 50 square feet in area.

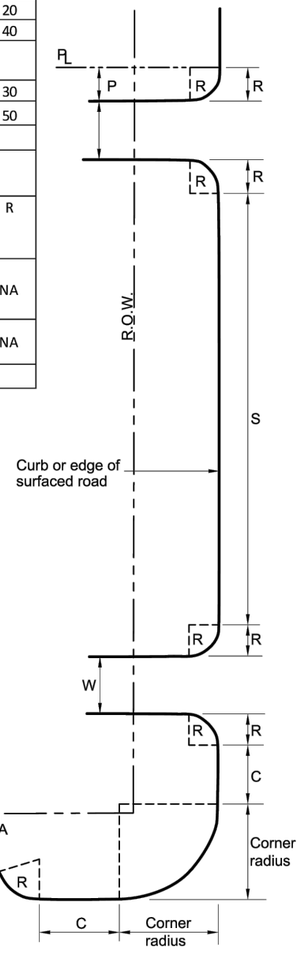
[2]Maximum width on bulb of cul-de-sac shall be 24 feet.

[3]On the side of a driveway exposed to entry or exit by right-turning vehicles. In high pedestrian activity areas, the radii should be half the values shown. The maximum radii for major generator driveways shall be designed in accordance with *A Policy on Geometric Design of Highways and Streets*, published by AASHTO latest edition.

[4]Measured along the curb or edge of pavement from the roadway end of the curb radius. In high pedestrian activity areas, the minimum spacing between driveways should be 5 feet.

[5]Minimum space between driveways may be reduced to 5 feet on one side on local streets only at the discretion of the City Engineer.

[6]Minimum acute angle measured from edge of pavement, and generally based on one-way operation. For two-way driveways, and in high pedestrian activity areas, the minimum angle should be 80 degrees.



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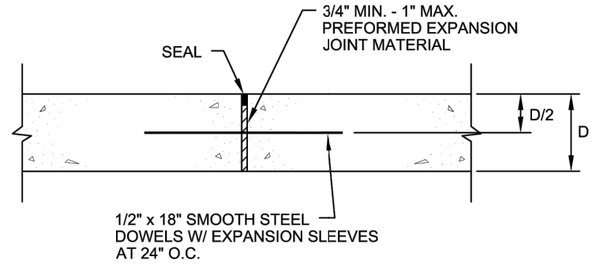
APPROACH DIMENSIONS DETAIL

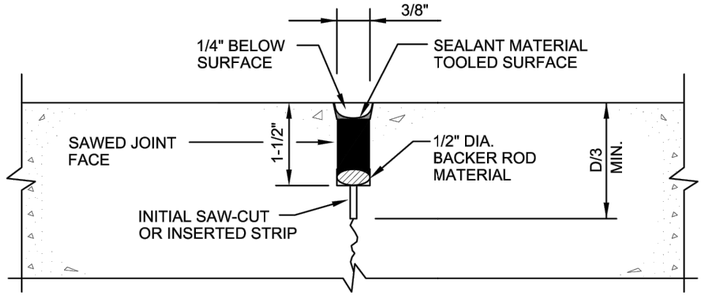
DWG. NO. 03030-3.01k

CITY of SHERIDAN

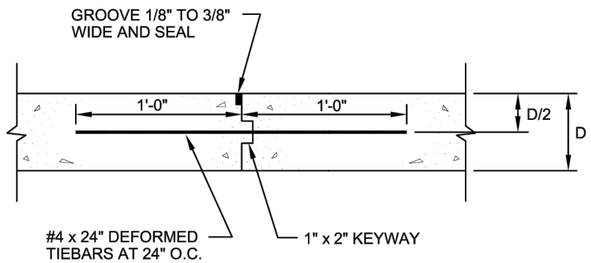
NOVEMBER 2015



A - EXPANSION JOINT



B - CONTRACTION JOINT



C - CONSTRUCTION JOINT

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CONSTRUCTION, EXPANSION AND CONTRACTION JOINT DETAILS

DWG. NO. 03040-2.01a

CITY of SHERIDAN

NOVEMBER 2015

NO.	REVISION	BY	DATE

PROJECT NO. 2023-137

PREPARED BY
WWC ENGINEERING
1849 TERRA AVE.
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(307) 672-0761
www.wwcengineering.com

STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET 81

DRAFT

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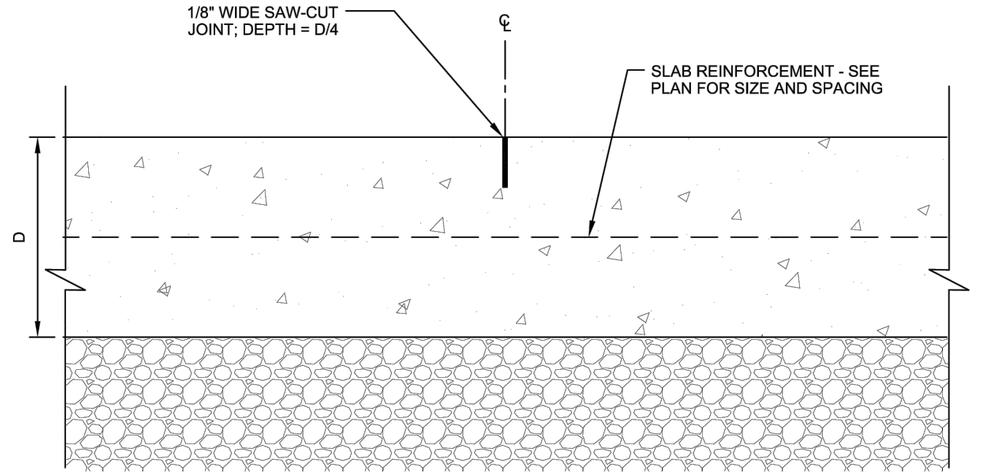
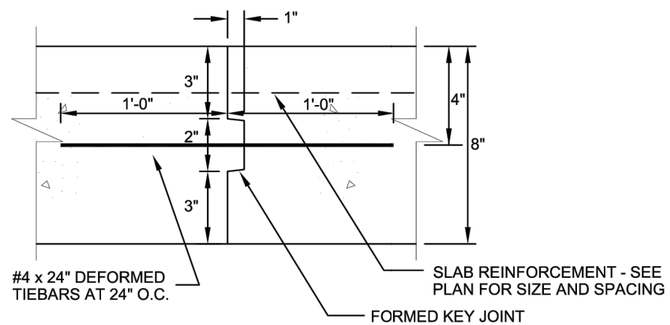


NOTE: SAW-CUT AS SOON AS POSSIBLE AFTER SLAB FINISHING, WITHOUT SPALLING OR DISLODGING AGGREGATE.

A - TYPICAL SAW-CUT JOINT



NOTES:

1. RETAINED-IN-PLACE GALVANIZED STEEL KEY FORM MAY BE USED IN LIEU OF FORMED KEY JOINT SHOWN. STEEL KEY FORM SHALL MATCH NOMINAL SLAB THICKNESS.

2. EXTEND REBAR THROUGH KEYWAY AND TIE TO ADJOINING SLAB.

B - TYPICAL KEYWAY JOINT

NOT TO SCALE

SAW-CUT / KEYWAY JOINTS DETAIL

DWG. NO. 03040-2.01b

CITY of SHERIDAN

NOVEMBER 2015

NO.	REVISION	BY	DATE

PROJECT NO. 2023-137

PREPARED BY
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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: *SER*
DRAWN BY: *CIG*
CHECKED BY: *JBG*
DATE: *12/20/2023*

SHEET
82

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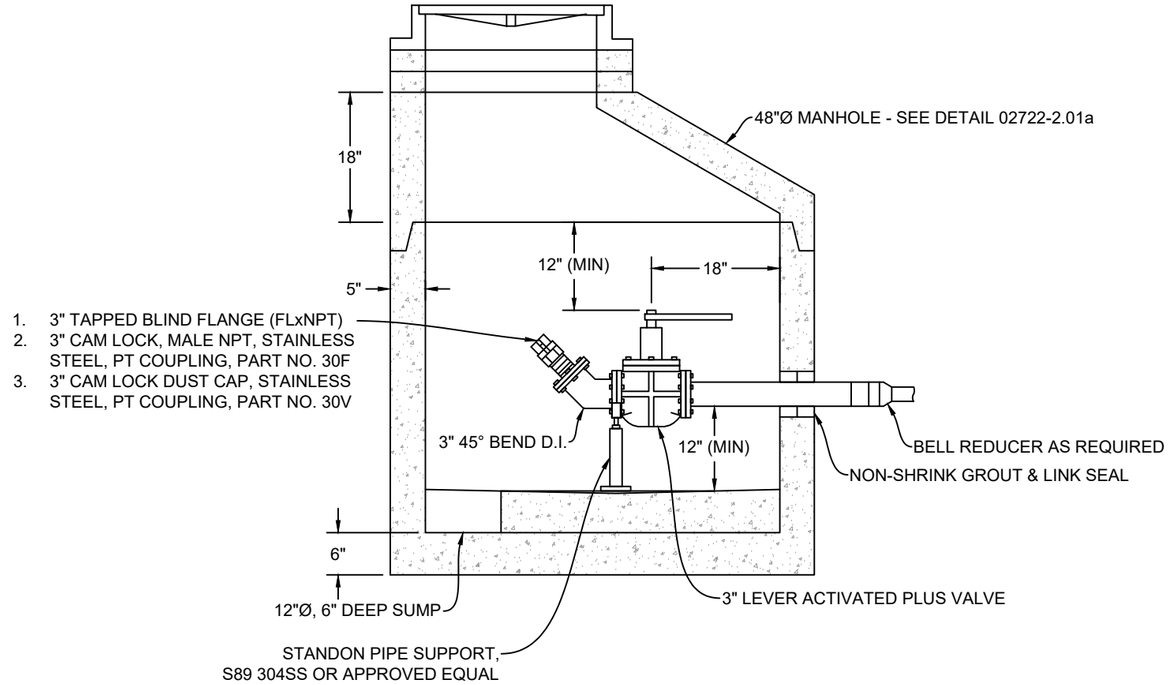
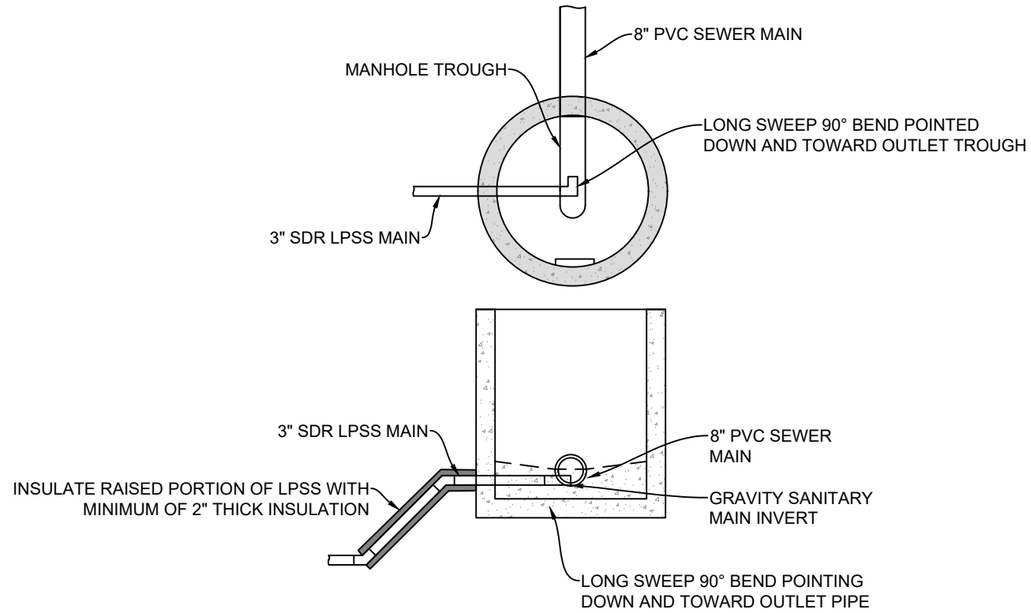


1/83 TERMINAL FORCE MAIN CLEANOUT
NOT TO SCALE



2/83 LPSS MANHOLE CONNECTION DETAIL
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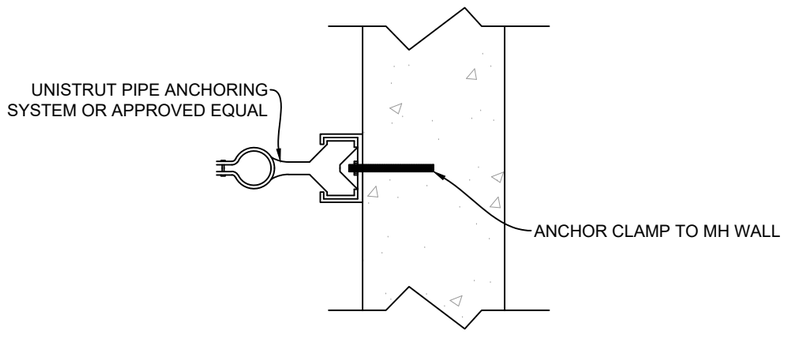

3/83 EXTENSION PIPE OR RISE CLAMP DETAIL
NOT TO SCALE

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NO.	REVISION	BY	DATE

PROJECT NO. 2023-137

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STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

DETAIL SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: *SER*
DRAWN BY: *CIG*
CHECKED BY: *JBG*
DATE: *12/20/2023*

SHEET
83

APPENDIX C

Water and Sewer Design Report

STORY HOUSE VILLAGE PUD PHASE 1

WATER AND SEWER REPORT

PREPARED FOR:

CITY OF SHERIDAN

ON BEHALF OF:

STORY HOUSE PROPERTY COMPANY, LLC

WWC ENGINEERING

December 2023

STORY HOUSE VILLAGE PUD – PHASE 1
WATER AND SEWER REPORT

Prepared for: City of Sheridan
55 Grinnell Plaza
Sheridan, WY 82801

On Behalf of: Story House Property Company, LLC
40 E Works Street #1B
Sheridan, WY 82801

Prepared by: WWC Engineering
1849 Terra Avenue
Sheridan, WY 82801
(307) 672-0761

Principal Authors: Tristan Greve, E.I.
Sarah Rohrer, P.E.

Reviewed by: Jeff Barron, P.E., Civil Department Manager

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INTRODUCTION

This report provides information regarding water and sanitary sewer design for the Story House Village Planned Unit Development (PUD) Phase 1 (Project) located in Sheridan, WY. The Project includes the expansion of a water system within the development and connecting to the City's existing water system adjacent to the Project. The Project also includes the installation of a sanitary sewer system that involves a STEP effluent system, a low pressure sewer system, and a package treatment plant. This report encompasses only Phase 1 of the Development. Future phases may occur on the remainder of the property and will be evaluated at that time. The water and sanitary sewer system described herein were designed in accordance with Sections 301 and 401 of the City of Sheridan (City) Public Infrastructure Design Standards (City, 2017) and Chapters 11 and 12 of the WDEQ Water Quality Rules and Regulations (WDEQ, 2021). This report includes a comparison of the proposed system improvements with City and WDEQ requirements and appendices containing supporting information.

LOCATION

The Project is located east of Interstate 90 north of State Highway 336, also known as Wyarno Road. It is bound by Wyarno Road to the south and private property to the north, west, and east. The Project encompasses approximately 38.77 acres within the southern half of the southeast quarter of Section 24, T56N, R84W as shown on Figure 1. The Project and proposed improvements are provided in the PUD plat and construction drawings included in Appendix A.

EXISTING WATER DISTRIBUTION & SANITARY SEWER SYSTEM

POTABLE WATER SYSTEM

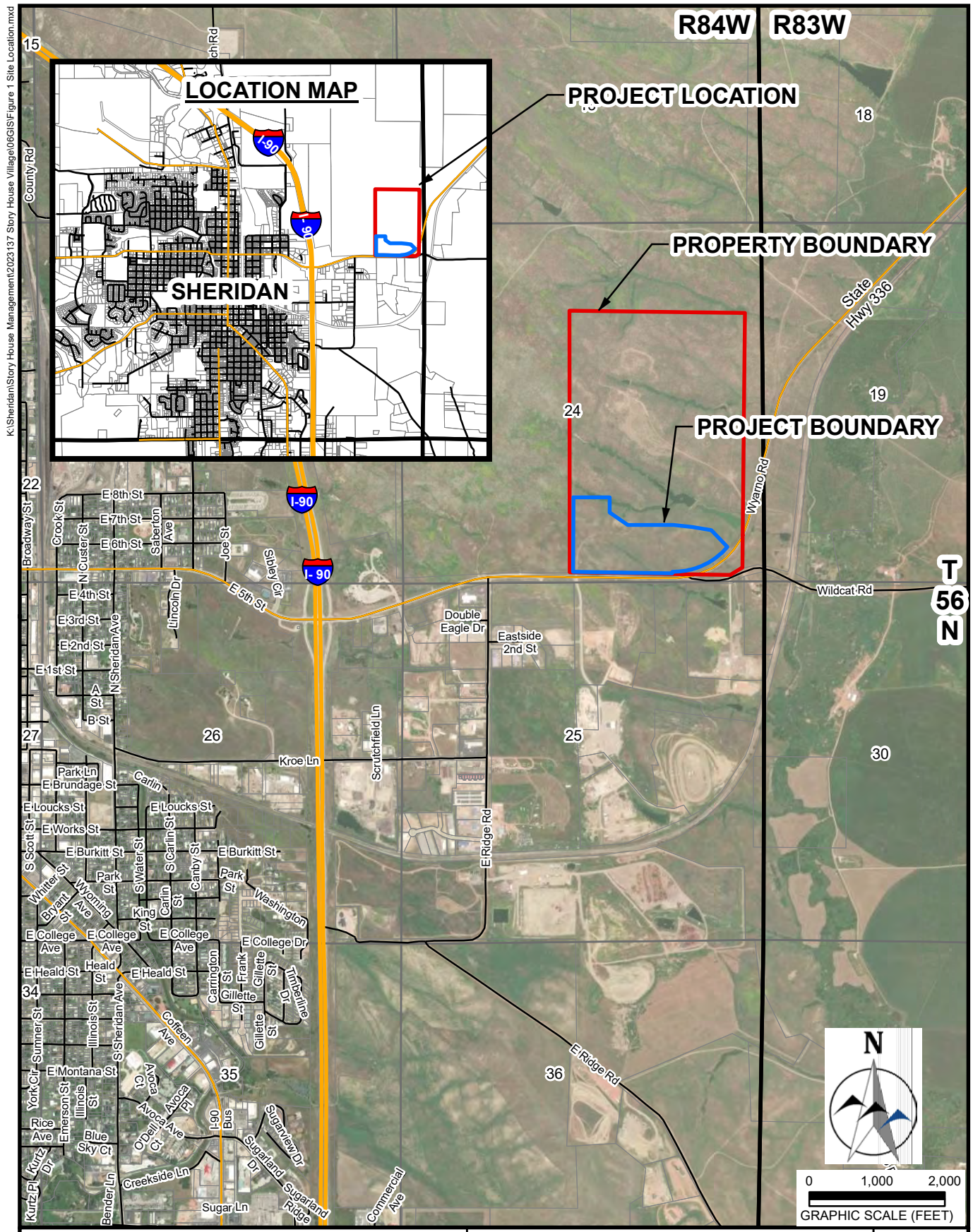
The City's existing water distribution system adjacent to the proposed development consists of a 12-inch PVC water main on Wyarno Road that terminates with a cap just east of Industrial Lane past a fire hydrant.

SANITARY SEWER SYSTEM

Connection to the City's existing sanitary sewer infrastructure will not occur during Phase 1 of the PUD, as such an analysis of the City's system was not completed.

PROPOSED DEVELOPMENT

The proposed development is a planned unit development (PUD) that includes both commercial and residential development. The PUD will include the installation of a potable water system, septic tank effluent pump (STEP) system, a low-pressure sanitary sewer system, and a package treatment plant. Roadways will include curb and gutter, sidewalks, and pathways. All infrastructure will be designed and constructed in accordance with the City of Sheridan's Standard Specifications and Details for Street and Utility Construction, 2016 Edition (City, 2016). The following sections outline the proposed potable water and sanitary sewer system improvements to be constructed as part of the Project. The water and sanitary sewer analysis described herein is based on the following assumptions:



Water and Sewer Plan

GENERAL LOCATION

STORY HOUSE VILLAGE PUD - PHASE 1

DESIGNED BY: SER
DRAWN BY: RAV
CHECKED BY: SER
DATE: 10/02/2023

WWC ENGINEERING
1849 TERRA AVENUE
SHERIDAN, WY 82801
307-672-0761

FIGURE 1

Table 1. PUD Proposed Density

Block	*Acreage*	*Land Use*	*Density*
1	6.86	Multifamily	171 Units
2	2.00	Single Family	17 Units
		Commercial	2000 ft^2
3	2.00	Single Family	17 Units
		Commercial	2000 ft^2
4	4.65	Single Family	15 Units
5	4.55	Single Family	60 Units
6	2.19	Single Family	48 Units
7	5.95	Single Family	62 Units
8	1.61	Commercial	2000 ft^2

Proposed Potable Water System Improvements

Demand Criteria

The following table presents the system demands and the water system's design criteria used in estimating demand for Phase 1 of the proposed PUD only.

Table 2. Demand Criteria

Demand	Per Capital Usage Rates (gpcd)
Average Day	210
Peak *Day*	555
Peak Hour	882
Peaking Factors	
Ave. Day/Peak Day	2.65
Ave. Day/Peak Hour	4.20

Table 2. Demand Criteria (Cont.)

Average Day Demand (gpcd) for Future Population	
Residential	125
Other Design Criteria (gpm for 2 hr)	
Single Family Residential (units less than 3,500 sf)	1,000
All Other Residential	1,500
Commercial	2,500

WATER SYSTEM HYDRAULICS

The City's current WaterCAD® water system model was supplied to WWC by DOWL. It is assumed the model provided was calibrated and in working order for our analysis. The elevation of the ground served by the proposed water main at the Project varies. The Development falls within the City of Sheridan's pressure zone of 4040. The water model was used to analyze existing and proposed hydraulic conditions for the proposed PUD and immediate surrounding area. The results are shown in the following Table 3. Results of the WaterCAD® modeling are provided in Appendix B.

Table 3. System Hydraulics

	2023 Peak Day		2023 Peak Hour	
Location	Flows (gpm)	Pressures (psi)	Flows (gpm)	Pressures (psi)
STA: 0+47	233	53	374	51
STA: 10+06	233	48	371	46
STA: 15+86	2	54	3	51
STA: 18+68	227	49	360	47
STA: 31+62	15	71	23	68
STA: 46+71	94	60	148	58
STA: 65+91	0	54	0	51

The fire flow scenario is the highest flowrate scenario and as required by WDEQ, Chapter 12, the following conditions need to be satisfied:

1. Chapter 12, Section 14.b.i, all water mains, including those not designed to provide fire protection, shall be sized after a hydraulic analysis based on flow demands and pressure requirements. The system shall be designed to maintain a minimum pressure of 20 psi at ground level at all points in the distribution system under all conditions of flow. The normal working pressure in the distribution system shall be not less than 35 psi, and

2. According to Chapter 12, Section 14.b.iii, when fire protection is to be provided, system design shall be such that fire flows can be served.

Fire flows were modeled under a peak day demand condition using peak day demand plus fire flow demand. The resulting pressures at representative points for fire flows are shown in Table 4. Although the property is zoned B-2 Business, a majority of the proposed PUD will consist of single family and multi-family residential dwellings, as such the "All Other Residential" fire flow requirement of 1,500 gpm was used for those blocks of land. As shown in Table 3, the available fire flows meet or exceed 2,500 gpm and 1,500 gpm for commercial and residential requirements respectively with acceptable pressure drops within the system.

The WaterCAD® model analysis was performed by iteratively increasing the flow rate at the proposed fire hydrant until the pressure dropped to 20 psi anywhere within the pressure zone. The maximum available fire flow and residual pressures at each of the pressure zone fire hydrants are summarized in Table 4 below and provided in Appendix B.

Table 4. Fire Flow Data

Location	2023 Pressure (psi)	2023 Fire Flow (gpm)
STA: 5+50*	25	2881
STA: 10+06*	20	2538
STA: 13+90*	32	2677
STA: 23+49	20	2269
STA: 28+31	25	2281
STA: 33+22	21	2184
STA: 37+89	33	2095
STA: 42+88	22	2144
STA: 49+64	21	2286
STA: 60+27	20	1668

*Commercial fire flow of 2,500 gpm required

POTABLE WATER MAIN

The proposed water main will be 12-inch and 8-inch C900 DR18 PVC bell and spigot pipe meeting the requirements of the City's specifications and details. Water service lines will be properly sized depending on the type of structure and in accordance with the latest edition of International Plumbing Code requirements (ICC, 2018). A summary of the WDEQ Chapter 12 requirements and the design parameters for the potable water main is provided in Table 5.

Table 5. Water Main WDEQ Requirements and Design Parameters

WDEQ Chapter 12	*Requirement*	*Design Parameter*
12.a.i.A	Types of commercial pipe approved for water systems include PVC water pipe: ASTM D2241, less than 4" diameter (10 cm); AWWA C900: 4" (10 cm) and larger diameter.	Buried water distribution pipe will be PVC meeting AWWA C900 standards and City Specification Section 02710.
12.b.i	Pressure. All watermains, including those not designed to provide fire protection, shall be sized after a hydraulic analysis based on flow demands and pressure requirements. The system shall be designed to maintain a minimum pressure of 20 psi (138 kPa) at ground level at all points in the distribution system under all conditions of flow. The normal working pressure in the distribution system shall be not less than 35 psi (276 kPa).	Please refer to the hydraulic calculations in this report. The calculations show all applicable flow scenarios and associated pressures and flow rates at fire hydrants are met.
12.b.ii	Diameter. The minimum size of a watermain for providing fire protection and serving fire hydrants shall be 6 inches (0.15 m) diameter when service is provided from 2 directions, or where the maximum length of 6 inches pipe serving the hydrant from 1 direction does not exceed 250 feet, or 8 inches (0.2 m) where service is provided from 1 direction only. Larger size mains shall be provided as necessary to allow the withdrawal of the required fire flow while maintaining the minimum residual pressure of 20 psi (138 kPa).	The water main is 12" and 8" C900 DR18 PVC
12.b.iv	Small mains. Any main smaller than 6 inches (0.15 m) shall be justified by hydraulic analysis and future water use.	All water mains are 12" and 8" C900 DR18 PVC
12.c	Valves. Valves shall be provided on water mains so that inconvenience and sanitary hazards will be minimized during repairs. Valves shall be located at not more than 500-foot (152 m) intervals in commercial districts and at not more than 1 block or 800-foot (244 m) intervals in other districts.	Valves are appropriately located throughout the PUD and are less than 500 feet apart.
12.e.i	Air relief valves. In all transmission lines and in distribution lines 16 inches and larger at high points (where the water pipe crown elevation falls below the pipe invert elevation), provisions shall be made for air relief. Fire hydrants or active service taps may be substituted for air relief valves on 6- and 8-inch lines.	There are no high points in the water main. The fire hydrant at the end of the 8-inch water main will serve as a substituted for an air relief valve.

Table 5. Water Main WDEQ Requirements and Design Parameters

WDEQ Chapter 12	*Requirement*	*Design Parameter*
12.f.i	Excavation. The trench bottom shall be excavated for the pipe bell. All rock shall be removed within 6 inches (15.2 cm) of the pipe. The trench shall be dewatered for all work.	The water main trench shall be installed per City Specification Sections 02221 and 02401.
12.f.ii	Bedding. Bedding shall be designed in accordance with ASTM C12 - types A, B, C - for rigid pipe and ASTM D2321 - types I, II, III - for flexible pipe.	Pipe bedding gradations will adhere to City Specification Section 02221.
12.f.iii	Installation. The pipe shall be joined to assure a watertight fitting. Ductile iron pipe shall be installed in accordance with AWWA 600 and PVC piping shall be installed in accordance with AWWA manual M23.	The water main will be installed to the manufacturer's recommendations. Pressure and leakage testing will be performed on all installed pipe in accordance with City Specification Section 02766.
12.f.iv	Backfill. Backfill shall be performed without disturbing pipe alignment. Backfill shall not contain debris, frozen material, unstable material, or large clods. Stones greater than 3 inches (7.6 cm) in diameter shall not be placed within 2 feet (0.6 m) of pipe. Compaction shall be to a density equal to or greater than the surrounding soil.	Backfill will be performed to meet City Specification Section 02221 and 02710.
12.f.v	Cover. All water mains shall be located to protect them from freezing and frost heave.	The water main will be installed with a minimum of 6 feet of cover to the top of the pipe as required by City Specification Section 02710.
12.f.vi	Blocking. All tees, bends, plugs, and hydrants shall be provided with reaction blocking, tie rods, or joints designed to prevent movement.	The water main will be installed with thrust blocking and/or joint restraints as required by City Specification Section 02710.
12.f.vii	Pressure and leakage testing. All types of installed pipe shall be specified to be pressure tested and leakage tested in accordance with AWWA Standard C600.	The water main will have pressure and leakage testing as required by City Specification Section 02766.
12.f.viii	Disinfection. All new, cleaned, repaired, or reused watermains shall be specified to be disinfected in accordance with AWWA Standard C601. Specifications shall include detailed procedures for the adequate flushing, disinfection, and microbiological testing of all watermains.	All water mains will have disinfection as required by City Specification Section 02766.

Table 5. Water Main WDEQ Requirements and Design Parameters

WDEQ Chapter 12	*Requirement*	*Design Parameter*
12.g.i	Horizontal and vertical separation from sewer lines. Minimum horizontal separation shall be 10 feet (3 m) where the invert of the watermain is less than 1.5 feet (0.46 m) above the crown of the sewer line. Minimum vertical separation shall be 1.5 feet (0.46 m) at crossings. Joints in sewers at crossings shall be located at least 10 feet (3 m) from water mains. The upper line of a crossing shall be specially supported. Where vertical and/or horizontal clearances cannot be maintained, the sewer or water line shall be placed in a separate conduit pipe.	Separation with sewers will be maintained as required by City Specification Section 02710. A minimum of 10 feet horizontal separation and 18 inches vertical separation will be maintained, and water main crossings shall be located so both water and sewer line joints are as far as possible from each other. Where 18 inches of separation cannot be met, the pipe will be encased in flowable fill.
12.h.ii	Underwater crossings. A minimum cover of 2 feet (0.61 m) shall be provided over the pipe. When crossing water courses which are greater than 15 feet (4.6 m) in width additional provisions shall be provided as required.	There are no proposed underwater crossings.
12.i	Cross-connections.	There will be no connections from the water main until the water enters the existing water distribution network.

Proposed Sanitary Sewer System Improvements

The Project will consist of installing a STEP effluent system, a low-pressure sanitary system, and a package treatment plant. Each lot will contain a processing tank that stores and filters solids, allowing the system to pump liquid only effluent. The liquid only effluent is pumped to the sanitary sewer collection mains. These small diameter, HDPE, low pressure mains route the partially treated water to a package treatment plant located northeast of Block 7 in Phase 1 of the PUD. Disinfected effluent from the package treatment plant is then discharged under the authority of a WYPDES permit. Plan and profile sheets detailing the sanitary sewer main are included in the construction drawings in Appendix A. Calculations to support the design of the sanitary sewer systems are provided in Appendix C. Additional information on the sanitary sewer system are included in Appendix D. The following sections describe the proposed improvements.

Sanitary Sewer Main & Services

The proposed sanitary sewer main system serving the PUD consists of 6-inch SDR 11 HDPE main lines. Sewer services to each lot will be properly sized depending on the type of structure and in accordance with current IPC requirements. The sewer services will consist of a small diameter service lateral from the main line to the tank that includes a tapped saddle, a ball valve, and a check valve. Lot owners will connect their buildings to the tank in accordance with current IPC requirements. Each tank contains a pump sized for the proposed development. A summary of the WDEQ Chapter 11 requirements and the design parameters for the sanitary sewer main is provided in Table 6.

Design Criteria

Table 6 presents the sanitary sewer design criteria used in estimating demand for the proposed PUD from WDEQ Chapter 11 regulations and Section 401 of the City's Design Standards.

Table 6. Sanitary Sewer Design Criteria

Land Use	*Unit Density (Dwellings/acre)*	*Equivalent Population (Persons/acre)*
Single Family Residential	3.0	6.6
Multi-family Residential	12.0	26.5
Commercial		18.0
Slope, Flow & Peaking Factors		
Design Slope = 0.40 ft/100 ft (8" Pipe) and 0.22 ft/100 ft (12" Pipe)		
Avg. Per Capita Daily (gpd) = 100		
Avg. Day/Peak Day = 2.43		
Avg. Day/Peak Hour = 2.74		

SANITARY SEWER SYSTEM HYDRAULICS

The design criteria in Table 6 were used to analyze, size, and design the sanitary sewer system for the PUD. Pressure zones were created and modeled for the maximum number of pumps in simultaneous operation based on the number of pumps connected in the particular zone. The zone analysis results are shown in Table 7 with calculations provided in Appendix C. As evidenced by the hydraulic calculations, 6" HDPE sanitary sewer mains have more than sufficient capacity to handle sanitary flows from the PUD.

Table 7. Sanitary Sewer System Pressure Zones

Zone No.	*Connected to Zone*	*No. Pumps in Zone*	*Cumulative Pumps in Zone*
1	3	6	6
2	3	9	9
3	5	30	45
4	5	19	19
5	7	3	67
6	7	27	27
7	7	2	96

A summary of the WDEQ Chapter 11 requirements and the design parameters for the sanitary sewer system is provided in Table 8.

Table 8. Sanitary Sewer System Design

WDEQ Chapter 11	*Requirement*	*Design Parameter*
Section 9	Design of Sewers.	The sanitary sewer includes the design of a low-pressure sanitary sewer system.
9.a	Separate sewers. Separate sewers shall be provided for collection of stormwater and wastewater. Roof, areaway, drive, or foundation drains shall not be connected to sanitary sewers.	This project includes design of separate sanitary sewer and stormwater conveyance systems that do not connect.
9.b	Pipe materials.	Sanitary sewer system pipes will be a 6" SDR 11 HDPE pipe meeting City Standard Specification 02712.
9.b.i	Wastewater characteristics. Pipe materials shall resist acid and alkaline solutions, organic solvents and other wastewater constituents and environmental conditions encountered.	The sanitary sewer system pipe is SDR 11 HDPE pipe meeting City Standard Specification 02712, which meets these standards.

Table 8. Sanitary Sewer System Design

WDEQ Chapter 11	*Requirement*	*Design Parameter*
9.b.ii	Pipe loadings. Pipe materials shall be chosen, and the pipeline shall be designed to withstand all trench and superimposed surface live loads with a minimum factor of safety. Rigid pipes shall have a minimum factor of safety of 1.5, and flexible pipes shall have a minimum factor of safety of 1.25.	Sanitary sewer pipe will be installed in accordance with City Standard Specification 02712.
9.b.iii	Soil characteristics. Pipe materials shall be chosen to resist corrosion due to aggressive soil characteristics by the soil it contacts. Iron or steel pipe shall be protected from corrosion with polyethylene encasement or cathodic protection.	Sanitary sewer pipe will be SDR 11 HDPE pipe, which is highly corrosion resistant.
9.b.iv	Joints. Pipe joints shall be flexible, durable, and designed to minimize infiltration/exfiltration and exclude roots.	SDR 11 HDPE pipe joints are flexible, durable, and designed to minimize infiltration/exfiltration and exclude roots.
9.b.v	Performance tests. Piping shall be subject to leakage tests. Leakage tests shall be infiltration, exfiltration, or air tests.	All proposed piping will have pressure and leakage testing as required by City Specification Section 02712.
9.c	Collection piping design, construction, and testing. A sewage collection line is any conduit that carries wastewater that originates from two (2) or more separate buildings or from a single building that generates more than 2,000 gpd (7.6 m3/d) of average daily flow.	The proposed sewer system meets this criterion.
9.c.ii	Force mains and pressure sewers	The proposed sewer system is designed as a pressure sewer system.
9.c.ii.A	Depth. Force mains shall be located to protect them from freezing and frost heave.	All sanitary sewer gravity mains have a minimum of six (6) feet of cover which will protect from freezing and frost heave.
9.c.ii.B	Size. Force mains shall be four (4) inches diameter or greater. Pressure sewer collection system piping shall be one (1) inch minimum.	The proposed sanitary sewer system has 6” diameter pipes and collection system piping shall be 1” minimum.
9.c.ii.C	Velocity. Minim velocity shall be 2.5 fps.	Velocity calculations are provided in Appendix B, which meet the minimum and maximum velocity requirements.

Table 8. Sanitary Sewer System Design

WDEQ Chapter 11	*Requirement*	*Design Parameter*
9.c.ii.D	Air release. Air release facilities shall be provided at the high point in the piping whenever the pipe crown elevation falls below the pipe invert elevation. Access to air release manholes shall not be in traffic-ways.	Air release valves will be included in the proposed sanitary sewer system. Air release valves will be enclosed in manholes fit to be in traffic-ways.
9.c.ii.E	Cleanouts. Cleanouts shall be provided at 400-foot maximum spacing in pressure piping four-inch diameter or less.	Cleanouts are not required as the proposed system has pressure piping diameters of 6". Flushing manholes will be provided at all dead ends and additional manholes have been designed to improve the ease of cleaning.
9.c.ii.F	Pressure sewer systems. Pressure sewer collection systems shall be preceded by grinder pumps or septic tanks.	Septic tanks on each lot will precede the pressure sewer collection system.
9.c.ii.G	Pressure sewer collection system pumps. Pumps shall be provided with isolation and check valves. IF a septic tank is not provided before the pump, a grinder pump shall be required. Pump holding sumps shall not be steel, iron, or coated metal. The sump chamber shall be fifty (50) gallon volume, minimum.	Isolation and check valves will be provided on each service lateral. The tanks will be 1000 gallon volume minimum and made of a polymer material.
9.c.iii	Service connections. A service connection is any conduit that carries wastewater that is not defined as a sewage collection line. Service connections shall conform to the requirements for sewage collection lines (Section 9(c)(i) and (ii)) with the following modifications	Sanitary sewer service connections will be sized in accordance with the current IPC and City Design Standard Section 401 requirements and installed following City Specification Section 02712.
9.c.iii.A	Size: minimum size shall be four (4) inches (10.2 cm).	Sanitary sewer service lines will be a minimum of 4-inches.
9.c.iii.B	Slope: minimum slope shall be 2 feet/100 feet (2 m/100 m).	Sanitary sewer service slopes will be at least 2 ft/100 ft.
9.c.iii.C	Flow: flow shall be determined from a fixture unit count and the sewage size based on flowing full.	Sanitary sewer service lines will be sized in accordance with latest edition of IPC requirements.
9.c.iii.D	Connections: all service connections to sewage collection lines shall be made with a wye or tee for new construction and a tapping saddle for connection to existing collection lines.	Sanitary sewer service connections will be installed following City Specification Section 02712 for tapping saddles.

Table 8. Sanitary Sewer System Design

WDEQ Chapter 11	*Requirement*	*Design Parameter*
9.d.i	Manhole Location. Manholes shall be located at all changes in pipe size, vertical or horizontal alignment, pipe intersections, and the end of lines.	Manholes are located at end of lines, pipe intersections, and at intervals suitable for cleanouts.
9.d.ii	Size. Minimum manhole interior size is four (4) feet (1.2 m).	The interior size of all proposed manholes are four (4) feet.
9.d.iii	Drop manhole. Drop manholes must be constructed where the change in elevation between two lines is greater than twenty-four (24) inches (0.6 m). Concrete encasement shall be provided around the drop pipe.	No drop manholes are proposed.
9.d.iv	Invert. Manhole inverts shall be constructed to conform to the shape of the sewer. The bench shall drain to the invert. Connections to the manhole shall be watertight and allow differential settlement between the manhole and pipe. Minimum fillet height shall be one half of the pipe diameter.	Manhole inverts will be constructed as shown in the details. Manhole connections will be constructed per these requirements.
9.d.v	Cover. The manhole cover shall be suitable to withstand all loads, including impact loading without deformation, slip or rattle. The manhole cover shall be watertight in areas subject to flooding and a bolt-down type in areas subject to unauthorized dumping or vandals.	The manhole cover will be suitable to withstand all loads. No manholes are proposed in areas subject to flooding or unauthorized dumping or vandals.
9.d.vi	Steps. Access to manholes shall be with portable ladders, or with cast iron manhole steps spaced at sixteen (16) inches (40.6 cm) maximum.	Access to the manholes will be provided with portable ladders with steps spaced at sixteen (16) inches maximum.
9.d.vii	Materials. Manholes shall be constructed watertight and durable using cast-in-place concrete, or precast concrete with gasketed joints. Where precast concrete bases are used, the first twelve (12) inches (30 cm) of wall will be monolithically cast with the base.	Manholes will be constructed as specified.
9.d.viii	Access. A twenty-two (22) inch (56 cm) minimum diameter clear opening shall be provided on all manholes. All manholes shall be located to be accessible by motorized equipment for maintenance.	All proposed manholes will have a twenty-four (24) inch diameter clear opening. All proposed manholes are located in a place accessible by motorized equipment.
9.f	Potable water supply protection.	

Table 8. Sanitary Sewer System Design

WDEQ Chapter 11	*Requirement*	*Design Parameter*
9.f.i	Cross connections. There shall be no cross-connections between sewer lines and potable water lines.	Cross connections are not proposed for this Project.
9.f.ii	Horizontal and vertical separation from water mains. Minimum horizontal separation shall be ten (10) feet (3 m) where the water main is less than 1.5 feet (0.46 m) above the elevation of the sewer. Minimum vertical separation shall be 1.5 feet (0.46 m) at crossing. Joints in sewers at crossing shall be located at least ten (10) feet (3 m) from water mains. The upper line of a crossing shall be specially supported. Where vertical and/or horizontal clearances cannot be maintained, the sewer shall be placed in a separate conduit pipe.	Horizontal and vertical separation from water mains and water services will be adhered to at all times and installed in accordance with City Specification Section 02645, 02710, and 02712.
Section 10	Pumping Stations	Individual septic tank effluent pumps are designed to meet WDEQ's Section 10 and City of Sheridan Standards.
10.a.i	Total dynamic head. The total dynamic head rating of pumping units shall be based on pipe friction, pressure losses from piping entrances, exits, appurtenances, and static head at the rated flow.	Total dynamic head was designed to meet these requirements.
10.a.ii	Grit. Where no grit removal is provided ahead of the pumping station, equipment and piping design shall minimize the deleterious effects of grit in the sewage.	Equipment and piping design minimized the deleterious effects of grit in the sewage.
10.a.iv	Pump cycle time. Intermittently operated pumps shall be designed to start no more often than once every ten (10) minutes at the minimum operating interval.	Pumps are designed to start no more often than once every ten minutes.
10.c.vi	Grinder pumps. Grinder pumps shall be limited to design flows equivalent to 25 residential connections.	Tanks and pumps will be designed to limit flows equivalent to 25 residential connections.
Section 11	General Treatment Plant Considerations	A treatment plant will be included in the proposed sanitary sewer system.

Table 8. Sanitary Sewer System Design

WDEQ Chapter 11	*Requirement*	*Design Parameter*
11.a	Surface water protection. Discharges to surface waters shall meet or exceed quality limitations in the National Pollution Discharge Elimination System permit. Plant configurations and piping shall be arranged to avoid the bypassing of process units that could result in inadequately treated sewage reaching the receiving surface water.	A WYPDES permit will be obtained to discharge to surface waters within or exceeding quality limitations. Piping shall be arranged to avoid bypassing process units.
11.b	Groundwater protection. Seepage and/or discharge to groundwater shall comply with Chapter 8 of the Water Quality Regulations. Plan configurations and piping shall be arranged to avoid the bypass of process units that could result in inadequate treated sewage reaching the groundwater.	Discharge will comply with Chapter 8 and piping shall be arranged to avoid bypassing processing units.
11.c.i	Siting requirements. Isolation. Treatment facilities shall be located to minimize public and private nuisances and health hazards on inhabited areas or residential areas. Where treatment plant siting does potentially affect inhabited areas, appropriate measures to minimize nuisances or hazards shall be incorporated in the design.	The packaged treatment plant will be isolated to minimize public and private nuisances and health hazards.
11.c.ii	Flood protection. All treatment process structures, mechanical equipment, and electrical equipment shall be protected from the 100-year flood. The treatment facilities shall remain fully operational and accessible during the 25-year flood.	The packaged treatment plant will be protected from the 100-year flood and fully operational and accessible during the 25-year flood.

REFERENCES

City of Sheridan, Public Works Department, 2016, City of Sheridan Standard Specifications & Details for Street and Utility Construction, 2016 Edition. Available on the Internet as of December 2023: https://www.sheridanwy.gov.

_____, 2017, Public Infrastructure Design Standards. Available on the Internet as of December 2023: https://www.sheridanwy.gov.

International Code Council, 2018, 2018 International Plumbing Code. Available on the Internet as of December 2023: https://codes.iccsafe.org/content/IPC2018P3

Wyoming Department of Environmental Quality, Water Quality Division, July 2023, Wyoming Water Quality Rules and Regulations, Chapter 12, Design and Construction Standards for Public Water Supplies. Available on the Internet as of December 2023: https://rules.wyo.gov/Search.aspx?mode=1.

_____, June 2018, Wyoming Water Quality Rules and Regulations, Chapter 11, Design and Construction Standards for Sewerage Systems, treatment works, disposal systems or other facilities capable of causing or contributing to pollution and mobile home park and campground sewerage and public water supply distribution systems. Available on the Internet as of December 2023: https://rules.wyo.gov/Search.aspx?mode=1.

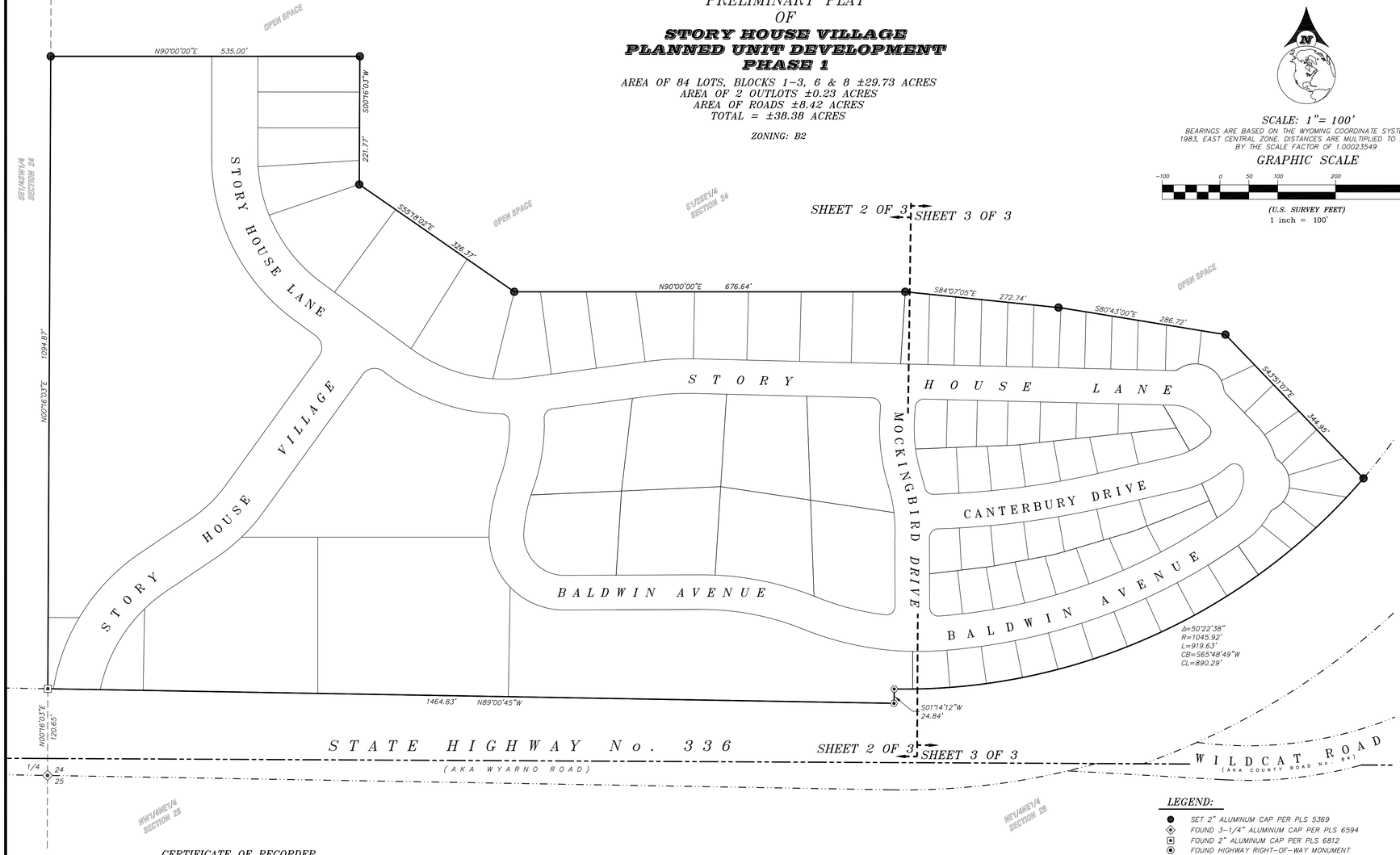
APPENDIX A

Preliminary Plat and Construction Drawings

PRELIMINARY PLAT
OF
STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1

AREA OF 84 LOTS, BLOCKS 1-3, 6 & 8 ±29.73 ACRES
AREA OF 2 OUTLOTS ±0.23 ACRES
AREA OF ROADS ±8.42 ACRES
TOTAL = ±38.38 ACRES

ZONING: B2



SCALE: 1"= 100'

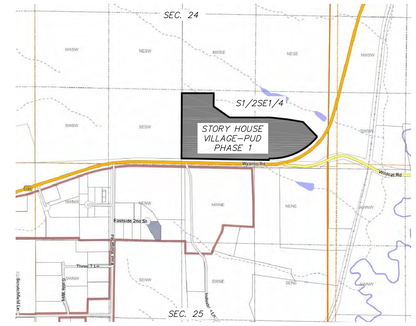
BEARINGS ARE BASED ON THE WYOMING COORDINATE SYSTEM NAD 1983, EAST CENTRAL ZONE. DISTANCES ARE MULTIPLIED TO SURFACE BY THE SCALE FACTOR OF 1.00023549

GRAPHIC SCALE

-100 0 50 100 200 400

(U.S. SURVEY FEET)
1 inch = 100'

T56N R84W



LOCATION MAP

NO TRUE SCALE

CERTIFICATE OF DEDICATION

KNOWN ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED STORY HOUSE PROPERTY COMPANY LLC BEING THE OWNER(S), PROPRIETORS OR PARTIES OF INTEREST IN THE LAND SHOWN ON THIS PLAT, DO HEREBY STATE:

THAT THE FOREGOING PLAT DESIGNATED AS ***STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1*** IS A SUBDIVISION OF THE S1/2SE1/4, SECTION 24, TOWNSHIP 56 NORTH, RANGE 84 WEST 6TH PRINCIPAL MERIDIAN, CITY OF SHERIDAN, SHERIDAN COUNTY, WYOMING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

Commencing at the quarter corner of said Section 24 (monumented with a 3¼" Aluminum Cap per PLS 6594); thence N00°16'03"E, 120.65 feet along the west line of said S½SE¼ to a 2" Aluminum Cap per PLS 6812 being the POINT OF BEGINNING this tract;
thence N00°16'03"E, 1094.87 feet along said west line to a 2" Aluminum Cap per PLS 5369;
thence N90°00'00"E, 535.00 feet to a 2" Aluminum Cap per PLS 5369;
thence S00°16'03"W, 221.77 feet to a 2" Aluminum Cap per PLS 5369;
thence S55°18'02"E, 326.37 feet to a 2" Aluminum Cap per PLS 5369;
thence N90°00'00"E, 676.64 feet to a 2" Aluminum Cap per PLS 5369;
thence S84°07'05"E, 272.74 feet to a 2" Aluminum Cap per PLS 5369;
thence S80°43'00"E, 286.72 feet to a 2" Aluminum Cap per PLS 5369;
thence S43°51'07"E, 344.95 feet to a 2" Aluminum Cap per PLS 5369, lying on the north right of way line of the Wyarno Road (AKA State Highway No. 336);
thence along said north right of way line, through a curve to the right, having a central angle of 50°22'38", a radius of 1045.92 feet, an arc length of 919.63 feet, a chord bearing of S65°48'49"W and a chord distance of 890.29 feet to a standard WYDOT right of way monument at the end of said curve to the right;
thence along said north right of way line S01°14'12"W, 24.84 feet to a standard WYDOT right of way monument;
thence N89°00'45"W, 1464.83 feet along said north right of way line to the POINT OF BEGINNING.

SAID SUBDIVISION CONTAINS ***±38.38 ACRES*** OF LAND, MORE OR LESS.

STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1, AS IT IS DESCRIBED AND AS IT APPEARS ON THIS PLAT, IS MADE WITH THE FREE CONSENT AND IN ACCORDANCE WITH THE DESIRES OF THE UNDERSIGNED OWNER(S) AND PROPRIETORS; AND THAT THIS IS A CORRECT PLAT OF THE AREA AS IT IS DIVIDED INTO LOTS, OUTLOTS, STREETS AND EASEMENTS.

THE UNDERSIGNED OWNER(S) OF THE LAND SHOWN AND DESCRIBED ON THIS PLAT DO HEREBY DEDICATE TO THE CITY OF SHERIDAN AND ITS LICENSEES FOR PUBLIC USE FOR THE INDICATED PURPOSES, ALL STREETS, EASEMENTS AND OTHER PUBLIC LANDS, AS INDICATED, AND NOT ALREADY OTHERWISE DEDICATED FOR PUBLIC USE.

UTILITY EASEMENTS, AS DESIGNATED ON THE PLAT, ARE HEREBY GRANTED TO THE CITY OF SHERIDAN AND IT'S LICENSEES FOR PUBLIC USE FOR THE PURPOSE OF INSTALLING, REPAIRING, REINSTALLING, REPLACING AND MAINTAINING SANITARY SEWERS, STORM SEWERS, WATER LINES, GAS LINES, ELECTRIC LINES, TELEPHONE LINES, CABLE TV LINE, AND OTHER FORMS AND TYPES OF PUBLIC UTILITIES NOW OR HEREAFTER GENERALLY UTILIZED BY THE PUBLIC.

OUTLOTS ARE DRAINAGE EASEMENTS, OTHER EASEMENTS (AS SHOWN & DEFINED), AND OPEN SPACES WHICH ARE OWNED & MAINTAINED BY THE HOMEOWNER'S ASSOCIATION.

CERTIFICATE OF RECORDER

STATE OF WYOMING :ss
COUNTY OF SHERIDAN

THIS PLAT WAS FILED FOR RECORD IN THE OFFICE OF THE CLERK AND RECORDER AT_____ O'CLOCK __M.,

THIS_____, DAY OF_____, 20_____, AND IS RECORDED IN PLAT BOOK _____, PAGE _____

_____ STAMP RECEIVING NUMBER _____
COUNTY CLERK

CITY OF SHERIDAN CERTIFICATES OF APPROVAL

REVIEWED BY THE CITY OF SHERIDAN PLANNING COMMISSION THIS_____ DAY OF _____, _____.

_____ _____
ATTEST: VICE-CHAIRMAN CHAIRMAN

_____
DIRECTOR OF PUBLIC WORKS

APPROVED BY THE CITY COUNCIL OF THE CITY OF SHERIDAN, WYOMING, THIS___DAY OF_____, ____.

_____ _____
ATTEST: CITY CLERK MAYOR

DECLARATION EXTINGUISHING PREVIOUS EASEMENTS

1) ALL EARLIER EASEMENTS OR PORTIONS THEREOF ENCOMPASSED BY THE BOUNDARY OF THIS PLAT ARE HEREBY EXTINGUISHED UNLESS NOTED OTHERWISE.

2) EXISTING UTILITIES PLACED IN PREVIOUS RECORDED EASEMENTS WITHIN THE BOUNDARY OF THIS PLAT HAVE SENIOR RIGHTS AND ARE NOW PROTECTED BY EASEMENTS OR ROADS AS SHOWN ON THIS PLAT.

SURVEYOR'S CERTIFICATE

STATE OF WYOMING :ss
COUNTY OF SHERIDAN

I, THONE STEWART, DO HEREBY STATE THAT I AM A REGISTERED LAND SURVEYOR, LICENSED UNDER THE LAWS OF THE STATE OF WYOMING, THAT THIS PLAT IS A TRUE, CORRECT AND COMPLETE PLAT OF ***STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1,*** AS LAID OUT, PLATTED, DEDICATED AND SHOWN HEREON, THAT THIS PLAT WAS MADE FROM AN ACCURATE SURVEY OF SAID PROPERTY CONDUCTED BY ME OR UNDER MY DIRECT SUPERVISION AND CORRECTLY SHOWS THE LOCATION AND DIMENSIONS OF ALL LOTS, EASEMENTS AND STREETS OF SAID SUBDIVISION IN COMPLIANCE WITH THE CITY OF SHERIDAN REGULATIONS GOVERNING THE SUBDIVISION OF LAND.

Professional Land Surveyor THONE STEWART Date: WYOMING

PRELIMINARY DRAFT

"PLAT IS VALID ONLY IF PRINT HAS ORIGINAL SIGNATURE OF SURVEYOR SIGNED AND DATED"

LEGEND:

- SET 2" ALUMINUM CAP PER PLS 5369
- FOUND 3-1/4" ALUMINUM CAP PER PLS 6594
- FOUND 2" ALUMINUM CAP PER PLS 6812
- FOUND HIGHWAY RIGHT-OF-WAY MONUMENT
- BOUNDARY LINE
- LOT LINE
- SECTION LINE
- INTERIOR SECTION LINE
- HIGHWAY RIGHT-OF-WAY

IN TESTIMONY WHEREOF:

ALL RIGHTS UNDER AND BY VIRTUE OF THE HOMESTEAD EXEMPTION LAWS OF THE STATE OF WYOMING ARE HEREBY WAIVED AND RELEASED.

THE UNDERSIGNED HAVE CAUSED THESE PRESENTS TO BE SIGNED THIS_____ DAY OF _____

FP STORY HOUSE PROPERTY COMPANY, LLC

BY:_____
, MEMBER

STATE OF WYOMING :ss
COUNTY OF SHERIDAN

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BY xxxxxxxxxxxx BEFORE ME THIS DAY OF _____, _____.

WITNESS MY HAND AND OFFICIAL SEAL. MY COMMISSION EXPIRES _____

_____
NOTARY PUBLIC

SIGNED BY AFFIDAVIT

BY: SECURITY STATE BANK ("LIEN HOLDER"), SEE AFFIDAVIT FILED AT THE SHERIDAN COUNTY COURTHOUSE.
DOCUMENT NUMBER: _____

PRELIMINARY PLAT
OF
STORY HOUSE VILLAGE PLANNED UNIT DEVELOPMENT PHASE 1

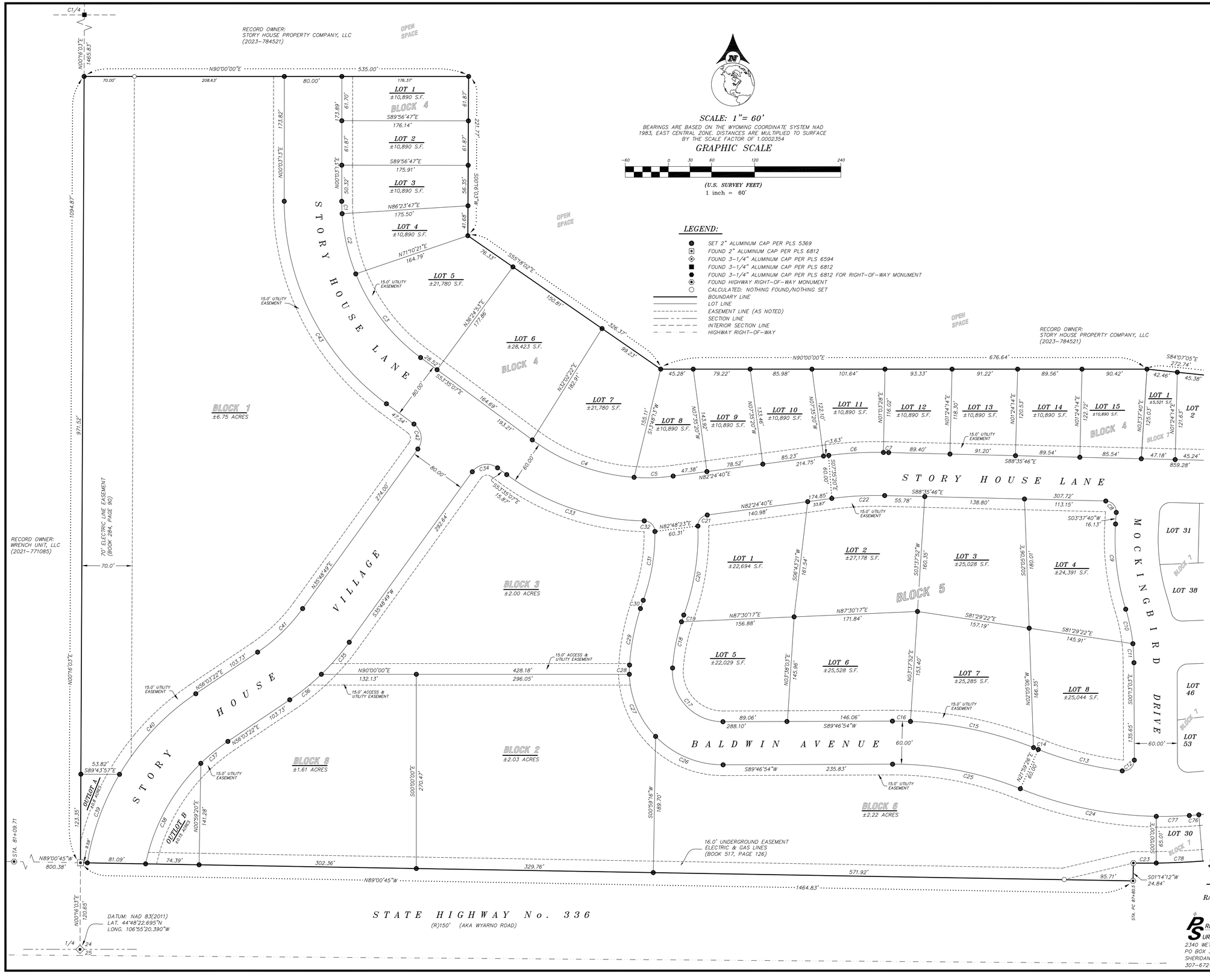
SITUATED IN THE S/2SE1/4 OF SECTION 24, TOWNSHIP 56 NORTH, RANGE 84 WEST, 6TH PRINCIPAL MERIDIAN, SHERIDAN COUNTY, WYOMING

DEVELOPER: STORY HOUSE PROPERTY COMPANY, LLC
40 EAST WORKS STREET, SUITE 18
SHERIDAN WY, 82801

PRESTFELDT SURVEYING
2340 WETLANDS DR., SUITE 100
PO BOX 3082
SHERIDAN, WY 82801
307-672-7415

CLIENT: WWC ENGINEERING
1849 TERRA AVENUE
SHERIDAN, WY 82801

JN: 2023-058
DN: 2023-058PUD
PF: T2023-058
REVIEWED BY: JSP
DECEMBER 19, 2023



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C2	18°19'08"	270.00'	86.33'	S12°45'47"E	85.96'
C3	31°39'47"	270.00'	149.21'	S37°45'14"E	147.32'
C4	32°26'57"	270.00'	152.91'	S69°48'36"E	150.88'
C5	11°33'16"	270.00'	54.45'	N88°11'18"E	54.36'
C6	8°38'49"	530.00'	79.99'	N86°44'04"E	79.91'
C7	0°20'46"	530.00'	3.20'	S88°46'09"E	3.20'
C8	92°13'26"	15.00'	24.14'	N42°29'03"W	21.62'
C9	20°53'28"	329.56'	120.17'	S06°49'04"E	119.50'
C10	17°02'45"	254.21'	75.63'	N08°44'25"W	75.35'
C11	17°02'45"	254.21'	75.63'	N08°44'25"W	75.35'
C12	97°08'28"	15.00'	25.43'	N48°21'11"E	22.49'
C13	15°04'01"	470.00'	123.60'	S75°32'35"E	123.24'
C14	0°28'37"	530.00'	4.41'	N68°14'52"W	4.41'
C15	19°00'43"	530.00'	175.87'	N77°59'33"W	175.06'
C16	2°43'11"	530.00'	25.16'	N88°51'30"W	25.16'
C17	94°08'19"	70.00'	115.01'	S43°08'56"E	102.50'
C18	13°56'56"	270.00'	65.73'	S10°53'41"W	65.57'
C19	2°06'21"	270.00'	9.92'	S18°55'20"W	9.92'
C20	21°54'40"	330.00'	126.20'	N09°01'10"E	125.43'
C21	84°20'49"	15.00'	22.08'	S40°14'15"W	20.14'
C22	8°59'34"	470.00'	73.77'	S86°54'27"W	73.69'
C23	1°44'42"	1045.92'	31.86'	S89°52'13"E	31.85'
C24	20°59'06"	530.00'	194.12'	S78°30'07"E	193.03'
C25	22°12'32"	470.00'	182.18'	N79°06'50"W	181.04'
C26	46°08'30"	130.00'	104.69'	S67°08'51"E	101.89'
C27	42°20'16"	130.00'	96.06'	S22°54'28"E	93.89'
C28	5°39'33"	130.00'	12.84'	S01°05'26"W	12.84'
C29	13°56'56"	330.00'	80.34'	S10°53'41"W	80.14'
C30	2°06'21"	330.00'	12.13'	S18°55'20"W	12.13'
C31	20°44'18"	270.00'	97.73'	N09°36'21"E	97.19'
C32	88°27'13"	15.00'	23.16'	N44°59'24"W	20.93'
C33	35°37'54"	330.00'	205.22'	S71°24'04"E	201.93'
C34	90°36'04"	25.00'	39.53'	S81°06'51"W	35.54'
C35	20°14'33"	328.00'	115.88'	N45°56'05"E	115.28'
C36	20°14'33"	328.00'	115.88'	N45°56'05"E	115.28'
C37	101°3'50"	272.00'	48.57'	S50°56'27"W	48.50'
C38	34°08'12"	272.00'	162.06'	S28°45'26"W	159.67'
C39	21°28'22"	352.00'	131.92'	S19°58'25"W	131.15'
C40	25°20'46"	352.00'	155.72'	S43°22'59"W	154.45'
C41	20°14'33"	248.00'	87.62'	N45°56'05"E	87.16'
C42	89°23'56"	25.00'	39.01'	N08°53'09"W	35.17'
C43	53°38'20"	350.00'	327.66'	S26°45'57"E	315.83'

PRELIMINARY PLAT
OF
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SITUATED IN THE S/2SE1/4 OF SECTION 24, TOWNSHIP 56 NORTH, RANGE 84 WEST, 6TH PRINCIPAL MERIDIAN, SHERIDAN COUNTY, WYOMING

DEVELOPER: STORY HOUSE PROPERTY COMPANY, LLC
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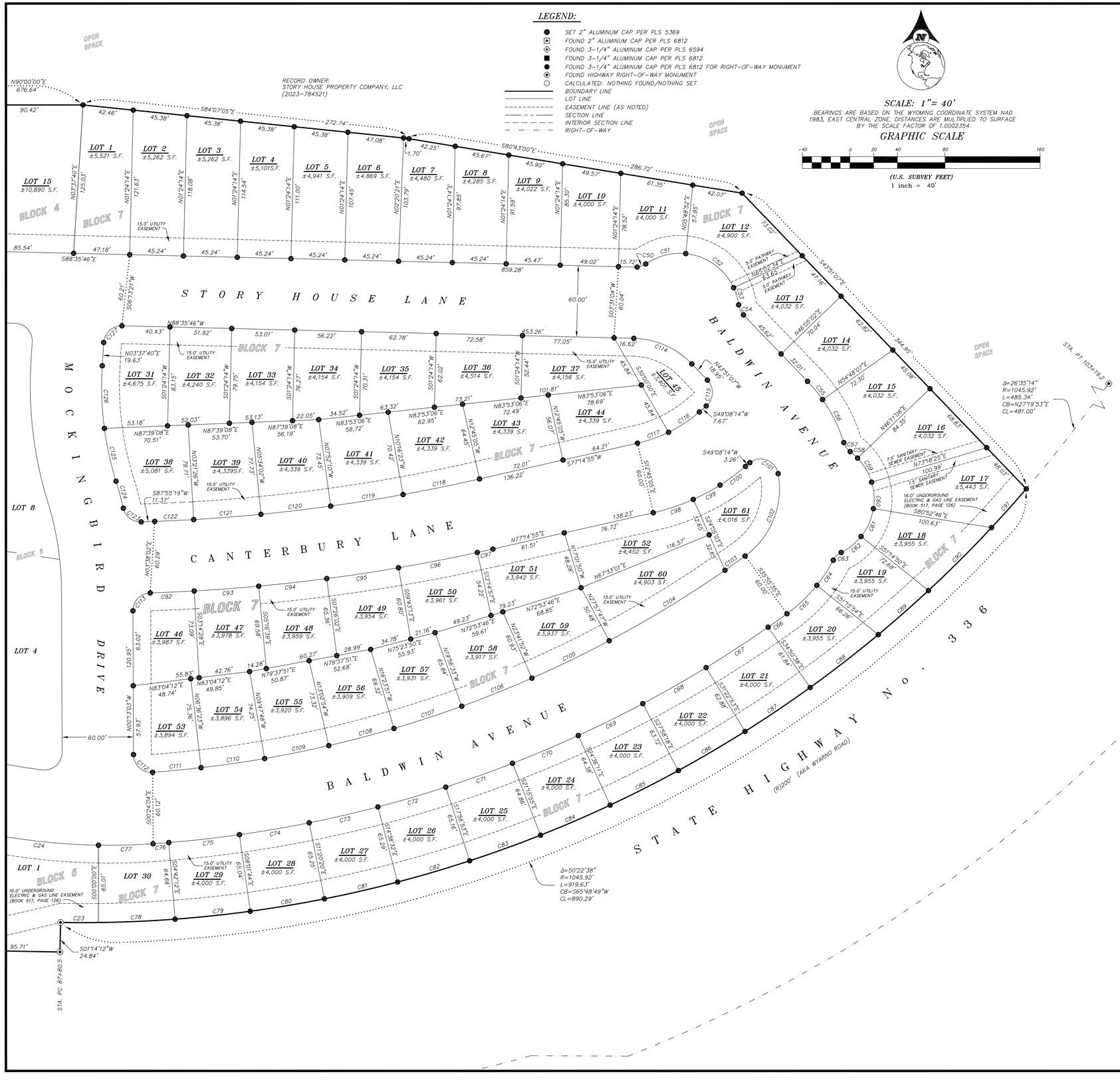

CURVE TABLE					
CURVE	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C50	29°51'54"	15.00'	7.82'	N70°06'35"E	7.73'
C51	40°38'14"	50.00'	35.46'	S75°29'45"W	34.72'
C52	59°13'43"	50.00'	51.69'	N54°34'17"W	49.42'
C53	17°19'27"	50.00'	15.12'	N16°17'42"W	15.06'
C54	36°16'58"	15.00'	9.50'	S25°46'28"E	9.34'
C55	8°46'55"	130.00'	19.93'	N39°35'21"W	19.91'
C56	17°50'51"	130.00'	40.49'	N26°16'27"W	40.33'
C57	35°59'59"	15.00'	9.42'	S35°21'02"E	9.27'
C58	9°32'09"	50.00'	8.32'	N48°34'57"W	8.31'
C59	27°07'16"	50.00'	23.67'	N30°15'14"W	23.45'
C60	25°48'49"	50.00'	22.53'	N03°47'11"W	22.34'
C61	29°37'56"	50.00'	25.86'	N23°56'12"E	25.57'
C62	24°49'08"	50.00'	21.66'	N51°09'45"E	21.49'
C63	35°59'59"	15.00'	9.42'	S45°34'19"W	9.27'
C64	11°09'47"	130.00'	25.33'	N33°09'13"E	25.29'
C65	15°20'19"	130.00'	34.80'	N46°24'15"E	34.70'
C66	1°04'57"	1030.00'	19.46'	N54°36'53"E	19.46'
C67	3°27'45"	1030.00'	62.24'	N56°53'14"E	62.24'
C68	3°24'35"	1030.00'	61.30'	N60°19'24"E	61.29'
C69	3°22'07"	1030.00'	60.56'	N63°42'45"E	60.55'
C70	3°20'17"	1030.00'	60.01'	N67°03'57"E	60.00'
C71	3°19'02"	1030.00'	59.63'	N70°23'36"E	59.62'
C72	3°18'21"	1030.00'	59.43'	N73°42'18"E	59.42'
C73	3°18'12"	1030.00'	59.38'	N77°00'34"E	59.38'
C74	3°18'36"	1030.00'	59.50'	N80°18'58"E	59.49'
C75	3°19'32"	1030.00'	59.78'	N83°38'02"E	59.78'
C76	0°44'07"	1030.00'	13.22'	N85°39'51"E	13.22'
C77	4°58'26"	530.00'	46.01'	N88°31'07"E	45.99'
C78	3°32'06"	1045.92'	64.53'	N87°29'23"E	64.52'
C79	3°28'53"	1045.92'	63.55'	N83°58'54"E	63.54'
C80	3°27'57"	1045.92'	63.27'	N80°30'29"E	63.26'
C81	3°27'33"	1045.92'	63.15'	N77°02'44"E	63.14'
C82	3°27'42"	1045.92'	63.19'	N73°35'06"E	63.18'
C83	3°28'23"	1045.92'	63.40'	N70°07'04"E	63.39'
C84	3°29'37"	1045.92'	63.77'	N66°38'04"E	63.76'
C85	3°31'26"	1045.92'	64.33'	N63°07'33"E	64.32'
C86	3°33'52"	1045.92'	65.07'	N59°34'54"E	65.06'
C87	3°37'00"	1045.92'	66.02'	N55°59'28"E	66.01'
C88	3°40'55"	1045.92'	67.21'	N52°20'30"E	67.20'
C89	4°05'08"	1045.92'	74.58'	N48°27'29"E	74.56'

CURVE TABLE					
CURVE	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C90	5°47'25"	1045.92'	105.70'	N43°31'12"E	105.66'
C91	5°47'25"	1045.92'	105.70'	N43°31'12"E	105.66'
C92	1°23'16"	1530.00'	37.06'	N87°27'10"E	37.05'
C93	2°02'11"	1530.00'	54.38'	N85°44'26"E	54.38'
C94	2°09'23"	1530.00'	57.58'	N83°38'39"E	57.58'
C95	2°17'10"	1530.00'	61.05'	N81°25'23"E	61.05'
C96	2°31'44"	1530.00'	67.53'	N79°00'55"E	67.53'
C97	0°30'09"	1530.00'	13.42'	N77°29'59"E	13.42'
C98	1°19'58"	180.00'	35.60'	N71°34'56"E	35.54'
C99	8°07'44"	180.00'	25.54'	N61°51'05"E	25.52'
C100	8°39'00"	180.00'	27.17'	N53°27'44"E	27.15'
C101	120°26'58"	15.00'	31.53'	N70°38'17"W	26.04'
C102	64°29'13"	70.00'	78.79'	N21°49'48"E	74.69'
C103	1°13'28"	970.00'	20.73'	N54°41'09"E	20.73'
C104	6°44'20"	970.00'	114.09'	N58°40'03"E	114.02'
C105	4°15'55"	970.00'	72.21'	N64°10'10"E	72.19'
C106	3°45'19"	970.00'	63.57'	N68°10'47"E	63.56'
C107	3°32'42"	970.00'	60.02'	N71°49'48"E	60.01'
C108	3°20'57"	970.00'	56.70'	N75°16'37"E	56.69'
C109	3°15'06"	970.00'	55.05'	N78°34'39"E	55.04'
C110	3°11'25"	970.00'	54.01'	N81°47'54"E	54.00'
C111	2°25'02"	970.00'	40.92'	N84°36'08"E	40.92'
C112	93°58'18"	15.00'	24.60'	S47°12'12"E	21.94'
C113	88°21'50"	15.00'	23.13'	S43°57'52"W	20.91'
C114	44°44'39"	70.00'	54.67'	N66°13'27"W	53.29'
C115	92°59'21"	15.00'	24.34'	N02°38'33"E	21.76'
C116	14°50'26"	120.00'	31.08'	N56°33'27"E	31.00'
C117	13°16'15"	120.00'	27.79'	N70°36'47"E	27.73'
C118	2°33'07"	1472.67'	65.59'	N78°26'59"E	65.58'
C119	2°24'13"	1470.00'	61.67'	N80°55'43"E	61.66'
C120	2°18'08"	1470.00'	59.06'	N83°16'54"E	59.06'
C121	2°12'36"	1470.00'	56.70'	N85°32'16"E	56.70'
C122	1°16'45"	1470.00'	32.82'	N87°16'56"E	32.82'
C123	79°06'29"	14.89'	20.56'	S52°31'26"E	18.97'
C124	4°17'29"	314.32'	23.54'	N15°07'02"W	23.54'
C125	9°40'24"	269.56'	45.51'	S12°25'36"E	45.46'
C126	11°13'04"	269.56'	52.78'	S01°58'52"E	52.69'
C127	87°46'34"	15.00'	22.98'	S47°30'57"W	20.80'

PRELIMINARY PLAT OF STORY HOUSE VILLAGE, PLANNED UNIT DEVELOPMENT PHASE 1

SITUATED IN THE S/2SE1/4 OF SECTION 24, TOWNSHIP 56 NORTH, RANGE 84 WEST, 6TH PRINCIPAL MERIDIAN, SHERIDAN COUNTY, WYOMING

DEVELOPER: STORY HOUSE PROPERTY COMPANY, LLC
40 EAST WORKS STREET, SUITE 18
SHERIDAN WY, 82801

PRESTFELDT SURVEYING
2340 WETLANDS DR., SUITE 100
PO BOX 3082
SHERIDAN, WY 82801
307-672-7415

CLIENT: WWC ENGINEERING
1849 TERRA AVENUE
SHERIDAN, WY 82801

JN: 2023-058
DN: 2023-058-PUD
PF: T2023-058
REVIEWED BY: JSP
DECEMBER 19, 2023

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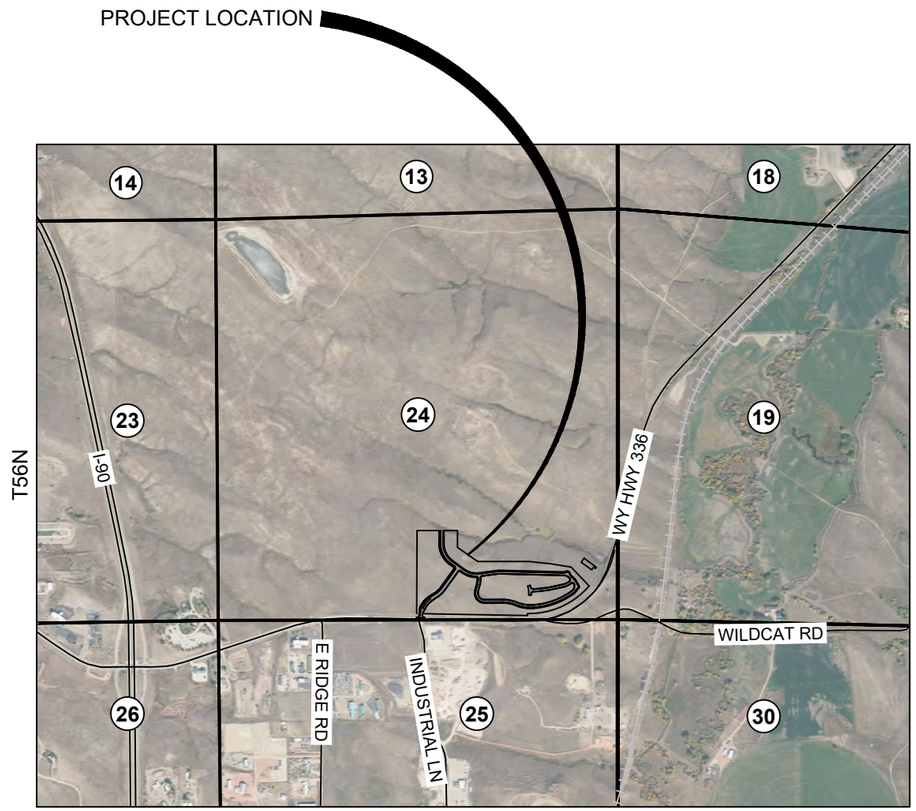
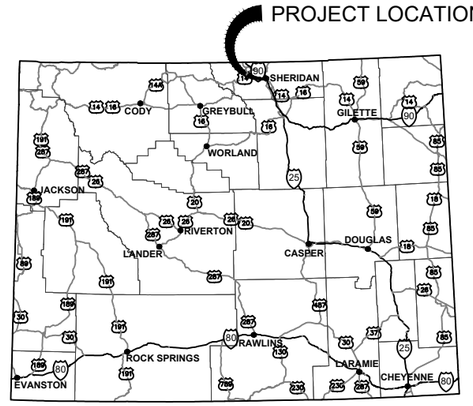
CONSTRUCTION DRAWINGS

STORY HOUSE PROPERTY COMPANY, LLC
STORY HOUSE VILLAGE PUD - PHASE 1



LOCATION MAP



SHERIDAN COUNTY, WYOMING

N

0 1000' 2000'

SCALE: 1" = 2000'
11" x 17" PAPER SIZE

Know what's below. Call before you dig.

DRAFT

PREPARED FOR:
STORY HOUSE PROPERTY COMPANY, LLC
40 E. WORKS STREET
SUITE #1B
SHERIDAN, WY 82801

PREPARED BY:
WWC ENGINEERING
1849 TERRA AVE.
SHERIDAN, WY 82801
(307) 672-0761
www.wwcengineering.com

PROJECT NO. 2023-137

NO.	REVISION	BY	DATE

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

DRAWING NO.
1

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Sheet List Table

Sheet Number	Sheet Title
1	COVER SHEET
2	SHEET LIST
3	GENERAL NOTES & LEGEND
4	PUD PHASING
5	EXISTING SITE
6	PROPOSED SITE
7	CONTROL ABSTRACT
8	ROAD KEY SHEET
9	STORY HOUSE VILLAGE - PLAN AND PROFILE
10	STORY HOUSE VILLAGE - PLAN AND PROFILE
11	STORY HOUSE LANE - PLAN AND PROFILE
12	STORY HOUSE LANE - PLAN AND PROFILE
13	STORY HOUSE LANE - PLAN AND PROFILE
14	STORY HOUSE LANE & BALDWIN AVE - PLAN AND PROFILE
15	BALDWIN AVENUE - PLAN AND PROFILE
16	BALDWIN AVENUE - PLAN AND PROFILE
17	BALDWIN AVENUE - PLAN AND PROFILE
18	BALDWIN AVENUE - PLAN AND PROFILE
19	CANTERBURY LN & MOCKINGBIRD DR - PLAN AND PROFILE
20	TYPICAL ROAD SECTIONS
21	TYPICAL ROAD SECTIONS
23	INTERSECTION DETAIL SHEET
24	INTERSECTION DETAIL SHEET
25	INTERSECTION DETAIL SHEET
26	INTERSECTION DETAIL SHEET
27	WATER KEY SHEET
28	WATER PLAN AND PROFILE SHEET

Sheet List Table

Sheet Number	Sheet Title
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32	WATER PLAN AND PROFILE SHEET
33	WATER PLAN AND PROFILE SHEET
34	WATER PLAN AND PROFILE SHEET
35	WATER PLAN AND PROFILE SHEET
36	WATER PLAN AND PROFILE SHEET
37	WATER PLAN AND PROFILE SHEET
38	WATER PLAN AND PROFILE SHEET
39	SANITARY SEWER KEY SHEET
40	SANITARY SEWER PLAN AND PROFILE SHEET
41	SANITARY SEWER PLAN AND PROFILE SHEET
42	SANITARY SEWER PLAN AND PROFILE SHEET
43	SANITARY SEWER PLAN AND PROFILE SHEET
44	SANITARY SEWER PLAN AND PROFILE SHEET
45	SANITARY SEWER PLAN AND PROFILE SHEET
46	SANITARY SEWER PLAN AND PROFILE SHEET
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49	SANITARY SEWER PLAN AND PROFILE SHEET
50	SANITARY SEWER PLAN AND PROFILE SHEET
51	SANITARY SEWER PLAN AND PROFILE SHEET
52	ORENCO DETAIL SHEET
53	ORENCO DETAIL SHEET
54	ORENCO DETAIL SHEET
55	ORENCO DETAIL SHEET
56	ORENCO DETAIL SHEET

Sheet List Table

Sheet Number	Sheet Title
57	DETAIL SHEET
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83	DETAIL SHEET

DRAFT

NO.	REVISION	BY	DATE

PROJECT NO. 2023-137

PREPARED BY
WWC ENGINEERING
1849 TERRA AVE.
SHERIDAN, WY 82801
(307) 672-0761
www.wwcengineering.com

STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

SHEET LIST

SHERIDAN COUNTY, WYOMING

DESIGNED BY: *SER*
DRAWN BY: *CIG*
CHECKED BY: *JBG*
DATE: *12/20/2023*

SHEET
2

K:\Sheridan\story house management\20231137 story house village\05CAD\Sheets\PLAN SET\231137_VILG_PLNST_COVR.dwg GENERAL NOTES 12/20/2023 10:52:24 AM

GENERAL CONSTRUCTION NOTES

1. UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS, ALL WORK SHALL CONFORM TO LATEST EDITION OF CITY OF SHERIDAN STANDARD SPECIFICATIONS & DETAILS AND ANY SPECIAL PROVISIONS.
2. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 48 HOURS PRIOR TO BEGINNING ANY WORK.
3. THE CONTRACTOR SHALL CONFINE CONSTRUCTION TO EASEMENTS AND RIGHT-OF-WAYS SHOWN. CONTRACTOR IS TO PROTECT FROM DAMAGE ALL FEATURES INSIDE THE DESIGNATED AREAS SO NOTED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS REQUIRED AND CONSTRUCTION TESTING FOR CONSTRUCTION ACTIVITIES.
5. THE CONTRACTOR SHALL SUPPLY ALL NECESSARY FITTINGS, COUPLINGS, AND SPOOL PIECES FOR CONNECTING NEW UTILITIES TO EXISTING UTILITIES. THESE PLANS MAY NOT SHOW ALL REQUIRED COMPONENTS FOR MAKING THE CONNECTIONS.
6. THE CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR, WHO SHALL ALSO BE SOLELY RESPONSIBLE FOR THE MEANS, METHODS AND SEQUENCING (WITHIN THE REQUIREMENTS OF THE CONTRACT DOCUMENTS) OF CONSTRUCTION OPERATIONS.
7. THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST AND EROSION DURING CONSTRUCTION AT CONTRACTOR'S EXPENSE. EROSION SHALL BE CONTROLLED IN ACCORDANCE WITH WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY REGULATIONS.
8. THE CONTRACTOR SHALL PREPARE AND SUBMIT A STORM WATER CONTROL PLAN TO THE WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY AND OBTAIN REQUIRED CONSTRUCTION RELATED PERMITS PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES. A COPY OF ALL PERMITS SHALL BE PROVIDED TO THE ENGINEER.
9. WHEN GROUNDWATER IS ENCOUNTERED THE CONTRACTOR MUST UTILIZE AN EFFECTIVE DEWATER/NG PROGRAM ACCEPTABLE TO THE ENGINEER AND AT NO COST TO THE OWNER, TO INSTALL MATERIALS IN COMPLIANCE WITH THE SPECIFICATIONS. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY DISCHARGING WATER IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
10. THE LOCATION, DEPTH AND SIZE OF EXISTING UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE. FIELD VERIFICATION OF BURIED GAS, ELECTRIC, TELEPHONE, CABLE, FIBER, WATER, SEWER AND OTHER LINES WERE NOT PERFORMED.
11. WATER SERVICES AND SANITARY SEWER SERVICES ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE TO LOCATE ALL WATER AND SEWER SERVICE LINES AND ENSURE EACH HOUSE AND/OR LOT IS CONNECTED TO THE NEW WATER AND SEWER MAINS.
12. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES AND DETERMINE THE EXACT LOCATION OF ALL UNDERGROUND UTILITIES BEFORE TRENCHING OR EXCAVATING. 48-HOUR NOTICE IS REQUIRED (AT LEASE TWO FULL BUSINESS DAYS BEFORE A WEEKEND OR HOLIDAY). CONTRACTOR SHALL NOTIFY ONE-CALL-OF-WYOMING @ 811 or 1-800-849-2476 FOR ONSITE UTILITY LOCATION. ALTERNATIVELY, EXCAVATION TICKETS CAN BE SUBMITTED ONLINE AT https://www.onecallofwyoming.com/excavators/. ALL EXISTING UTILITIES SHALL BE MARKED PRIOR TO ANY EXCAVATION.
13. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ALL UTILITIES (WHETHER SHOWN ON DRAWINGS OR NOT) ENCOUNTERED DURING CONSTRUCTION AND SHALL NOT BACKFILL UNTIL THE ENGINEER HAS MADE A RECORD OF UTILITY TYPE, SIZE AND LOCATION. THE CONTRACTOR SHALL DOCUMENT THE SAME FOR HIS RECORDS. ENGINEER OR OWNER WILL NOT BE RESPONSIBLE FOR DELAYS TO CONSTRUCTION ACTIVITIES AS A RESULT OF UTILITY LOCATES, RELOCATION, UTILITIES ENCOUNTERED OR WHILE ENGINEER IS RECORDING UTILITY INFORMATION.
14. ALL UTILITY CONDUITS FOR IRRIGATION, ELECTRICAL, GAS, PHONE, CATV, FIBER, ETC. SHALL BE BURIED A MINIMUM 24" BELOW FINISHED GRADE, OR AS REQUIRED BY SUCH UTILITY, BEDDED WITH TYPE A BEDDING MATERIAL, AND THE TRENCH BACKFILLED WITH IMPORTED TRENCH BACKFILL MATERIAL, PER CITY SPECIFICATIONS. EXISTING TRENCH EXCAVATION MATERIAL MAY BE USED AS APPROVED BY THE ENGINEER.
15. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DESIGNING AND CONSTRUCTING STABLE, TEMPORARY EXCAVATIONS AND SHALL SHORE AND BRACE, SLOPE, OR BENCH THE SIDES OF THE EXCAVATIONS AS REQUIRED TO MAINTAIN STABILITY OF BOTH THE EXCAVATION SIDES AND BOTTOM. ALL EXCAVATIONS SHALL COMPLY WITH APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS INCLUDING THE CURRENT OSHA EXCAVATION AND TRENCH SAFETY STANDARDS 29 CFR PART 1926, SUBPART P - EXCAVATIONS.
16. IF GROUNDWATER IS ENCOUNTERED, WEEPLESS FIRE HYDRANTS SHALL BE INSTALLED.
17. PAVEMENT MARKINGS, STRIPING, AND SIGNS TO BE INSTALLED PER CURRENT VERSION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
18. THE LOCATIONS OF ALL PAVEMENT MARKINGS, STRIPING, AND SIGNS SHALL BE AS DIRECTED IN THE FIELD BY THE ENGINEER.
19. ALL DISTRUBED AREAS SHALL BE SEEDED BY THE CONTRACTOR USING A SEED MIX APPROVED BY THE ENGINEER.

BLOCK LEGEND

EXISTING	PROPOSED	EXISTING	PROPOSED	EXISTING	PROPOSED
	SANITARY SEWER MANHOLE		WATER VENT		FIBER OPTIC MANHOLE
	SANITARY SEWER CLEANOUT		WATER MANHOLE		FIBER OPTIC MARKER
	SANITARY SEWER CAP		WATER REDUCER		FIBER OPTIC PULL BOX
	SANITARY SEWER METER VAULT		WATER MARKER		FIBER OPTIC PEDESTAL
	SANITARY SEWER LIFT STATION		FIRE HYDRANT		FIBER OPTIC VAULT
	SANITARY SEWER FM (TEE)		WATER CURB STOP		NATURAL GAS MARKER
	SANITARY SEWER FM (11.25°)		WATER METER		NATURAL GAS METER
	SANITARY SEWER FM (22.5°)		WATER VAULT		NATURAL GAS VALVE
	SANITARY SEWER FM (45°)		WATER BOOSTER STATION		TELEPHONE MANHOLE
	SANITARY SEWER FM (90°)		WATER WELL		TELEPHONE MARKER
	SANITARY SEWER FM (CROSS)		WATER MONITORING WELL		TELEPHONE PULL BOX
	SANITARY SEWER FM FLANGE		WATER TEST STATION		TELEPHONE PEDESTAL
	SANITARY SEWER FM VALVE		CABLE TELEVISION MARKER		TELEPHONE VAULT
	SANITARY SEWER FM REDUCER		CABLE TELEVISION PULL BOX		TREE (DECIDUOUS)
	SANITARY SEWER FM BF PREV.		CABLE TELEVISION PEDESTAL		TREE (CONIFER)
	STORMWATER AREA INLET		CABLE TELEVISION VAULT		ADA RAMP
	STORMWATER COMBO INLET		POWER GUY ANCHOR		SIGN
	STORMWATER FLARED END		POWER GUY POLE		BOLLARD
	STORMWATER MANHOLE		POWER MANHOLE		MILEPOST
	STORMWATER PUMP STATION		POWER MARKER		CATTLE GUARD
	STORM SEWER HEAD WALL		ELECTRIC POWER METER		BORE LOCATION
	WATER FITTING BEND 11.25°		POWER POLE		PROP CORNER ALUMINUM CAP
	WATER FITTING BEND 22.5°		POWER TRANSFORMER		PROP CORNER BRASS CAP
	WATER FITTING BEND 45°		POWER VAULT		PROP CORNER CHISELED X
	WATER FITTING BEND 90°		STREET LIGHT		HIGHWAY ROW MONUMENT
	WATER FITTING CAP		IRRIGATION PULL BOX		PROP CORNER IRON PIPE
	WATER FITTING CROSS		IRRIGATION SPRINKLER HEAD		PROP CORNER LEAD & TACK
	WATER FITTING FLANGE		IRRIGATION VALVE		PROP CORNER REBAR
	WATER FITTING TEE		IRRIGATION VAULT		PROP CORNER STONE
	WATER FITTING VALVE				CONTROL POINT
					PROP CORNER PLASTIC CAP

LINE STYLE LEGEND

EXISTING	PROPOSED	
		MAJOR CONTOUR
		MINOR CONTOUR
OHT — OHT	OHT — OHT	OVERHEAD TELEPHONE
OHP — OHP	OHP — OHP	OVERHEAD POWER
NG — NG	NG — NG	NATURAL GAS
IR — IR	IR — IR	IRRIGATION LINE
FO — FO	FO — FO	FIBER OPTIC
FM — FM	FM — FM	FORCEMAIN
O — O	O — O	FENCE [CHAIN]
X — X	X — X	FENCE [BARBED]
[ ] — [ ]	[ ] — [ ]	FENCE [PRIVACY]
F — F	F — F	FIRE LINE
OHTV — OHTV	OHTV — OHTV	OVERHEAD TV
RW — RW	RW — RW	RAW WATER
SS — SS	SS — SS	SEWER
ST — ST	ST — ST	STORM
UGP — UGP	UGP — UGP	UNDERGROUND POWER
UGT — UGT	UGT — UGT	UNDERGROUND TELEPHONE
UGTV — UGTV	UGTV — UGTV	UNDERGROUND TV
W — W	W — W	WATER

DRAWING NOTATION

A / 10 — INDICATES CROSS SECTION LOCATION. "A" REFERS TO THE CROSS SECTION DESIGNATION. "10" REFERS TO THE SHEET NUMBER WHERE THE SECTION IS CUT OR SHOWN.

1 / 12 — INDICATES DETAIL LOCATION. "1" REFERS TO THE DETAIL DESIGNATION. "12" REFERS TO THE SHEET NUMBER WHERE THE DETAIL IS INDICATED OR SHOWN.

ABRREVIATIONS

ACI	AMERICAN CONCRETE INSTITUTE	HWY	HIGHWAY
BAR	REBAR	INV	INVERT ELEVATION
BMP	BEST MANAGEMENT PRACTICES	LF	LINEAR FEET
BOT	BOTTOM	MH	MANHOLE
BVC	BEGIN VERTICAL CURVE	MJ	MECHANICAL JOINT
CFS	CUBIC FEET PER SECOND	O.C.	ON CENTER
CL	CENTERLINE	O.C.E.F.	ON CENTER EACH FACE
CMP	CORRUGATED METAL PIPE	OHP	OVERHEAD POWER
CONC	CONCRETE OR CONCENTRIC	PI	POINT OF INTERSECTION
CP	CONTROL POINT	PC	POINT OF CURVATURE
CSP	CORRUGATED STEEL PIPE	PCC	POINT OF COMPOUND CURVE
CTR	CENTER	POT	POINT ON TANGENT
CU FT	CUBIC FEET	PRC	POINT OF REVERSE CURVE
CULV	CULVERT	PS	PIPE SUPPORT
DI	DUCTILE IRON OR DRAIN INLET	PT	POINT, POINT OF TANGENCY
DIA	DIAMETER	PVC	POLYVINYL CHLORIDE
EA	EACH	PWR	POWER
E.F.	EACH FACE	RCP	REINFORCED CONCRETE PIPE
EL, ELEV	ELEVATION	R/W OR ROW	RIGHT OF WAY
EOP	EDGE OF PAVEMENT	SAN	SANITARY
EVC	END VERTICAL CURVE	SST	STAINLESS STEEL
FT	FOOT OR FEET	STA	STATION
GPM	GALLONS PER MINUTE	TBC	TOP BACK OF CURB
HP	HORSEPOWER	TYP	TYPICAL
		UG	UNDERGROUND
		WTR	WATER

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PROJECT NO. 2023-137

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STORY HOUSE PROPERTY COMPANY, LLC

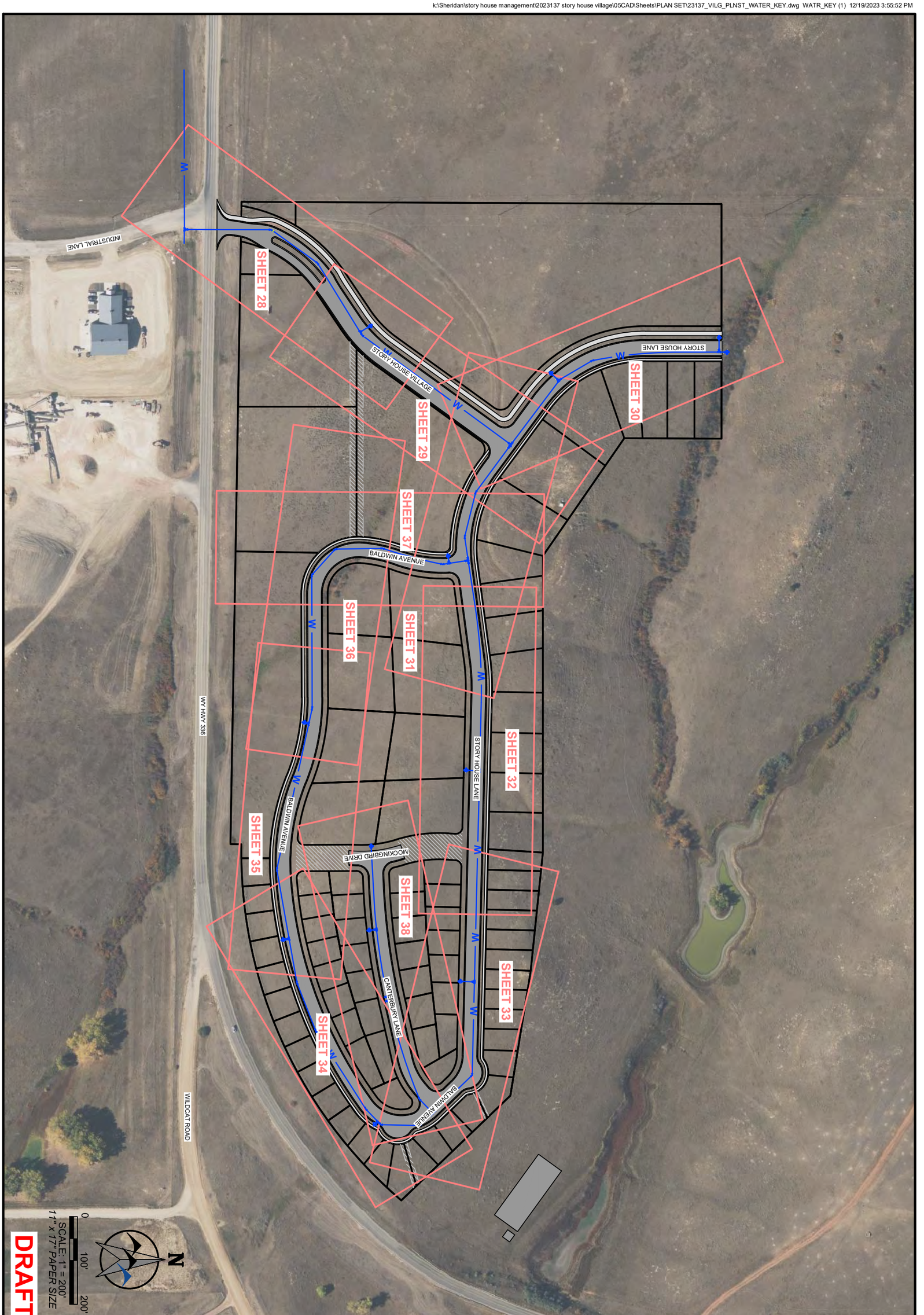
STORY HOUSE VILLAGE PUD - PHASE 1

GENERAL NOTES & LEGEND

SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

SHEET 3



STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

WATER KEY SHEET

SHERIDAN COUNTY, WYOMING

SHEET 27

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

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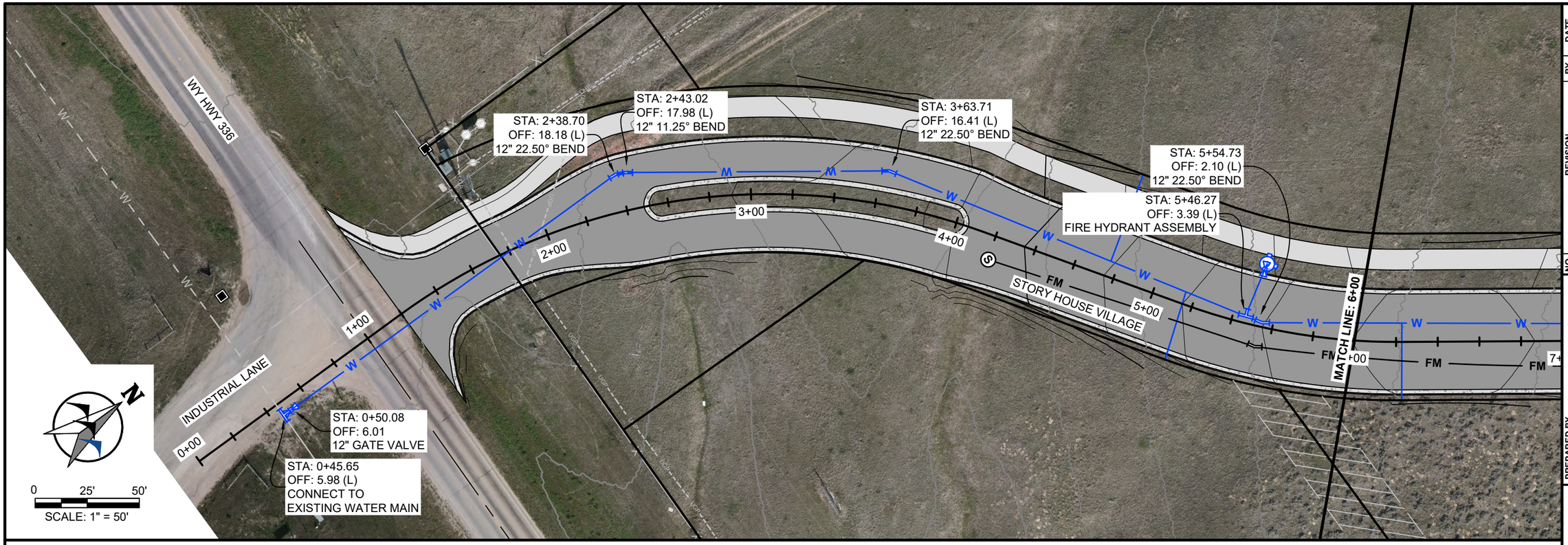
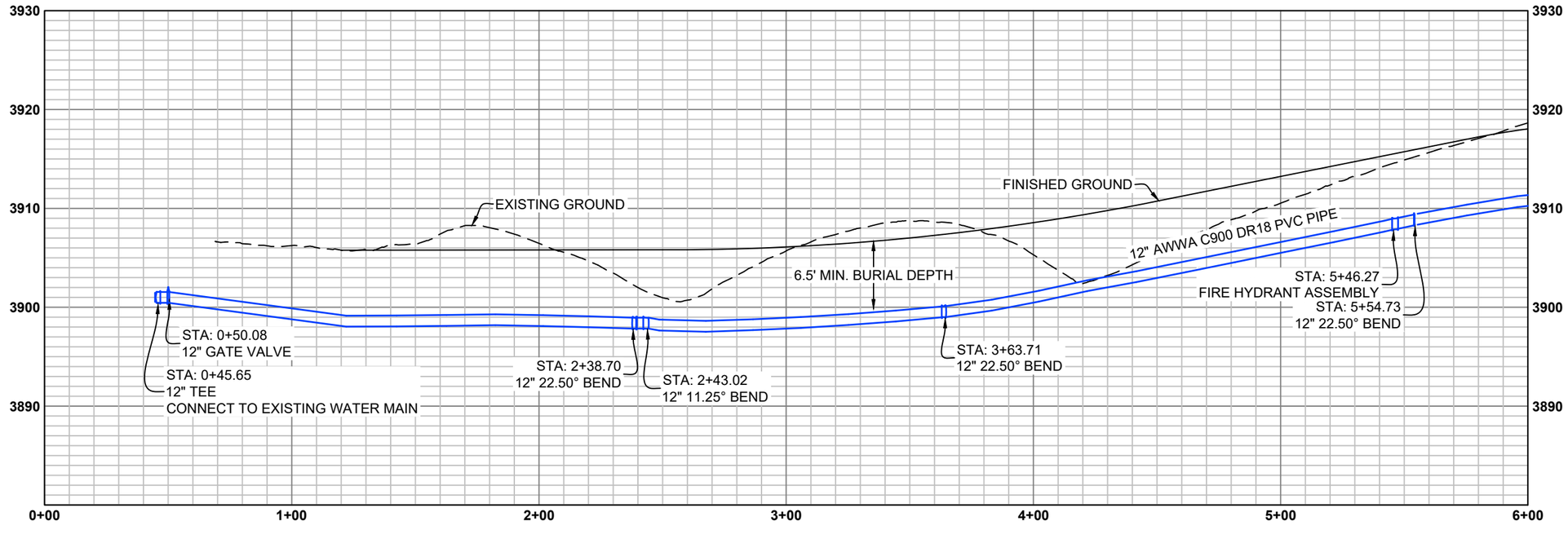
PROJECT NO. 2023-137





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STORY HOUSE VILLAGE PUD - PHASE 1

WATER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

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DATE: 12/20/2023

SHEET
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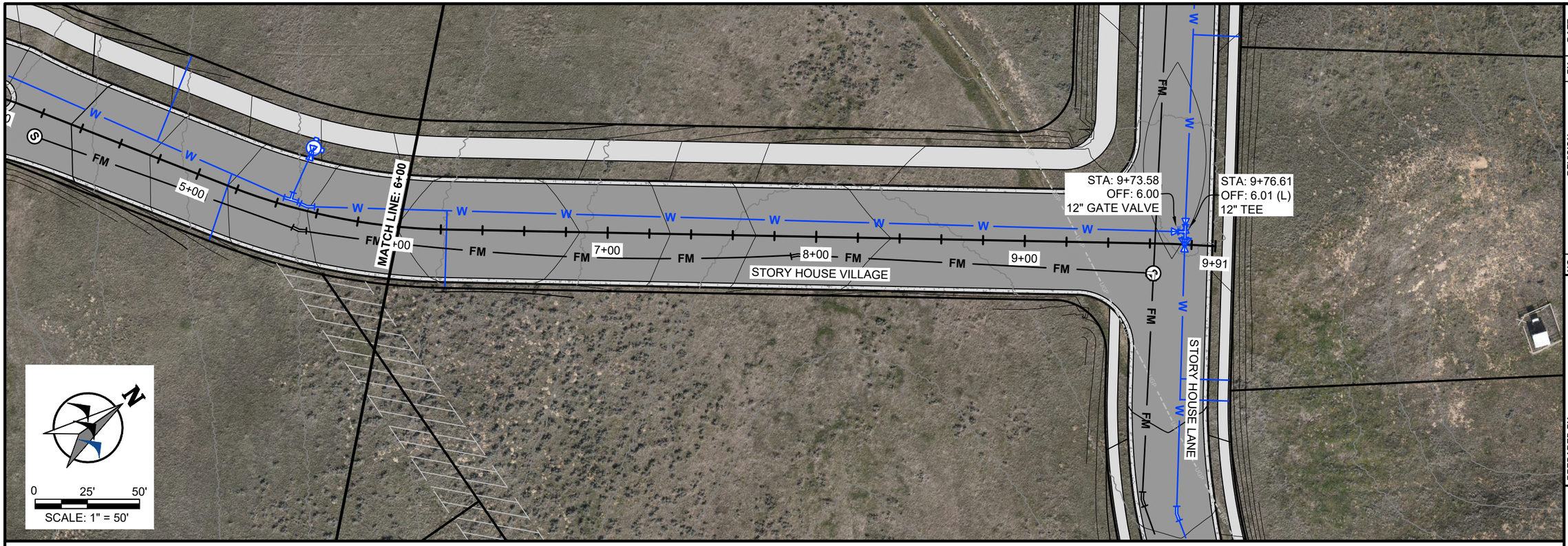

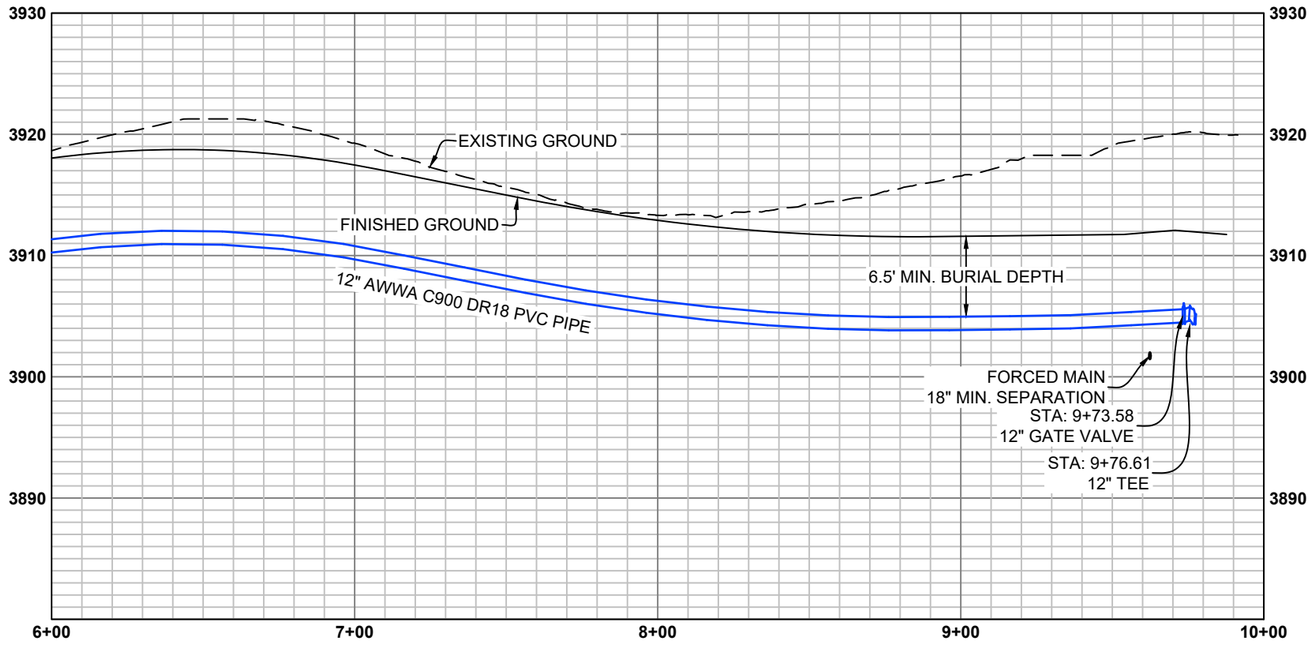

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WATER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

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SHEET
29

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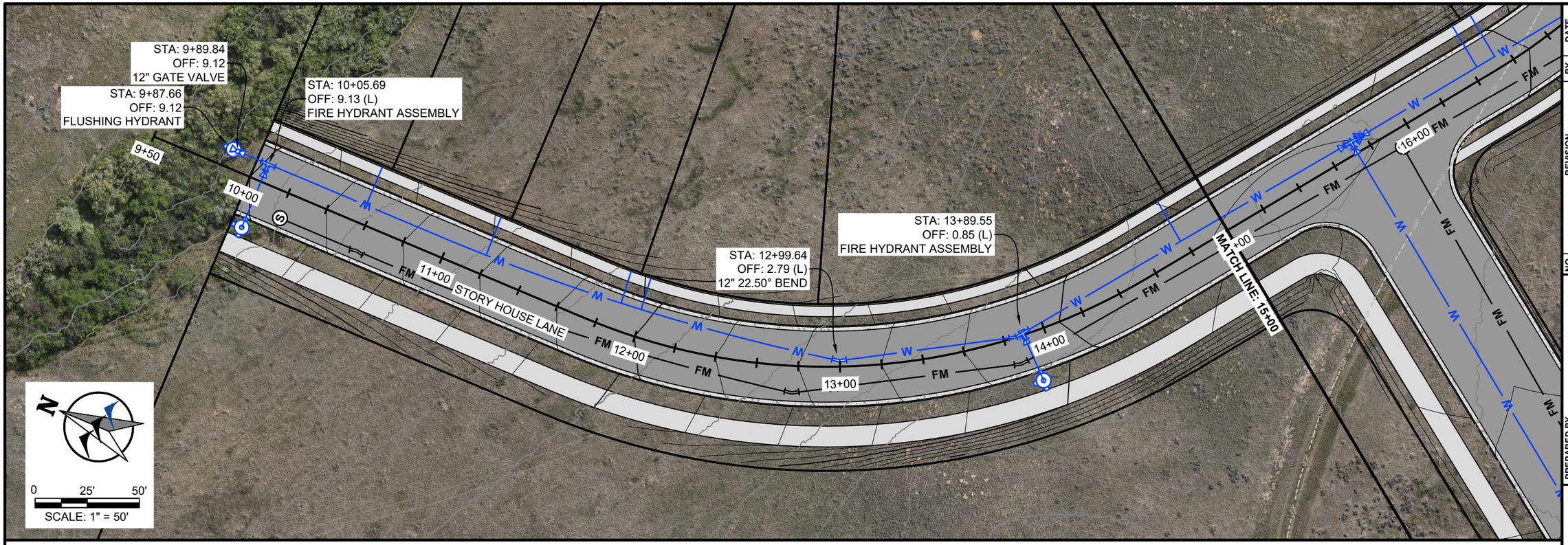

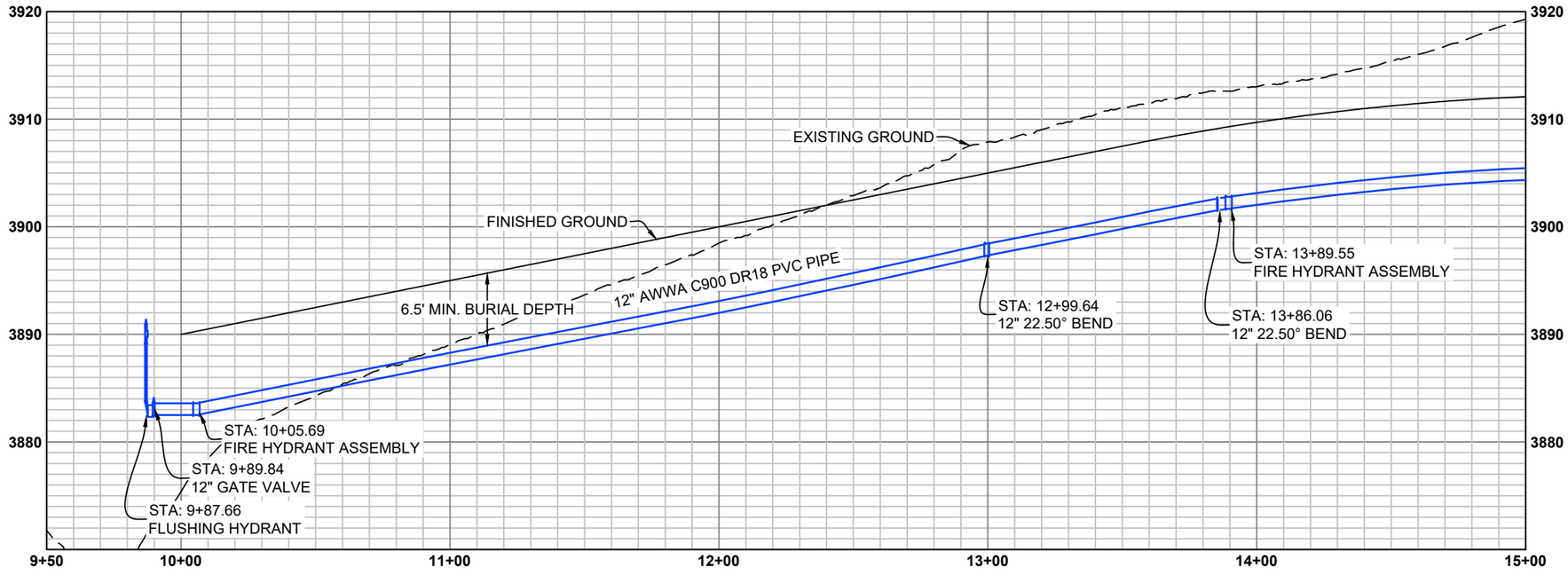

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WATER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

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SHEET
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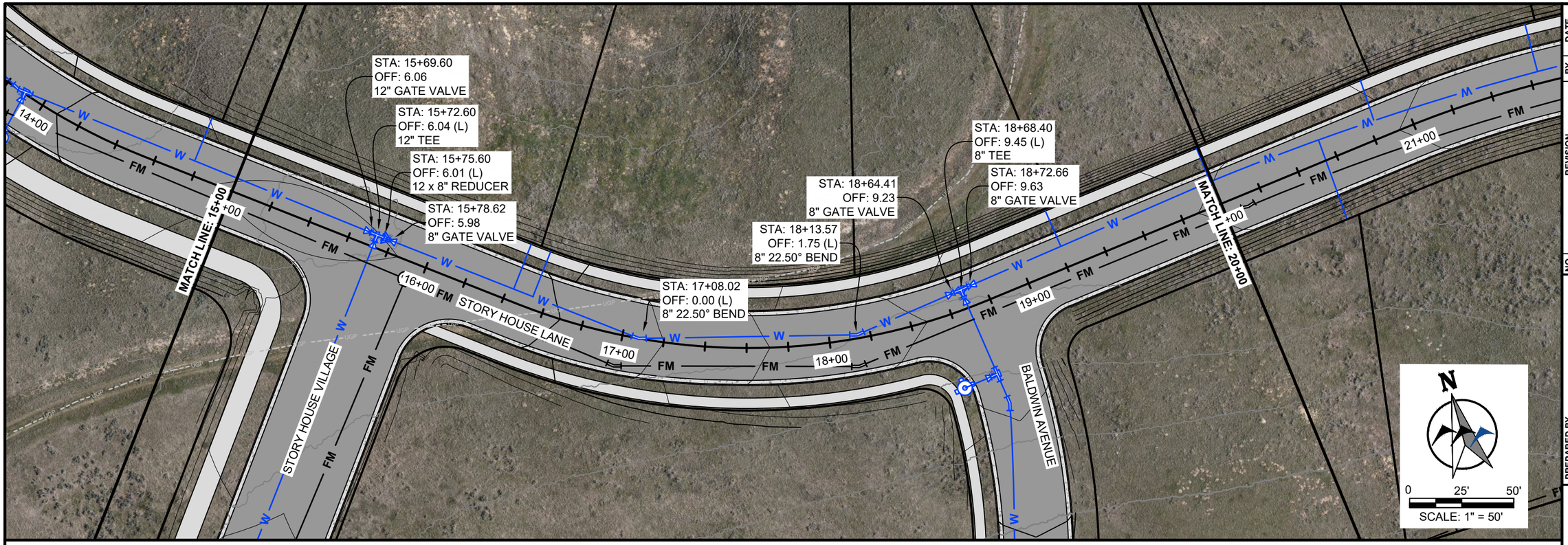

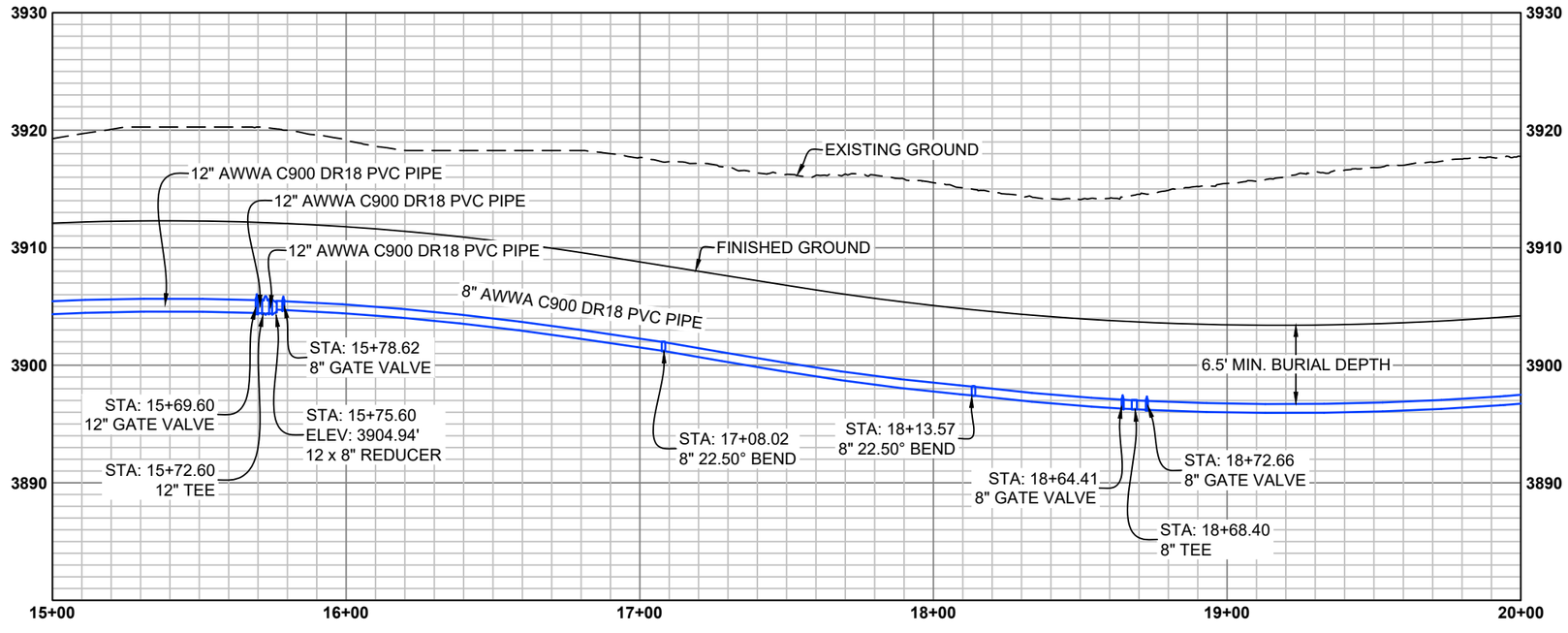

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WATER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

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SHEET
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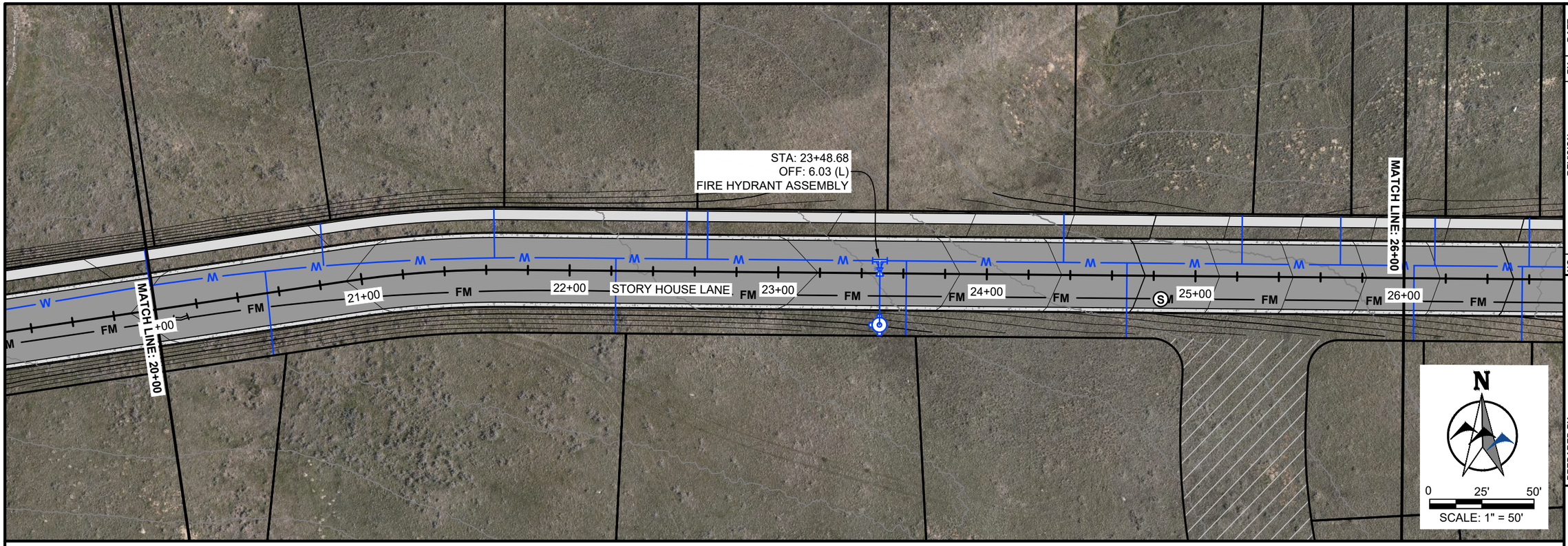

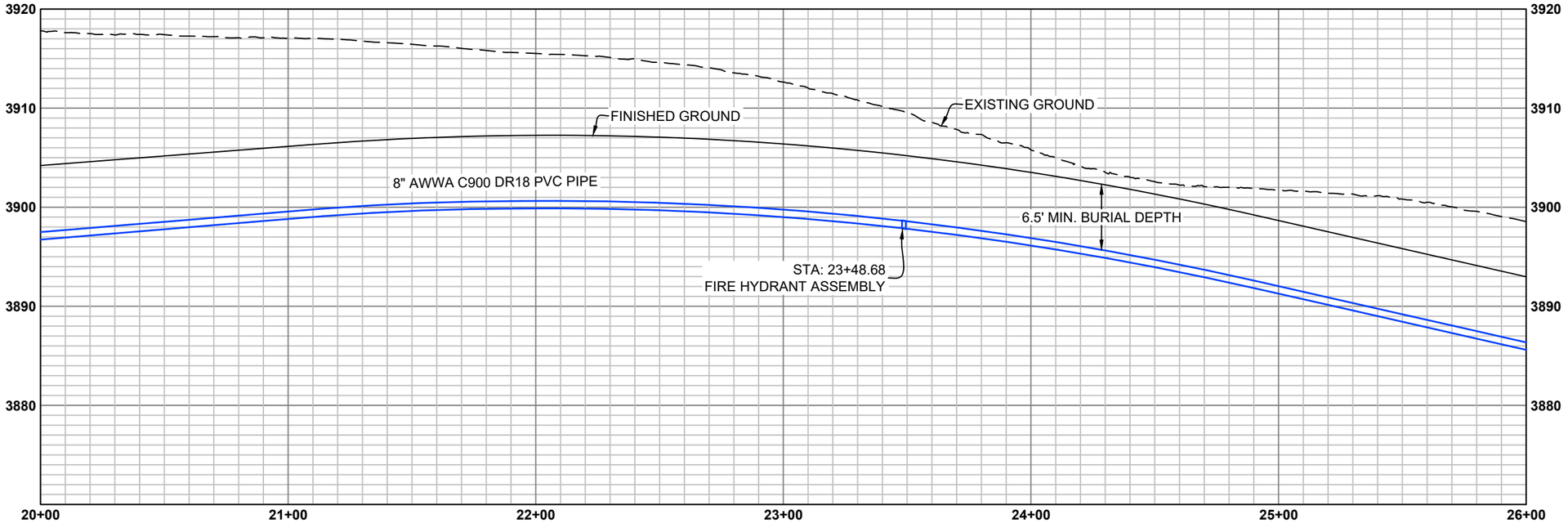

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32

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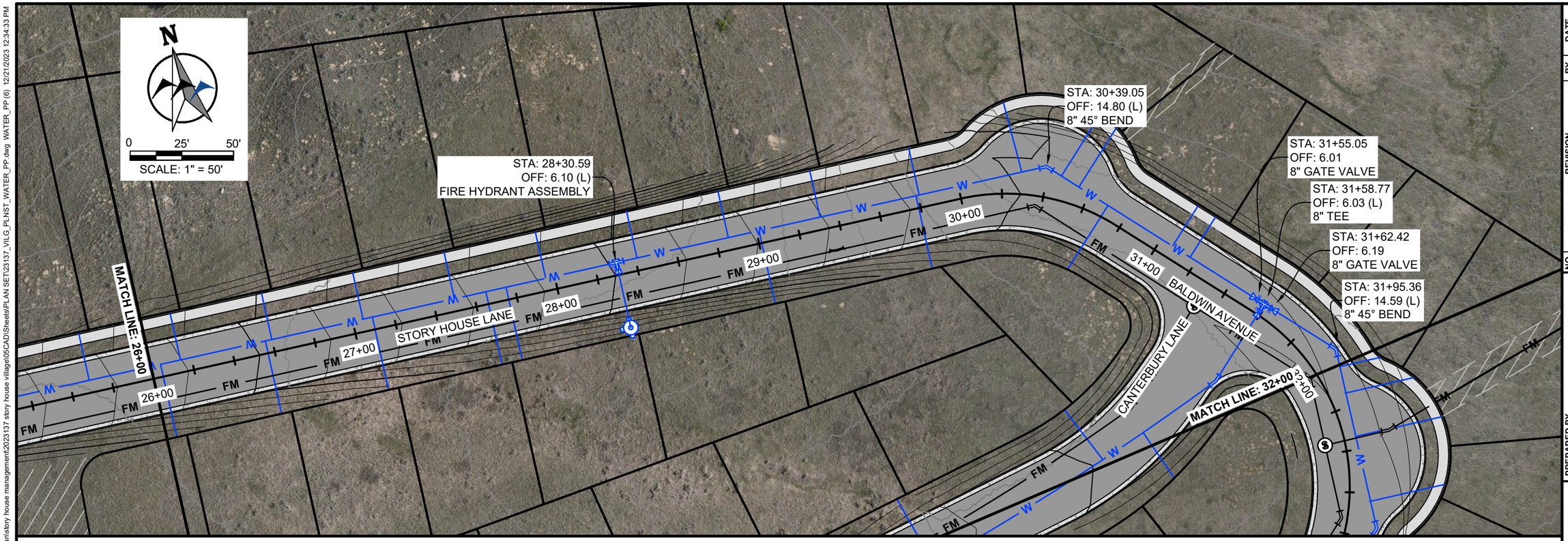

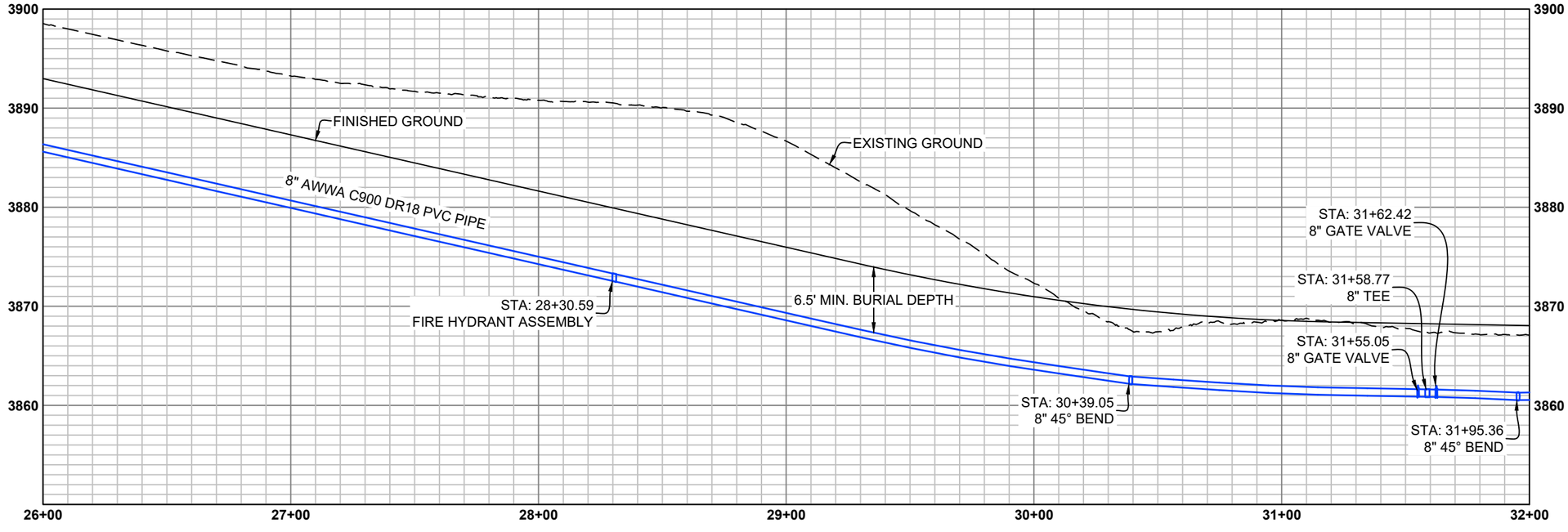

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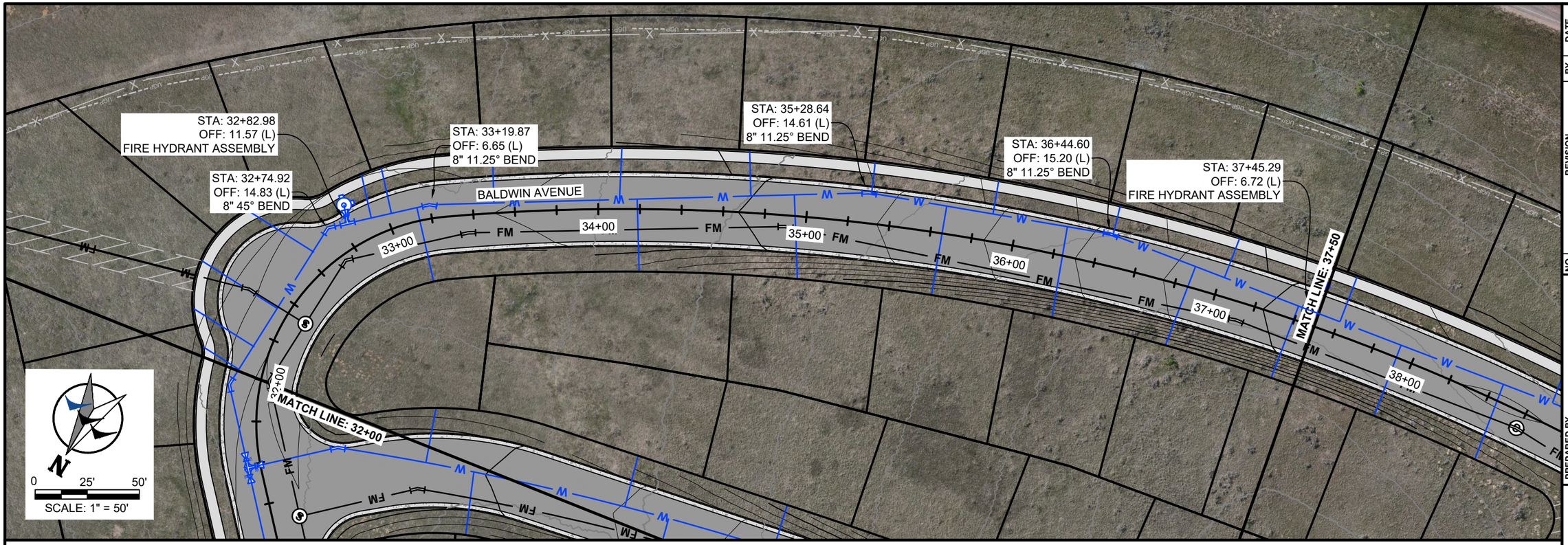

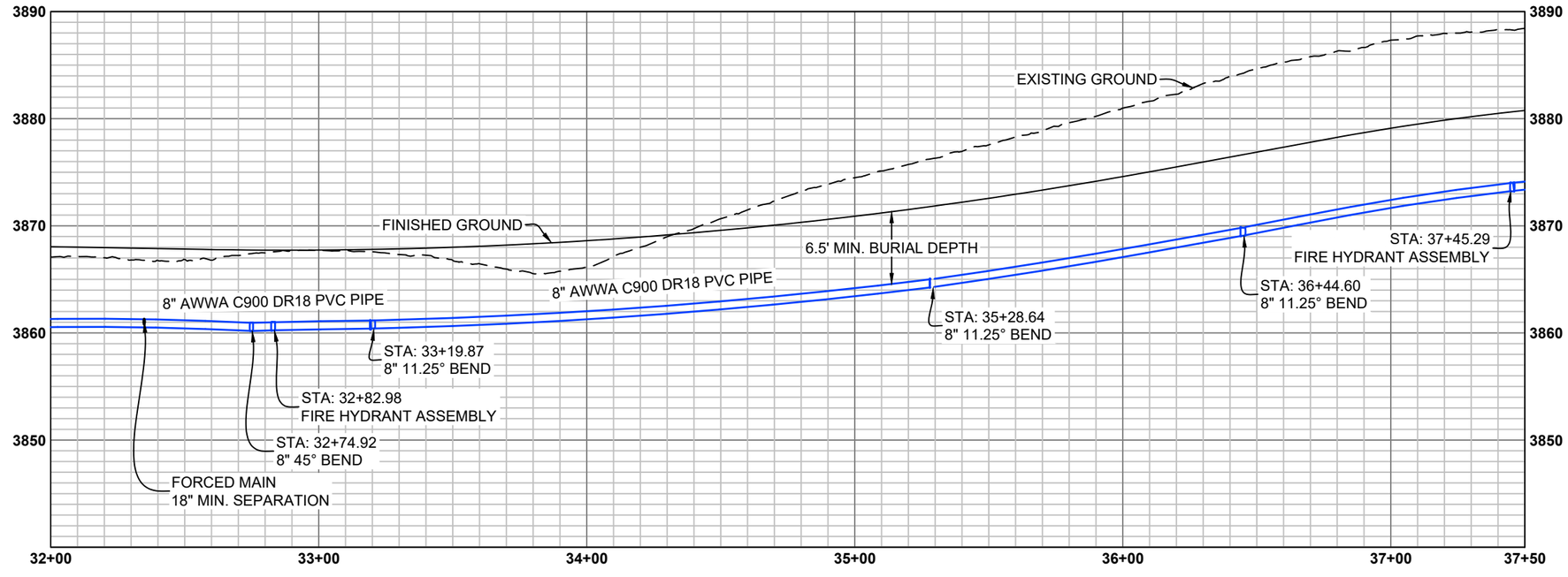

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WATER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

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SHEET
34

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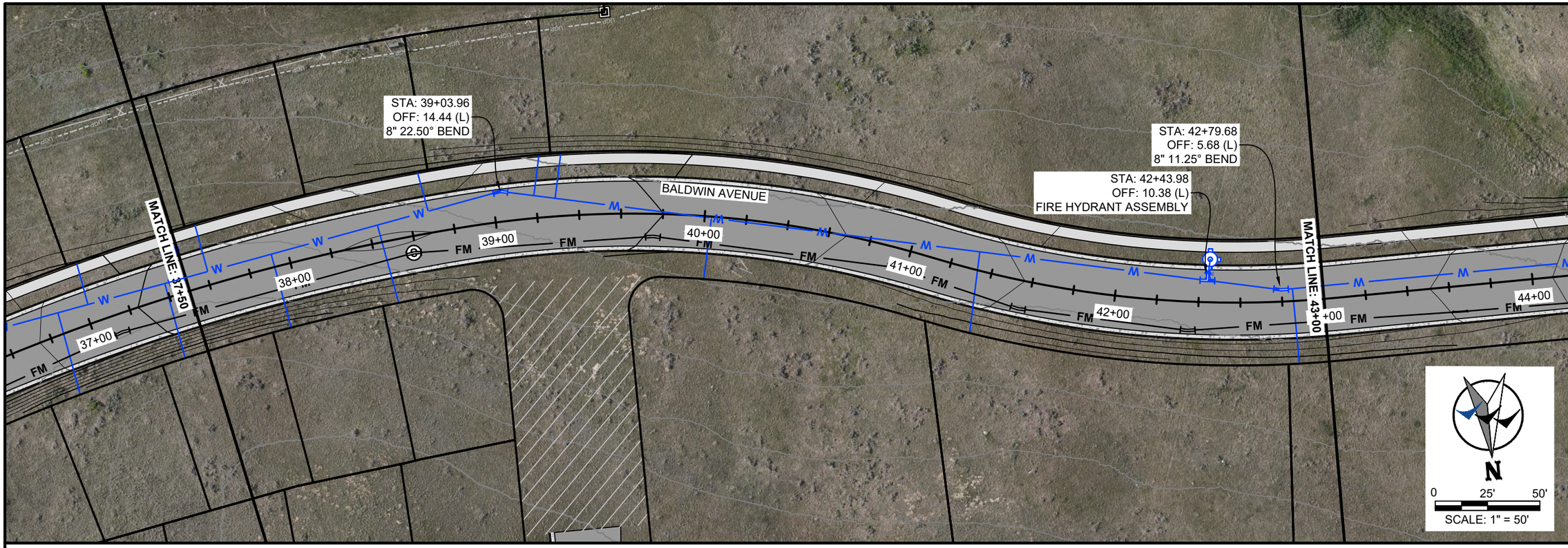

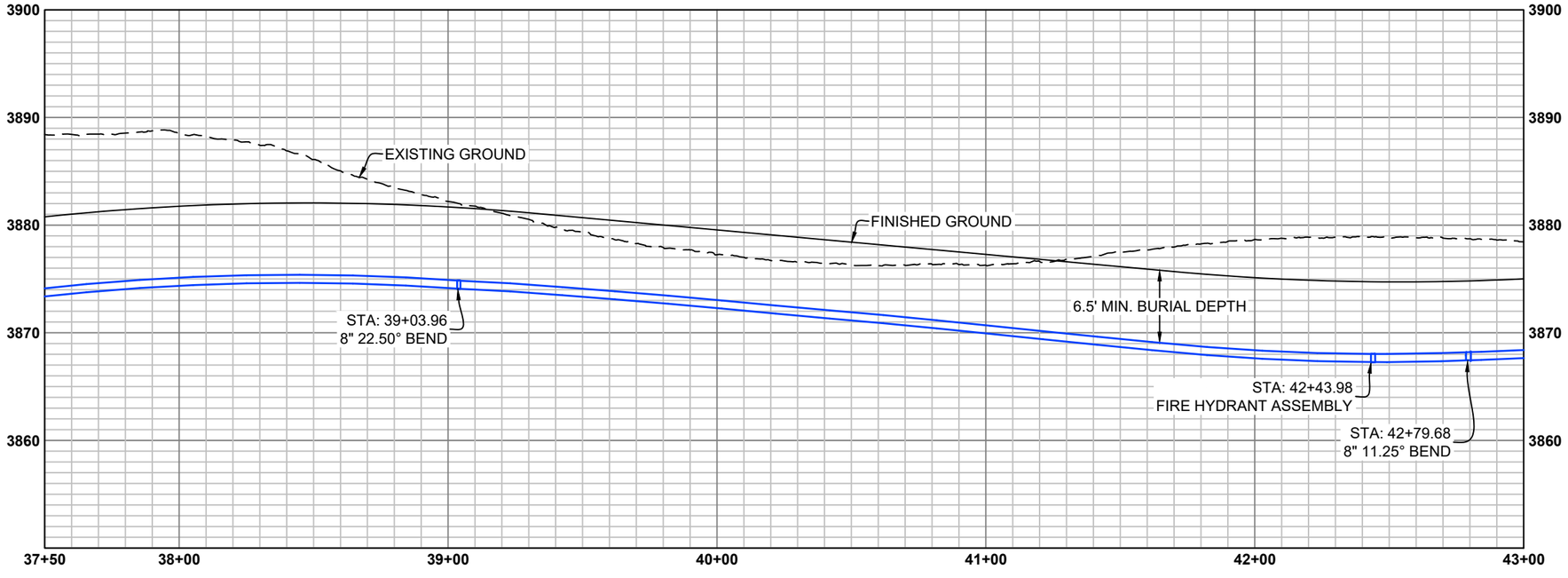

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WATER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

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SHEET
35

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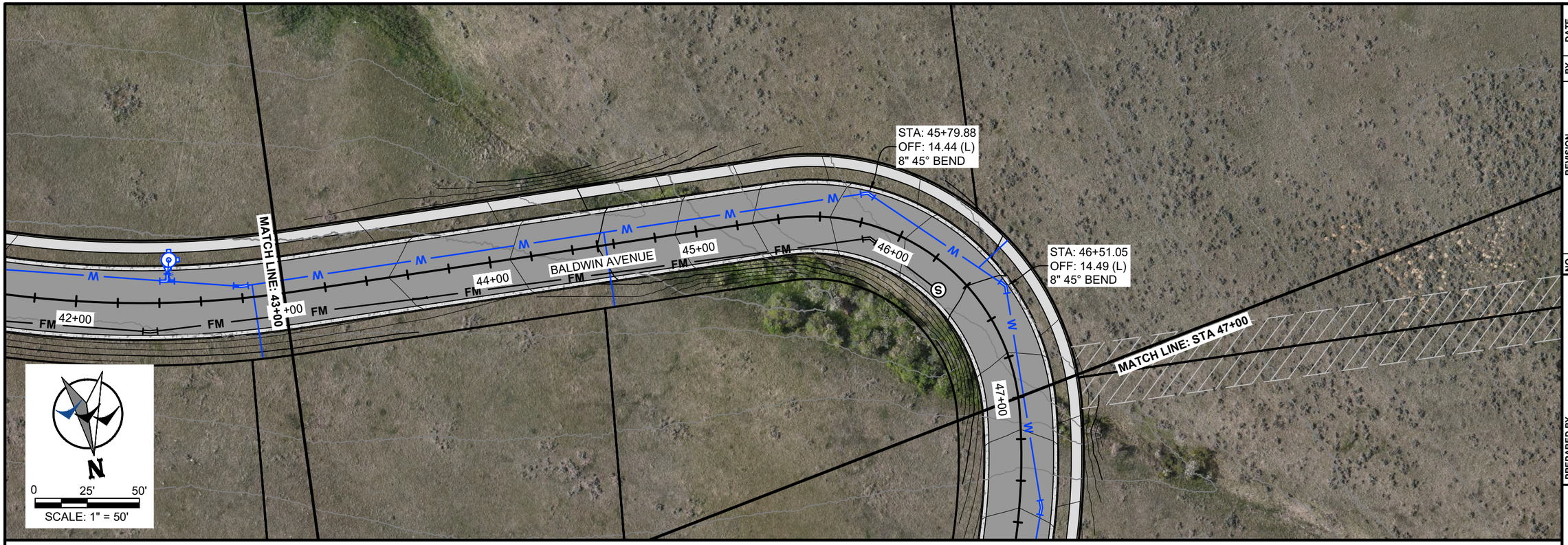

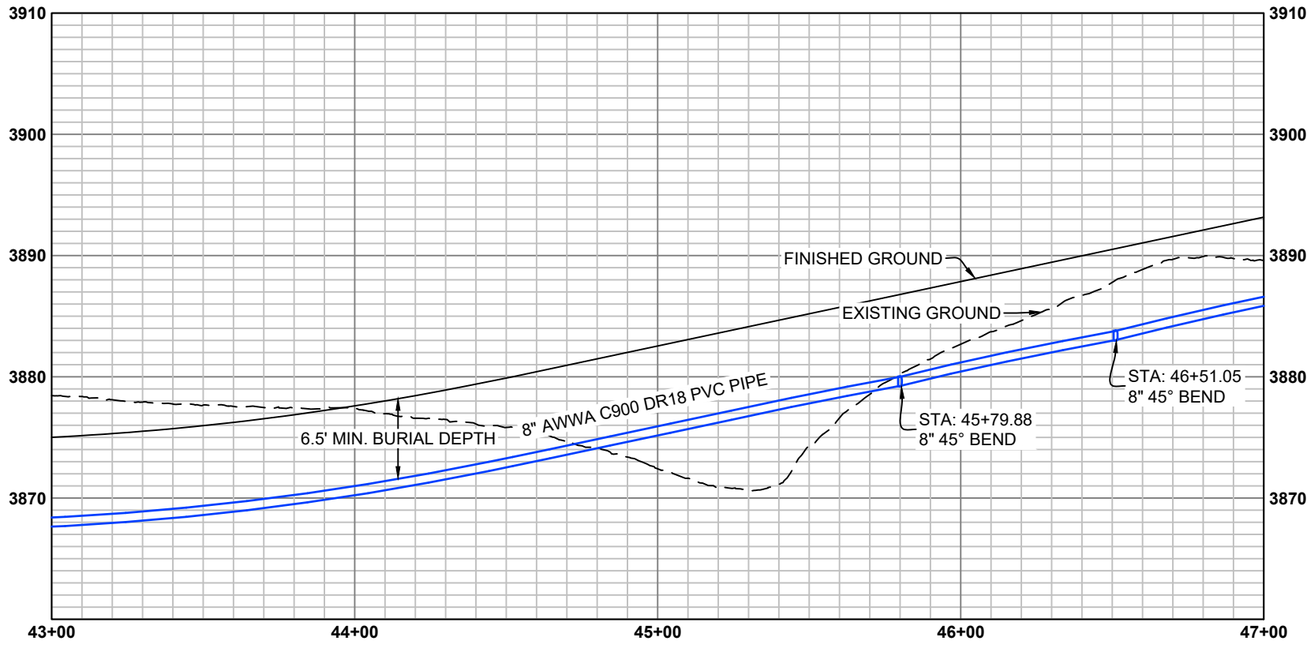

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WATER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

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36

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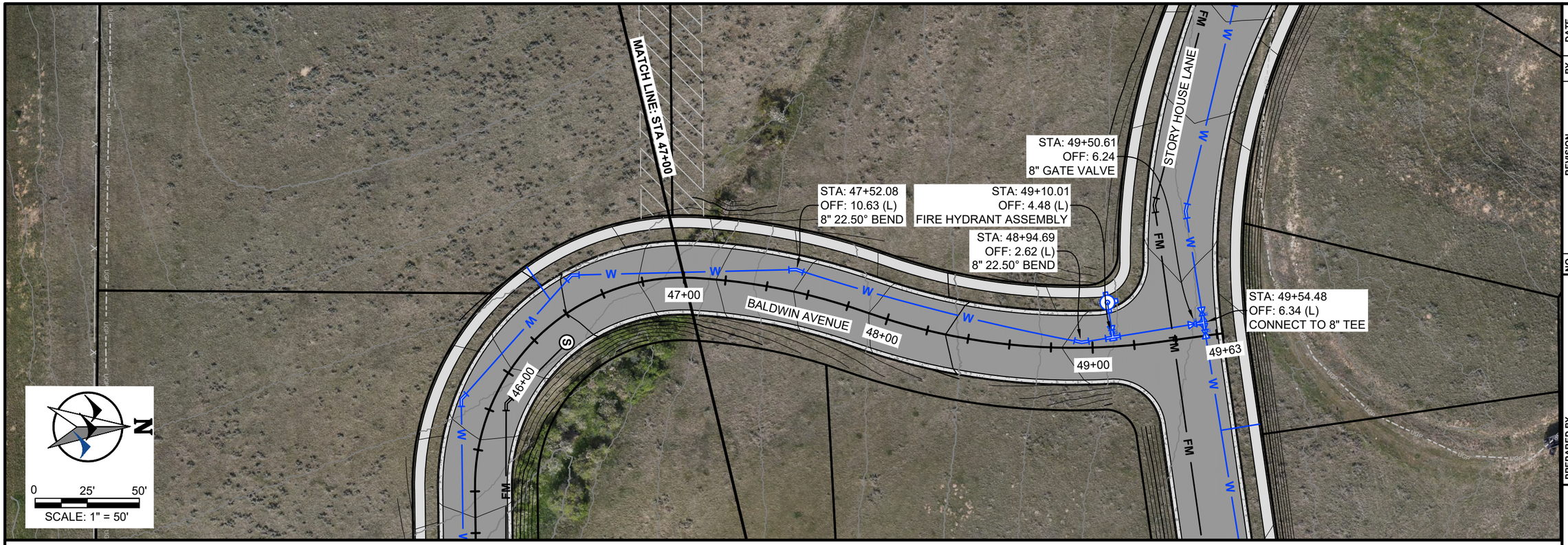

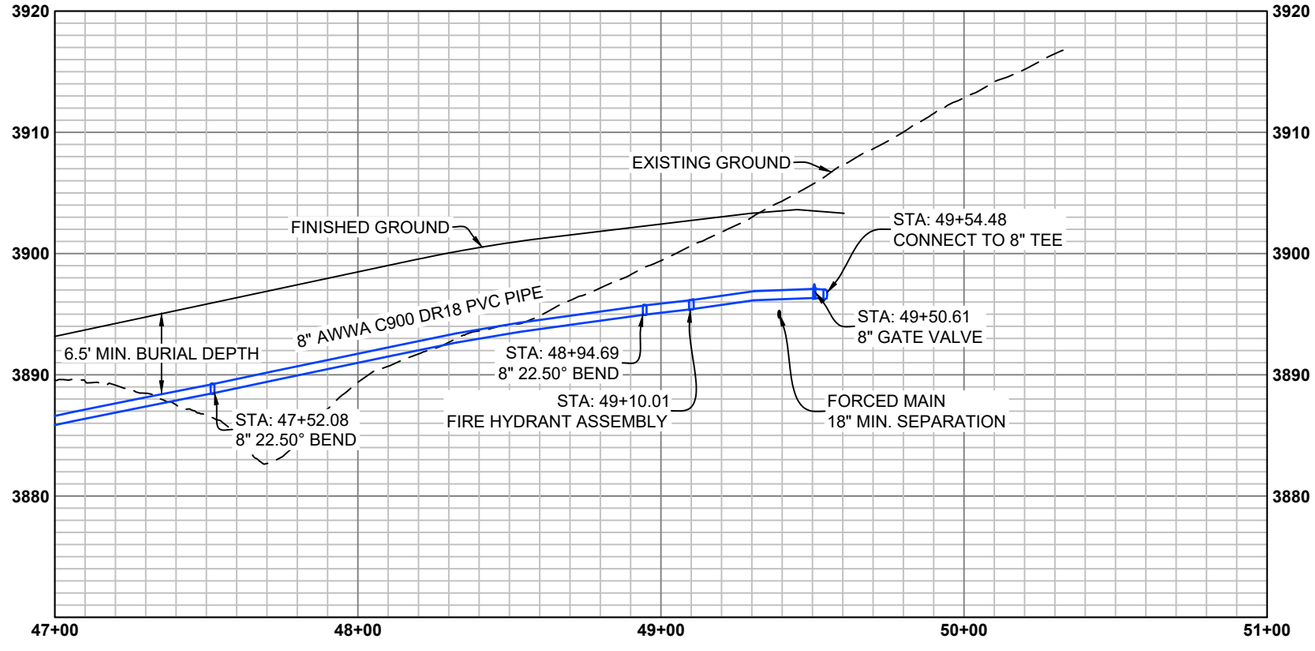

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WATER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

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DATE: 12/20/2023

SHEET
37

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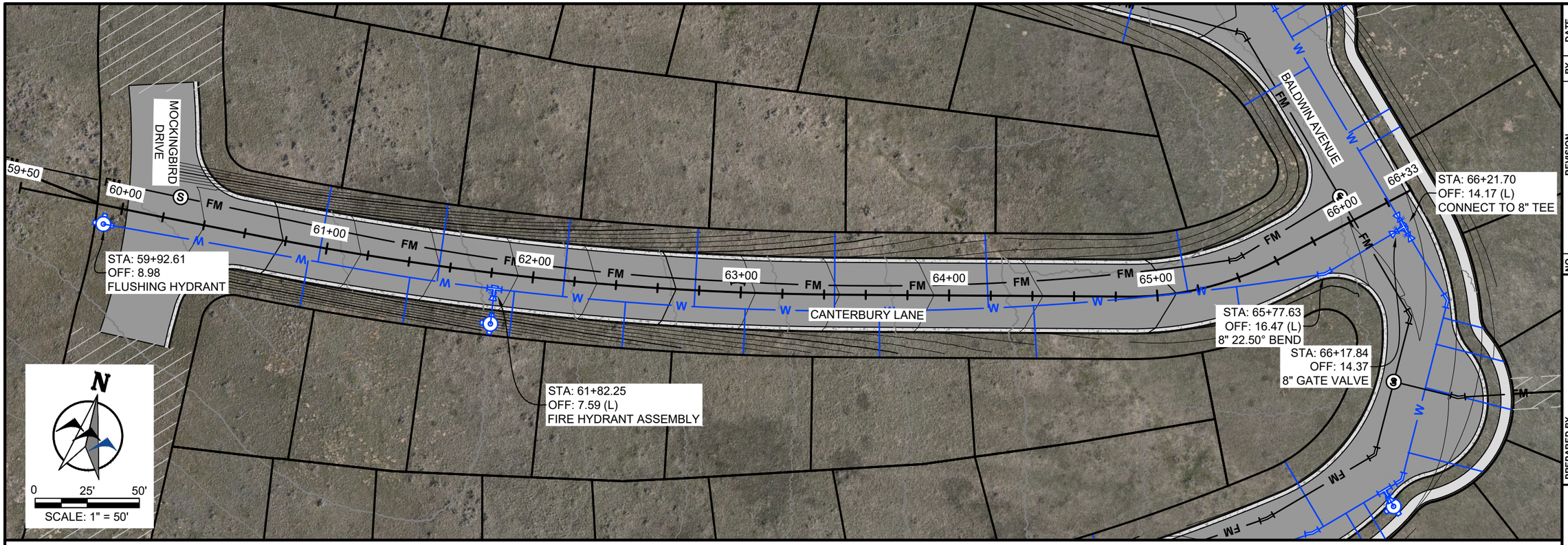

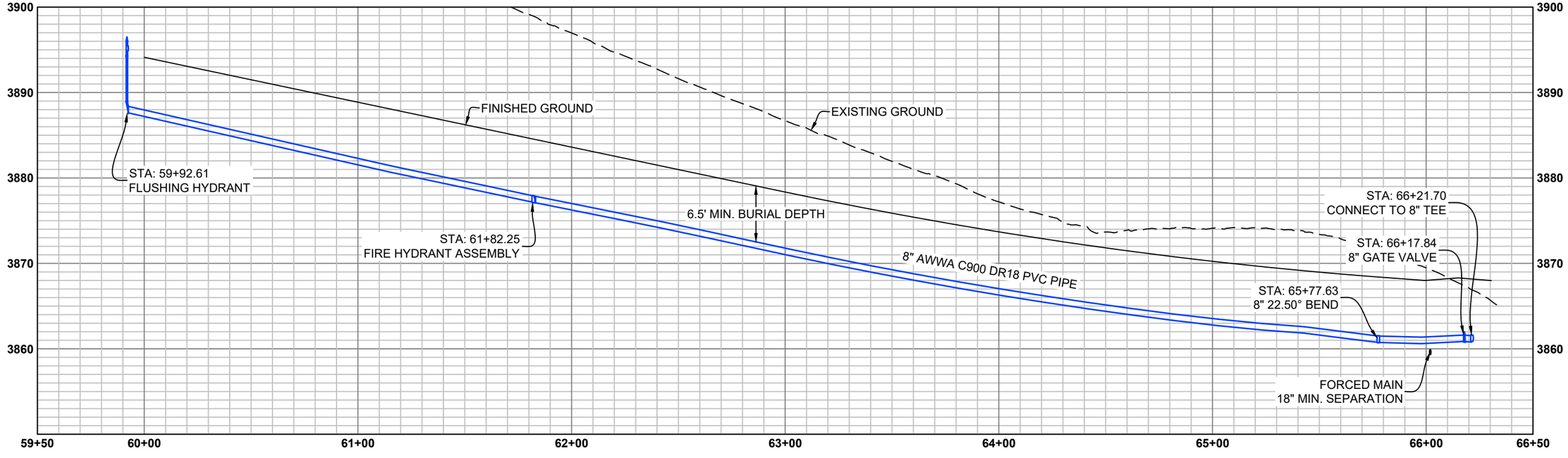

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WATER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

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DATE:	12/20/2023

SHEET
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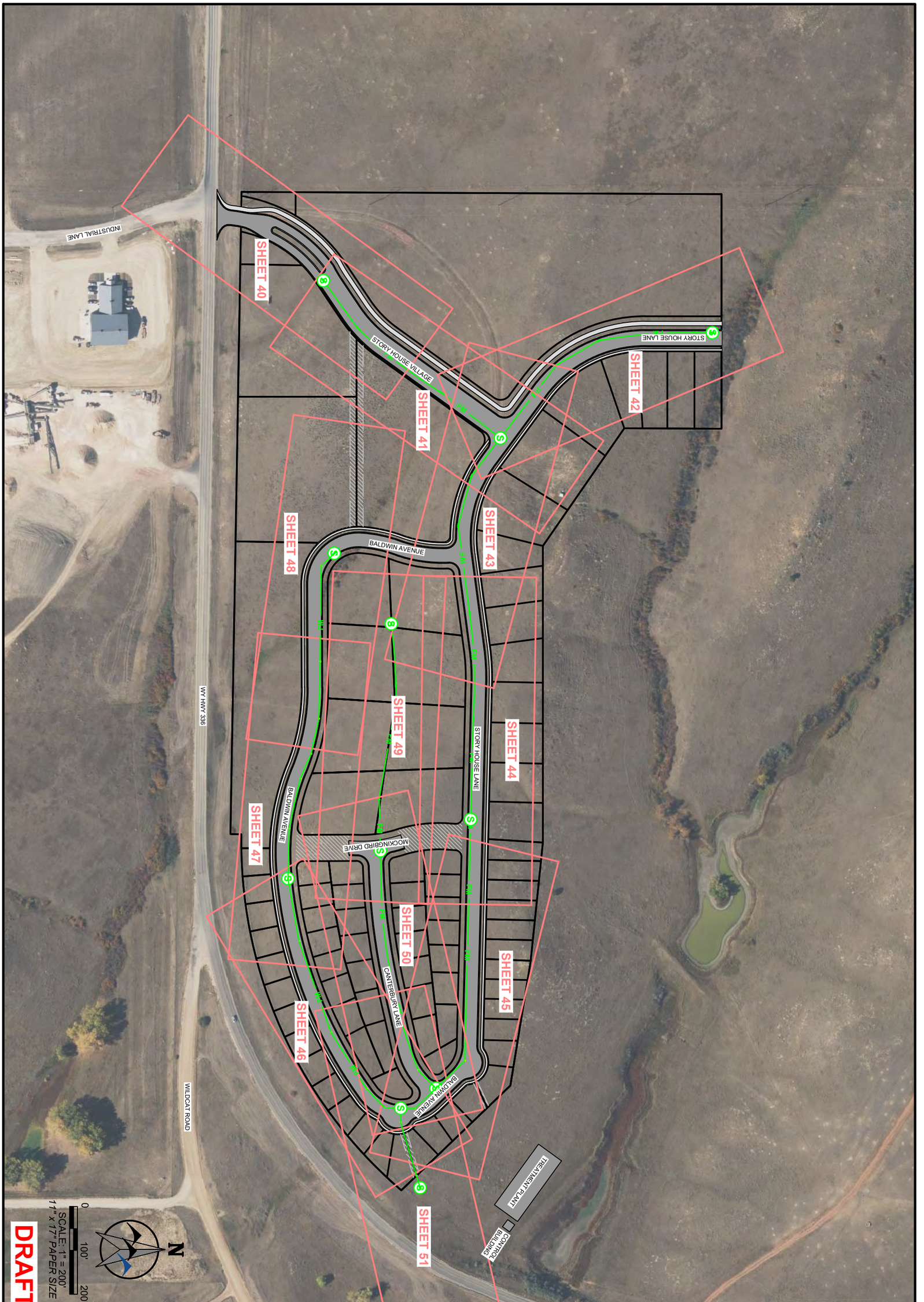

STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

SANITARY SEWER KEY SHEET

SHERIDAN COUNTY, WYOMING

SHEET 39

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: JBG
DATE: 12/20/2023

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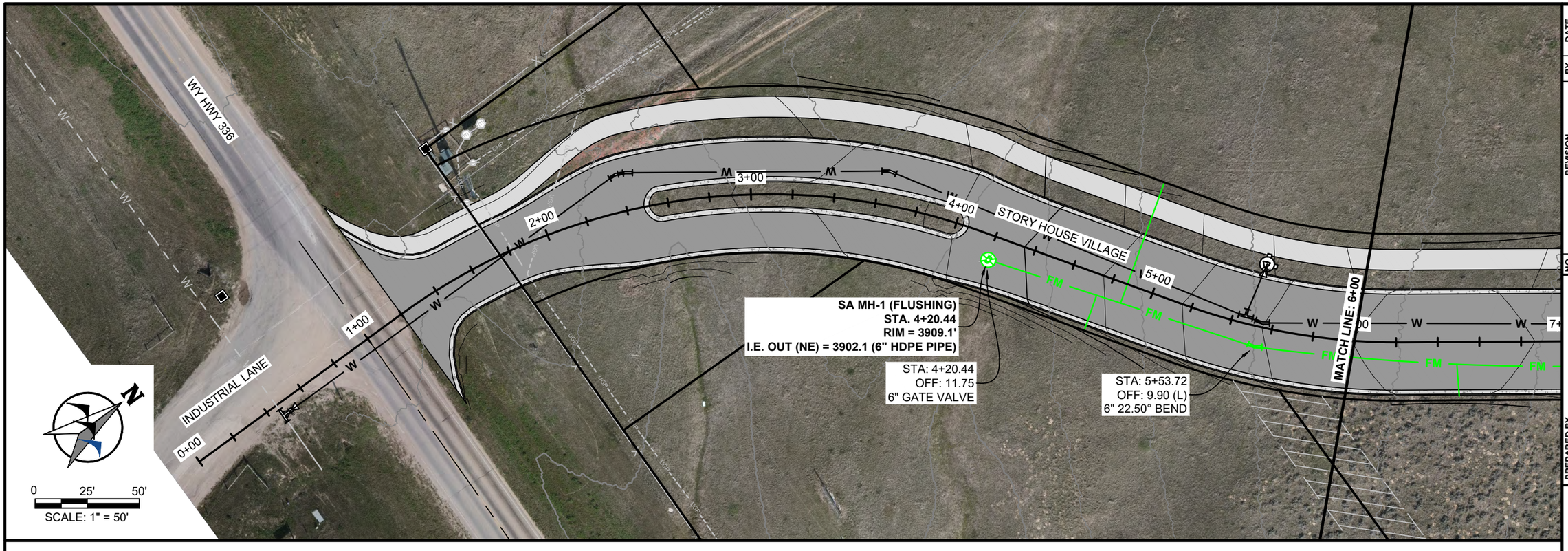

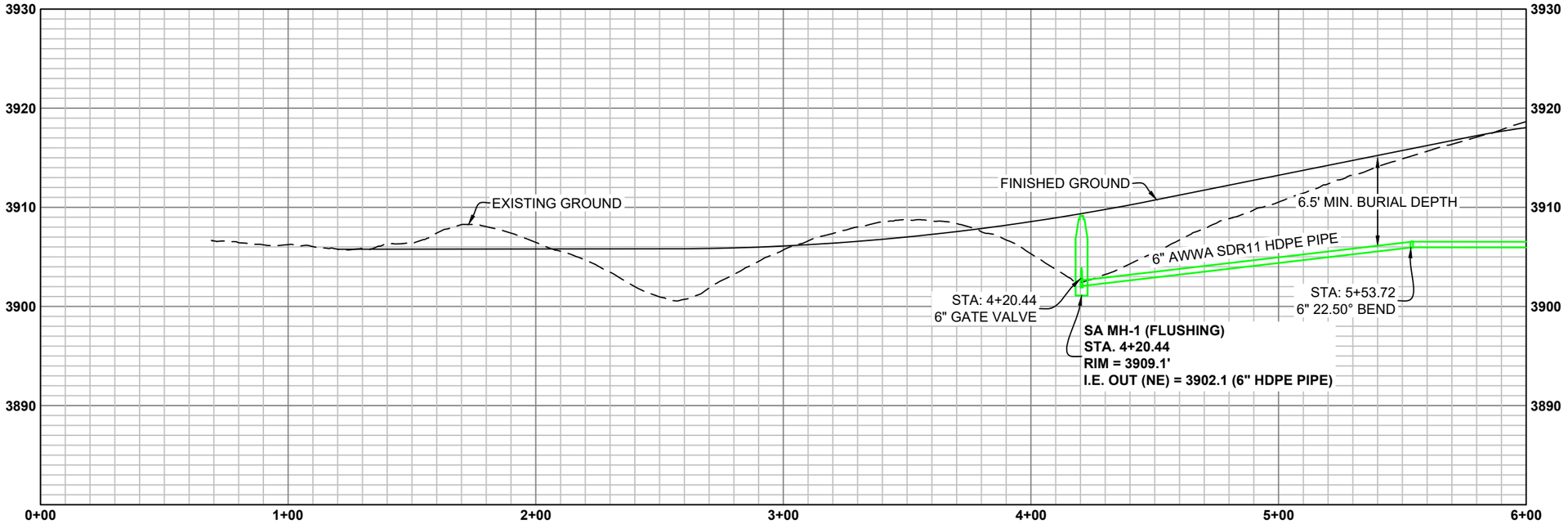

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SANITARY SEWER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

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SHEET
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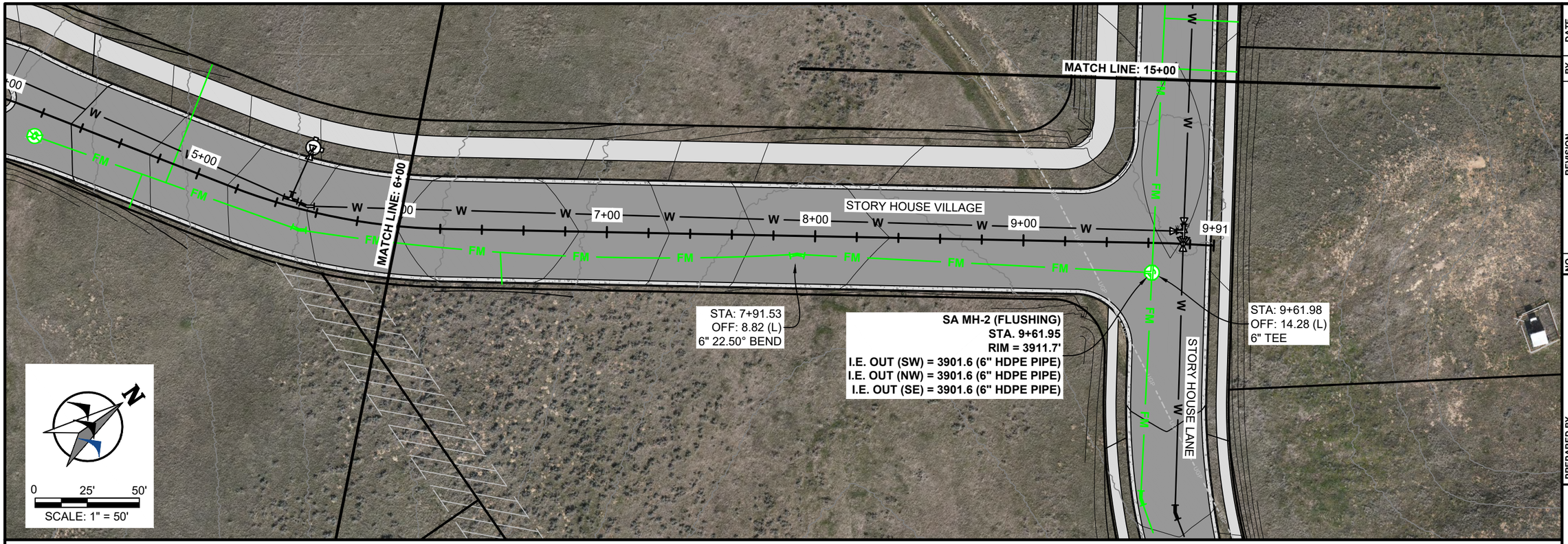

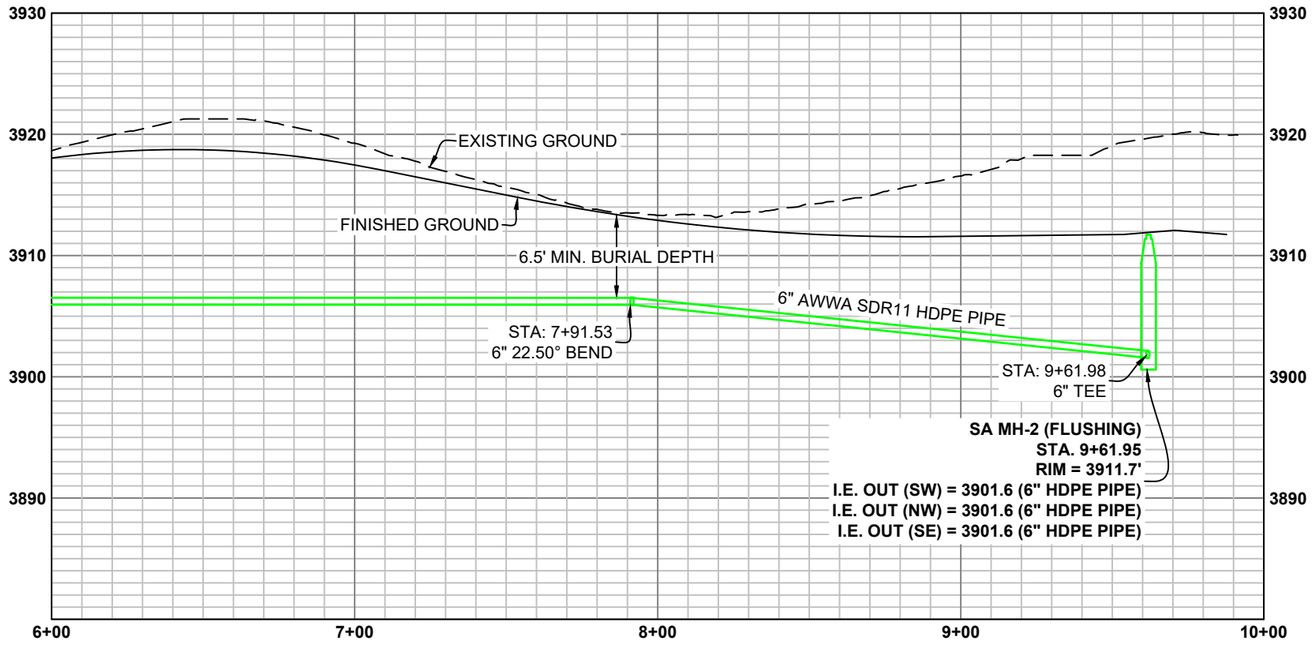

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SANITARY SEWER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY: *SER*
DRAWN BY: *CIG*
CHECKED BY: *JBG*
DATE: *12/20/2023*

SHEET
41

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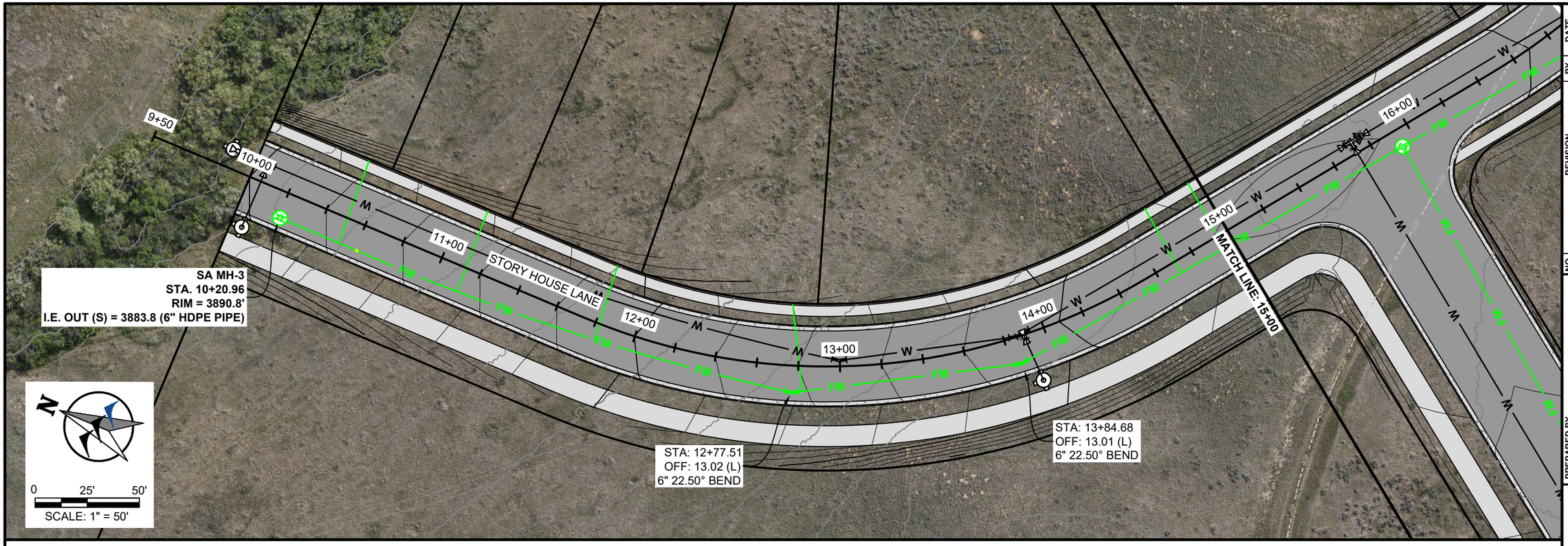

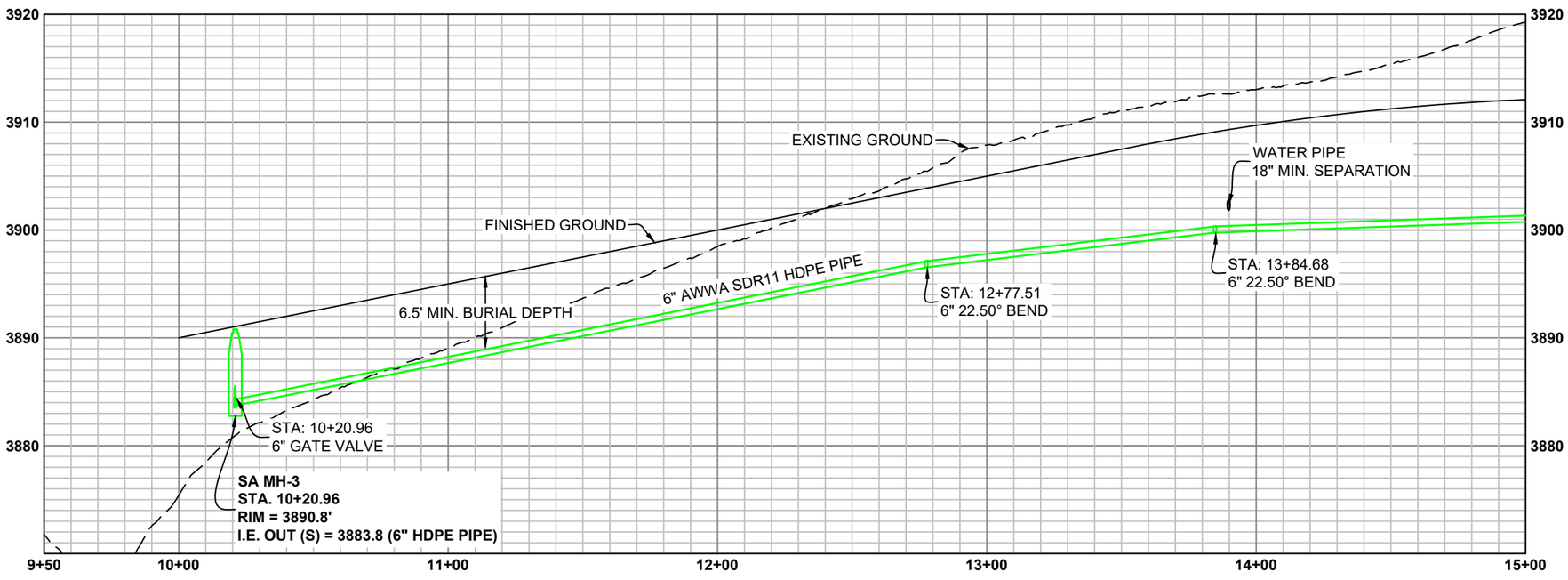

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PROJECT NO. 2023-137

PREPARED BY
WWC ENGINEERING
1849 TERRA AVE.
SHERIDAN, WY 82801
(307) 672-0761
www.wwcengineering.com

STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE PUD - PHASE 1

SANITARY SEWER PLAN AND PROFILE SHEET

SHERIDAN COUNTY, WYOMING

DESIGNED BY:	SER
DRAWN BY:	CIG
CHECKED BY:	JBG
DATE:	12/20/2023

SHEET
42

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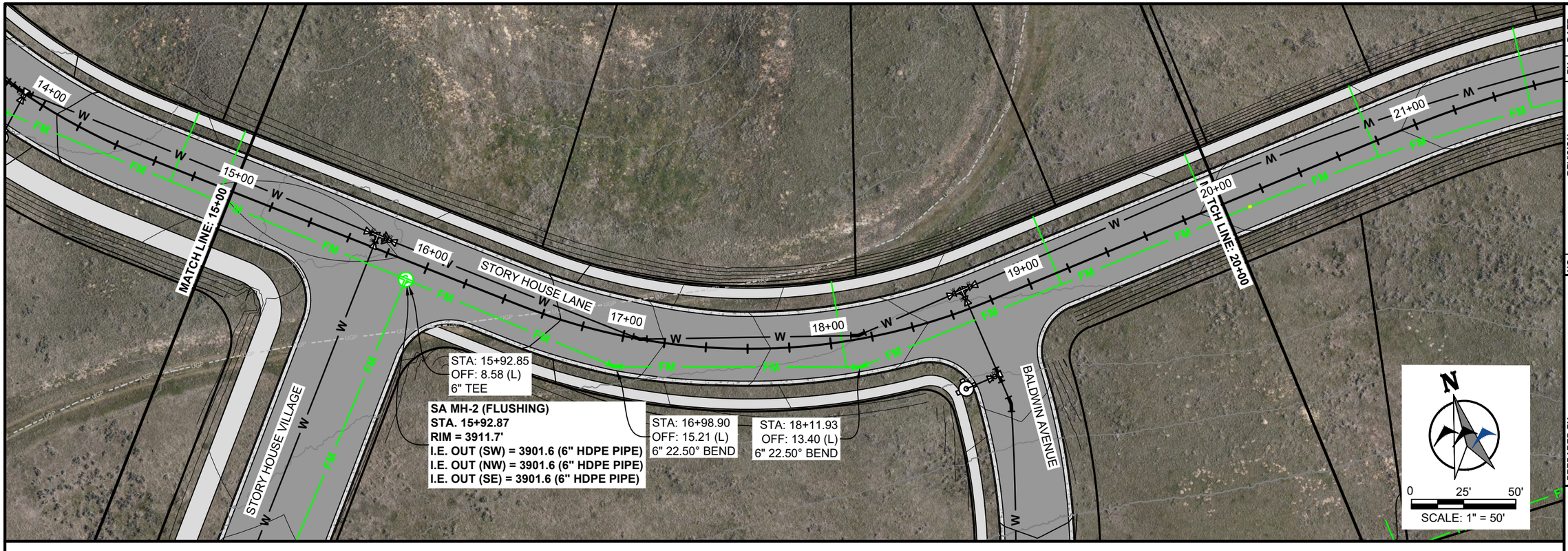

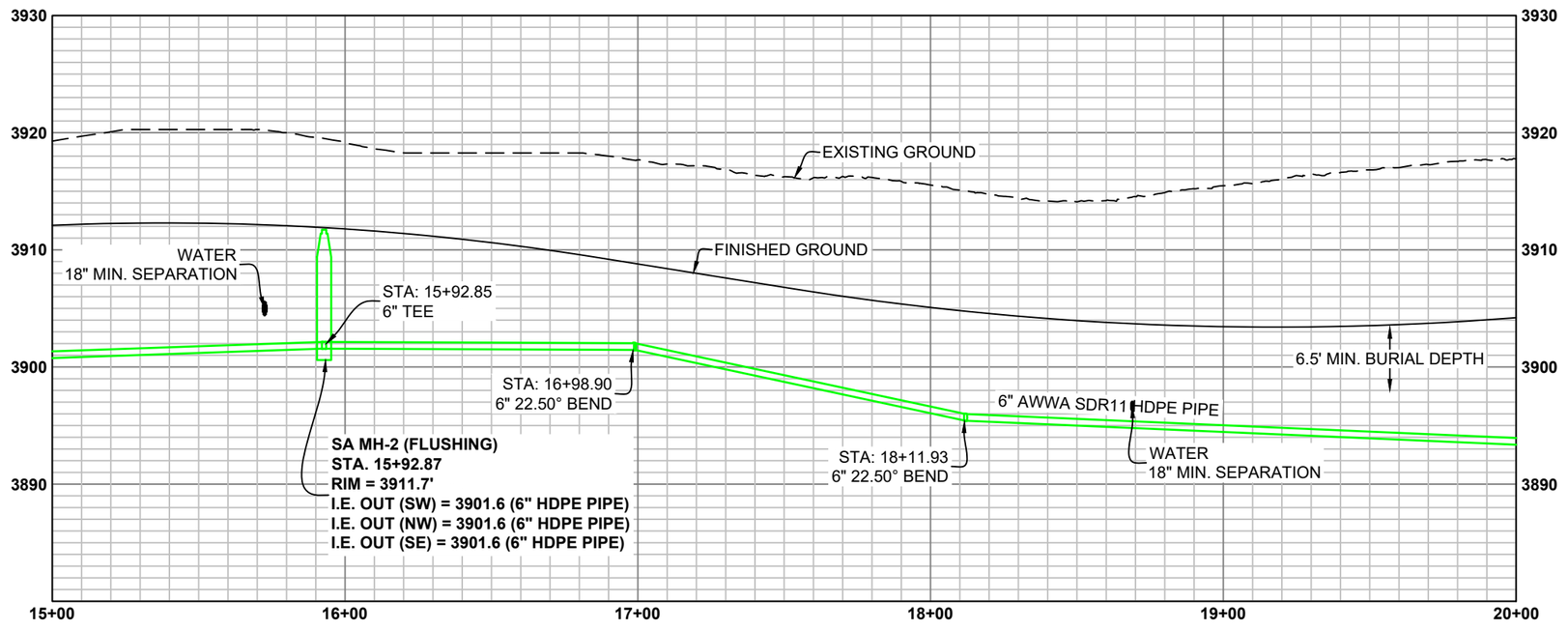

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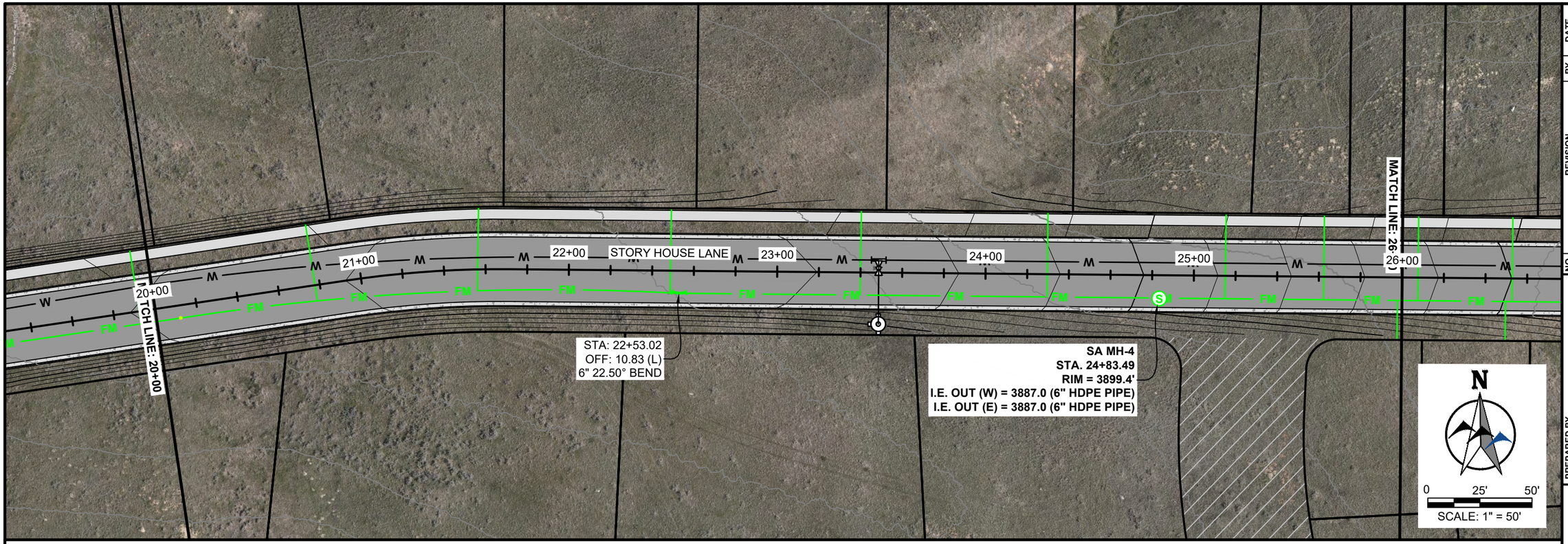

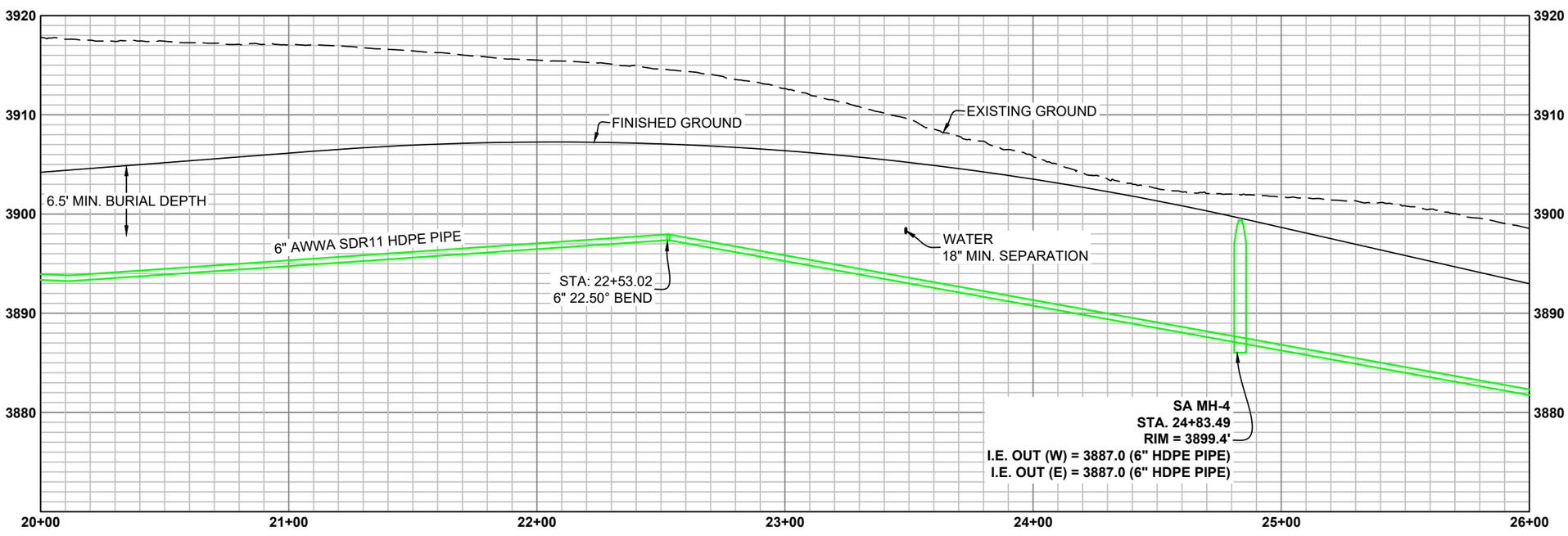

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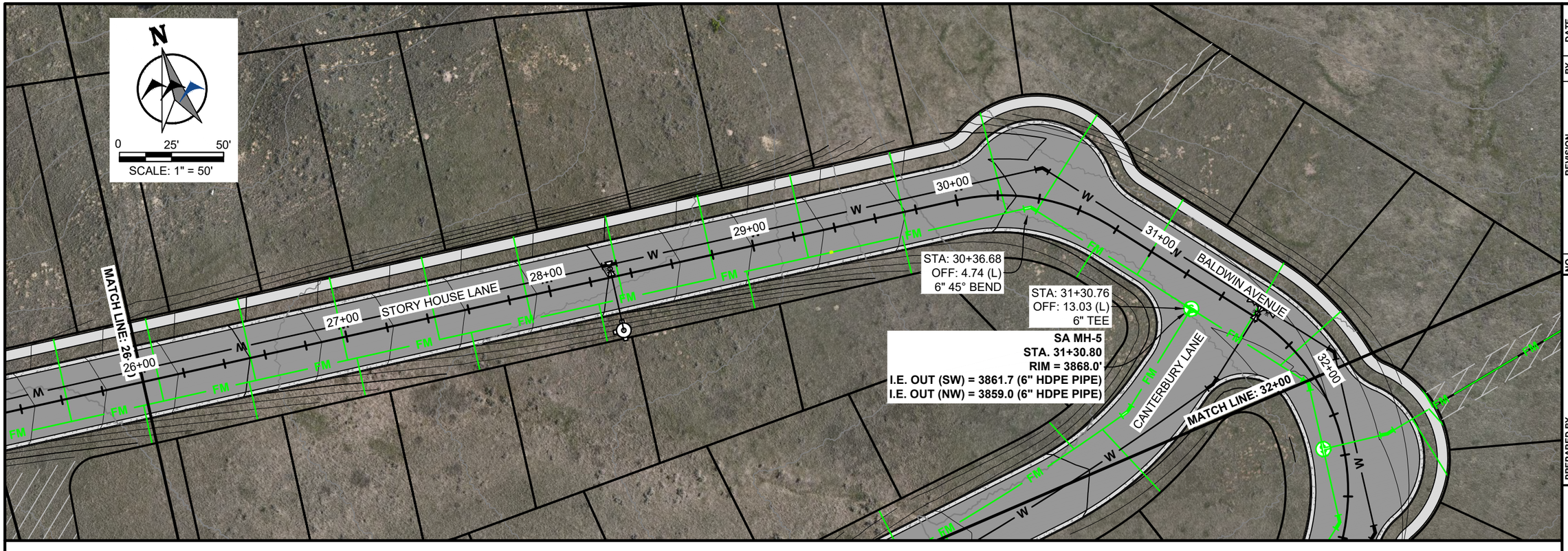

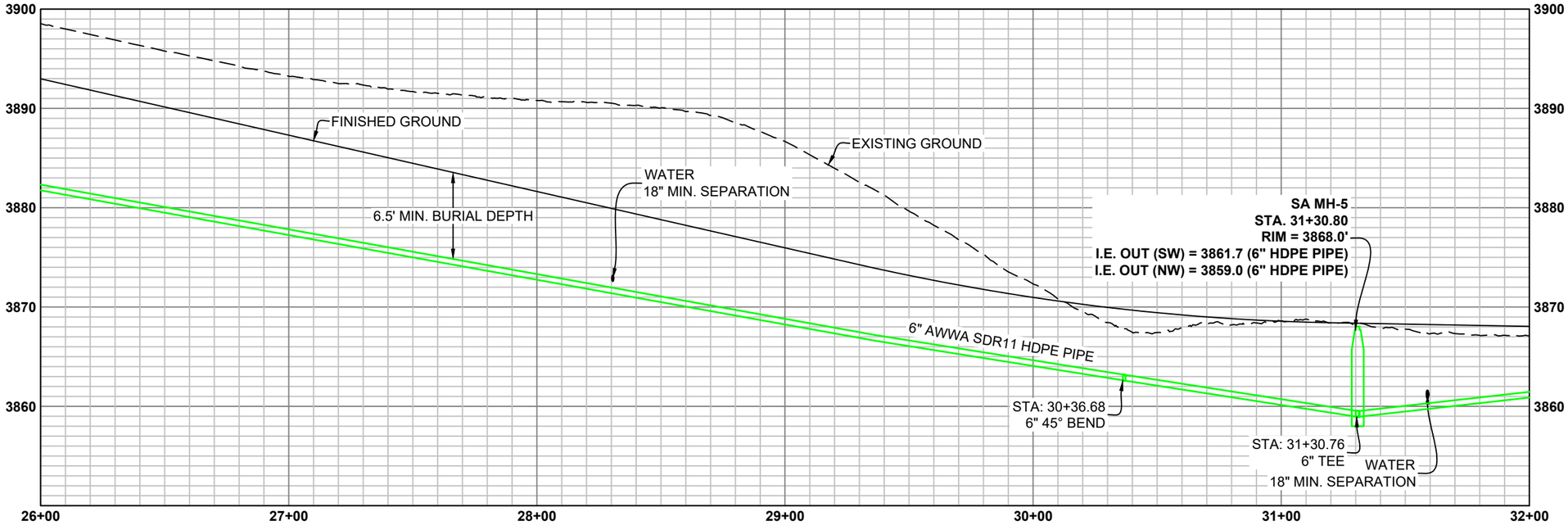

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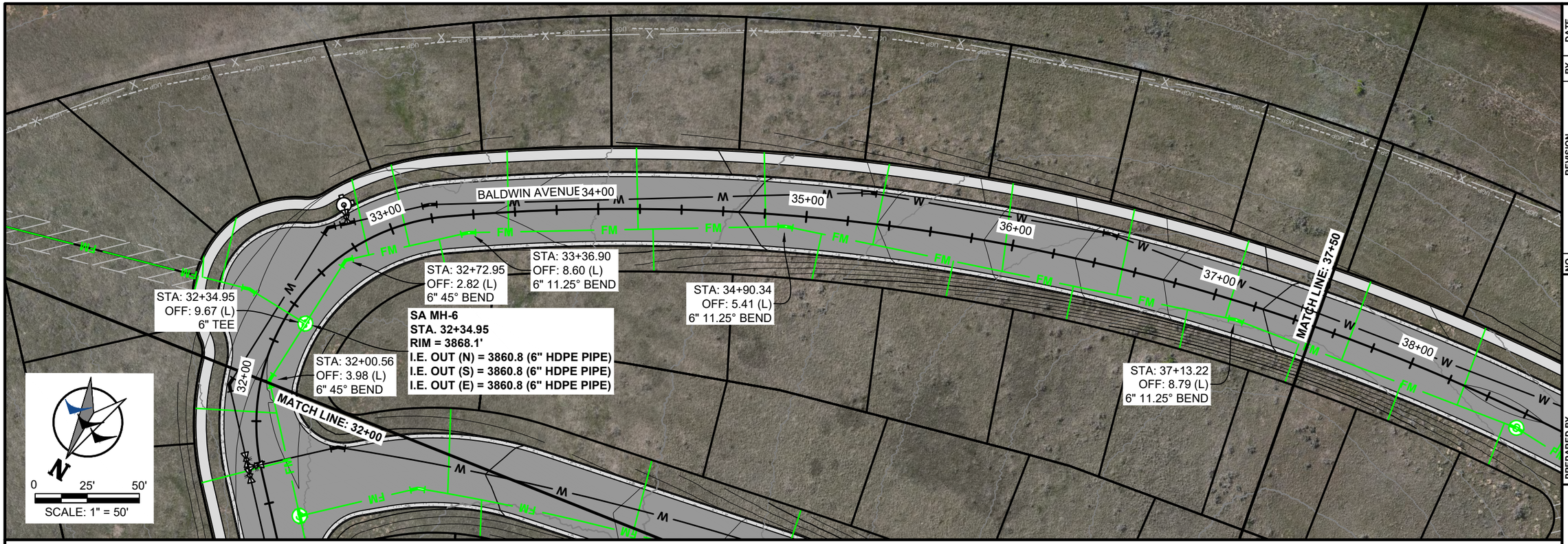

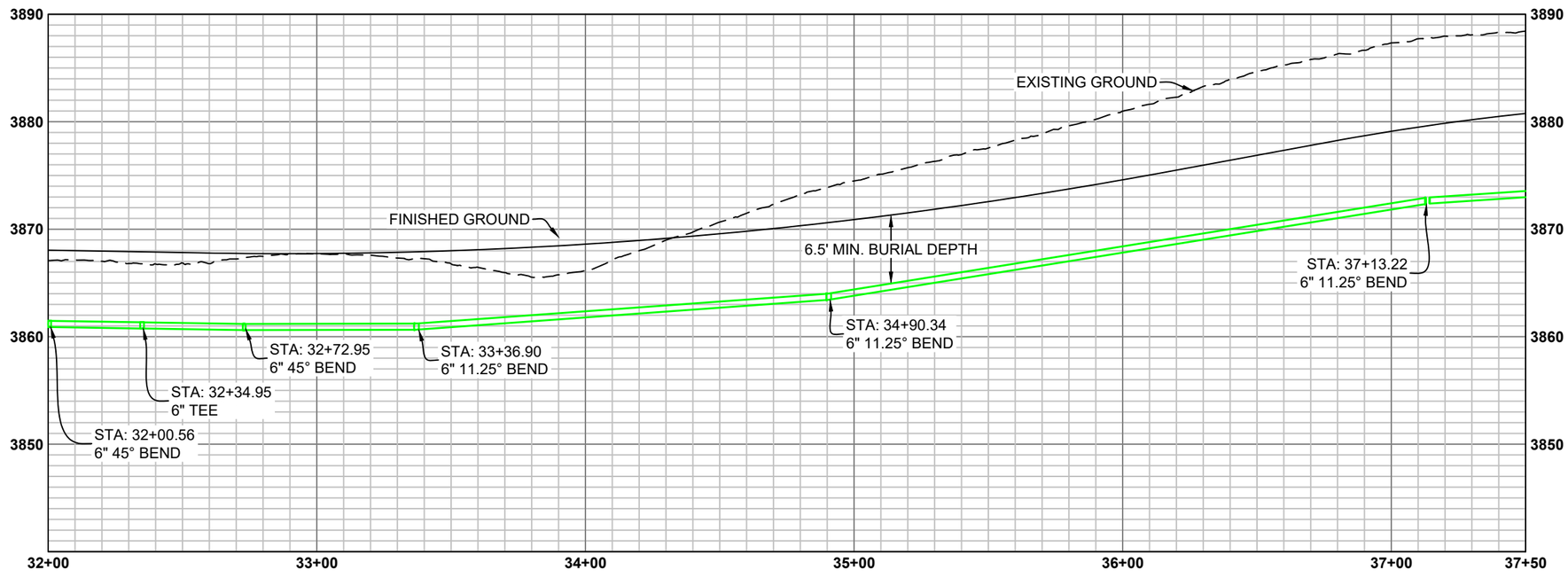

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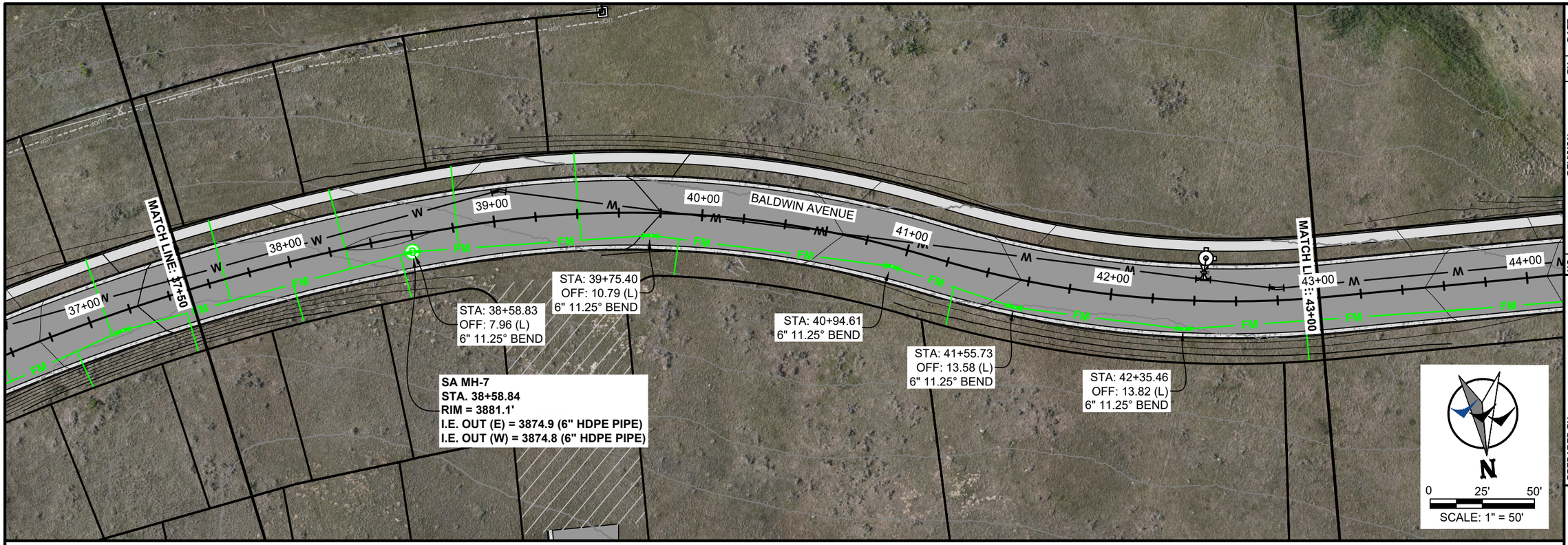

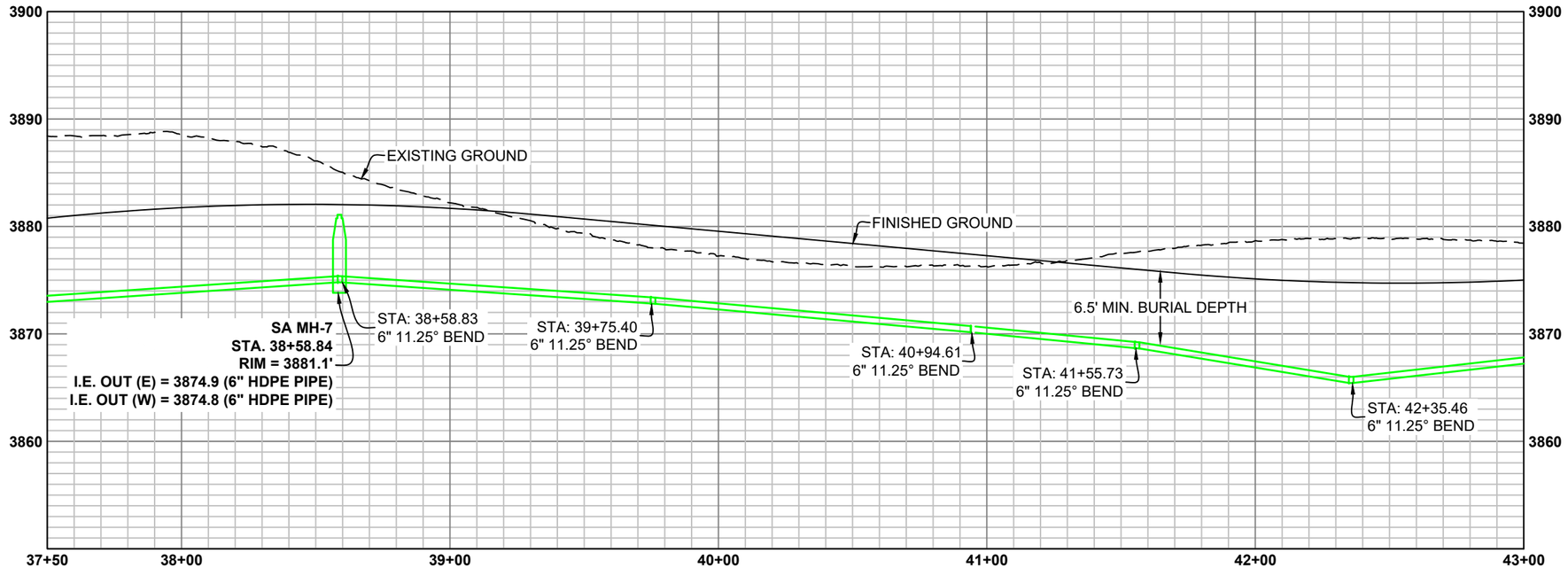

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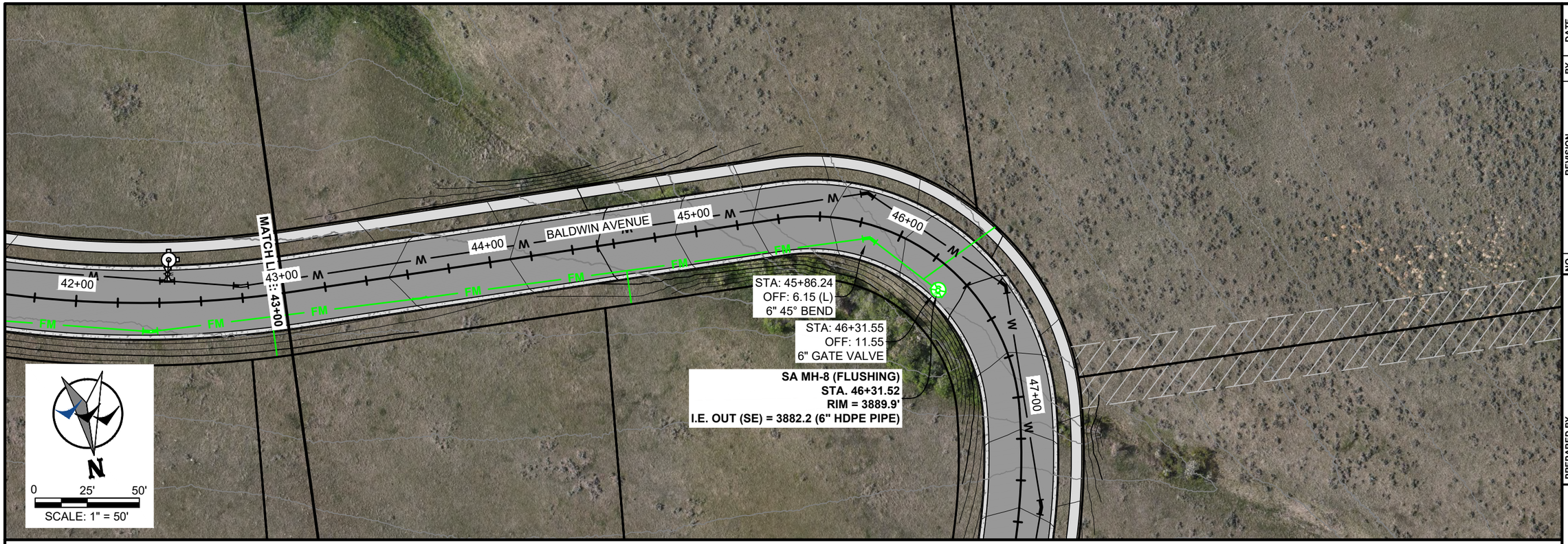

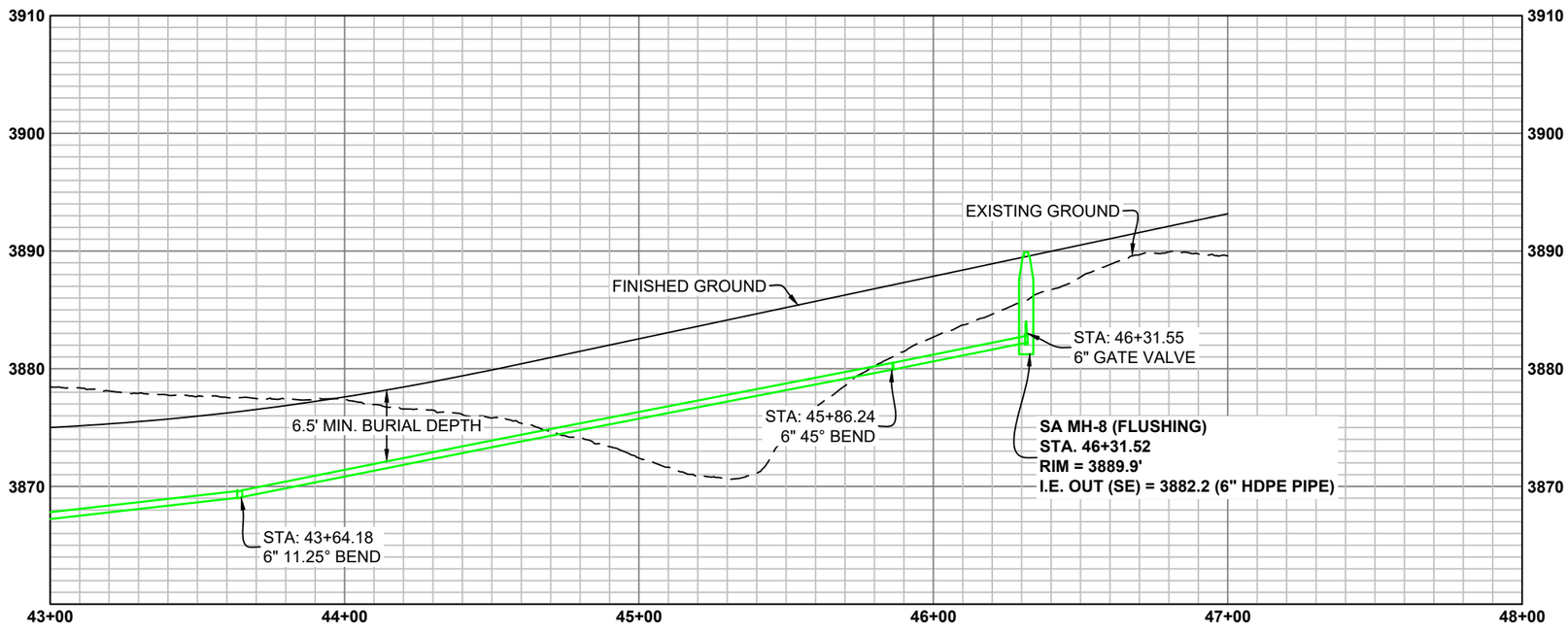

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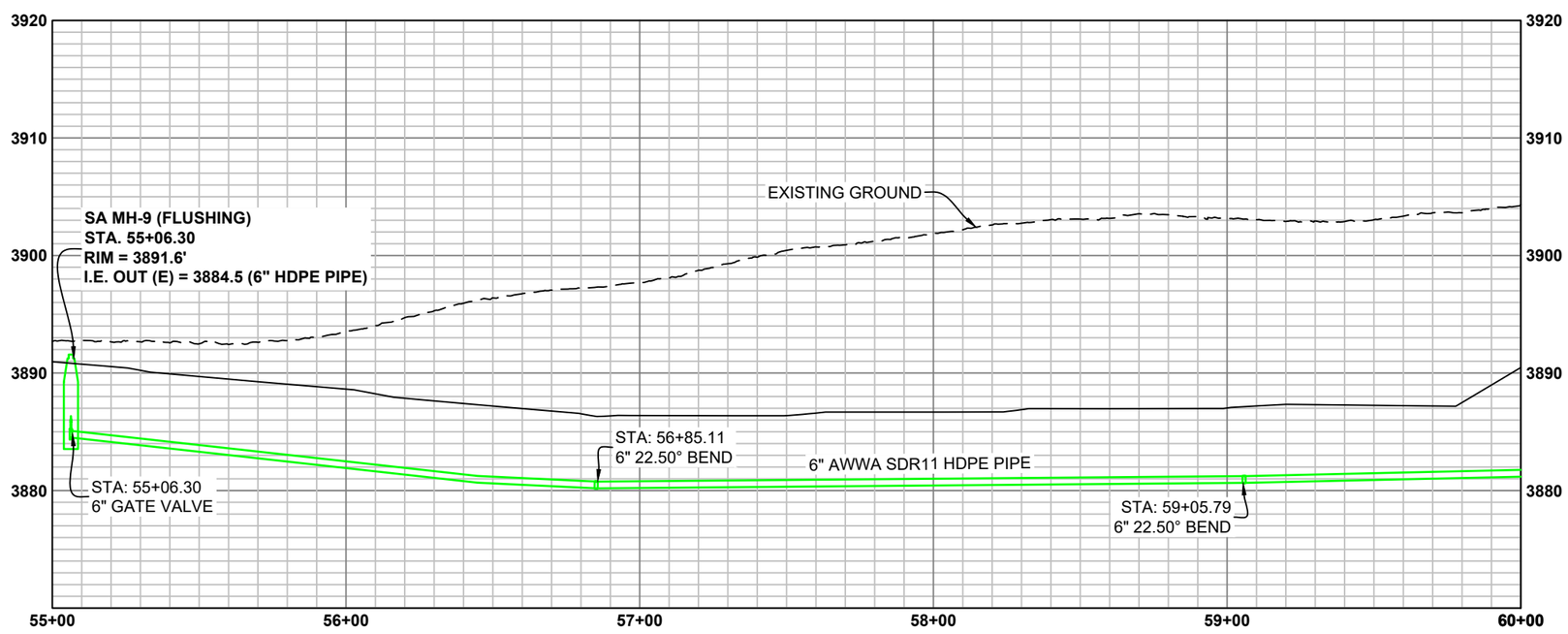

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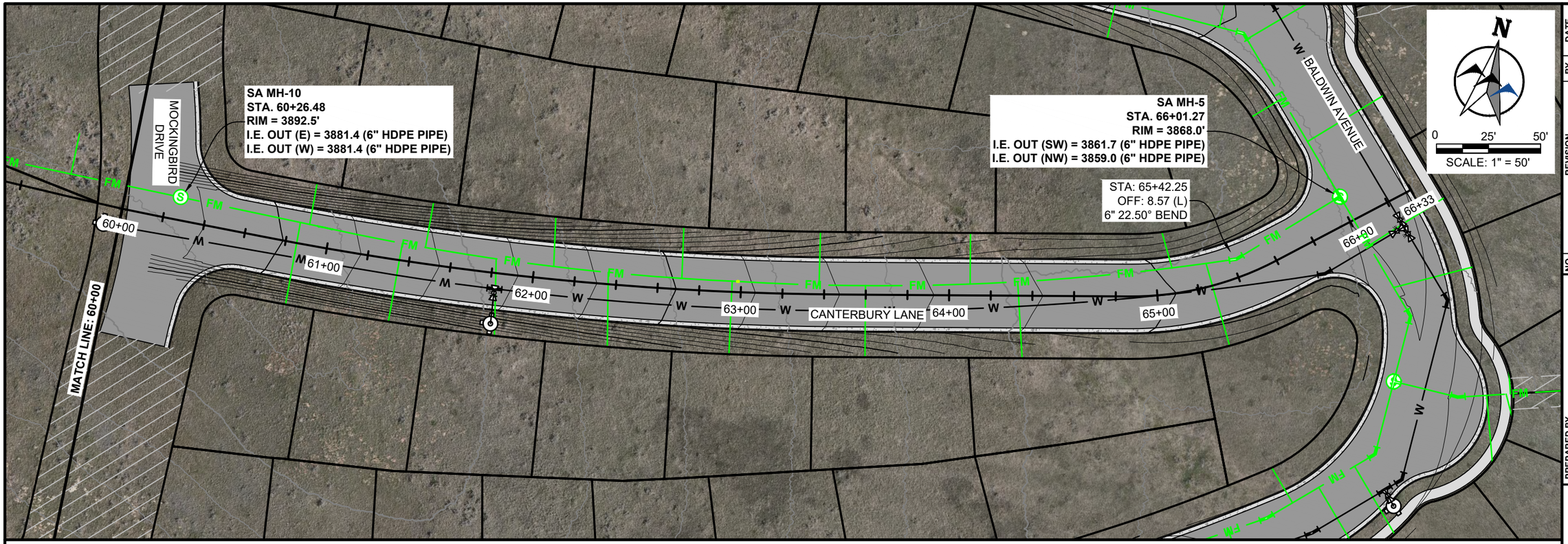

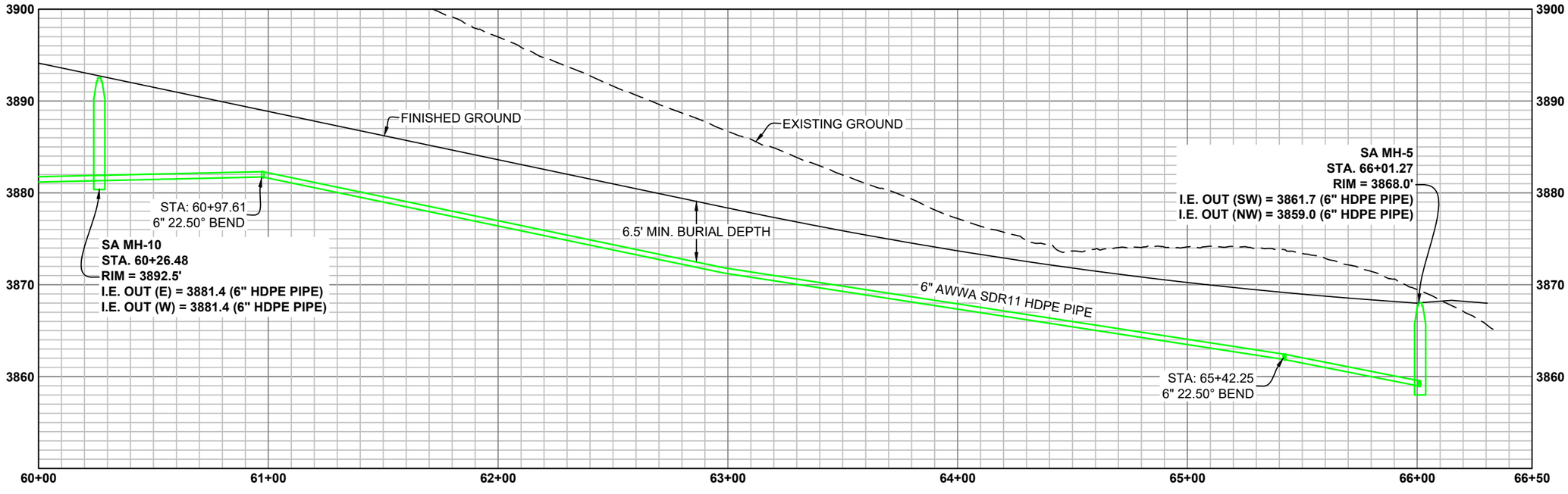

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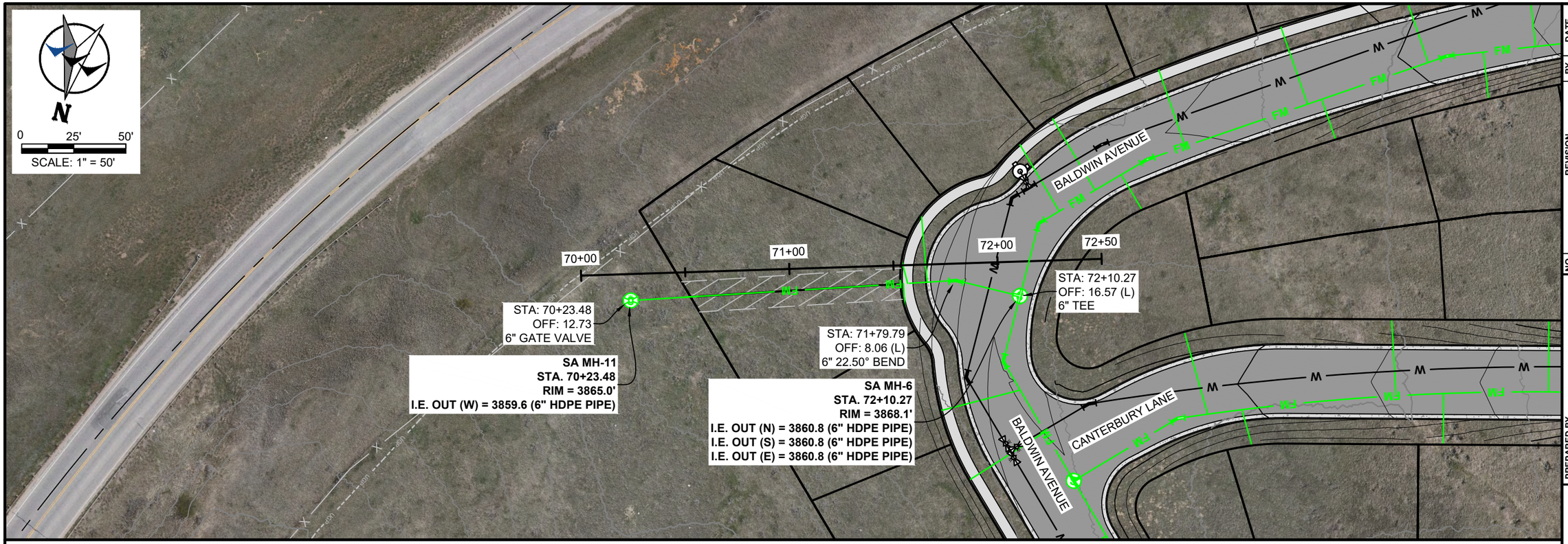

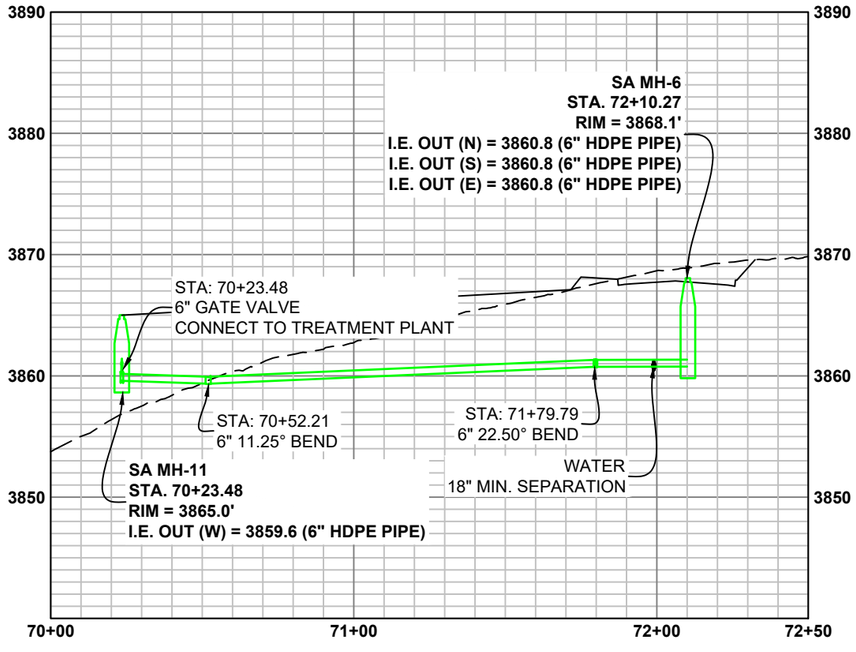

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SHERIDAN COUNTY, WYOMING

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DATE: *12/20/2023*

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51

APPENDIX B

Water Calculations

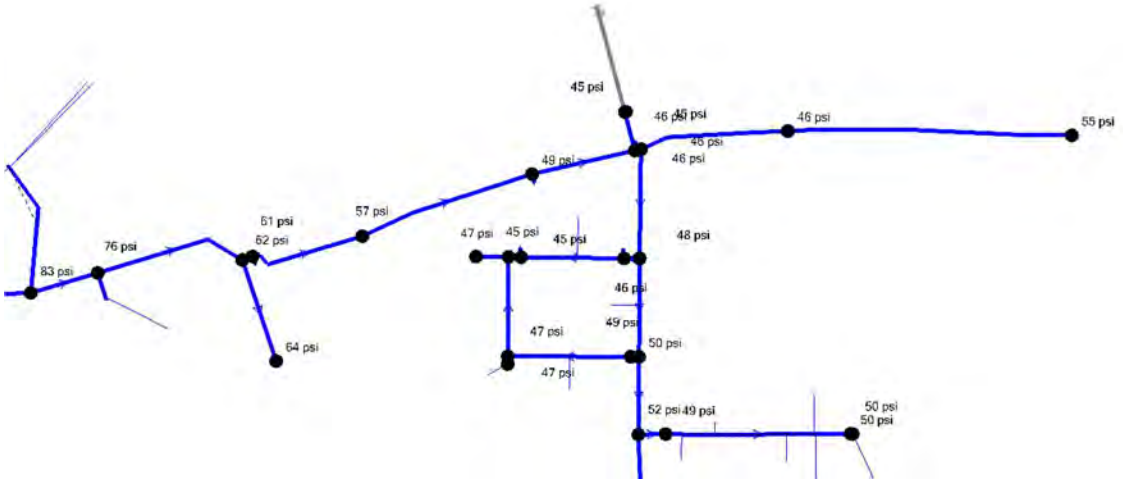
Scenario: FF Exist System
Current Time Step: 0.0 h
FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Pressure (psi)
61447	J-3734	3,907.56	0.14	53
61448	J-3735	3,905.86	0.14	54
61449	J-3736	3,920.96	0.39	47
61450	J-3737	3,907.33	0.00	53
61451	J-3738	3,919.52	0.39	48
61452	J-3739	3,907.68	0.48	53
61453	J-3740	3,892.46	0.62	59
61454	J-3741	3,905.81	1.93	54
61455	J-3742	3,917.53	0.00	48
61456	J-3743	3,915.09	0.00	49
61457	J-3744	3,916.00	11.87	49
61458	J-3745	3,917.18	23.74	49
61459	J-3746	3,865.45	4.35	71
61460	J-3747	3,865.79	1.93	71
61461	J-3748	3,866.73	0.97	70
61462	J-3749	3,866.26	2.90	71
61463	J-3750	3,904.88	0.00	54
61464	J-3751	3,878.56	21.83	65
61466	J-3753	3,877.54	19.88	66
61467	J-3754	3,888.42	19.88	61
61468	J-3755	3,890.10	0.30	60
61469	J-3756	3,892.21	10.24	59
61470	J-3757	3,868.05	8.21	70
61471	J-3758	3,883.49	7.25	63
61476	J-3762	3,907.56	0.00	53
61502	J-3763	3,869.32	2.90	69
61780	J-3764	3,914.30	0.00	50
61785	J-3765	3,911.67	0.00	51
61790	J-3766	3,895.51	2.07	58
61796	J-3767	3,877.64	20.38	66
61801	J-3768	3,876.04	7.25	66
61807	J-3769	3,877.16	18.63	66
61811	J-3770	3,915.44	0.48	49
61816	J-3771	3,903.84	37.06	54
61821	J-3772	3,904.21	4.35	54
61826	J-3773	3,867.18	2.90	70

Scenario: FF Exist System
Current Time Step: 0.0 h
FlexTable: Pipe Table

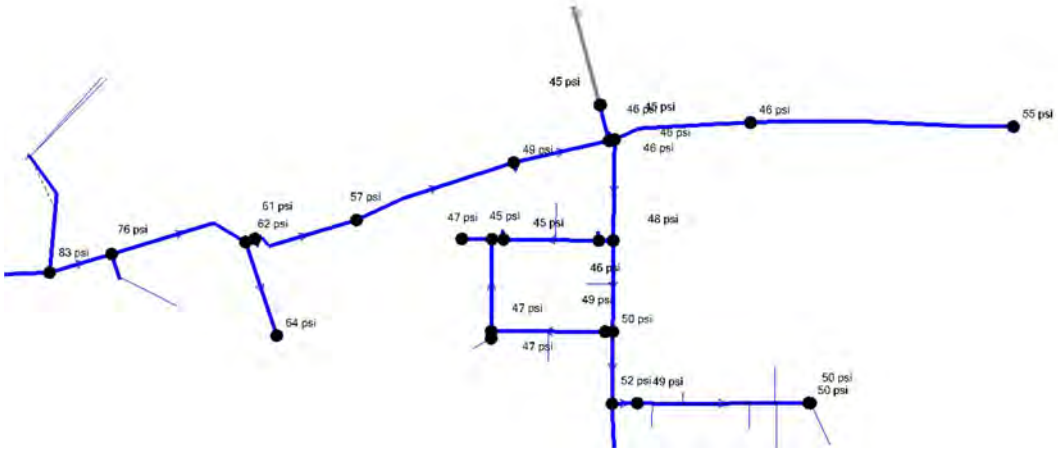
ID	Label	Length (Scaled) (ft)	Start Node	Pressure (Start) (psi)	Pressure (Stop) (psi)	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)
61479	P-1066	52	J-3762	53	53	J-3734	12.0	PVC	150.0	233.45	0.66
61480	P-1067	201	J-3734	53	54	J-3735	12.0	PVC	150.0	233.31	0.66
61481	P-1068	208	J-3735	54	53	J-3737	12.0	PVC	150.0	233.17	0.66
61483	P-1070	332	J-3736	47	48	J-3738	12.0	PVC	150.0	232.78	0.66
61485	P-1072	159	J-3739	53	59	J-3740	12.0	PVC	150.0	4.62	0.01
61487	P-1074	116	J-3738	48	48	J-3742	8.0	PVC	150.0	227.28	1.45
61488	P-1075	105	J-3742	48	49	J-3743	8.0	PVC	150.0	227.28	1.45
61490	P-1077	221	J-3744	49	49	J-3745	8.0	PVC	150.0	110.70	0.71
61492	P-1079	124	J-3746	71	71	J-3749	8.0	PVC	150.0	26.92	0.17
61493	P-1080	95	J-3749	71	71	J-3747	8.0	PVC	150.0	9.53	0.06
61494	P-1081	23	J-3747	71	70	J-3748	8.0	PVC	150.0	7.60	0.05
61498	P-1085	332	J-3753	66	61	J-3754	8.0	PVC	150.0	-73.81	0.47
61499	P-1086	40	J-3754	61	60	J-3755	8.0	PVC	150.0	-93.69	0.60
61500	P-1087	133	J-3755	60	59	J-3756	8.0	PVC	150.0	-93.99	0.60
61501	P-1088	200	J-3756	59	49	J-3744	8.0	PVC	150.0	-104.22	0.67
61503	P-1089	25	J-3749	71	69	J-3763	8.0	PVC	150.0	14.50	0.09
61504	P-1090	266	J-3763	69	63	J-3758	8.0	PVC	150.0	11.60	0.07
61781	P-1069(1)	91	J-3737	53	50	J-3764	12.0	PVC	150.0	233.17	0.66
61782	P-1069(2)	87	J-3764	50	47	J-3736	12.0	PVC	150.0	233.17	0.66
61783	P-1092	11	H-1726	53	50	J-3764	8.0	PVC	150.0	0.00	0.00
61786	P-1071(1)	186	J-3738	48	51	J-3765	12.0	PVC	150.0	5.11	0.01
61787	P-1071(2)	95	J-3765	51	53	J-3739	12.0	PVC	150.0	5.11	0.01
61788	P-1093	76	H-1727	47	51	J-3765	8.0	PVC	150.0	0.00	0.00
61791	P-1073(1)	140	J-3740	59	58	J-3766	12.0	PVC	150.0	4.00	0.01
61792	P-1073(2)	470	J-3766	58	54	J-3741	10.0	PVC	150.0	1.93	0.01
61793	P-1094	57	H-1728	64	58	J-3766	8.0	PVC	150.0	0.00	0.00
61797	P-1084(1)	372	J-3751	65	66	J-3767	8.0	PVC	150.0	-33.56	0.21
61798	P-1084(2)	42	J-3767	66	66	J-3753	8.0	PVC	150.0	-53.94	0.34
61799	P-1095	18	H-1730	67	66	J-3767	6.0	PVC	150.0	0.00	0.00
61802	P-1083(1)	372	J-3757	70	66	J-3768	8.0	PVC	150.0	-4.48	0.03
61803	P-1083(2)	117	J-3768	66	65	J-3751	8.0	PVC	150.0	-11.73	0.07
61804	P-1096	39	H-1731	64	66	J-3768	6.0	PVC	150.0	0.00	0.00
61809	P-1078(2)	213	J-3769	66	71	J-3746	8.0	PVC	150.0	31.27	0.20
61810	P-1097	30	H-1733	61	66	J-3769	6.0	PVC	150.0	0.00	0.00
61812	P-1076(1)	27	J-3743	49	49	J-3770	8.0	PVC	150.0	227.28	1.45
61813	P-1076(2)	43	J-3770	49	49	J-3744	8.0	PVC	150.0	226.79	1.45
61814	P-1098	41	H-1729	52	49	J-3770	6.0	PVC	150.0	0.00	0.00
61817	P-1078(1)(1)	242	J-3745	49	54	J-3771	8.0	PVC	150.0	86.96	0.56
61818	P-1078(1)(2)	485	J-3771	54	66	J-3769	8.0	PVC	150.0	49.90	0.32
61819	P-1099	29	H-1734	61	54	J-3771	6.0	PVC	150.0	0.00	0.00
61822	P-1091(1)	301	J-3758	63	54	J-3772	8.0	PVC	150.0	4.35	0.03
61823	P-1091(2)	10	J-3772	54	54	J-3750	8.0	PVC	150.0	0.00	0.00
61824	P-1100	32	H-1735	55	54	J-3772	6.0	PVC	150.0	0.00	0.00
61827	P-1082(1)	58	J-3748	70	70	J-3773	8.0	PVC	150.0	6.63	0.04
61828	P-1082(2)	111	J-3773	70	70	J-3757	8.0	PVC	150.0	3.73	0.02
61829	P-1101	18	H-1732	71	70	J-3773	6.0	PVC	150.0	0.00	0.00

Existing Peak Day (City of Sheridan Model):



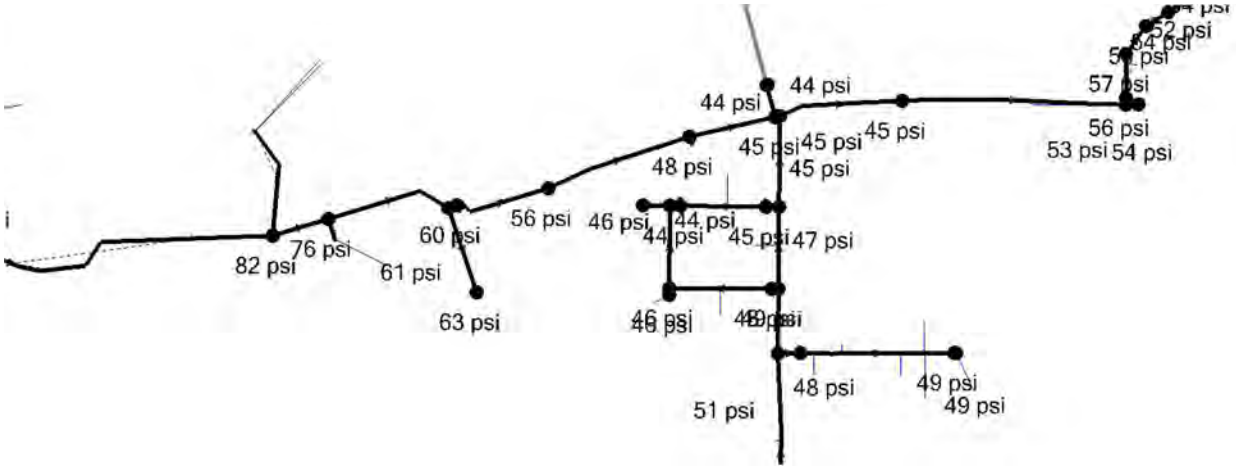
Junction ID (From Water Gems)	Pressure (psi)
3803	55
9144	46
9847	49
9566	47

Existing Peak + Fire Flow (City of Sheridan Model):



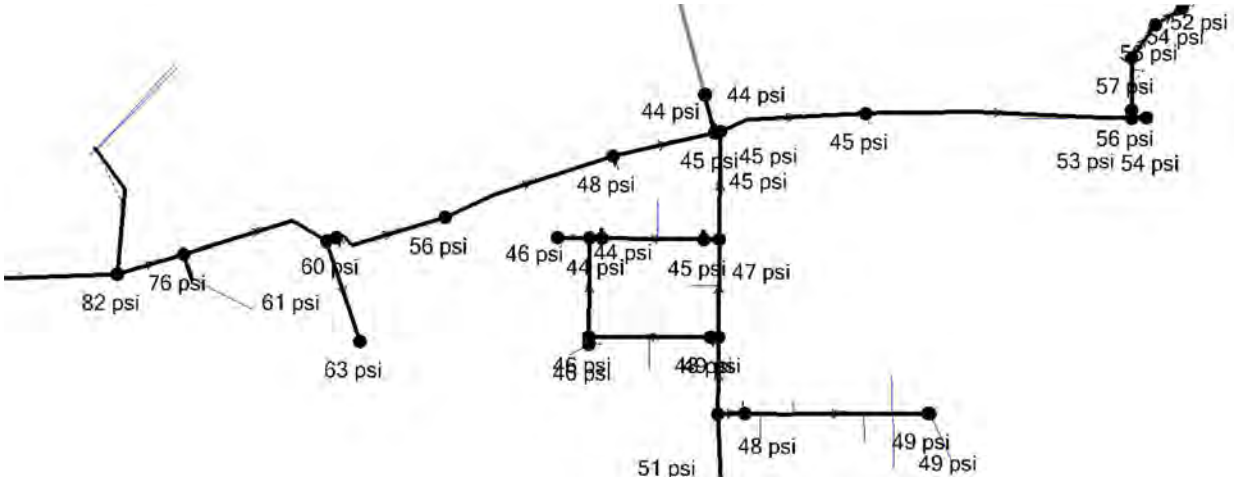
Junction ID (From Water Gems)	Pressure (psi)
3803	55
9144	46
9847	49
9566	47

Existing Peak Day (City of Sheridan Model + Story House):



Junction ID (From Water Gems)	Pressure (psi)
3803	54
9144	45
9847	48
9566	46

Existing Peak + Fire Flow (City of Sheridan Model + Story House):



Junction ID (From Water Gems)	Pressure (psi)
3803	54
9144	45
9847	48
9566	46

APPENDIX C

Sanitary Sewer Calculations

Zone No	Connected to Zone	No. Pumps in Zone	Cumulative Pumps in Zone	EDU	Cumulative EDU	Max Simul. Operating	Max Flow (gpm)	Pipe Size (in)	Length (ft)	Q_p (gpm)	Q_p (cfs)	C	h_L (ft)	h_L (ft) + h_{hv} (ft)	Accum. Frictio Loss (ft)	Max Main Elev.	Min. Ground Elev.	h_E (ft)	Min. Pump Elev.	h_P (ft)	TDH (ft)	TDH (psi)
1	3	6	6	6	6	3	33	6	585	16.44	0.036615	140	0.02	20	0.02	3903	3892	5	3887	11	16.02	6.9
2	3	9	9	216	216	3	33	6	545	591.84	1.318129	140	13.446	20	13.446	3909	3911	5	3906	0	18.45	8.0
3	5	30	45	30	252	6	66	6	1540	690.48	1.537817	140	0.657	20	14.123	3898	3868	5	3863	30	49.12	21.3
4	5	19	19	79	79	5	55	6	1090	216.46	0.482094	140	4.183	20	4.183	3884	3869	5	3864	15	24.18	10.5
5	7	3	67	3	334	7	77	6	120	915.16	2.038218	140	6.631	20	11.471	3862	3867	5	3862	0	16.47	7.1
6	7	27	27	142	142	5	55	6	1420	389.08	0.866548	140	16.124	20	16.124	3886	3867	5	3862	19	40.12	17.4
7	7	2	96	2	478	8	88	6	300	1309.72	2.916971	140	32.175	20	54.93	3862	3867	5	3862	0	59.93	25.9

APPENDIX D

Additional Sewer Information

Sewer Systems: Construction Considerations

Introduction

Pressure sewers, including liquid-only (aka "effluent") sewers and grinder sewers, differ from gravity sewers in method of construction, installation techniques, and degree of accessibility for installing the various products and system components. The construction impact of installing any sewer system technology falls into two main categories: on-lot and right-of-way (ROW).

Due to the use of small-diameter mainlines that follow the contour of the land, the typical ROW construction impact of pressure sewers is considerably less than that of gravity sewers. The on-lot construction impact of liquid-only sewers is similar to grinder sewers, but liquid-only sewers provide primary treatment, lower life-cycle costs,[i] and emergency capacity.

Liquid-only sewer systems have been installed all over the country and around the world – in sparsely populated rural areas, dense downtown commercial areas, and neighborhoods with small lots, mature landscaping, and underground utilities. As a result of its low construction impact and overall affordability, this efficient technology is an ideal solution for a wide range of applications.

This document explains various aspects of liquid-only sewer construction and how it compares to grinder and gravity sewer requirements in areas with small lots and existing streets, homes, and businesses.

Right-Of-Way Construction Impact

Pressure Sewers

The ROW components of pressure sewers consist of small-diameter, low-pressure force mains, typically 2- to 4-inch (50- to 100-mm) diameter PVC or HDPE, shallowly buried below frost depth, adjacent to the road surface, and following the contour of the land.

The force main components are typically installed via open-trench construction with trenching machines or directional boring (trenchless) construction methods. Open-trench construction methods for pressure sewers typically require a trench opening of 12 inches (305 mm) and shallowly buried pipe, as illustrated in Figure 1. Consequently, they have significantly less excavated material when compared to gravity sewers.

As illustrated in Figures 2 and 3, trenchless construction is the least-intrusive sewer construction method. Trenchless construction offers additional benefits to the public and the environment when compared to open-trench construction for pressure sewers, and especially when compared to open-trench construction methods for gravity sewers. According to the ASCE,[ii] trenchless construction is a less-intrusive method for installing new pipes while reducing:

- Indirect construction costs (known as "social costs to third parties")
- Adverse environmental impacts and permitting concerns
- Problems with handling and disposing of contaminated soils and groundwater
- Costs of utility conflicts and the resulting relocations
- Costs for surface restoration, including pavement reconstruction

Figure 1. Typical open-trench construction (courtesy of Innoflow Technologies)

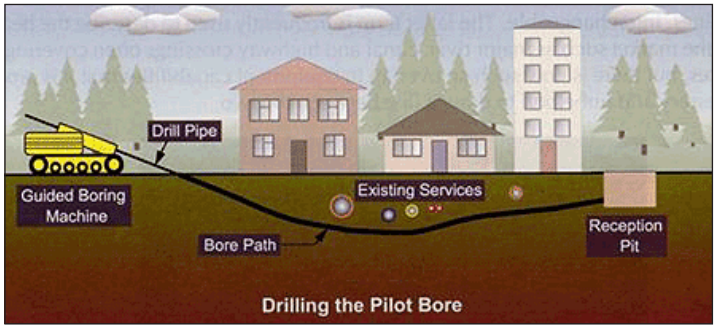


Figure 2. Drilling the pilot bore (trenchless construction)

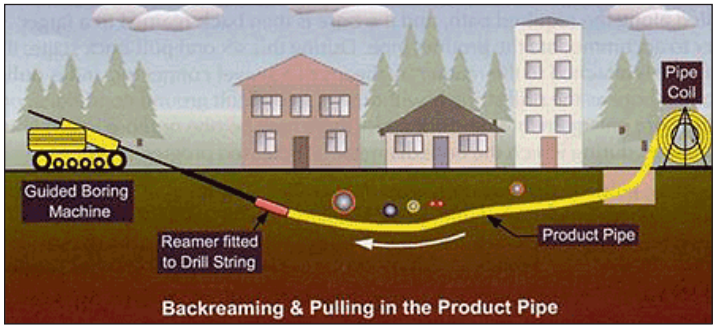


Figure 3. Backreaming and pulling the pipe (trenchless construction)

Figures 2 and 3 from the FHWA's "Manual for Controlling and Reducing the Frequency of Pavement Utility Cuts" report; used with permission. Contract number DTFH61-01-C-00024.

Gravity Sewers

In contrast, gravity sewers generally require open-trench construction (without trenching machines or directional boring methods) directly within road surfaces, large-diameter pipe (> 8-inch or 200-mm diameter), and deep excavations often in excess of 10-15 ft (3-4.6 m). The construction impact is comparatively extensive and intrusive, frequently requiring large excavation zones (Figure 4) and generous construction easements to accommodate bulky installation equipment, manholes, and lift stations. Manholes and lift stations also require dedicated public land and permanent electrical infrastructure. Because they require deeper excavations, gravity sewers are also more susceptible to dewatering requirements, complicated and time-consuming rock excavation, and more difficult designs and methods for crossing railroads and streams.[iii]

For example, Figures 4 and 5 show a typical gravity sewer main installation in Vero Beach, Florida. Trench dewatering and shoring was required, slowing the construction process, destroying streets, and requiring complete road restoration.

Figure 4. Gravity sewer mainline excavation

For new subdivisions, gravity sewer pipe installation is often accomplished by sloping the sides of the trenches for earth stability. This eliminates the need for trench boxes, but substantially increases the construction footprint of the installation. Existing communities, however, typically opt to restrict the trench width to reduce restoration costs and the tendency for utility conflicts, prompting the necessity for steel trench boxes (sheeting and bracing).

Indirect construction costs for gravity sewers are substantial and include the following:

- disruption to vehicular traffic
- road and pavement damage
- potential damage to adjacent utilities
- possibility of damage to adjacent structures
- heavier construction and air pollution
- risk of pedestrian safety
- higher tendency for citizen complaints
- increased environmental impact[iv]

When constructing a gravity sewer in an existing and active street, prolonged and inconvenient traffic delays will likely occur. Road and landscape restoration costs, due to gravity sewer's larger construction footprint, are also more expensive when compared to the restoration costs associated with pressure sewer force mains. "Depending upon soil conditions, either a portion of the roadway or the entire roadway may be removed during the (gravity sewer) trenching operation. In some cases, where only a portion of the roadway is removed for sanitary sewer installation, the remainder of the roadway is effectively destroyed due to the heavy construction traffic that must use it to complete the project."[v]

Figure 5. Gravity sewer mainline installation

Backfilling of the gravity sewer trench is particularly important when considering the location of the pipe underneath road surfaces. Specific construction methods for backfilling and compaction aren't covered in this document, but vary based upon the width of the trench, excavated material characteristics, and the degree of compac-

tion required. Nonetheless, a higher degree of compaction is often required for gravity sewers, more so than for pressure sewers, because the pipe is located directly below the road surface.

Even though records of existing utilities are more accurate today than ever before, communities are still littered with unmarked and hidden electrical, gas, and telephone utilities. Gravity sewers, due to their larger construction zone and the resulting amount of excavated material, have a greater propensity for encountering existing utilities. Slope requirements of gravity sewers also make it challenging – and costly – to avoid existing utilities. The costs associated with existing utility conflicts include additional design costs, repair costs of inadvertently damaged utilities, and loss of production time (down time) while making the repairs. Conversely, pressure sewer mains can be easily re-routed to avoid existing utilities.

The time required to construct the ROW components of a gravity sewer is much longer than for a pressure sewer. This often translates to increased direct and indirect construction costs, especially the potential for citizen complaints. In Vero Beach, Florida, the engineer estimated that the time necessary to construct the pressure sewer mains was 25% of the time required for a gravity sewer.[vi] In Montesano, Washington, the time required to construct the pressure sewer was half that of a gravity sewer.[vii]

On-Lot Construction Impact

Pressure Sewers

Orenco's Prelos™ Sewer is a pressurized, liquid-only sewer. Its on-lot components typically consist of a short building sewer, a 1,000-gallon (3,785-liter) processor tank, a pump package (0.5 hp or 0.37 kW), and a small-diameter (1-inch or 25-mm) service lateral that follows the contour of the land at a shallow burial depth. The on-lot components, specifically the watertight tank, typically constitute the largest construction impact relative to the entire liquid-only sewer collection system. However, installation is rarely unfeasible, even in communities with small (< 0.15 acre or < 0.06 ha) parcels. Tank excavations are typically 74-143 ft^2 (6.9-13.3 m^2),[viii] whereas the usable space available to accommodate a tank generally exceeds 1,000 ft^2 (92.9 m^2), even in existing communities or new subdivisions with small parcels and mature vegetation (see Figure 6).

Figure 6. Liquid-only collection system installation on 6,000 ft^2 (557 m^2) parcel

Grinder sewers, by comparison, commonly use 30- to 36-inch (762- to 914-mm) diameter basins,[ix] larger (1.0-5.0 hp or 0.75-3.7 kW) pumps,[x] and are typically installed with a small excavator.[xi] The construction disruption zone for these pumps is typically 36 ft^2 (3.3 m^2)[xii] or more, depending on the size of the pump, and grinder basins have a capacity of roughly 30-70 gallons (114-265 liters).[xiii] Even though excavations for 1,000-gallon (3,785-liter) liquid-only sewer tanks are two to four times larger than grinder sewer excavations, such tanks offer nearly fifteen times more storage capacity than a grinder pump. This allows for considerably more reserve storage during high-use periods or when a problem arises.

Figure 7. Grinder sewer basin installation

The installation and construction impact of a small-diameter service lateral within a pressure sewer is similar to that of the force main infrastructure. Site disruption and excavated soil are minimized, especially when trenchless construction methods are employed.

Gravity Sewers

Gravity sewer laterals, in contrast, are laid at a constant slope and often require deep excavations to tie into the deeply excavated sewer main. Gravity sewer on-lot pipe is typically installed by sloping the sides of the trenches for earth stability. Though this eliminates the need for trench boxes, it increases the overall construction footprint on private property. The overall on-lot construction impact of installing a gravity sewer lateral alone often exceeds that of a Prelos Sewer or grinder sewer.[xiv]

Liquid-Only Sewer Tank Dimensions and Excavation Estimates

At a typical home (as opposed to a commercial establishment), Prelos Sewers use a 1,000-gallon (3,785-liter) tank manufactured out of DCPD (dicyclopentadiene). Other Orenco liquid-only sewers use a concrete or fiberglass tank, or the Orenco-approved polyethylene tanks manufactured by Roth Industries. Tank dimensions and approximate excavation requirements are listed in Tables 1 and 2, respectively. Concrete tank dimensions vary considerably based on the specific manufacturer. Consult a local tank manufacturer, engineer, and installer to determine necessary tank dimensions and approximate excavation requirements.

Table 1. Typical tank dimensions for 1,000-gallon (3,785-liter) tanks

	DCPD (Prelos™)	Concrete	Fiberglass (Orenco)	Polyethylene (Roth)
Diameter	96 in. (2.4 m)	not applicable	not applicable	not applicable
Width	not applicable	63 in. (1.6 m)	72 in. (1.8 m)	62 in. (1.6 m)
Length	not applicable	99 in. (2.5 m)	123 in. (3.1 m)	133 in. (3.4 m)
Height	61 in. (1.5 m)	64 in. (1.6 m)	65 in. (1.7 m)	51 in. (1.3 m)

Table based on manufacturers' data from Orenco Systems, Willamette Graystone, and Roth Industries

Table 2. Estimated tank excavation requirements for 1,000-gallon (3,785-liter) tanks

	DCPD (Prelos)	Concrete	Fiberglass (Orenco)	Polyethylene (Roth)
Width	144 in. (3.7 m)	87 in. (2.2 m)	120 in. (3.0 m)	110 in. (2.8 m)
Length	144 in. (3.7 m)	123 in. (3.1 m)	171 in. (4.3 m)	181 in. (4.6 m)
Total Excavated Footprint	144 ft^2 (13.4 m^2)	74 ft^2 (6.9 m^2)	143 ft^2 (13.3 m^2)	138 ft^2 (12.8 m^2)

Table based on manufacturers' data from Orenco Systems, Willamette Graystone, and Roth Industries

The excavation requirements listed in Table 2 assume an 18- to 36-inch (457- to 914-mm) burial cover over the tank in stable soils. Tanks buried deeper typically require larger excavations to ensure personnel safety and proper tank installation. Sloping excavation faces, shielding, and shoring methods should be considered and implemented based upon workplace safety regulations, along with the engineer's and contractor's evaluation of the specific site and installation risks.

In comparison, grinder systems use a 30- or 36-inch (762- or 914-mm) diameter basin with a typical depth of 7-8 ft (2.1-2.4 m). Depending on construction techniques, soil type, and ballast requirements, actual excavations are generally 36 ft^2 (3.3 m^2) or more.[xv]

Liquid-Only Sewer Systems: Parcel Statistics

Though Prelos Sewers are ideal for low-density communities and new subdivisions, they are also suitable for communities with high-density residential or commercial areas. Many have been installed in communities with small parcels, large commercial districts, mature landscaping, and limited space. For example, in Montesano, Washington, 25% of all the installations are on lots that are smaller than 6,500 ft^2 (604 m^2). For new construction, it is even easier to plan for tank location. Knolls Estates in Sutherlin, Oregon, has over two hundred new homes on lots smaller than 10,000 ft^2 (929 m^2), many of which also have considerable slopes across the lot. Figure 8 shows a finished liquid-only collection package installed in Vero Beach, Florida.

Figure 8. On-lot Orenco liquid-only collection package installed in Vero Beach, Florida

The usable area available to install the tank depends on the overall parcel area minus the area associated with impervious surfaces, setbacks from wells and waterways, proximity to sensitive vegetation (trees, shrubs, etc.), and permanent or immovable structures. The inability to properly maneuver installation equipment to certain areas of a site may also reduce the area available to install the tank. Table 3 summarizes the parcel data for several communities and demonstrates the ability to install tanks on small lots. Due to the availability and format of county GIS data, the parcel data summarized may not include all of the parcels that the sewer system serves or include empty parcels within the service area that have yet to be built out.

Table 3. Parcel statistics for existing liquid-only sewer systems[A]

Size	# Parcels						
Acres (1 acre = 0.4 hectare)	Montesano, Washington	Missoula, Montana	Coburg, Oregon	Elkton, Oregon	Diamond Lake, Washington	Christiansburg, Ohio	Vero Beach, Florida
0 - 0.15	369	68	55	42	19	5	4
0.16 - 0.2	158	14	74	10	5	1	3
0.2 - 0.3	468	15	156	36	15	12	82
0.3 - 0.4	183	3	72	8	5	5	38
0.4 - 0.5	111	8	32	8	6	9	18
> 0.5	127	2	31	19	206	42	12

[A] *Orenco site documentation based on county GIS data*

Aerial Photos

Figure 9. Montesano, WA

Montesano, Washington

Installed in 1991, Montesano's liquid-only sewer system has over 1,500 connections. It replaced an antiquated gravity sewer that suffered extreme infiltration and inflow. Initially, the city's engineer proposed a new gravity sewer system. However, because of tight lot constraints, the 1.5-year expected installation time, and the physical disruption a gravity sewer installation would cause, the city council and public works department requested that other options be presented. Montesano's liquid-only sewer system was installed in half the time and at a lower cost than the proposed gravity sewer, and allowed the town to convert the existing gravity sewer to a storm sewer. (See Orenco's *Custom Solutions Using Liquid-Only Sewers*, NCS-RU-7, for more details.)

Figure 10. Missoula, MT

Missoula, Montana

Beginning in 1995, Missoula installed a liquid-only sewer with 1,300 on-lot collection packages to replace existing onsite septic systems that were failing. The city continues to replace failing systems as needed with liquid-only collection packages and now has over 1,700 total packages installed. In the older parts of the city, the average lot size is less than 6,000 ft^2 (557.4 m^2), and the tank burial depth is typically greater than 6 ft (1.83 m).

Figure 11. Coburg, OR

Coburg, Oregon

Installed in 2013, Coburg's liquid-only sewer system consists of 420 connections, including a large contingent of commercial businesses and mobile home parks. The older part of the city is comprised of small lots, established trees, and limited usable area for tank installation.

Figure 12. Elkton, OR

Elkton, Oregon

Elkton's liquid-only sewer system serves 113 connections (79 of these have collection packages with an effluent pump; 34 are gravity only.) The system also serves a commercial downtown core area and an older, densely populated residential area. (See Orenco's Elkton case study, NCS-22, for more details.)

Figure 13. Diamond Lake, WA

Diamond Lake, Washington

In the early 1970's, residents of Diamond Lake, WA, were concerned about leaking septic tanks and failing drainfields damaging the lake. It wasn't until 1987 that the Diamond Lake Water & Sewer Commission was finally able to install watertight tanks and a liquid-only sewer system. The project's 537 connections are mostly residential units, but also include multiple commercial establishments. (See Orenco's Diamond Lake case study, NCS-21, for more details.)

Figure 14. Christiansburg, OH

Christiansburg, Ohio

Christiansburg, OH, is an existing community with 250 liquid-only sewer connections. Due to incomplete county GIS data, there were many small lots not accounted for in the parcel statistics data. The two-stage Orenco AX-Max treatment system was designed to meet strict ammonia discharge limits. (See Orenco's Christiansburg case study, NCS-41, for more details.)

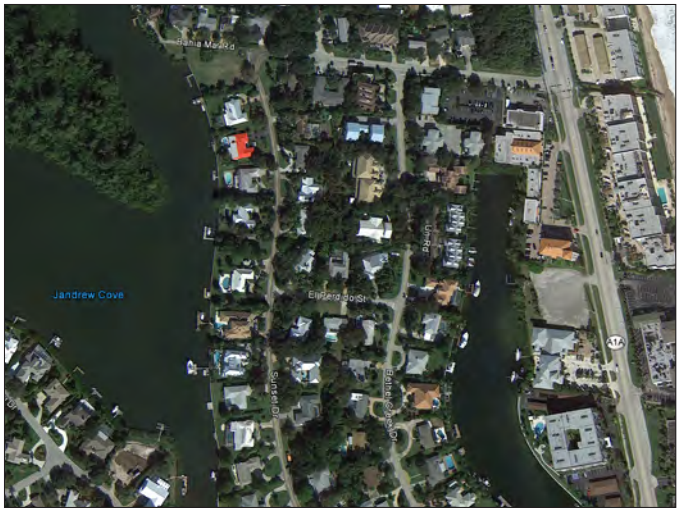


Figure 15. Vero Beach, FL

Vero Beach, Florida

Vero Beach's liquid-only sewer system will ultimately serve about 1,500 connections, the vast majority of which are residential. These large homes are surrounded by mature live oak trees and limited space, with various homes sited along the Indian River Lagoon. (See Orenco's Vero Beach case study, NCS-42, for more details.)

Conclusion

Construction impact, indirect construction costs, ease of installation, and the time required to complete the installation are major considerations for homeowners and communities when evaluating wastewater collection system options. Gravity, grinder, and liquid-only sewers require different methods of construction and different accessibility requirements to install the various products and system components. Liquid-only sewer systems are routinely installed in communities with low- and high-density residential neighborhoods, downtown commercial districts, and areas with mature and established landscapes. The overall construction impact associated with liquid-only sewers is similar to grinder sewers, but often considerably less than gravity sewers. Gravity sewers, because of their deeply excavated mains and service laterals and their need for manholes and lift-stations, require significant construction disruption zones. The time required to construct a gravity sewer is frequently two to three times longer than a pressure sewer. Compared to gravity and grinder sewers, liquid-only sewers also offer the benefit of providing primary treatment, low life-cycle costs, and emergency storage. In short, their minimal impact, ease of installation, and high value make Prelos liquid-only sewers a logical choice for wastewater collection.

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xiv Crites & Tchobanoglous, *Small and Decentralized*, 347.

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CASE STUDY

An Affordable Wastewater Collection and Treatment Solution for Municipalities and Communities

CHRISTIANSBURG, OHIO

Problem

The smell of sewage was becoming harder to ignore in Christiansburg, Ohio, especially following a rainstorm. The village was plagued with failing onsite septic systems, and nearby West Fork Honey Creek had tested high for bacteria. With the Ohio EPA becoming concerned, village leaders began to explore wastewater management options.

Solution

Because Christiansburg is a community of roughly 500 residents with a median household income of just $34,282 (2013),[1] village leaders needed an affordable solution. For collection, they chose an Orenco® Effluent Sewer System, which includes individual 1,000-gallon (3.8-m^3) tanks for residences and 1,500- (5.7-m^3) or 2,000-gallon (7.6-m^3) tanks for businesses. All tanks contain an Orenco septic tank effluent pump (STEP) package. The collection system conveys primary-treated effluent through small-diameter mainlines, without manholes or lift stations, to a two-stage AdvanTex® AX-Max™ treatment facility. Disinfected effluent from the AdvanTex system is then discharged to West Fork Honey Creek under the authority of an NPDES permit with strict ammonia limits.

Evaluating Alternatives and Options

To solve its ongoing wastewater problems, the village council of Christiansburg, Ohio, chose the one option that would allow it to affordably manage its own wastewater system: an Orenco Effluent Sewer followed by AdvanTex treatment.

Residents of Christiansburg, Ohio, already knew they had a problem with their onsite wastewater systems. System failures and odors were common, particularly during or shortly after significant rainfall. In 2012, the Ohio EPA detected high levels of bacteria in the stream that runs along the west side of the village, prompting community leaders to seek cost-effective wastewater management solutions. The big question was which wastewater option would be best for their small village ... and how to pay for it.

Municipal and Community Market

Project Overview

CHRISTIANSBURG, OHIO

Design Parameters
- 250 EDUs (residential and commercial)
- 65,000 gpd (246 m^3/day) design average daily flow
- 85,000 gpd (322 m^3/day) maximum daily flow

Permit Limits (NPDES)
- < 10 mg/L $cBOD_5$
- < 12 mg/L TSS
- < 1 mg/L NH_3-N summer (< 3 mg/L winter)
- < 161 CFU/100 ml E. coli
- 6.5 to 9 pH

Average Effluent Quality*
- 3.6 mg/L $cBOD_5$
- 1.7 mg/L TSS
- < 0.1 mg/L NH_3-N

Start-Up Date
- November, 2014

Total Project Cost
- $5,100,000 (includes engineering, legal, administrative, and construction costs)

Total Constructed Cost
- $4,089,400 or $16,358/EDU (includes collection and treatment costs)

Funding Sources
- Ohio EPA, Ohio Water Development Authority (OWDA), Ohio Public Works Commission (OPWC), Community Development Block Grant (CDBG) program
- Approximately 60% grants, 40% loans

**Samples collected and analyzed by a third party between 1 June 2015 and 31 August 2015.*

sidebar continued on back page

CHRISTIANSBURG, OHIO

Before the EPA took regulatory action, community leaders hired an engineer to evaluate their options and estimate costs. With the population of Christiansburg at little more than 500 people – and the village's median household income well below the national average – the village council knew it was imperative that up-front capital outlays, as well as operation and maintenance (O&M) costs, be kept affordable. The engineer evaluated multiple options ranging from centralized collection and treatment to pumping raw wastewater or effluent to the neighboring town of St. Paris for treatment.

Many residents of Christiansburg advocated for complete control of their wastewater infrastructure due to a desire to maintain affordable monthly rates. In 2012, St. Paris' proposed fee for processing the wastewater from Christiansburg was assessed at $92,400 per year, with no cap on future fee escalation. If Christiansburg chose this option, the village would also have to finance the up-front capital costs to install a wastewater collection system, including miles of force mains to convey the wastewater to St. Paris, as well as provide revenue to cover the cost of ownership. This would result in higher projected sewer fees, plus possible rate increases enacted by St. Paris. In the end, the village of Christiansburg voted to install its own treatment facility.

The Christiansburg wastewater facility consists of twelve AdvanTex AX-Max treatment units. The treatment system is configured as a two-stage process, designed to meet low ammonia limits in both the summer and winter.

Chuck Lyons, a member of the village council for 16 years, recalls his determination that the village end up with an efficient, workable sewage system. "Keeping costs down for the residents was a high priority," he says. After reviewing the cost comparisons in the engineer's report, council members realized that an Orenco Effluent Sewer followed by AdvanTex treatment was the most economical option. In addition, it offered the ease of operation that would allow the village to affordably manage its own system.

Constructing a new wastewater treatment facility required that Christiansburg obtain an NPDES permit through the Ohio EPA. With the goal of reducing nutrient content in state waterways, the EPA mandated that all discharges to West Fork Honey Creek had to meet a strict ammonia limit of <1 mg/L (summer). The AdvanTex system the council chose would be ideal to ensure that the village could meet this limit. In addition, the AdvanTex treatment system offered low biosolids management requirements, low energy consumption, and low maintenance requirements, as well as the ability to successfully treat highly variable flows.

The Chosen Solution: "A Success Without a Doubt"

Construction began in January, 2014. Every septic tank in the entire village was decommissioned and new interceptor tanks, which included Orenco Pro-STEP® Pump Packages, were installed at each residence and business. In an effluent sewer system, also known as a STEP system, the onsite primary tankage provides passive anaerobic digestion that reduces the organic and solids load to the wastewater treatment facility. Primary-treated effluent from the tank's "clear zone" is pumped with individual ½-hp (0.37-kW), 115 VAC effluent pumps through small-diameter (2-4 inch or 50-100 mm) force mains to the treatment facility.

The Christiansburg treatment facility consists of twelve AdvanTex AX-Max units, configured in two stages to meet the stringent ammonia limits required by the NPDES permit. The first stage includes nine AX-Max units, while the remaining three units essentially provide additional treatment for enhanced biological nitrification.

AdvanTex treatment systems use a fixed-film, attached-growth treatment process and are an excellent solution

The AX-Max is a fully plumbed and compact treatment unit, making it relatively easy to install. The entire system – including treatment media, recirculation tankage, pumps, and active ventilation – is built inside an insulated fiberglass tank.

The AX-Max system uses fractional-horsepower, high-head effluent pumps that are inexpensive and operate intermittently throughout the day, thus minimizing electrical consumption and life-cycle costs.

for small communities and small-flow applications. In an AdvanTex system, wastewater is uniformly distributed onto the textile media in an unsaturated condition. The system uses fractional-horsepower fans to draw air through the media and provide sufficient oxygen for aerobic digestion. Low-horsepower, high-head turbine pumps operate intermittently with sophisticated controls that automatically adjust pump run-times based on daily flows to meet pre-set recirculation ratios. The energy required for aerating and distributing the wastewater onto the media is considerably less than for activated-sludge facilities commonly used by larger cities.

Randy VanTilburg, P.E., designed the Christiansburg project. "This was my first time working with Orenco," says VanTilburg, "and it's been a success without a doubt. I am actively seeking new projects we can work together on in the future."

Saving on Both Capital and O&M Costs

With a constructed cost of just $16,358 per equivalent dwelling unit (EDU), the Orenco Effluent Sewer and AdvanTex Treatment System at Christiansburg are highly affordable compared to other wastewater technologies. Conventional technologies, including gravity sewers, have a diseconomy of scale, especially when lift stations are required. Lift stations, manholes, and other appurtenances essential for gravity sewers are expensive when applied to small communities, such as Christiansburg, which lack critical density. Effluent sewers have proven to be a cost-effective solution largely because they use small-diameter, shallowly buried PVC or HDPE mainlines along variable grades to convey wastewater to a treatment facility, rather than using large-diameter, deeply excavated conveyance mains laid at a constant slope.

Another important feature of effluent sewer systems is the settling of solids in the interceptor tanks, which facilitates the use of inexpensive, durable pumps. These pumps are lightweight (~30 lbs or 14 kg) and typically last longer than 20 years. The cost-effectiveness of these pumps, combined with infrequent tank pumpouts, translates to low solids management and equipment repair and replacement (R&R) costs for effluent sewer systems – so low that they are insignificant when compared to the costs of managing, repairing, and replacing expensive grinder pumps. All of these factors contribute to the life-cycle cost of effluent sewers being widely reported as less than half the life-cycle cost of grinder collection systems.[2]

An additional financial benefit of effluent sewers is that they provide years of anaerobic digestion. Textbook process evaluations indicate that typically 80% of biosolids in onsite interceptor tanks are digested on an annual basis.[3] This lower organic and solids load from the STEP system provides a substantial reduction in power costs at the treatment facility. In addition to saving on O&M expenses, the reduced organic load of a STEP system decreases the size and capital cost of the facility.

Operational costs were also kept in check by using the AdvanTex Treatment System, especially compared with O&M costs at a conventional activated-sludge plant. Small community treatment systems like the one in Christiansburg generally require infrequent, part-time O&M with limited adjustment and occasional, rather than continuous, laboratory control. However, when conventional activated-sludge technologies are applied to small communities, aeration controls are normally set to over-aerate. As a result of such operational inefficiencies, energy consumption in small plants is typically 30-40% or more of the plant's overall O&M budget, compared with 15-30% of the O&M budget at a large facility.[4] The AdvanTex system helps the Christiansburg facility minimize its energy use.

In addition to low power consumption, AdvanTex systems are known for low labor requirements. A part-time operator currently spends just 4-6 hours per week maintaining the Christiansburg facility, and that's not expected to change much for the first few years of operation.

At small wastewater treatment plants, energy consumption is elevated compared to that of larger plants because small

CHRISTIANSBURG, OHIO

plants typically lack economies of scale and the ability to provide round-the-clock O&M – a common problem with villages like Christiansburg. Generally, these small communities do not have the necessary funding or the access to experienced operators to allow them to be able to run a complex, activated-sludge treatment facility optimally at low flows. Thus, AdvanTex treatment technologies provide a welcome alternative.

Other villages in Ohio are already taking note of Christiansburg's new sewer system and wastewater facility. They've sent representatives to tour the community and ask questions, researching the possibility of building their own wastewater facility. Orenco Effluent Sewers and AdvanTex Treatment Systems provide a much needed option to many of these smaller communities that might not otherwise be able to afford a sewer system.

1. City-Data. "Christiansburg, Ohio." Accessed September 9, 2015. http://www.city-data.com/city/Christiansburg-Ohio.html.

2. Water Environment Research Foundation. "Fact Sheet C2: Pressure Sewer Systems" and "Fact Sheet C3: Effluent Sewer Systems." Accessed September 17, 2015. http://www.werf.org/i/c/DecentralizedCost/Decentralized_Cost.aspx.

3. Metcalf & Eddy, Inc. Wastewater Engineering: Collection, Treatment, and Disposal. New York: McGraw-Hill, 1972.

4. Water Environment Federation. Energy Conservation in Water and Wastewater Facilities. New York: McGraw-Hill, 2010.

Municipal and Community Market

Regulatory Authority
- Ohio EPA

User Charges
- Monthly residential rate: $60/EDU (includes cost of debt retirement plus operation and maintenance)

Collection System
- 250 STEP tanks:
  ~ 1,000-gallon (3.8-m^3) tanks for homes
  ~ 1,500- or 2,000-gallon (5.7- or 7.6-m^3) tanks for businesses
- 1.25-inch (32-mm) diameter service laterals
- 2,800 LF (853 meters) of 4-inch (100-mm) diameter mainlines
- 1,075 LF (328 meters) of 3-inch (75-mm) diameter mainlines
- 17,250 LF (5,258 meters) of 2-inch (50-mm) diameter mainlines

Secondary Treatment
- 1st Stage: (9) AdvanTex 42-foot (12.8-meter) AX-Max units
- 2nd Stage: (3) AdvanTex 42-foot (12.8-meter) AX-Max units
- Automatic alkalinity feed system
- Magnetic flow meter
- UV disinfection

Discharge
- Surface discharge (NPDES) to West Fork Honey Creek

Monitoring, Control, and Instrumentation
- Orenco TCOM™ telemetry controls
- Temperature, pH, ORP, and dissolved oxygen instrumentation

Engineering Project Manager
- Brice Schmitmeyer, P.E., Access Engineering Solutions

Designer
- Randy VanTilburg, P.E., Mannik Smith Group

For information about Prelos® Sewer, AdvanTex® Wastewater Treatment, or Orenco Controls™, contact Orenco Systems®, Inc.

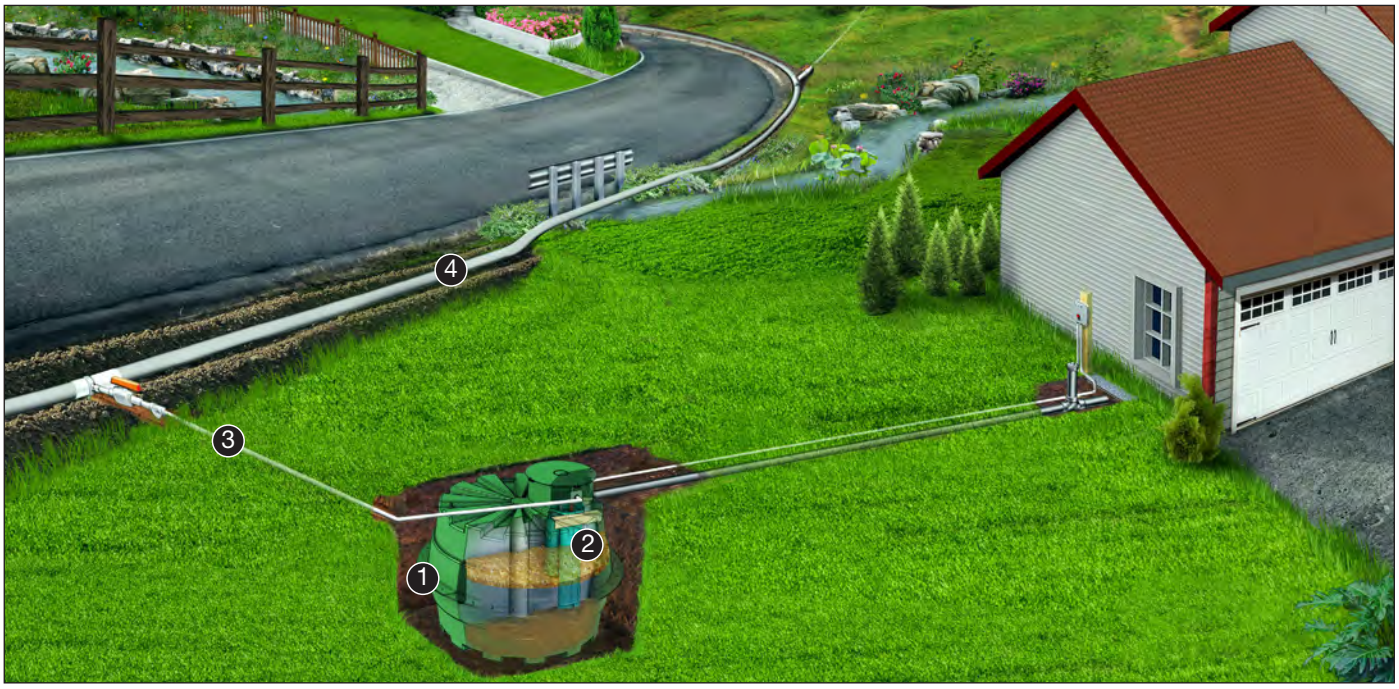
Orenco® WATER

800-348-9843 • +1 541-459-4449
www.orenco.com

All product and performance assertions are based on proper design, installation, operation, and maintenance according to Orenco's current published documentation. Data used by Orenco to derive the representations and conclusions contained within this Case Study were current as of September 2015.

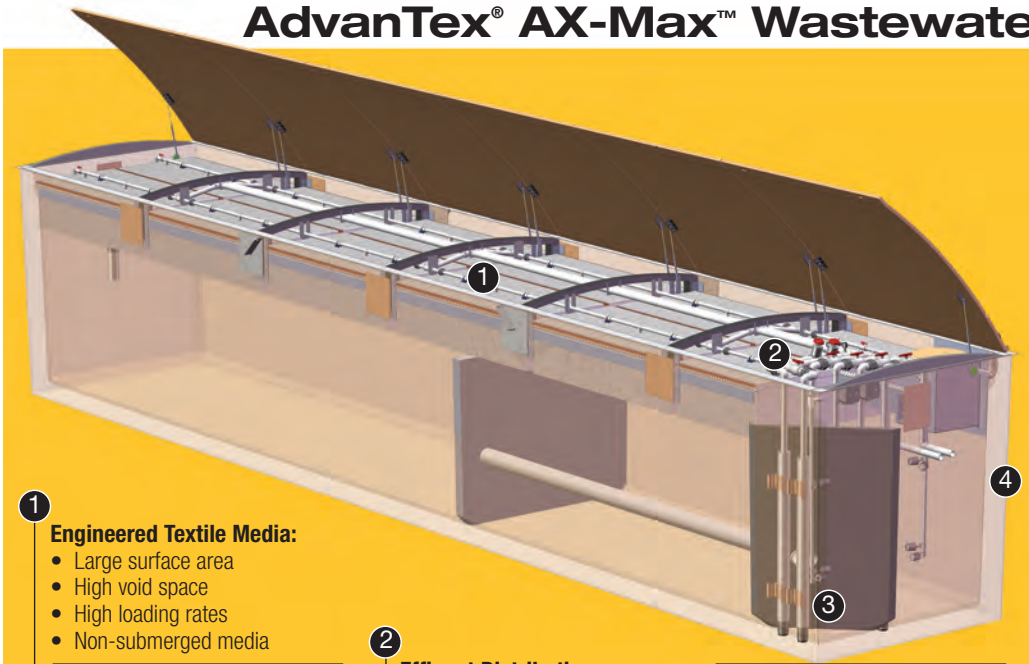
Christiansburg, OH
Wastewater Collection and Treatment

Prelos® or Orenco Liquid-Only Sewer



1. Prelos Processors or on-lot tanks provide primary treatment, so only liquids are conveyed to the treatment facility.
2. Our patented Biotube® Pump Vault filters out solids, and our pumps can last more than 25 years (as seen in the Elkton, Oregon, sewer system), requiring little or no maintenance.
3. One-inch (25-mm) diameter service lines can be easily installed with a trencher or directionally bored.
4. Small-diameter main lines follow the contour of the ground, saving on excavation costs. No expensive manholes or lift stations are required.

AdvanTex® AX-Max™ Wastewater Treatment



3 Low-Horsepower Pumps:
- High-quality
- Simple operation
- Low energy usage
- Low equipment R&R costs

1 Engineered Textile Media:
- Large surface area
- High void space
- High loading rates
- Non-submerged media

2 Effluent Distribution:
- Proprietary spin nozzles
- Efficient distribution
- Microdosed at regular intervals
- Optimized treatment

4 Insulated, Pre-Manufactured AX-Max Unit:
- Containerized, fully plumbed
- Portable, versatile, compact
- Above- or in-ground installation
- Easy to set

Orenco® Effluent Sewer Systems: Operational Costs – On-Lot Components

Executive Summary

Communities that want to build or improve their wastewater infrastructure soon discover that more than one type of sewer system is available. When researching, bidding, and selecting a sewer system, community leaders and their consulting engineers often focus on up-front capital costs. Decision-makers will make a more financially sustainable decision if they evaluate all the costs of any given technology — up-front costs but also ongoing O&M costs (operation and maintenance) and future R&R costs (equipment repair and replacement). That's because these "life cycle" costs differ greatly by technology.

Community decision-makers need this complete cost picture for two reasons: 1) to make a fair cost comparison, before a technology is selected and buried underground, and 2) to establish a rate structure for citizens that will fully fund all system costs, after the system is operational.

Orenco's engineers have spent more than three decades researching, designing, manufacturing, and supporting the installation and maintenance of Orenco® Effluent Sewer Systems (also known as STEP systems or pressure sewers). Approximately 600 communities throughout North America and around the world have selected Orenco Effluent Sewers for their wastewater needs. Not only are effluent sewer capital costs frequently lower than those for gravity sewers, O&M and R&R costs are lower as well. This position was first taken by the US Environmental Protection Agency in 1997.[1] And it was reiterated by the EPA, in a March 2009 article surveying multiple effluent sewer systems in Alabama, Tennessee, and Georgia. According to the EPA's Robert Freeman and Joyce Hudson, effluent sewer systems in Mobile, Alabama (for example) "...have provided savings of 25% to 50% over centralized collection and treatment."[2]

In fact, based on the documented performance of thousands of households, the operational costs for an Orenco® Effluent Sewer total about $7.05/month/equivalent dwelling unit (EDU).[3]

This Technology Fact Sheet explains the basis for that figure.

O&M and R&R costs for Orenco Effluent Sewers fall into four main categories. These categories and costs are summarized in Table 1:

Table 1. Orenco® Effluent Sewers: Uniform Equivalent Monthly O&M and R&R Costs (4% Interest)

I.	Preventative Maintenance (PM)	$1.60/month/EDU
II.	Reactive Maintenance (RM)	$0.60/month/EDU
III.	Equipment Repair & Replacement (R&R)	$2.81/month/EDU
IV.	Tank Pumping	$2.04/month/EDU
	TOTAL	**$7.05/Month/EDU**

Each of these cost categories is described in greater detail in this Fact Sheet, beginning with a general overview of effluent sewer O&M requirements.

1 *Response to Congress on Use of Decentralized Wastewater Treatment Systems*, USEPA, April 1997, pp. 13-14.

2 Freeman, Robert, and Hudson, Joyce, "Small, Green, and Useful," *Water Environment & Technology*, March, 2009, p. 68.

3 These costs are consistent with those reported by Kevin White, Ph.D., P.E., in his article titled "Decentralized Wastewater Cluster Management: Operation and Maintenance Experience and Costs," published in *WEFTEC 2005 Proceedings* by the Water Environment Federation.

Overview: Effluent Sewer O&M Requirements

Operation and maintenance of effluent sewers is relatively simple and, for most small communities, only requires a part-time operator and inexpensive equipment and tools.

Operation and maintenance of the mainlines for an effluent sewer system is, by and large, insignificant. Occasionally, the operator services or exercises the mainline valves, including air release valves. If the system includes odor control filters, these are periodically replaced. While it's possible to pig or flush the mains in an Orenco effluent sewer, it's rarely necessary. Also, breaks or leaks from collection mains are rare and very inexpensive to repair.

Most of the operator's time will be allocated to maintaining the on-lot part of the system: e.g., periodic checking and cleaning of the STEP (Septic Tank Effluent Pumping) components inside each property's on-lot tank. These include filters or screens, as well as servicing the pump, floats, and controls. Due to the number of components and products in the on-lot part of effluent sewers, the quality of the equipment purchased by system managers and operators has a profound impact on the overall life cycle cost of the system.

It is imperative to purchase and install reliable, durable equipment. Failure to do so will negatively affect operation and maintenance requirements and therefore greatly increase O&M and R&R costs.

According to Mike Saunders, who served nearly 10 years as a Utility Engineer and Technical Services Manager for Charlotte County, Florida, a single technician with a small maintenance vehicle can maintain 2,000 STEP connections in an effluent sewer system, as long as the system has been installed correctly with high-quality products. Saunders was responsible for coordinating and planning a system that included 360 miles of gravity sewer lines, 200 miles of force mains, 250 miles of effluent sewer lines, more than 6,000 STEP connections, and 300 lift stations.

To keep costs low, not only is it important to purchase and install high-quality equipment, it is also important to standardize on an equipment package so that operators can stock and carry a limited number of items that are designed to work together.

Following is additional information on the four main categories of O&M and R&R costs for effluent sewer systems. Unless otherwise noted, the economic calculations in the following sections assume a 4% effective annual interest rate.

I. Preventative Maintenance (PM) = $1.60/Month/EDU

Preventive maintenance (PM) protocols vary widely between systems, which is one reason why system operators and their utilities report widely different O&M costs.

Typically, a PM program includes periodic servicing of the following on-lot components:

- Interceptor Tank — Measuring the sludge/scum in the tank
- Pump and effluent filter or screen — Cleaning the pump and its surrounding effluent filter or screen
- Control panel and float switches — Verifying the operation of the control panel and float switches

Some utilities have elected to operate their effluent sewers with little or no PM. In a 2009 article titled "O&M Considerations for STEP Systems,"[4] Saunders notes that this approach can yield low PM costs in the early years but "major repairs and replacement activities will escalate as the system suffers from neglect." This increases reactive maintenance (RM) requirements and total operational costs.

Conversely, some utilities have elected to operate effluent sewers with highly aggressive — even excessive — PM schedules. This, says Saunders, can also "result in higher overall O&M costs when PM activities unnecessarily target components that have a significant level of reliability with less frequent PM." Saunders concludes, "The most cost-efficient STEP management approaches balance PM and RM to achieve the lowest overall cost for O&M."

Specifically, that means scheduling PM activities every 3-5 years. Conservatively estimating a service visit every three years at about 1.5 hours per service visit and a labor rate of $40/hour, that comes to $60/visit over 36 months or a uniform equivalent monthly PM cost of about $1.60/month/EDU.

[4] Saunders, Mike, "O&M Considerations for STEP Systems," *Water Environment and Technology*, March, 2009, p. 24.

Orenco Effluent Sewer Systems: On-Lot Operational Costs (cont.)

II. Reactive Maintenance (RM) = $0.60/Month/EDU

In the initial year of operation, Reactive Maintenance (RM) requirements tend to be related to installation issues. After the first year, as noted in the previous section, Reactive Maintenance is affected by Preventive Maintenance schedules. However, to arrive at a "typical" RM cost, Orenco has gathered RM data from 11 Orenco Effluent Sewer Systems, totaling more than 3,100 connections, and compiled it into Table 2, below.

Table 2. Residential Service Call-Out Requirement per 100 Connections.

State	Community	EDUs	Screened	Hrs/Month/100 EDUs
CA	Mt. Lake Estate	8	yes	1.0
CA	Villa Verona	337	yes	2.5
MT	Missoula	350	yes	1.5
OR	Elkton	135	yes	0.7
OR	Glide	1,054	30%	1.5
OR	Lake Side	51	yes	0.3
OR	La Pine	215	yes	1.8
OR	Tangent	180	yes	2.5
WA	Boston Harbor	166	yes	1.6
WA	Conconnully	75	yes	0.5
WA	Diamond Lake	525	yes	1.2
Average Annual Hrs/Month/100 EDUs				**1.4**

As you can see, these systems average 1.4 hours/month of RM per 100 EDUs. Even conservatively estimating 1.5 hours/month/100 EDUs, that comes to $60/month/100 EDUs or an RM cost of $0.60/month/EDU – assuming a typical business-hour labor rate of $40/hr. (We can apply a non-overtime labor rate because tanks have sufficient reserve capacity to allow operators to handle after-hours calls during the next business day.)

III. Equipment Repair & Replacement (R&R) = $2.81/Month/EDU

Equipment Repair & Replacement (R&R) costs for effluent sewers consist primarily of R&R costs for pumps, floats, and various other miscellaneous components, with pumps contributing most of the cost. These costs are low when the proper pump is used. A high-quality multi-stage effluent pump should have run-dry capability, a UL listing, a continuous operation rating, and a 3-5 year warranty. Additionally, the pump should be corrosion-resistant and rebuildable, either by replacement of individual components or by replacement of either the liquid-end or the motor-end. Used in conjunction with an effluent filter or screen, such a high-quality pump will provide, on average, more than 20 years of service.

Note that, of the four cost factors in operating effluent sewers, R&R costs are the largest. And these costs are directly related to equipment quality.

Poor quality equipment almost always requires frequent and costly R&R schedules and thus significantly contributes to overall operational costs.

To arrive at a typical monthly R&R cost, Orenco empirically derived costs from a number of Orenco Effluent Sewer systems and compiled it into Table 3, below. As you can see, R&R averages only $2.81/month/EDU, partly because Orenco's pumps are small (10 GPM, ½ HP, 115 VAC) and relatively inexpensive.

In reality, however, costs may be even lower, since pump R&R assumes complete replacement of the pump every 20 years at approximately $600 per event (materials plus labor). Orenco Effluent Pumps are repairable, however, and repair costs are often half as much as replacement costs. At the Orenco Effluent Sewer System in Yelm, Washington, which includes 1,700 pumps, only 28 had been replaced since 1994.[5]

Table 3. Orenco Effluent Sewers: Uniform Equivalent Monthly Repair and Replacement Costs for On-Lot Components (45% Interest)

Component	Frequency	Cost/Event (Materials + Labor)	Amortized at 4% Interest
Pump Replacement	20 years	$600	$1.62/month
Float Replacement	10 years	$100	$0.68/month
Misc. Component R&R	10 years	$75	$0.51/month
			Total: ~$2.81/month/EDU

[5] Yelm, Washington Case Study, "Low Life Cycle Costs Keep Rates Low," Orenco Systems®, Inc., October 2009 (NCS-7).

Orenco Effluent Sewer Systems: On-Lot Operational Costs (cont.)

IV. Tank Pumping = $2.04/Month/EDU Uniform Equivalent Monthly Cost

Not unlike PM and RM protocols, tank pumping costs and mandated frequencies vary widely. Based on an 8-year audit of watertight tanks in Glide, Oregon, during the 1980's and a 5-year audit in Montesano, Washington, during the 1990's, Orenco established reliable pump-out intervals for households with various sizes of tanks and number of occupants, as shown in Figure 1[6].

Assuming a 1,000 gallon tank and 2, 3, or 4 people per residence, Orenco projects a pump-out interval of ~21 years, ~11 years, and ~7 years, respectively. Conservatively estimating a pump-out frequency of 10 years with a per event fee of $300 at an annual interest rate of 4%, the cost comes to $2.04/month/EDU.

These figures are for watertight tanks – which are required in an Orenco Effluent Sewer system – calculated at a 95% confidence level.

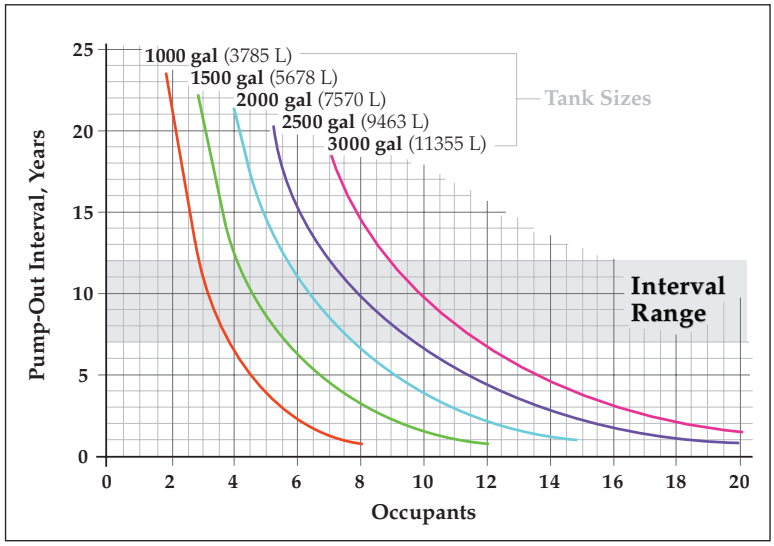


Figure 1. Pump-Out Intervals at 95% Level of Confidence

Average pump-out intervals can be even longer. In the Orenco Effluent Sewer system in Glide, Oregon, for example, the average pump-out frequency was 55, 28, and 17 years, respectively.[7]

A Comment About Low Power Costs and Low Treatment Costs

The four O&M/R&R cost categories described above are the costs assumed by the utility and therefore must be calculated into user rates. Please note that there are no power costs. Power costs for Orenco Effluent Sewer systems are minimal. It costs little more than $1.50 per month to run each household's on-lot pump[8] — and that negligible cost is part of each household's monthly electric bill, so doesn't need to be factored into utility rates. Typically, energy-consuming lift stations are not required with effluent sewers, as they are with gravity sewers.

Orenco Effluent Sewer systems also provide primary treatment, reducing solids by about 80%. Therefore, they are often followed by downsized and less costly secondary treatment facilities, such as a media filter, constructed wetland, or lagoon.[9] Additionally, infiltration and inflow rates are nearly eliminated with effluent sewers, further reducing treatment facility costs.

Low power and treatment costs are one reason why Orenco Effluent Sewers are not just an affordable technology; they are an environmentally sustainable one.

In Conclusion

Clearly, when evaluating and selecting a sewer system, community engineers and decision-makers should ask for and then evaluate all costs — up-front capital costs, ongoing O&M costs, and recurring R&R costs — to make a financially supportable decision. Get real life data to validate all manufacturers' claims. And, if possible, visit, tour, and acquire data from sewer systems that have been operational for several years, preferably longer than ten. Contact manufacturers or your regulatory authorities to find a system close to you.

For more information on Orenco Effluent Sewers, call Orenco Systems®, Inc., 800-348-9843.

6 *Bounds, T.R., PE, "Septic Tank Septage Pumping Intervals," 1995, pp. 7-13 (NTP-TNK-TRB-1).*

7 *Ibid., p.10.*

8 *Run Time = 20 min/day, VAC = 115, A = 12.7, National Average Power Cost = $0.10/kWh*

9 *See descriptions of secondary treatment facilities for Mobile, Alabama, and Lake City, Michigan, in "Affordable Wastewater Solutions that Fit Your Community," Orenco Systems®, Inc., April 2009 (ACS-SMALLCOMM-1).*

APPENDIX D

Drainage Design Report

STORY HOUSE VILLAGE PUD
PHASE 1

DRAINAGE REPORT

PREPARED FOR:

CITY OF SHERIDAN

ON BEHALF OF:

STORY HOUSE PROPERTY COMPANY, LLC

WWC ENGINEERING

December 2023

STORY HOUSE VILLAGE PUD – PHASE 1
DRAINAGE REPORT

Prepared for:	City of Sheridan 55 Grinnell Plaza Sheridan, WY 82801
On Behalf of:	Story House Property Company, LLC 40 E Works Street #1B Sheridan, WY 82801
Prepared by:	WWC Engineering 1849 Terra Avenue Sheridan, WY 82801 (307) 672-0761
Principal Authors:	Kenneth Markley, E.I.
Reviewed by:	Cody Wyatt, P.E. Sarah Rohrer, P.E.

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PROJECT DESCRIPTION

The purpose of this preliminary drainage report is to provide runoff control recommendations resulting from the hydrologic effects of the proposed Story House Village – Phase 1 (Project). Phase 1 of the development includes commercial and residential development. Future development may occur on the property at which time hydrologic effects will be assessed and reported as required. Hydrology and hydraulic calculations provided hereafter will detail the comparison of pre-development and post-development runoff from the proposed Project and provide recommendations on best management practices for any increased runoff post-development in accordance with the 2016 City of Sheridan Storm Drainage Manual (City, 2016); hereafter referred to as the Manual. Stormwater design calculations are included in Appendix A.

Location

The Project is located on State Highway 336, also known as Wyarno Road, in Sheridan, Wyoming. The property is bound by Highway 336 to the south and private property to the north, west, and east. The Project encompasses approximately 38.38 acres within the southern half of the southeast quarter of Section 24, T56N, R84W. Figure 1 provides the general location of the Project.

SITE CONDITIONS

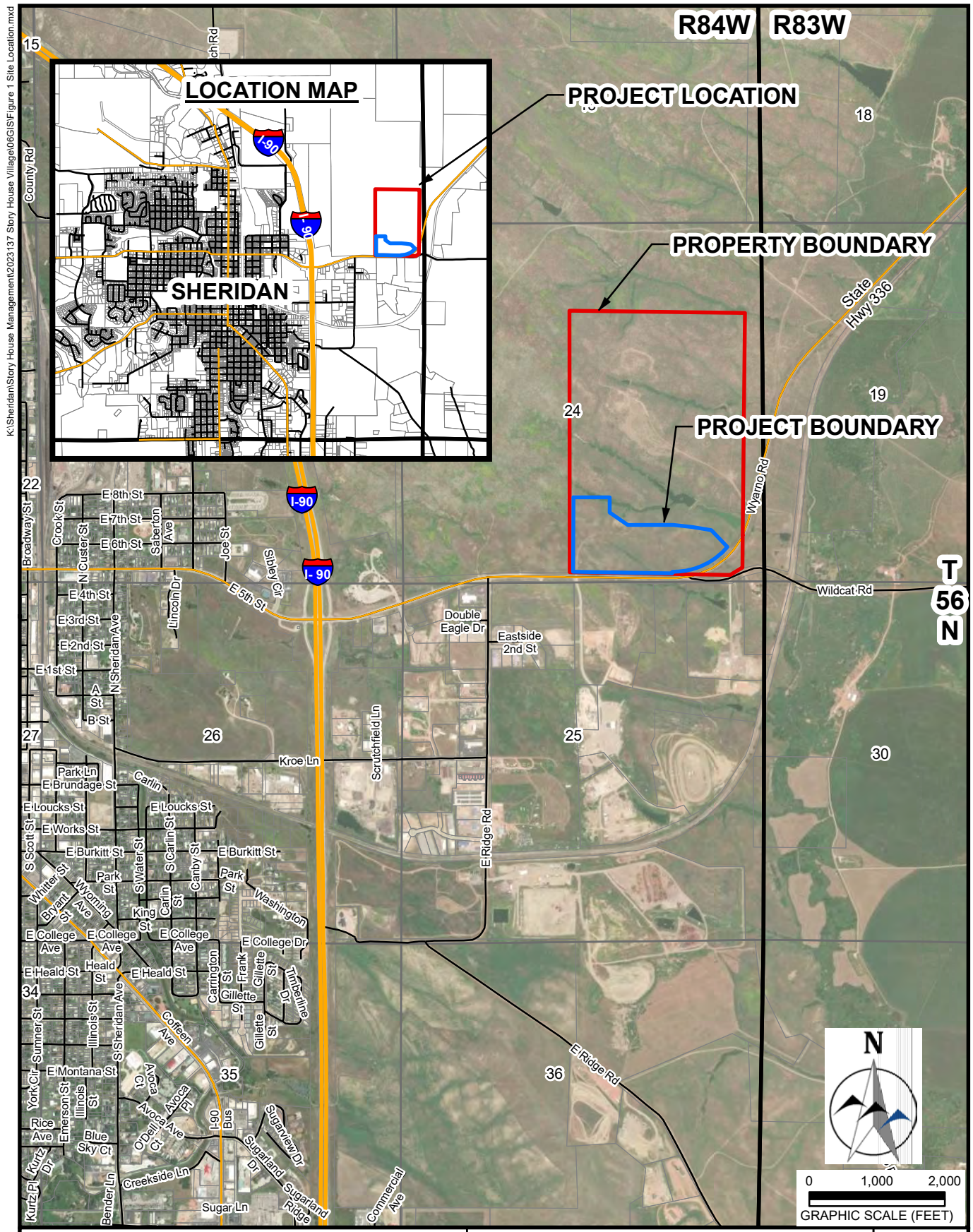
The soils in the area are divided into 6 map units and range from 3 to 75 percent slopes. Based on a geological investigation on the Project, the soils found near the surface are generally composed of lean clay or clayey sand alluvial soils with claystone bedrock underneath. The geotech report prepared by American Engineering Testing is included in Appendix B and the NRCS soil survey for the Project are included in Appendix C. There are no apparent previous drainage reports for this area. The Project area is classified as Zone X, an area of minimal flood hazard, and is not within the 100-year base flood elevation. See Appendix D for FEMA information. The ground cover in the area is native herbaceous land with grass and shrubs with some exposed areas of soil.

Pre-development

Pre-development conditions of the area include an existing two-track road that enters the Project and unimproved grazing land with a minor gully bisecting portions of the project running northwest to southeast. Stormwater runoff from the adjacent property to the west drains onto the Project area. The general topography east of the Project slopes to the east. Stormwater runoff on the Project currently drains north and east.

Post-development

The proposed Project is a commercial and residential planned unit development (PUD). A layout of the proposed Project is depicted in Figure 2. The Project will drain utilizing curb and gutter and by sheet flow to existing ponds to the north and an existing road drainage ditch and culverts to the south. Roads, curbs, gutters, and sidewalks will be constructed as part of the Project. The drainage area to the west will drain to the Project and ultimately to the road drainage ditch to the south.



DRAINAGE PLAN

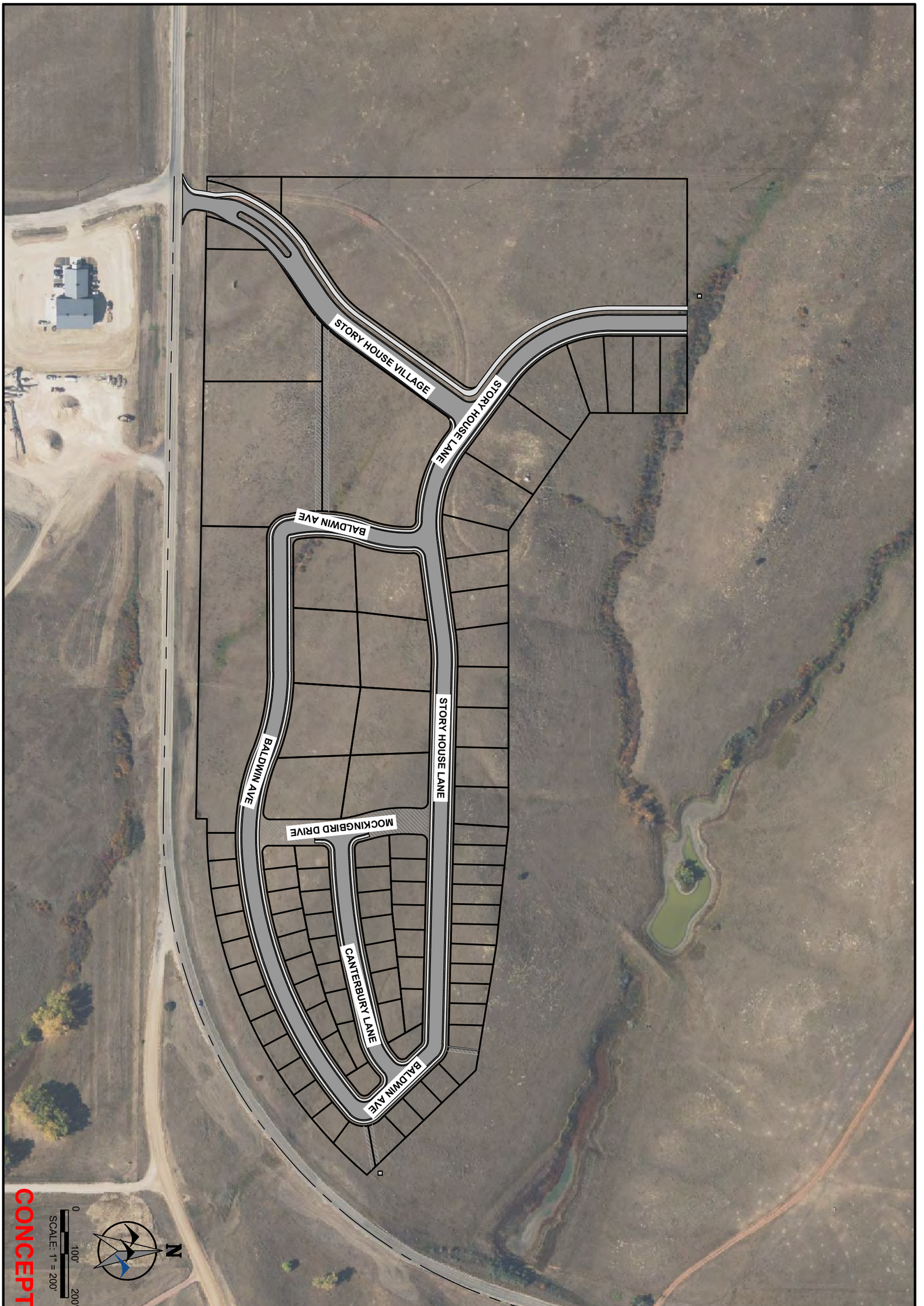
GENERAL LOCATION

STORY HOUSE VILLAGE PUD - PHASE 1

DESIGNED BY: SER
DRAWN BY: RAV
CHECKED BY: SER
DATE: 10/02/2023

WWC ENGINEERING
1849 TERRA AVENUE
SHERIDAN, WY 82801
307-672-0761

FIGURE 1



CONCEPT

STORY HOUSE PROPERTY COMPANY, LLC

STORY HOUSE VILLAGE - PHASE 1

PRELIMINARY DRAINAGE REPORT

SHERIDAN COUNTY, WY

FIGURE 2

DESIGNED BY: SER
DRAWN BY: SER
CHECKED BY: JGB
DATE: 10/20/2023

PREPARED BY
WWC ENGINEERING
1849 TERRA AVE.
SHERIDAN, WY 82801
(307) 672-0761
www.wwcengineering.com

NO.	REVISION	BY	DATE

PROJECT NO. 2023-137

HYDROLOGIC ANALYSIS AND RESULTS

The Manual was used for the hydrologic analysis of the Project using B-2 Business design parameters. The land use was conservatively estimated as general commercial and or central business. WYDOT classifies Wyarno Road as a collector street. The 10-year and 100-year design storms were used for this analysis. The storm recurrence interval of the 10-year and 100-year storms with 24-hour rainfall amounts of 2.35 and 3.46 inches were used. The NRCS (formerly SCS) Method was selected to analyze runoff events based on the size of drainage areas exceeding five acres; WinTR-55 computer modelling was employed in the analyzation.

Design standards for the hydraulics of the Project are found in the Manual. The NRCS procedure in HEC-22 was used to estimate preliminary detention volume needs. Detention calculations are detailed in Appendix A

Pre-Development Drainage Area

Hydrologic analyses were performed for the following drainage basins: East, Center, West, Off-Site West, and North for the pre-development drainage areas. The drainage basins used for the analysis are shown in Figure 3 and described in Table 1.

Table A in Appendix A shows the weighted curve numbers used for the pre-development basins. The curve numbers were used to determine the stormwater flows that will infiltrate or evaporate and the remainder that will become runoff. NRCS soils data were used to determine the hydrologic groups. NRCS data is included in Appendix C.

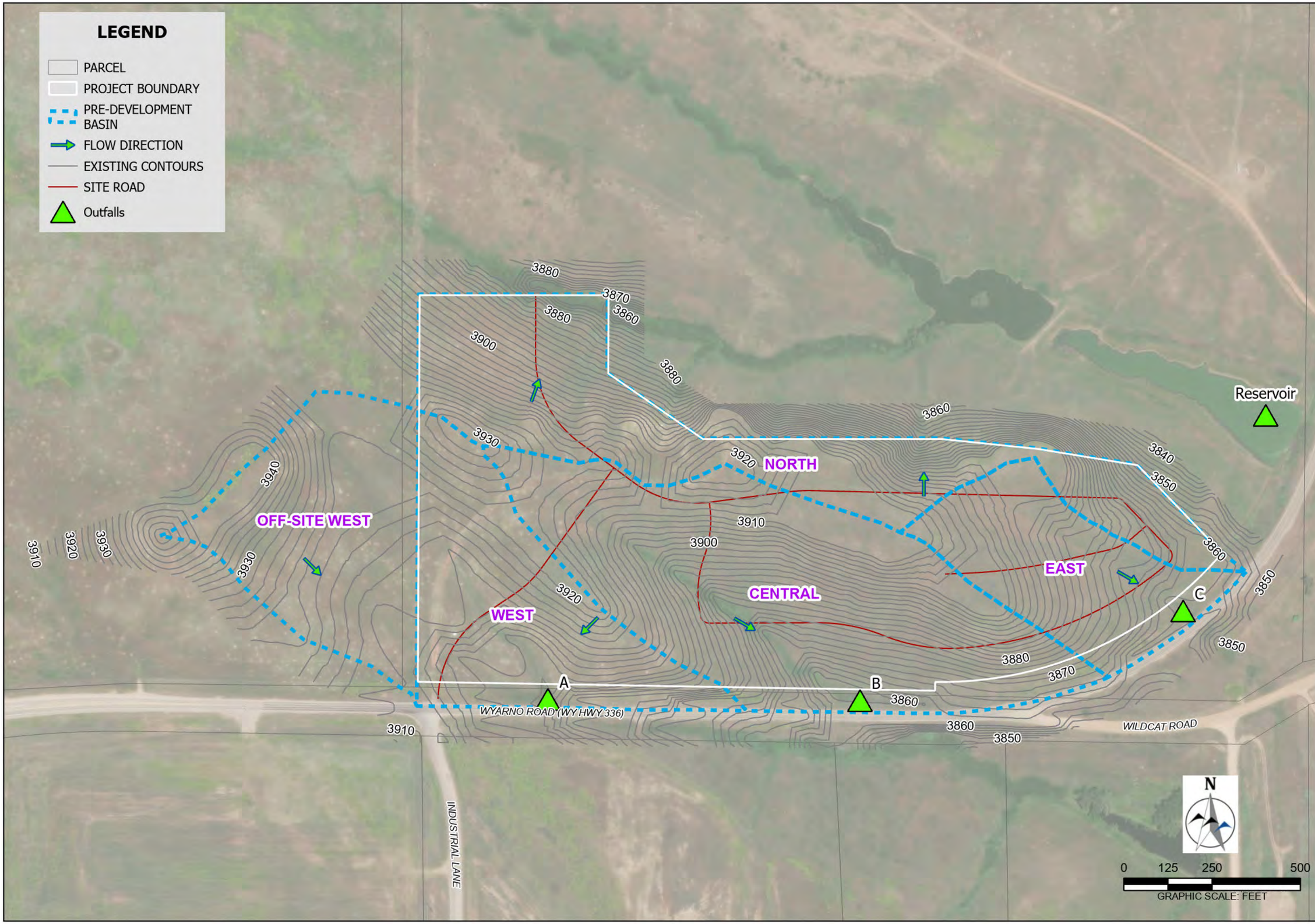
Table 1. Pre-Development Drainage Basins

Outfall	Pre-Development Basins
A	Off-Site West West
B	Central
C	East
Reservoir	North

Post-Development System

The sub-watersheds impacting stormwater flows as part of the Project are provided in Figure 4 and further described below. Post-developed conditions include paved roads, curbs and gutters, sidewalks, and buildings with drainage planned to follow gutter flow to the existing pond areas to the north and to the existing road drainage ditch and culverts to the south. Detailed design calculations for all sub-watersheds are provided in Appendix A.

The boundaries of these areas were determined based on drainage that will be routed onto the Project and the proposed development from the Project itself. The post-development drainage was divided into eleven basins including Off-Site West. The Off-Site West basin will drain east



K:\Sheridan\Story House Management\2023137 Story House Village\06GIS\23137_Story_House.aprx 12/7/2023 10:21 AM

NO.	REVISION	BY	DATE

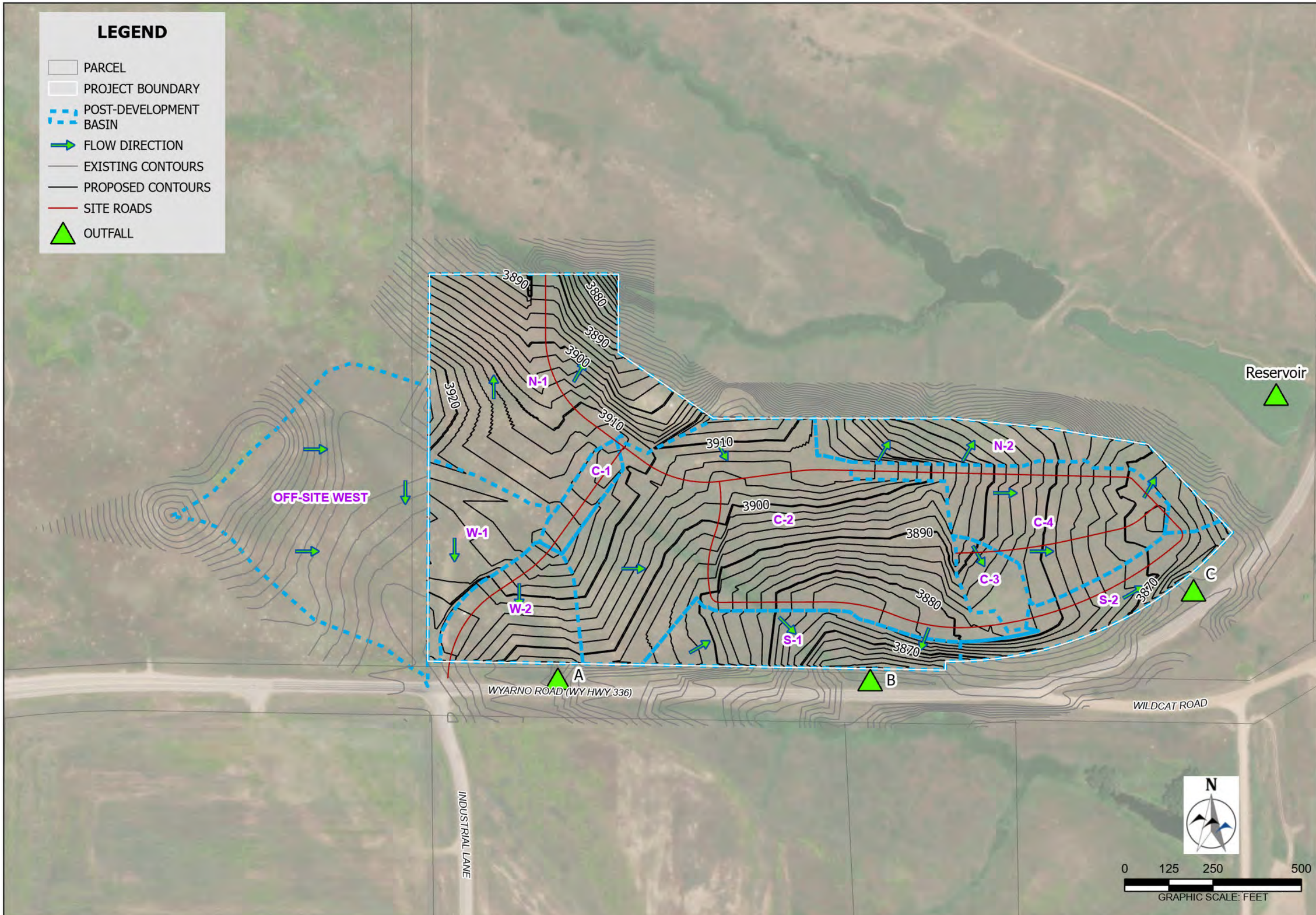
PROJECT NO. 2023-137

PREPARED BY
WWC ENGINEERING
1849 TERRA AVENUE
SHERIDAN, WY 82801
(307) 672-0761
www.wwcengineering.com

STORY HOUSE PROPERTY COMPANY, LLC
STORY HOUSE VILLAGE - PHASE 1
PRE-DEVELOPMENT DRAINAGE PLAN
SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: SER
DATE: 10/19/2023

FIGURE
3



K:\Sheridan\Story House Management\2023137 Story House Village\06GIS\23137_Story_House.aprx 12/7/2023 10:21 AM

NO.	REVISION	BY	DATE

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POST-DEVELOPMENT DRAINAGE PLAN
SHERIDAN COUNTY, WYOMING

DESIGNED BY: SER
DRAWN BY: CIG
CHECKED BY: SER
DATE: 10/19/2023

FIGURE
4

towards the Project and then along the west edge to the south into the Wyarno Road drainage ditch. The ten new basins were determined based on proposed grading for the proposed development. Basins N-1 & N2 drain to the north via sheet flow to the reservoir north of the Project, basins C-1, C-2, W-1, W-2, S-1, and S-2 drain to the culverts in the road ditch to the south of the Project, basins C-3 and C-4 will drain to the curb and gutter that will outfall to the reservoir to the north of the Project as shown in Table 2.

Table B in Appendix A shows the weighted curve numbers used for the post-development basins. The curve numbers were used to determine the stormwater flows that will infiltrate or evaporate and the remainder that will become runoff. NRCS soils data were used to determine the hydrologic groups. NRCS data is included in Appendix C.

Table 2. Post-Development Drainage Basins

Outfall	Post-Development Basins
A	Off-Site West W-1 W-2
B	C-1 C-2 S-1
C	S-2
Reservoir	N-1 N-2 C-3 C-4

The pre-development and post-development conditions were compared for the Project area to determine potential stormwater impacts due to the proposed development. Tables C and D in Appendix A show the times of concentration for the pre-development and post-development basins. Table E in Appendix A displays the estimated drainage flows for each storm event frequency for the pre-development and post-development conditions in the Project drainage area. As shown in Tables 3 and 4, post-development drainage flows decreased for culvert outfalls A and C, flows increased for the runoff out-falling to the existing reservoir and outfall B, and the ponding depth at culvert outfall B shows no change resulting from development improvements. Detailed calculations for ponding are shown in Appendix A following Tables A through E.

Table 3.Runoff Summary

Outfall	Recurrence Interval	Timeframe	Total Q (cfs)	Difference (cfs)
A	10-Year	Pre-developed	20.9	-3.4
		Post-developed	17.5	
	100-Year	Pre-developed	39.8	-7.2
		Post-developed	32.6	
B	10-Year	Pre-developed	23.6	8.4
		Post-developed	32.0	
	100-Year	Pre-developed	42.4	11.8
		Post-developed	54.2	
C	10-Year	Pre-developed	8.1	-1.8
		Post-developed	6.3	
	100-Year	Pre-developed	14.8	-4.3
		Post-developed	10.5	
Reservoir	10-Year	Pre-developed	12.8	23.5
		Post-developed	36.3	
	100-Year	Pre-developed	26.6	32.1
		Post-developed	58.7	

Table 4. Outfall B Ponding Summary

Outfall	Recurrence Interval	Timeframe	Ponding Depth (in)	Difference (in)
B	10-Year	Pre-developed	23.5	0
		Post-developed	23.5	
	100-Year	Pre-developed	35.0	0
		Post-developed	35.0	

POST-DEVELOPMENT RUNOFF CONTROL

During construction, excelsior logs, silt fence or other best management practices (BMPs) will be implemented to prevent runoff to adjacent streets or properties. These erosion control measures will remain in place throughout construction to minimize erosion and sedimentation. Should the lots be further developed beyond the description in the report, the hydrologic effects should be reevaluated for post-development flows.

Post-construction BMPs will be properly installed and maintained until vegetation is reestablished. All structures will be constructed at proper elevation to facilitate positive drainage away from the structures and allow stormwater to drain to the roadways.

CONCLUSIONS AND RECOMMENDATIONS

The Project and the drainage areas were combined to calculate the runoff flow from a 100-year major storm. The results indicate a storm sewer will be necessary for basins C-1, C-2, C-3, & C-4 with the runoff from these basins being routed to the ponds to the north. Basins N-1 and W-1 will need additional runoff management based on future site plans; in the green space of the south end of basin W-1 or the north of basin N-1, a detention pond will be built for the runoff from future development as part of a future project.

A detention volume of 2.45 acre-feet was indicated for the entire Project. Of the total detention volume, the flow leaving the Project to the south was previously 97 cfs compared to 47 cfs leaving the Project to the south once developed. Thus, a detention pond is not needed for basins draining to the south. The remaining runoff will be routed to the existing ponds to the north of the Project.

REFERENCES

City of Sheridan Public Works Dept. (2016) "Storm Drainage Design Criteria". City of Sheridan, 55 Grinnell Plaza, Sheridan, WY. Available on the Internet as of October 2023: https://www.sheridanwy.gov.

US Department of Transportation, FHWA. (2013) "Urban Drainage Design Manual". Hydraulic Engineering Circular No. 22, Third Edition. Publication No. FHWA-NHI-10-009, Rev. August 2013. Available on the Internet as of October 2023: https://www.fhwa.dot.gov/engineering/hydraulics/library_listing.cfm

APPENDIX A

Stormwater Design Calculations

Table A. Pre-development Curve Numbers for the SCS Method

Curve Number (SCS Peak Flow Method)						
Basin	Total Area (acres)	Surface	Subarea (acres)	Hydrologic Group	Curve Number	
Off-Site West	8.32	Pasture	5.12	B	71	77
			0.64	C	81	
			2.56	D	89	
West	8.45	Pasture	0.13	C	81	89
			7.93	D	89	
		Dirt	0.20	D	89	
		Paved with open ditches	0.20	D	93	
North	11.7	Pasture	5.98	D	89	80
			5.68	B	71	
		Dirt	0.02	D	89	
			0.02	B	82	
Central	16.69	Pasture	14.63	D	89	87
			1.66	B	71	
		Dirt	0.13	D	89	
			0.02	B	93	
		Paved with open ditches	0.25	D	93	
East	5.8	Pasture	2.57	C	81	86
			3.10	D	89	
		Paved with open ditches	0.03	C	92	
			0.10	D	93	

Table B. Post-development Curve Numbers for the SCS Method

Curve Number (SCS Peak Flow Method)						
Basin	**Total Area (acres)**	**Surface**	**Subarea (acres)**	**Hydrologic Group**	**Curve Number**	
Off-Site West	8.32	Pasture	5.12	B	71	77
			0.64	C	81	
			2.56	D	89	
C-1	0.68	Paved parking lots, roofs, driveways	0.68	D	98	98
C-2	12.44	Paved parking lots, roofs, driveways	0.78	B	98	89
			2.33	D	98	
		Poor Condition Lawns	2.34	B	79	
			7.01	D	89	
C-3	0.84	Paved parking lots, roofs, driveways	0.28	B	98	91
			0.17	D	98	
		Poor Condition Lawns	0.24	B	79	
			0.15	D	89	
C-4	4.26	Paved parking lots, roofs, driveways	0.62	B	98	95
			2.49	D	98	
		Poor Condition Lawns	0.23	B	79	
			0.92	D	89	
N-1	8.06	Paved parking lots, roofs, driveways	0.12	B	98	93
			3.96	D	98	
		Poor Condition Lawns	0.12	B	79	
			3.86	D	89	
N-2	2.88	Paved parking lots, roofs, driveways	1.26	C	98	87
		Poor Condition Lawns	1.62		79	
W-1	2.24	Paved parking lots, roofs, driveways	0.01	B	98	94
			1.14	D	98	
		Poor Condition Lawns	0.01	B	79	
			1.08	D	89	
W-2	2.26	Paved parking lots, roofs, driveways	0.84	D	98	92
		Poor Condition Lawns	1.43	D	89	
S-1	2.74	Paved parking lots, roofs, driveways	0.04	B	98	91
			0.81	D	98	
		Poor Condition Lawns	0.09	B	79	
			1.79	D	89	
S-2	1.95	Paved parking lots, roofs, driveways	0.03	B	98	91
			0.58	D	98	
		Poor Condition Lawns	0.07	B	79	
			1.28	D	89	

Table C. Pre-development Time of Concentration Calculations

Time of Concentration (SCS Peak Flow Method)						
Basin	**Flow Type**	**Flow Length (ft)**	**Slope (ft/ft)**	**Velocity (ft/s)**	**tc (min)**	**tc (min)**
Off-Site West	Sheet Flow	100	0.0852	- -	7.7	**11.2**
	Shallow Concentrated Flow	717	0.0460	1.21	3.5	
West	Sheet Flow	100	0.0513	- -	9.5	**14.8**
	Shallow Concentrated Flow	983	0.0364	1.22	5.3	
North	Sheet Flow	100	0.0988	- -	7.3	**8.9**
	Shallow Concentrated Flow	483	0.1042	1.09	1.6	
Central	Sheet Flow	100	0.0338	- -	11.2	**16.8**
	Shallow Concentrated Flow	1247	0.0534	1.34	5.6	
East	Sheet Flow	100	0.0222	- -	13.3	**14.9**
	Shallow Concentrated Flow	500	0.0961	0.67	1.7	

Table D. Post-development Time of Concentration Calculations

Time of Concentration (SCS Peak Flow Method)						
Basin	**Flow Type**	**Flow Length (ft)**	**Slope (ft/ft)**	**Velocity (ft/s)**	**tc (min)**	**tc (min)**
Off-Site West	Sheet Flow	100	0.0852	- -	7.7	**11.2**
	Shallow Concentrated Flow	717	0.0460	1.21	3.5	
W1	Sheet Flow	100	0.0271	- -	1.5	**6.0**
	Shallow Concentrated Flow	232	0.0160	1.84	1.5	
W2	Sheet Flow	100	0.0476	- -	1.5	**6.0**
	Shallow Concentrated Flow	238	0.0676	0.52	1.5	
N-1	Sheet Flow	100	0.0282	- -	1.5	**6.0**
	Shallow Concentrated Flow	591	0.0432	3.00	1.5	
N-2	Sheet Flow	100	0.0617	- -	1.5	**6.0**
	Shallow Concentrated Flow	550	0.0314	2.54	1.5	
C-1	Sheet Flow	100	0.0225	- -	1.5	**6.0**
	Shallow Concentrated Flow	154	0.0300	1.81	1.5	
C-2	Sheet Flow	100	0.0621	- -	8.8	**13.7**
	Shallow Concentrated Flow	983	0.0284	1.31	5.0	
C-3	Sheet Flow	100	0.0640	- -	1.1	**6.0**
	Shallow Concentrated Flow	177	0.0265	2.08	1.1	
C-4	Sheet Flow	100	0.0264	- -	1.5	**7.4**
	Shallow Concentrated Flow	1247	0.0296	3.02	5.9	
S-1	Sheet Flow	100	0.0350	- -	11.0	**13.0**
	Shallow Concentrated Flow	482	0.0632	0.75	2.0	
S-2	Sheet Flow	100	0.0350	--	1.5	**6.0**
	Shallow Concentrated Flow	150	0.0632	0.75	1.5	

Table E. Runoff Summary

Pre-Development Flow Rates			
Basin	**Total Area (acres)**	**10-Year Event (cfs)**	**100-Year Event (cfs)**
Off-Site West	8.32	6.95	15.68
West	7.51	13.95	24.12
North	11.7	12.75	26.64
Central	16.7	23.55	42.40
East	5.8	8.08	14.83
Total	50.94	64.20	121.01
Post Development Flow Rates			
Basin	**Total Area (acres)**	**10-Year Event (cfs)**	**100-Year Event (cfs)**
W-1	2.24	5.79	9.14
W-2	2.26	4.73	7.73
N-1	8.06	19.97	32.06
N-2	2.88	5.27	9.48
C-1	0.68	2.00	2.98
C-2	12.44	21.05	36.37
C-3	0.84	1.89	3.15
C-4	4.26	11.01	17.11
S-1	2.74	5.21	8.68
S-2	1.95	4.41	7.34
Total*	46.67	88.28	149.72

*Total includes acreage and runoff from Off-Project West basin

SCS Method Detention Calculation

	P (in)		
	3.46		Formula
Basin	CN	Q_D (in)	Q_D=(B2-0.2*(1000/B4-10)^2/(B2+0.8(1000/B4-10)))
W-2	98	3.458	
W-1	94	3.439	
N-1	93	3.432	
N-2	87	3.364	
C-1	98	3.458	
C-2	89	3.391	
C-3	91	3.414	
C-4	95	3.446	
S-1	91	3.414	
S-2	91	3.414	

Basin	**CN**	**Q_D (in)**	**Q_i**	**Q_o**	**A**	**K_r**		
Total	89	3.391	149.72	121.01	50.96	53.33		
		Qo/Qi	V_r (ac*ft)		Vs		Vs/Vr	
		0.81	14.40		**2.45**		0.17	

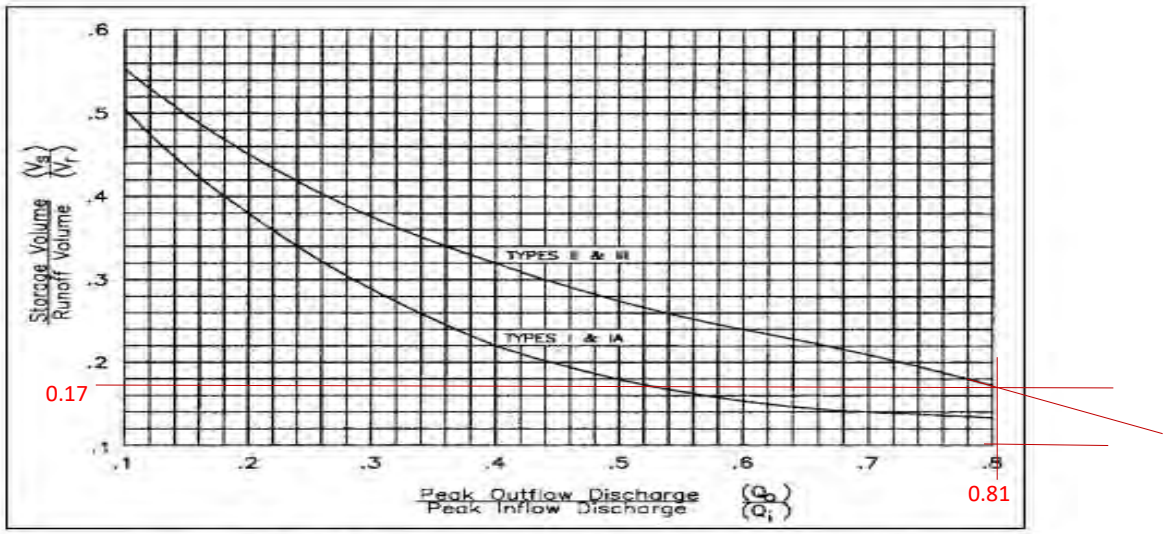

Figure 8-5. SCS detention basin routing curves.[13]

The procedure for using Figure 8-5 in estimating the detention storage required is described as follows:[13]

1. Determine the inflow and outflow discharges Q_i and Q_o
2. Compute the ratio Q_o/Q_i
3. Compute the inflow runoff volume, V_r, for the design storm

$$V_r = K_r Q_D A_m \quad (8\text{-}2)$$

where:

V_r = Inflow volume of runoff, ha-mm (ac-ft)
K_r = 1.00 (53.33 for English units)
Q_D = Depth of direct runoff, mm (in)
A_m = Area of watershed, ha (mi^2)

4. Using Figure 8-5, determine the ratio V_s/V_r
5. Determine the storage volume, V_s, as

$$V_s = V_r (V_s / V_r) \quad (8\text{-}3)$$

WinTR-55 Current Data Description

--- Identification Data ---

User: kmarkley
Project: Story House
SubTitle: Pre-Development
State: Wyoming
County: Sheridan
Filename: K:\Sheridan\Story House Management\2023137 Story House Village\07Calc\Drainage Calcs\Story House Pre-Development.w55

Date: 10/19/2023
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
East		Outlet	5.8	86	.249
Central		Outlet	16.69	87	.28
West		Outlet	8.45	89	.247
Off-Site_W		Outlet	8.32	77	.187
North		Outlet	11.7	80	.148

Total area: 50.96 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
1.61	2.05	2.35	2.78	3.12	3.46	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

kmarkley
Story House
Pre-Development
Sheridan County, Wyoming

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
1.61	2.05	2.35	2.78	3.12	3.46	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

kmarkley Story House
Pre-Development
Sheridan County, Wyoming

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 10-Yr (cfs)	100-Yr (cfs)
SUBAREAS		
East	8.08	14.83
Central	23.55	42.40
West	13.95	24.12
Off-Site_W	6.95	15.68
North	12.75	26.64
REACHES		
OUTLET	64.20	121.01

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Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 10-Yr (cfs)	(hr)	100-Yr (cfs)	(hr)
SUBAREAS				
East	8.08	12.04	14.83	12.04
Central	23.55	12.07	42.40	12.06
West	13.95	12.05	24.12	12.03
Off-Site_W	6.95	12.03	15.68	12.01
North	12.75	11.99	26.64	11.98
REACHES				
OUTLET	64.20		121.01	

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Pre-Development

Sheridan County, Wyoming

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
East	5.80	0.249	86	Outlet	
Central	16.69	0.280	87	Outlet	
West	8.45	0.247	89	Outlet	
Off-Site_W	8.32	0.187	77	Outlet	
North	11.70	0.148	80	Outlet	

Total Area: 50.96 (ac)

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Story House
Pre-Development
Sheridan County, Wyoming

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
East							
SHEET	100	0.0222	0.150				0.221
SHALLOW	500	0.0961	0.050				0.028
						Time of Concentration	.249
Central							
SHEET	100	0.0338	0.150				0.187
SHALLOW	1247	0.0534	0.050				0.093
						Time of Concentration	.28
West							
SHEET	100	0.0513	0.150				0.158
SHALLOW	983	0.0364	0.050				0.089
						Time of Concentration	.247
Off-Site_W							
SHEET	100	0.0852	0.150				0.129
SHALLOW	717	0.0460	0.050				0.058
						Time of Concentration	.187
North							
SHEET	100	0.0988	0.150				0.122
SHALLOW	483	0.1042	0.050				0.026
						Time of Concentration	.148

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Story House
Pre-Development
Sheridan County, Wyoming

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
East	Paved; open ditches (w/right-of-way)		C	.03	92
	Paved; open ditches (w/right-of-way)		D	.1	93
	Herbaceous	(fair)	C	2.57	81
	Herbaceous	(fair)	D	3.1	89
	Total Area / Weighted Curve Number			5.8	86
Central	Paved; open ditches (w/right-of-way)		D	.25	93
	Dirt (w/ right-of-way)		B	.02	82
	Dirt (w/ right-of-way)		D	.13	89
	Herbaceous	(fair)	B	1.66	71
	Herbaceous	(fair)	D	14.63	89
	Total Area / Weighted Curve Number			16.69	87
West	Paved; open ditches (w/right-of-way)		D	.2	93
	Dirt (w/ right-of-way)		D	.2	89
	Herbaceous	(fair)	C	.125	81
	Herbaceous	(fair)	D	7.925	89
	Total Area / Weighted Curve Number			8.45	89
Off-Site_W	Herbaceous	(fair)	B	5.12	71
	Herbaceous	(fair)	C	.64	81
	Herbaceous	(fair)	D	2.56	89
	Total Area / Weighted Curve Number			8.32	77
North	Dirt (w/ right-of-way)		B	.02	82
	Dirt (w/ right-of-way)		D	.02	89
	Herbaceous	(fair)	B	5.68	71
	Herbaceous	(fair)	D	5.98	89
	Total Area / Weighted Curve Number			11.7	80

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WinTR-55 Current Data Description

--- Identification Data ---

User: kmarkley
Project: Story House
SubTitle: Post-Development
State: Wyoming
County: Sheridan
Filename: K:\Sheridan\Story House Management\2023137 Story House Village\07Calc\Drainage Calcs\Story House Post-Development.w55

Date: 12/7/2023
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
N-2		Outlet	2.88	87	0.1
C-1		Outlet	0.68	98	0.1
W-1		Outlet	2.24	94	0.1
N-1		Outlet	8.06	93	0.1
C-2		Outlet	12.44	89	.229
C-3		Outlet	0.84	91	0.1
C-4		Outlet	4.26	95	.124
W-2		Outlet	2.26	92	.179
S-1		Outlet	2.74	91	.217
S-2		Outlet	1.95	91	0.100

Total area: 38.35 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
1.61	2.05	2.35	2.78	3.12	3.46	.0

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

kmarkley
Story House
Post-Development
Sheridan County, Wyoming

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
1.61	2.05	2.35	2.78	3.12	3.46	.0

Storm Data Source: User-provided custom storm data

Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

kmarkley

Story House
Post-Development
Sheridan County, Wyoming

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)
SUBAREAS			
N-2	2.67	5.27	9.48
C-1	1.34	2.00	2.98
W-1	3.54	5.79	9.14
N-1	11.93	19.97	32.06
C-2	11.35	21.05	36.37
C-3	1.07	1.89	3.15
C-4	6.90	11.01	17.11
W-2	2.76	4.73	7.73
S-1	2.96	5.21	8.68
S-2	2.50	4.41	7.34
REACHES			
OUTLET	43.68	75.87	125.50

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Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	100-Yr (cfs) (hr)
SUBAREAS			
N-2	2.67	5.27	9.48
	11.94	11.94	11.93
C-1	1.34	2.00	2.98
	11.93	11.93	11.92
W-1	3.54	5.79	9.14
	11.93	11.93	11.93

N-1	11.93	19.97	32.06
	11.93	11.93	11.93
C-2	11.35	21.05	36.37
	12.04	12.03	12.02
C-3	1.07	1.89	3.15
	11.93	11.93	11.93
C-4	6.90	11.01	17.11
	11.95	11.94	11.94
W-2	2.76	4.73	7.73
	12.00	11.99	11.98
S-1	2.96	5.21	8.68
	12.03	12.03	12.01
S-2	2.50	4.41	7.34
	11.93	11.93	11.93

REACHES

OUTLET	43.68	75.87	125.50

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
N-2	2.88	0.100	87	Outlet	
C-1	.68	0.100	98	Outlet	
W-1	2.24	0.100	94	Outlet	
N-1	8.06	0.100	93	Outlet	
C-2	12.44	0.229	89	Outlet	
C-3	.84	0.100	91	Outlet	
C-4	4.26	0.124	95	Outlet	
W-2	2.26	0.179	92	Outlet	
S-1	2.74	0.217	91	Outlet	
S-2	1.95	0.100	91	Outlet	

Total Area: 38.35 (ac)

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Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
N-2							
SHEET	100	0.0617	0.011				0.018

SHALLOW	550	0.0314	0.050		0.053
				Time of Concentration	0.1
C-1					
SHEET	100	0.0225	0.011		0.027
SHALLOW	154	0.0300	0.025		0.012
				Time of Concentration	0.1
W-1					
SHEET	100	0.0271	0.011		0.025
SHALLOW	232	0.0160	0.025		0.025
				Time of Concentration	0.1
N-1					
SHEET	100	0.0282	0.011		0.025
SHALLOW	591	0.0432	0.025		0.039
				Time of Concentration	0.1
C-2					
SHEET	100	0.0621	0.150		0.146
SHALLOW	143	0.0284	0.050		0.015
SHALLOW	840	0.0284	0.025		0.068
				Time of Concentration	.229
C-3					
SHEET	100	0.0640	0.011		0.018
SHALLOW	177	0.0265	0.050		0.019
				Time of Concentration	0.1
C-4					
SHEET	100	0.0264	0.011		0.025
SHALLOW	1247	0.0296	0.025		0.099
				Time of Concentration	.124
W-2					
SHEET	100	0.0476	0.150		0.163
SHALLOW	238	0.0676	0.050		0.016
				Time of Concentration	.179
S-1					
SHEET	100	0.0350	0.150		0.184
SHALLOW	482	0.0632	0.050		0.033
				Time of Concentration	.217
S-2					
User-provided					0.100
				Time of Concentration	0.100

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Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
N-2	Open space; grass cover < 50%	(poor)	B	1.62	79
	Paved parking lots, roofs, driveways		B	1.26	98
	Total Area / Weighted Curve Number			2.88	87
C-1	Paved parking lots, roofs, driveways		D	.68	98
	Total Area / Weighted Curve Number			.68	98
W-1	Open space; grass cover < 50%	(poor)	B	.01	79
	Open space; grass cover < 50%	(poor)	D	1.08	89
	Paved parking lots, roofs, driveways		B	.01	98
	Paved parking lots, roofs, driveways		D	1.14	98
	Total Area / Weighted Curve Number			2.24	94
N-1	Open space; grass cover < 50%	(poor)	B	.12	79
	Open space; grass cover < 50%	(poor)	D	3.86	89
	Paved parking lots, roofs, driveways		B	.12	98
	Paved parking lots, roofs, driveways		D	3.96	98
	Total Area / Weighted Curve Number			8.06	93
C-2	Open space; grass cover < 50%	(poor)	B	2.335	79
	Open space; grass cover < 50%	(poor)	D	7.005	89
	Paved parking lots, roofs, driveways		B	.775	98
	Paved parking lots, roofs, driveways		D	2.325	98
	Total Area / Weighted Curve Number			12.44	89
C-3	Open space; grass cover < 50%	(poor)	B	.242	79
	Open space; grass cover < 50%	(poor)	D	.148	89
	Paved parking lots, roofs, driveways		B	.279	98
	Paved parking lots, roofs, driveways		D	.171	98
	Total Area / Weighted Curve Number			.84	91
C-4	Open space; grass cover < 50%	(poor)	B	.23	79
	Open space; grass cover < 50%	(poor)	D	.92	89
	Paved parking lots, roofs, driveways		B	.62	98
	Paved parking lots, roofs, driveways		D	2.49	98
	Total Area / Weighted Curve Number			4.26	95
W-2	Open space; grass cover < 50%	(poor)	D	1.428	89

	Paved parking lots, roofs, driveways	D	.835	98
	Total Area / Weighted Curve Number		2.26	92
			====	==
S-1	CN directly entered by user	-	2.74	91
	Total Area / Weighted Curve Number		2.74	91
			====	==
S-2	CN directly entered by user	-	1.95	91
	Total Area / Weighted Curve Number		1.95	91
			====	==

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Story House Village

Date: 12/7/2023
Project #: 2023137

INPUTS

PIPE DIAMETER (D):	24	inches
DOWNSTREAM INVERT ELEVATION:	100	feet
PIPE LENGTH:	140	feet
MANNINGS "n":	0.025	
Km:	1	
ENTRANCE LOSS Ke:	0.9	

CALCULATED PARAMETERS

DIAMETER (D):	2	feet
AREA PIPE (A):	3.1415927	ft^2
KpL:	6.42966188	
full wetted perimeter=	6.2831854	ft
R=	0.5	ft
	Water	

Orifice Hydraulics

$$Q = C_d \cdot A_c \cdot \sqrt{2 \cdot g \cdot (HW} \quad Q = C_d \cdot A_o \cdot \sqrt{2 \cdot g \cdot HW}$$

$$C_d = 1/\sqrt{1 + K_e}$$

Full Pipe Hydraulics

$$Q = A \sqrt{\frac{2 \cdot g \cdot (HW - TW + S_o \cdot L)}{1 + K_e + f \cdot \frac{L}{4 \cdot R}}}$$

$$f \cdot \frac{L}{4 \cdot R} = \frac{2 \cdot g \cdot n^2 \cdot L}{1.486^2 \cdot R^{4/3}}$$

TR-55 coefficient of discharge is set at 0.6
Cd= 0.51

	Elevation	h	H	Q weir	HW/d	Cd	Q orifice	Q pipe	Straight pipe Q used	Dro Pipe Q used	TR-55 (Q)	TR-55 (Q)	TR-55 (Q) used
	ft	ft	ft	cfs			cfs	cfs	**cfs**	cfs	cfs	cfs	cfs
Upstream pipe invert	102.50	0.00	2.50	300.00	0.00	0.44	0.00	13.73	**0.00**	0.00	0	0	0
	102.58	0.08	2.58	1.22	0.04	0.44	3.20	13.96	**1.22**	6.89	3.711621	1.259205	1.259205
	102.67	0.17	2.67	4.47	0.08	0.44	4.53	14.18	**4.47**	15.13	5.249025	2.518409	2.518409
	102.75	0.25	2.75	9.72	0.12	0.44	5.55	14.40	**5.55**	16.87	6.428717	3.777614	3.777614
	102.83	0.33	2.83	16.58	0.17	0.44	6.40	14.62	**6.40**	17.90	7.423243	5.036819	5.036819
	102.92	0.42	2.92	24.63	0.21	0.44	7.16	14.83	**7.16**	18.87	8.299438	6.296024	6.296024
	103.00	0.50	3.00	34.61	0.25	0.44	7.84	15.04	**7.84**	19.79	9.091579	7.555228	7.555228
	103.08	0.58	3.08	45.11	0.29	0.44	8.47	15.25	**8.47**	20.67	9.820027	8.814433	8.814433
	103.17	0.67	3.17	56.50	0.33	0.44	9.06	15.45	**9.06**	21.51	10.49805	10.07364	10.07364
	103.25	0.75	3.25	3.77	0.37	0.44	9.61	15.65	**3.77**	22.32	11.13486	11.33284	11.13486
	103.33	0.83	3.33	4.74	0.42	0.44	10.13	15.85	**4.74**	23.10	11.73718	12.59205	11.73718
	103.42	0.92	3.42	5.73	0.46	0.44	10.62	16.05	**5.73**	23.86	12.31006	13.85125	12.31006
	103.50	1.00	3.50	6.84	0.50	0.44	11.09	16.24	**6.84**	24.60	12.85743	15.11046	12.85743
	103.58	1.08	3.58	7.98	0.54	0.44	11.55	16.44	**7.98**	25.31	13.38244	16.36966	13.38244
	103.67	1.17	3.67	9.16	0.58	0.44	11.98	16.63	**9.16**	26.00	13.88762	17.62887	13.88762
	103.75	1.25	3.75	10.43	0.62	0.44	12.40	16.82	**10.43**	26.68	14.37505	18.88807	14.37505
	103.83	1.33	3.83	11.80	0.67	0.44	12.81	17.00	**11.80**	27.34	14.84649	20.14728	14.84649
	103.92	1.42	3.92	13.22	0.71	0.44	13.20	17.18	**13.20**	27.98	15.30341	21.40648	15.30341
	104.00	1.50	4.00	14.72	0.75	0.44	13.59	17.37	**13.59**	28.61	15.74708	22.66568	15.74708
	104.08	1.58	4.08	16.29	0.79	0.44	13.96	17.55	**13.96**	29.23	16.17858	23.92489	16.17858
	104.17	1.67	4.17	17.97	0.83	0.44	14.32	17.72	**14.32**	29.83	16.59888	25.18409	16.59888
	104.25	1.75	4.25	19.73	0.87	0.44	14.67	17.90	**14.67**	30.42	17.00879	26.4433	17.00879
	104.33	1.83	4.33	21.39	0.92	0.44	15.02	18.08	**15.02**	31.00	17.40905	27.7025	17.40905
	104.42	1.92	4.42	23.14	0.96	0.44	15.36	18.25	**15.36**	31.57	17.80031	28.96171	17.80031
	104.50	2.00	4.50	24.94	1.00	0.44	15.69	18.42	**15.69**	32.13	18.18316	30.22091	18.18316
	104.58	2.08	4.58	26.79	1.04	0.44	16.01	18.59	**16.01**	32.68	18.55811	31.48012	18.55811
	104.67	2.17	4.67	28.71	1.08	0.44	16.33	18.76	**16.33**	33.22			
	104.75	2.25	4.75	30.71	1.12	0.44	16.64	18.92	**16.64**	33.75			
	104.83	2.33	4.83	32.80	1.17	0.44	16.94	19.09	**16.94**	34.27			
	104.92	2.42	4.92	34.98	1.21	0.44	17.24	19.25	**17.24**	34.79			
	105.00	2.50	5.00	37.24	1.25	0.44	17.54	19.42	**17.54**	0.00			
	105.08	2.58	5.08	39.58	1.29	0.44	17.83	19.58	**17.83**	0.00			
	105.17	2.67	5.17	42.01	1.33	0.44	18.11	19.74	**18.11**	0.00			
	105.25	2.75	5.25	44.53	1.37	0.44	18.40	19.90	**18.40**	0.00			
	105.33	2.83	5.33	47.12	1.42	0.44	18.81	20.05	**18.81**	0.00			
	105.42	2.92	5.42	49.66	1.46	0.45	19.45	20.21	**19.45**	0.00			
	105.50	3.00	5.50	52.06	1.50	0.46	20.09	20.36	**20.09**	0.00			
	105.58	3.08	5.58	54.52	1.54	0.46	20.55	20.52	**20.52**	0.00			
	105.67	3.17	5.67	57.02	1.58	0.47	21.01	20.67	**20.67**	0.00			
	105.75	3.25	5.75	59.59	1.62	0.47	21.47	20.82	**20.82**	0.00			
	105.83	3.33	5.83	62.20	1.67	0.48	21.94	20.97	**20.97**	0.00			
	105.92	3.42	5.92	64.87	1.71	0.48	22.41	21.12	**21.12**	0.00			
	106.00	3.50	6.00	67.59	1.75	0.48	22.87	21.27	**21.27**	0.00			
	106.08	3.58	6.08	70.35	1.79	0.49	23.34	21.42	**21.42**	0.00			
	106.17	3.67	6.17	73.16	1.83	0.49	23.82	21.56	**21.56**	0.00			
	106.25	3.75	6.25	75.85	1.87	0.50	24.29	21.71	**21.71**	0.00			
	106.33	3.83	6.33	98.70	1.92	0.50	24.76	21.85	**21.85**	0.00			
	106.42	3.92	6.42	98.70	1.96	0.51	25.24	22.00	**22.00**	0.00			
	106.50	4.00	6.50	98.70	2.00	0.51	25.71	22.14	**22.14**	0.00			
	106.58	4.08	6.58	98.70	2.04	0.51	26.11	22.28	**22.28**	0.00			
	106.67	4.17	6.67	98.70	2.08	0.51	26.50	22.42	**22.42**	0.00			
	106.75	4.25	6.75	98.70	2.12	0.52	26.90	22.56	**22.56**	0.00			
	106.83	4.33	6.83	98.70	2.17	0.52	27.29	22.70	**22.70**	0.00			
	106.92	4.42	6.92	98.70	2.21	0.52	27.68	22.84	**22.84**	0.00			
	107.00	4.50	7.00	98.70	2.25	0.52	28.08	22.97	**22.97**	0.00			
	107.08	4.58	7.08	98.70	2.29	0.53	28.47	23.11	**23.11**	0.00			
	107.17	4.67	7.17	98.70	2.33	0.53	28.86	23.25	**23.25**	0.00			
	107.25	4.75	7.25	98.70	2.37	0.53	29.26	23.38	**23.38**	0.00			
	107.33	4.83	7.33	98.70	2.42	0.53	29.65	23.51	**23.51**	0.00			
	107.42	4.92	7.42	98.70	2.46	0.54	30.05	23.65	**23.65**	0.00			
Overtopping road	107.50	5.00	7.50	98.70	2.50	0.54	30.44	23.78	**23.78**	0.00			

	Hydrologic element	Drainage area (mi^2)	Q peak (cfs)	Time of peak	Volume (in)	Ponding depth (in)
Pre 10	Central	0.026	18.6	22Mar2023, 00:00	1.18	
	Culvert ponding hist	0.026	15.5	22Mar2023, 00:10	1.17	23.5
Pre 100	Central	0.026	34	22Mar2023, 00:00	2.14	
	Culvert ponding hist	0.026	19.3	22Mar2023, 00:20	2.11	35
Post 10	C1	0.001	1.5	22Mar2023, 00:00	2.12	
	C2	0.019	17.2	22Mar2023, 00:00	1.32	
	C2-Culvert	0.019	15.6	22Mar2023, 00:10	1.32	
	S1	0.0043	4.4	22Mar2023, 00:00	1.47	
	Culvert ponding	0.0233	15.5	22Mar2023, 00:10	1.34	23.5
	C1-C2	0.001	1.4	22Mar2023, 00:00	2.12	
Post 100	C1	0.001	2.3	22Mar2023, 00:00	3.22	
	C2	0.019	29.9	22Mar2023, 00:00	2.31	
	C2-Culvert	0.019	27.1	22Mar2023, 00:10	2.31	
	S1	0.0043	7.4	22Mar2023, 00:00	2.5	
	Culvert ponding	0.0233	19.5	22Mar2023, 00:20	2.32	35
	C1-C2	0.001	2	22Mar2023, 00:00	3.22	

Culvert of interest is Outfall B shown in the pre and post drainage plans

Area Capacity Table

Pre-developed		
Elevation (ft)	Area (acres)	Flow (cfs)
0	0.007	0
1	0.034	2.93
2	0.091	10
3	0.154	20
4	0.269	22
5	0.385	23.78
Post developed		
0	0.007	0
1	0.034	2.93
2	0.069	10
3	0.114	20
4	0.220	22
5	0.341	23.78

ponding depth (ft)	Q (cfs)	ponding depth (in)
0.00	0	0.0
0.08	1.223260918	1.0
0.17	4.468759494	2.0
0.25	5.546344068	3.0
0.33	6.404366481	4.0
0.42	7.160299402	5.0
0.50	7.843715002	6.0
0.58	8.472180507	7.0
0.67	9.057141936	8.0
0.75	3.765264506	9.0
0.83	4.738892961	10.0
0.92	5.734122862	11.0
1.00	6.843643443	12.0
1.08	7.983069617	13.0
1.17	9.160546452	14.0
1.25	10.4323354	15.0
1.33	11.80349101	16.0
1.42	13.20293973	17.0
1.50	13.5857129	18.0
1.58	13.95799314	19.0
1.67	14.3205988	20.0
1.75	14.67424709	21.0
1.83	15.01957074	22.0
1.92	15.35713133	23.0
2.00	15.68743	24.0
2.08	16.0109162	25.0
2.17	16.32799483	26.0
2.25	16.6390322	27.0
2.33	16.94436101	28.0
2.42	17.24428449	29.0
2.50	17.53907994	30.0
2.58	17.82900173	31.0
2.67	18.11428387	32.0
2.75	18.39514223	33.0
2.83	18.81274835	34.0
2.92	19.4461821	35.0
3.00	20.08589815	36.0
3.08	20.5177492	37.0
3.17	20.6702969	38.0
3.25	20.82172701	39.0

ponding depth (ft)	Q (cfs)	ponding depth (in)
3.33	20.97206373	40.0
3.42	21.12133042	41.0
3.50	21.26954961	42.0
3.58	21.41674303	43.0
3.67	21.56293171	44.0
3.75	21.70813593	45.0
3.83	21.85237532	46.0
3.92	21.99566887	47.0
4.00	22.13803493	48.0
4.08	22.27949129	49.0
4.17	22.42005517	50.0
4.25	22.55974325	51.0
4.33	22.6985717	52.0
4.42	22.8365562	53.0
4.50	22.97371195	54.0
4.58	23.1100537	55.0
4.67	23.2455958	56.0
4.75	23.38035213	57.0
4.83	23.51433621	58.0
4.92	23.64756116	59.0
5.00	23.78003975	60.0

APPENDIX B

Geotechnical Data

Report of Geotechnical Exploration
Proposed Story House Village
Phase I Development

Wyarno Road
Sheridan, Wyoming

AET Project No. P-0022564

Date:
September 11, 2023
Revised December 15, 2023

Prepared for:
WWC Engineering
1849 Terra Avenue
Sheridan, Wyoming 82801

Geotechnical • Materials
Forensic • Environmental
Building Technology
Petrography/Chemistry

American Engineering Testing
72 E. Ridge Road, Unit D
Sheridan, Wyoming 82801
TeamAET.com • 307.675.1862

September 11, 2023
Revised December 15, 2023

WWC Engineering
1849 Terra Avenue
Sheridan, Wyoming 82801

Attn: Ms. Sarah Rohrer
srohrer@wwcengineering.com

RE: Report of Geotechnical Exploration
Proposed Story House Village
Phase I Development
Wyarno Road
Sheridan, Wyoming
AET Project No. P-0022564

Dear Ms. Rohrer:

American Engineering Testing, Inc. (AET) is pleased to present the results of our subsurface exploration program and geotechnical engineering review for the above referenced site on the northeast side of Sheridan Wyoming. These services were performed in general accordance with our proposal to you dated June 28, 2023 and WWC's written authorization to proceed provided on June 29, 2023. We are submitting one (1) electronic copy of the report to you.

Please contact me if you have any questions about the report. I can also be contacted for arranging observation and testing services during construction of the project. We highly recommend testing and observations be performed during construction at this site.

Sincerely,
American Engineering Testing, Inc.

Robert Temme PE
VP West Division Business Development
rtemme@teamaet.com
Phone: (605-391-5018)

72 E. Ridge Road, Unit D | Sheridan, WY 82801
Phone (307) 675-1862 | (800) 972-6364 | Fax (605) 388-0064 | teamAET.com | AA/EEO
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SIGNATURE PAGE

Prepared for:

WWC Engineering
1849 Terra Avenue
Sheridan, Wyoming 82801

Attn: Ms. Sarah Rohrer

Prepared by:

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1.0 INTRODUCTION

We understand the construction of the Story House Village Phase I Development is being proposed along Wyarno Road, on the northeast side of Sheridan Wyoming. Please refer to the Site Location Map included in Appendix A of this report for the location of the project. To assist with the planning and design, American Engineering Testing, Inc. (AET) has been authorized to conduct a subsurface exploration program at the site, conduct soil laboratory testing, and perform a geotechnical engineering review for the project. This report presents the results of the above services and provides our engineering recommendations based on this data.

Note that AET provided a Preliminary Geotechnical Report for this site under AET Project No. P-0010998, dated April 22, 2022. Two of the borings drilled in that study, Borings B-4 and B-5, are located in the area of the current development. These two borings are included in this report and the data gained from them have been used in the preparation of this report.

2.0 SCOPE OF SERVICES

AET's services were performed in general accordance with our proposal dated June 28, 2023. The authorized scope consists of the following:

- Five (5) Standard Penetration Test (SPT) borings across the proposed subdivision project site to depths ranging from approximately 10 -50 feet below existing grade.
- Soil laboratory testing.
- Geotechnical engineering analysis based on the gained data and preparation of this report.

These services are intended for geotechnical purposes only. The scope is not intended to explore for the presence or extent of environmental contamination in the soil or groundwater.

3.0 PROJECT INFORMATION

Based on the information provided, we understand the Site is moving into a development phase. Preliminary plans indicates roads, lots and utilities to be constructed at the Site.

We have assumed cuts and fill depth will be 10 feet or less, roads/street grades will be set based on the final grading of the site, standard utility depths are anticipated and residential structures may contain basement levels and will be constructed on the specific lots.

The purpose of the geotechnical study was to determine the subsurface conditions at the site and to evaluate the suitability of the site soils for their use in the overall grading, construction of streets and residential structures. Our foundation design assumptions include a minimum factor of safety of 3 with respect to the ultimate bearing capacity.

The previously stated information represents our understanding of the proposed construction. This information is an integral part of our engineering review. It is important that you contact us if there are changes from that described so that we can evaluate whether modifications to our recommendations are appropriate.

4.0 SUBSURFACE EXPLORATION AND TESTING

4.1 Field Exploration Program

The subsurface exploration program conducted for the project consisted of five (5) standard penetration test (SPT) borings drilled on August 16, 2023. The borings were drilled at locations selected by WWC Engineering.

The logs of the borings and details of the methods used appear in Appendix A. The logs contain information concerning soil layering, soil classification, geologic origins, and moisture condition. A density description or consistency is also noted for the natural soils, which is based on the standard penetration resistance (N-value).

The approximate boring locations are shown on Figure 2: Boring Location Map, included in Appendix A. Surface elevations were determined from GoogleEarth.

4.2 Laboratory Testing

The laboratory test program included natural moisture content, dry density, Atterberg Limits, sieve analysis, percent passing the No. 200 sieve, swell-consolidation, standard Proctor and California Bearing Ratio (CBR) tests. The test results of the moisture content, dry density, Atterberg Limits and percent passing the No. 200 sieve appear in Appendix A on the individual boring logs adjacent to the samples upon which they were performed.

Results of the sieve analysis, unconfined compression, swell-consolidation, standard Proctor and CBR tests are presented on the data sheets following the logs.

The swell/consolidation test is commonly performed to evaluate the swell or consolidation potential of soils or bedrock for determining foundation and concrete slab-on-grade design criteria. In this test, relatively undisturbed samples obtained directly from the ring-lined barrel sampler are placed in a laboratory device and saturated under a predetermined load. The swell-index is the resulting amount of swell (+) as a percent of the sample's thickness after the saturation period. Conversely, the consolidation index is the amount of consolidation (-) as a percent of the sample's thickness after consolidation under the confining load. Test results are summarized as follows:

Boring	Depth, ft	Soil Type	Swell (+) or Consolidation (-) Potential, %	Swell Pressure, psf
B-7	10	Lean Clay (CL)	+0.4	2,270

The results for the swell-consolidation test is included within Appendix A. Our judgement of the swell test results is that the site clay soils have a low swell potential with corresponding low to moderate swell pressures.

Results of the standard Proctor and CBR tests are summarized below. The CBR test was remolded to approximately 95% of maximum dry density at the optimum moisture content for the specific boring/material.

Boring	Soil Classification	Optimum Moisture Content, % [1]	Maximum Dry Density, pcf [1]	CBR Value[2]
B-6	Lean Clay (CL)	20.4	102.2	-
B-9	Lean Clay (CL)	20.2	101.9	2.2
B-10	Lean Clay with a little Sand (CL)	15.8	107.4	-

[1] Based on ASTM D 698 (standard proctor) [2] Remolded to 95% of maximum dry density

It should be noted the bulk soil samples represents a mixture of the soils encountered within the upper 1 to 5 foot interval of the borehole. As such, the soil classification as presented on the Moisture-Density Relationship (Proctor) and CBR data sheets may differ from the classifications of the individual soil layers identified on the respective Subsurface Boring Log.

5.0 SITE CONDITIONS

5.1 Surface Observations

In general, the site primarily consisted of a ridge used mainly as undeveloped grazing land and bordered on the north by a drainage with a small reservoir and bordered on the south by Wyarno Road. The Site topography slopes from west to east, with relief ranging from approximately 3,922 feet above sea level on the west side to 3,842 feet on the east.

5.2 Subsurface Soils/Geology

In general, below a thin layer of topsoil, the subsurface soils encountered within the borings consisted of native site alluvial soils overlying weathered and weathered claystone bedrock of the Wasatch Formation. The alluvial soils consisted of layers of approximately 5 to as much as 11 feet of firm to very stiff lean clay with sand and/or loose to medium dense clayey to silty sand.

Below the alluvial soils, weathered and unweathered claystone bedrock (silty lean clay) was encountered to the final depths drilled of approximately 51 feet. The bedrock ranged from very stiff to hard in consistency.

The Subsurface Boring Logs included in Appendix A give a more detailed description of the soils encountered within the borings.

5.3 Groundwater

At the time of our field work, ground water was not encountered within boring depths explored during our subsurface exploration. Temporary piezometers were installed in Borings B-6 and B-7. Water levels were checked in the piezometers on September 1, 2023 and as before, groundwater was not measured in any of the borings. The temporary piezometers were plugged and abandoned.

The lack of groundwater noted at the boring locations should not be taken as an accurate representation of the actual groundwater levels. Groundwater levels can fluctuate due to varying seasonal and annual rainfall and snow melt amounts, as well as other factors. A long period of time may be required for groundwater to stabilize in the soils present at the site; this period of time is generally not available during a typical subsurface exploration program.

6.0 RECOMMENDATIONS

6.1 Discussion

Our recommendations in the following sections are intended to minimize, to varying degrees, movement related problems for the proposed foundations and floor slabs of the residential structures. Even if our recommendations are followed, we cannot guarantee that some movement will not occur. The present state of the art is such that the risk of movement cannot be accurately assessed. It depends on a number of uncontrolled variables such as climatic conditions during and after construction, long term fluctuations of the groundwater level, utility line leakage, landscaping, and other similar aspects. The risk of detrimental movement must be assumed by the project owner.

The following recommendations are based on the soil conditions observed, and in the samples collected from the soil borings advanced at the time of the field activities. The location of the borings and the recommendations provided, were based on the information available to AET at the time of our field work. The soils encountered at each boring location and the soils encountered during excavation and site grading may vary due to the surficial geology of the site. Further, changes in climatic conditions between the time of exploration and the time of construction may also affect subsurface conditions, particularly groundwater levels and the moisture content of the soils. Due to the potential variations, we recommend that AET be retained to verify the soil conditions encountered during excavations match the information gained during our field investigation.

Final grading such as cuts and fills made on the site during construction may have a direct impact on the performance of the streets, residential structures and the following recommendations. AET must be allowed to review the final grading plans of the site to verify the following recommendations will remain applicable and/or if additional recommendations apply. Also note that modifications made to the completed structures and site, such as future additions and grade and drainage changes, may result in a direct impact to the performance of the original structures and site and cannot be addressed at this time.

Also, the following recommendations must be verified and observed in the field by the geotechnical engineer during construction. As the cost associated with the construction observations and testing will vary depending on the size and complexity of the structures and site, AET must be allowed to provide a proposal for these services during construction. The costs associated with the observations and testing services need to be included in the overall project construction cost.

To reduce the risk of movement of the bearing strata, good drainage must be maintained during and after construction. We recommend the final site grading be designed with positive drainage away from the buildings for at least a distance of 10 feet. We also recommend the excavations be left open a minimal amount of time to reduce the possible amount of surface water to accumulate in the base of the excavation.

6.2 Surficial Reconnaissance

AET visited the Site on August 16, 2023 to perform a surficial reconnaissance of the Site prior to drilling operations. AET gained access through a gate located along the north side of Wyarno Road. The access gate is located at the high point of the proposed Site development. Two drainages run through the Site from west to east. A small reservoir is located along the north drainage. The site is characterized by short grasses and shrubs and occasional cobbles and boulders. The Site is currently utilized for grazing livestock. Five soil borings were located by WWC engineering and each boring was visited to check access conditions for the drill rig. Access was deemed suitable for drilling operations.

6.3 Site Preparation

We recommend existing topsoil and any organic matter be removed from within the construction limits of the new residential structures, project streets and all areas to receive fill. Topsoil may be stockpiled on site for reuse once grading is complete; however, any organic material, and any old construction debris encountered should be wasted from the site.

We anticipate that cuts and fills of varying depths will be required within the streets and building footprints. Where required, grading should continue to the desired construction elevations. All exposed subgrades need to be scarified to a depth of approximately 8 to 12-inches, the moisture content of the scarified soils adjusted to within ±3% of their optimum moisture content and the scarified soils compacted to at least 95% of the maximum standard Proctor dry density (ASTM D 698).

The excavated soils, cleaned of all unsuitable/organic materials and rocks greater than 3-inches in nominal size, may be used obtain final grades or stockpiled on-site and reused as utility trench backfill and overlot fill. We recommend the soils to be used as fill be moisture conditioned to within ±3% of optimum moisture and compacted to at least 95% of the maximum dry density (ASTM D698). Imported fill material, if required, should be approved by the geotechnical engineer prior to use.

To reduce the potential for movement related distress and to provide a uniform bearing surface, we recommend, the concrete slab-on-grade floors systems for the residential structures, bear on at least 1 foot of compacted granular engineered fill material. placed directly on the recompacted site soils.

The imported granular engineered fill should be pre-approved by the geotechnical engineer prior to its use. The granular engineered fill above the water table, should be a non-expansive material with a maximum size of 2-inches, 40% to 85% passing the #4 sieve, and no more than 20% passing the #200 sieve, with a liquid limit of less than 30. All granular engineered fill to be placed above the water table, whether from on-site or imported, should be placed in 8-inch thick maximum loose lifts; the moisture content should be conditioned to within ±3% of optimum moisture and compacted to at least 95% of maximum standard Proctor (ASTM D 698) dry density.

We recommend all final cut and fill slopes be constructed with 3H:1V slopes or flatter. It is our opinion temporary cut slopes can be cut to slopes of 2H:1V.

As noted, groundwater was not encountered across the site. Temporary dewatering of excavations will be necessary if groundwater is encountered, or surface drainage is allowed to accumulate in the excavations. Contractors working on the project should be prepared to have equipment on-site that will lower and maintain the groundwater level a minimum of two feet below the base of the excavations. We recommend that the groundwater levels be check prior to and during construction operations on site.

For more information on site preparation see the Standard Sheets section of this report.

6.4 Foundation Design

Based on the information obtained from the borings and laboratory testing, as well as our analysis, it is our opinion the residential structures may be founded on conventional spread footing foundation systems placed directly on the reconditioned site soils and/or claystone bedrock. We anticipate full depth basement levels will be 7 to 8 feet below final grades.

If a basement level is to be constructed, we recommend the placement of a perimeter drain system at the bottom outside edge of the basement footing excavation. The perimeter drain system should be routed to a sump pumping system to remove water from below the basement level.

Footings can be designed for an allowable bearing capacity of 2,000 pounds per square foot (psf). We recommend all footings be placed at least 42-inches below final grades for frost protection. As constructed, the above loading should provide a theoretical safety factor of three or more with respect to a general shear or base failure of the footings.

6.5 Basement Wall Design Considerations

If basement levels are constructed, the basement or lower-level walls will be subject to lateral earth pressure from the backfill. These types of walls are normally designed for the “at-rest” earth pressure condition because the walls are restrained from rotating. If the site soils are used as backfill, a value of 75 pounds per square foot, per foot of depth, should be used for the at-rest lateral earth pressure against the basement walls. The lateral earth pressure does not include any factor of safety and it not applicable for submerged conditions or hydrostatic loading

6.6 Floor Slab Design

Due to the presence of clay soils at the site, floor slabs should be placed on at least 1 foot of compacted granular engineered fill. Prior to placement we recommend the exposed subgrade be scarified to a depth of one foot and moisture conditioned to within ±3% of the optimum moisture content and compacted to at least 95% of maximum standard Proctor (ASTM D 698) dry density. We also recommend the floor slabs be constructed independent of the foundations in the event some movement does occur.

We also recommend providing a 6-inch thick continuous sand and/or gravel cushion layer directly below the floor slab to prevent capillary moisture rise to the slab. This free-draining granular fill should contain less than 12% by weight passing the #200 sieve, and less than 40% passing the #40 sieve. This 6-inch thick sand and/or gravel cushion layer can be incorporated into the 1 feet of engineered fill, where appropriate.

Refer to the "Floor Slab Moisture/Vapor Protection" document in the Standard Sheets section of this report for additional information.

6.7 Utility Trench and Exterior Backfill Considerations

It is our opinion utility trench backfill and exterior backfill around the addition may consist of the excavated alluvial soils. Based on the existing moisture content of the site soils, processing and drying of the material will very likely be required prior to re-use as backfill material.

All recommendations are based on the standard Proctor method (ASTM: D698).

1. All backfill should be free of deleterious/frozen material, and construction debris, and have a maximum aggregate size of 2-inches.
2. Site clays soils should be moisture conditioned to within -1 to +3% of the optimum moisture content. All granular backfill should be moisture conditioned to within ±3% of optimum moisture content prior to being placed.
3. All backfill should be placed in loose lift thicknesses of 8-inches or less. If hand-operated compaction equipment is used, the loose lift thickness should be reduced to 4-inches or less.
4. Each lift should be compacted to at least 95% of maximum proctor density. We recommend the final lift of backfill be compacted to at least 97% of the maximum dry density.
5. Compaction density tests should be performed on alternating lifts to ensure the minimum density is maintained.
6. Utility lines entering or exiting the structures should be leak tested prior to the placement of the slab.

6.8 Trench Excavation

If excavation faces are not retained, the excavations should maintain maximum allowable slopes in accordance with *OSHA Regulations (Standards 29 CFR), Part 1926, Subpart P, "Excavations"* (can be found on www.osha.gov). Even with the required OSHA sloping, water seepage or surface runoff can potentially induce side slope erosion or running which could require slope maintenance. For trench excavations, it is our opinion the site clays and sand soils, can be classified as Type C soils with recommended slope laybacks of 1.5H:1V. For the weathered and unweathered claystone formation, it is our opinion the soils can be classified as Type A soils with recommended slope laybacks of 3/4H:1V.

These classifications should be considered preliminary and should be verified in the field on a daily basis by the contractor and/or geotechnical engineer. Excavations deeper than 20 feet and/or in saturated soils or below the ground water table should be considered on an individual basis. Water levels, due to climatic conditions should be evaluated at the time of construction. If the above trench layback recommendations are not feasible, due to space limitations or other factors, the OSHA rules should be consulted for alternative trench stabilization methods. Trench boxes or shoring in compliance with OSHA rules may be acceptable alternatives.

6.9 Pavements

6.9.1 Considerations

The following pavement section was designed based on the City of Sheridan Standard Specifications and the procedures outlined in the 1993 AASHTO Empirical Equation for Flexible Pavements and Rigid Pavements.

It is anticipated that pavement subgrade soils will consist of sandy lean clay soils. Based on our laboratory results, a California Bearing Ratio (CBR) value of 2.2 was used in the pavement design analysis utilizing the site lean clay soils as the subgrade material. We have used a correlation of 1500 x CBR value to estimate the resilient modulus (MR).

A Traffic Impact Study report, prepared by Sustainable Traffic Solutions, was provided by WWC Engineering. Based on our review of the data contained in that report, we have assumed the proposed subdivision streets will be utilized by moderate traffic volumes consisting primarily of passenger trucks and cars with a smaller amount of truck related traffic such as seen from garbage and general delivery/service vehicles. Based on the subdivision layout, we have assumed the east half of the subdivision will be exposed to lighter traffic loads (residential) as the portion of the subdivision will be residential housing.

The west half of the subdivision, which will provide apartment and commercial space, will experience the higher traffic and truck related traffic. Therefore, an equivalent 20-year design 18-kip single axle load (ESAL) of 45,000 was utilized for the Phase I subdivision residential streets and an equivalent 20-year design 18-kip single axle load (ESAL) of 125,000 was utilized for the multi-family housing and commercial lots within the subdivision streets.

The 20-year design period is considered to be the interval over which, with proper maintenance, the pavement will not require major repairs. A continuing regular maintenance program should be implemented to maintain satisfactory serviceability over the design life. The maintenance program should include sealing cracks and repairing minor deficiencies. Please notify us if any of the parameters used in the pavement design do not adequately define the anticipated conditions.

6.9.2 Subgrade Preparation

Prior to placement of base course or any fill to obtain final subgrade elevations, the exposed subgrade soils should be scarified to a depth of 8-inches, the moisture content of the scarified soils adjusted to near optimum moisture content and the material compacted to at least 95% of maximum standard Proctor dry density (ASTM: D 698).

All prepared subgrades should be proof rolled to verify a firm and unyielding subgrade has been obtained prior to the placement of new fill and/or base course materials. To obtain a firm and unyielding subgrade, on which to construct the new pavement section, scarification and drying of the subgrade soils should be anticipated. If project schedules do not allow for sufficient time to dry the soil back to acceptable levels, use of a geo-textile stabilization/separation material can be incorporated in the design. The geo-textile should be placed on top of the graded subgrade and below the aggregate base course layer. Please note the pavement section, including base course thickness, may be subject to change if incorporating a geo-textile stabilization material into the design.

Prior to placement of the base course, an observed proof roll should be performed to confirm a firm and unyielding subgrade. Any areas that "pump" under the loaded dump truck should be evaluated by a geotechnical engineer, or their representative, to determine whether additional excavation and replacement with a coarse, clean rock or the use of a geo-textile fabric should be used to stabilize the subgrade. Once the subgrade has been proof rolled and approved by the engineer, base course may be placed.

6.9.3 Aggregate Base Course

Aggregate base course should be moisture conditioned to within ±3% of optimum and compacted to a minimum of 95% of maximum density as determined by the standard proctor method (ASTM: D698) and should meet the requirements as outlined in the City of Sheridan Standard Specifications.

6.9.4 Pavement Section Recommendations

Based on the above stated information and our analysis, we recommend the following pavement sections be used for this project:

Recommended Pavement Section Thickness (inches)				
Traffic Area	**Flexible (Asphalt), in.**	**Rigid (Concrete), in**	**Aggregate Base Course, in.**	**Total, in.**
Residential – Story House Lane, Baldwin Avenue, Mockingbird Lane, Canterbury Lane	4	--	9	13
	--	6	5	11
Blocks 1,2,3,8 of Story House Lane, Story House Village, Baldwin Lane	5	-	12	17
	-	6.5	5	11.5

Aggregate base course used in the pavement section can typically be reduced by about 25% when utilizing a geotextile separation/stabilization fabric or a geogrid. We recommend the geotextile manufacturer, such as Tensar or Mirafi, be contacted for design parameters and additional considerations for the pavement sections.

The asphalt should be obtained from an approved mix design within the City of Sheridan Standard Specifications. Mix designs should be submitted prior to construction to verify their adequacy. Asphalt material should be placed in maximum 3-inch lifts and compacted to the minimum standards outlined in the City of Sheridan Standard Specifications.

If Portland Cement Concrete (PCC) pavement is selected for use at this site, the concrete pavement should conform to City of Sheridan Standard Specifications. Longitudinal and transverse joints should be provided as needed in concrete pavements for expansion/contraction and isolation. The location and extent of joints should be based

upon the final pavement geometry. Sawed joints should be cut within 24-hours of concrete placement. All joints should be sealed to prevent entry of foreign material and dowelled where necessary for load transfer.

6.10 General Site Recommendations

6.10.1 Surface Water Management

Surface water runoff is important to the long-term performance of the foundation systems and paved surfaces. The site should slope away from all structures constructed on site, directing water away from all foundation elements. All hard surfacing should have a minimum slope of 1% to facilitate the rapid removal of water from these surfaces.
In landscaped areas, a minimum slope of 2% should be maintained, directing water away from any structures on site. Additionally, in landscaped areas, water should not be allowed to pond behind any curb and gutter systems on site. We recommend that a French drain be installed in areas where water would be likely to pond on landscaped areas.

6.10.2 Site Excavations and Deleterious Soils

We anticipate that the soils encountered on site, within the depths explored during our field services, will be able to be excavated using conventional earth moving equipment. If deleterious soils/material is encountered it should be removed from the construction limits, site soils cleaned of all deleterious substances may be used for backfilling, in areas where deleterious substances are encountered. The following are considered deleterious substances/soils; coal, lignite, organic material, construction debris, mud, site soils significantly disturbed by construction traffic, any material greater than 6 inches in diameter, and any site soils with moisture content greater than 6% above the optimum moisture as determined by ASTM D698. If coal or lignite is encountered during site excavations and grading the geotechnical engineer should be contacted to observe and assist in developing a plan for removal and replacement with suitable material.

During construction, operations care should be taken to avoid unnecessary disturbance of the site soils. Disturbance of the site soils may result in additional over excavation and replacement of the disturbed soils. Excessively disturbed soils may occur from construction traffic over unprotected soft or wet subgrades, excessive erosion, deposition and scouring from surface water runoff during construction. To mitigate potential disturbed soils during construction operations, we recommend that construction traffic be limited to the minimum necessary for construction of the project, and in areas where high construction traffic is anticipated we recommend that a temporary gravel/rock surfacing

be used to minimize potential damage to subgrade soils.

6.10.3 Site Landscaping Recommendations

We suggest avoiding the planting of deep rooted trees within 10 feet of the structure to minimize changes in the moisture content of the subsurface soils. We recommend that hard surfacing be placed directly against the structure extending a minimum of 5 feet away from foundation walls, and sloping away from the structure. Additionally, we recommend that any landscape sprinkler systems be designed so that no water from the sprinklers is spread within 5 feet of any structures on site.

7.0 CONSTRUCTION CONSIDERATIONS

7.1 Potential Difficulties

7.1.1 Soft Subgrade Soils

Depending on the time of year in which construction takes place, unstable subgrade soils could be encountered during the site and building grading operations. If encountered, additional conditioning of the soils may be required to obtain moisture contents which allow for firm and unyielding subgrade and/or compaction.

Localized areas of soft wet subgrades can be remedied with additional excavation to expose firmer soils, placement of coarse rock to provide a solid base on which to place additional fill and/or the use of geotextiles between the soft soils and the overlying fill and/or pavement sections. The appropriate means of subgrade stabilization should be evaluated by the geotechnical engineer at the time of construction.

7.1.2 Runoff Water in Excavation

Water can be expected to collect in the excavation bottom during times of inclement weather or snow melt. To allow observation of the excavation bottom, to reduce the potential for soil disturbance, and to facilitate filling operations, we recommend water be removed from within the excavation during construction. Based on the soils encountered, we anticipate the groundwater can be handled with conventional sump pumping.

7.1.3 Disturbance of Soils

The on-site soils can be disturbed under construction traffic, especially if the soils are wet. If soils become disturbed, they should be subcut to the underlying undisturbed soils. The subcut soils can then be dried and recompacted back into place, or they should be removed and replaced with drier imported fill.

7.2 Excavation Backsloping

If excavation faces are not retained, the excavations should maintain maximum allowable slopes in accordance with *OSHA Regulations (Standards 29 CFR), Part 1926, Subpart P, "Excavations"* (can be found on www.osha.gov). Even with the required OSHA sloping, water seepage or surface runoff can potentially induce sideslope erosion or sloughing which could require slope maintenance.

7.3 Observation and Testing

The recommendations in this report are based on the subsurface conditions found at our test boring locations. Since the soil conditions can be expected to vary away from the soil boring locations, we recommend on-site observation by a geotechnical engineer/technician during construction to evaluate these potential changes. Soil density testing should also be performed on new fill placed in order to document that project specifications for compaction have been satisfied.

8.0 LIMITATIONS

Within the limitations of scope, budget, and schedule, we have endeavored to provide our services according to generally accepted geotechnical engineering practices at this time and location. Other than this, no warranty, expressed or implied, is intended. Important information regarding risk management and proper use of this report is given in Appendix B entitled "Geotechnical Report Limitations and Guidelines for Use."

Standard Sheets

EXCAVATION AND REFILLING FOR STRUCTURAL SUPPORT

EXCAVATION

Excavations for structural support at soil boring locations should be taken to depths recommended in the geotechnical report. Since conditions can vary, recommended excavation depths between and beyond the boring location should be evaluated by geotechnical field personnel. If groundwater is present, the excavation should be dewatered to avoid the risk of unobservable poor soils being left in-place. Excavation base soils may become disturbed due to construction traffic, groundwater or other reasons. Such soils should be subcut to underlying undisturbed soils.

Soil stresses under footings spread out with depth. Therefore, the excavation bottom and subsequent fill system should be laterally oversized beyond footing edges to support the footing stresses. A lateral oversize equal to the depth of fill below the footing (i.e., 1:1 oversize) is usually recommended. The lateral oversize is usually increased to 1.5:1 where compressible organic soils are exposed on the excavation sides. Variations in oversize requirements may be recommended in the geotechnical report or can be evaluated by the geotechnical field personnel.

Unless the excavation is retained, the backslopes should be maintained in accordance with OSHA Regulations (Standards-29 CFR), Part 1926, Subpart P, "Excavations" (found on www.osha.gov). Even with the required OSHA sloping, groundwater can induce sideslope raveling or running which could require that flatter slopes or other approaches be used.

FILLING

Filling should proceed only after the excavation bottom has been approved by the geotechnical engineer/technician. Approved fill material should be uniformly compacted in thin lifts to the compaction levels specified in the geotechnical report. The lift thickness should be thin enough to achieve specified compaction through the full lift thickness with the compaction equipment utilized. Fine grained soils are moisture sensitive and are often wet (water content exceeds the "optimum moisture content" defined by a Proctor test). In this case, the soils should be scarified and dried to achieve a water content suitable for compaction. This drying process can be time consuming, labor intensive, and requires favorable weather.

Filling operations for structural support should be closely monitored for fill type and compaction by a geotechnical technician. Monitoring should be on a full-time basis in cases where vertical fill placement is rapid; during freezing weather conditions; where groundwater is present; or where sensitive bottom conditions are present.

EXCAVATION/REFILLING DURING FREEZING TEMPERATURES

Soils that freeze will heave and lose density. Upon thawing, these soils will not regain their original strength and density. The extent of heave and density loss depends on the soil type and moisture condition; and is most pronounced in clays and silts. Foundations, slabs, and other improvements should be protected from frost intrusion during freezing weather. For earthwork during freezing weather, the areas to be filled should be stripped of frozen soil, snow and ice prior to new fill placement. In addition, new fill should not be allowed to freeze during or after placement. For this reason, it may be preferable to do earthwork operations in small plan areas so grade can be quickly attained instead of large areas where much frost stripping may be needed.

FREEZING WEATHER EFFECTS ON BUILDING CONSTRUCTION

GENERAL

Because water expands upon freezing and soils contain water, soils which are allowed to freeze will heave and loose density. Upon thawing, these soils will not regain their original strength and density. The extent of heave and density/strength loss depends on the soil type and moisture condition. Heave is greater in soils with higher percentages of fines (silts/clays). High silt content soils are most susceptible, due to their high capillary rise potential which can create ice lenses. Fine grained soils generally heave about 1/4" to 3/8" for each foot of frost penetration. This can translate to 1" to 2" of total frost heave. This total amount can be significantly greater if ice lensing occurs.

DESIGN CONSIDERATIONS

Clayey and silty soils can be used as perimeter backfill, although the effect of their poor drainage and frost properties should be considered. Basement areas will have special drainage and lateral load requirements which are not discussed here. Frost heave may be critical in doorway areas. Stoops or sidewalks adjacent to doorways could be designed as structural slabs supported on frost footings with void spaces below. With this design, movements may then occur between the structural slab and the adjacent on-grade slabs. Non-frost susceptible granular soils (with less than 12% passing a #200 sieve) can be used below such areas. Depending on the function of surrounding areas, the granular soil layer may need a thickness transition away from the area where movement is critical. With granular soil placement over slower draining soils, subsurface drainage would be needed for the granular layer. High density extruded insulation could be used within the granular soils to reduce frost penetration, thereby reducing the granular soil thickness needed. We caution that insulation placed near the surface can increase the potential for ice glazing of the surface.

The possible effects of adfreezing should be considered if clayey or silty soils are used as backfill. Adfreezing occurs when backfill adheres to rough surfaced foundation walls and lifts the wall as it freezes and heaves. This occurrence is most common with masonry block walls, unheated or poorly heated building situations and clay backfill. The potential is also increased where backfill soils are poorly compacted and become saturated. The risk of adfreezing can be decreased by placing a low friction separating layer between the wall and backfill.

Adfreezing can occur on exterior piers (such as deck, fence or other similar pier footings), even if a smooth surface is provided. This is more likely in poor drainage situations where soils become saturated. Additional footing embedment and/or widened footings below the frost zones (which include tensile reinforcement) can be used to resist uplift forces. Specific designs would require individual analysis.

CONSTRUCTION CONSIDERATIONS

Foundations, slabs, and other improvements which may be affected by frost movements should be insulated from frost penetration during freezing weather. If filling takes place during freezing weather, all frozen soils, snow, and ice should be stripped from areas to be filled prior to new fill placement. The new fill should not be allowed to freeze during transit, placement, or compaction. This should be considered in the project scheduling, budgeting, and quantity estimating. It is usually beneficial to perform cold weather earthwork operations in small areas where grade can be attained quickly rather than working large areas where a greater amount of frost stripping may be needed. If slab subgrade areas freeze, we recommend the subgrade be thawed prior to floor slab placement. The frost action may also require reworking and recompaction of the thawed subgrade.

FLOOR SLAB MOISTURE/VAPOR PROTECTION

Floor slab design relative to moisture/vapor protection should consider the type and location of two elements, a granular layer and a vapor membrane (vapor retarder, water resistant barrier or vapor barrier). In the following sections, the pros and cons of the possible options regarding these elements will be presented, such that you and your specifier can make an engineering decision based on the benefits and costs of the choices.

GRANULAR LAYER

In American Concrete Institute (ACI) 302.1-96, a "base material" is recommended, rather than the conventional cleaner "sand cushion" material. The manual maintains that clean sand (common "cushion" sand) is difficult to compact and maintain until concrete placement is complete. ACI recommends a clean, fine graded material (with at least 10% to 30% of particles passing a #100 sieve) which is not contaminated with clay, silt or organic material. We refer you to ACI 302.1-96 for additional details regarding the requirements for the base material.

In cases where potential static water levels or significant perched water sources appear near or above the floor slab, an underfloor drainage system may be needed wherein a drain tile system is placed within a thicker clean sand or gravel layer. Such a system should be properly engineered depending on subgrade soil types and rate/head of water inflow.

VAPOR MEMBRANE

The need for a vapor membrane depends on whether the floor slab will have a vapor sensitive covering, will have vapor sensitive items stored on the slab, or if the space above the slab will be a humidity controlled area. If the project does not have this vapor sensitivity or moisture control need, placement of a vapor membrane may not be necessary. Your decision will then relate to whether to use the ACI base material or a conventional sand cushion layer. However, if any of the above sensitivity issues apply, placement of a vapor membrane is recommended. Some floor covering systems (adhesives and flooring materials) require a vapor membrane to maintain a specified maximum slab moisture content as a condition of their warranty.

VAPOR MEMBRANE/GRANULAR LAYER PLACEMENT

A number of issues should be considered when deciding whether to place the vapor membrane above or below the granular layer. The benefits of placing the slab on a granular layer, with the vapor membrane placed below the granular layer, include reduction of the following:

- Slab curling during the curing and drying process.
- Time of bleeding, which allows for quicker finishing.
- Vapor membrane puncturing.
- Surface blistering or delamination caused by an extended bleeding period.
- Cracking caused by plastic or drying shrinkage.

The benefits of placing the vapor membrane over the granular layer include the following:

- The moisture emission rate is achieved faster.
- Eliminates a potential water reservoir within the granular layer above the membrane.
- Provides a "slip surface", thereby reducing slab restraint and the associated random cracking.

If a membrane is to be used in conjunction with a granular layer, the approach recommended depends on slab usage and the construction schedule. The vapor membrane should be placed above the granular layer when:

- Vapor sensitive floor covering systems are used or vapor sensitive items will be directly placed on the slab.
- The area will be humidity controlled, but the slab will be placed before the building is enclosed and sealed from rain.
- Required by a floor covering manufacturer's system warranty.

The vapor membrane should be placed below the granular layer when:

- Used in humidity controlled areas (without vapor sensitive coverings/stored items), with the roof membrane in place, and the building enclosed to the point where precipitation will not intrude into the slab area. Consideration should be given to slight sloping of the membrane to edges where draintile or other disposal methods can alleviate potential water sources, such as pipe or roof leaks, foundation wall damp proofing failure, fire sprinkler system activation, etc.

Appendix A

Geotechnical Field Exploration and Testing
Boring Log Notes
Unified Soil Classification System
Figure 1: Site Location Map
Figure 2: Boring Location Map
Subsurface Boring Logs
Sieve Analysis Test Results
Swell-Consolidation Results

A.1 FIELD EXPLORATION

The subsurface conditions at the site were explored by drilling and sampling standard penetration test borings. The locations of the borings appear on Figure 2, preceding the Subsurface Boring Logs in this appendix.

A.2 SAMPLING METHODS

A.2.1 Split-Spoon Samples (SS) - Calibrated to N_{60} Values

Standard penetration (split-spoon) samples were collected in general accordance with ASTM: D1586 with one primary modification. The ASTM test method consists of driving a 2-inch O.D. split-barrel sampler into the in-situ soil with a 140-pound hammer dropped from a height of 30 inches. The sampler is driven a total of 18 inches into the soil. After an initial set of 6 inches, the number of hammer blows to drive the sampler the final 12 inches is known as the standard penetration resistance or N-value. Our method uses a modified hammer weight, which is determined by measuring the system energy using a Pile Driving Analyzer (PDA) and an instrumented rod.

In the past, standard penetration N-value tests were performed using a rope and cathead for the lift and drop system. The energy transferred to the split-spoon sampler was typically limited to about 60% of its potential energy due to the friction inherent in this system. This converted energy then provides what is known as an N_{60} blow count.

The most recent drill rigs incorporate an automatic hammer lift and drop system, which has higher energy efficiency and subsequently results in lower N-values than the traditional N_{60} values. By using the PDA energy measurement equipment, we are able to determine actual energy generated by the drop hammer. With the various hammer systems available, we have found highly variable energies ranging from 55% to over 100%. Therefore, the intent of AET's hammer calibrations is to vary the hammer weight such that hammer energies lie within about 60% to 65% of the theoretical energy of a 140-pound weight falling 30 inches. The current ASTM procedure acknowledges the wide variation in N-values, stating that N-values of 100% or more have been observed. Although we have not yet determined the statistical measurement uncertainty of our calibrated method to date, we can state that the accuracy deviation of the N-values using this method is significantly better than the standard ASTM Method.

A.2.2 Disturbed Samples (DS)/Spin-up Samples (SU)

Sample types described as "DS" or "SU" on the boring logs are disturbed samples, which are taken from the flights of the auger. Because the auger disturbs the samples, possible soil layering and contact depths should be considered approximate.

A.2.3 Sampling Limitations

Unless actually observed in a sample, contacts between soil layers are estimated based on the spacing of samples and the action of drilling tools. Cobbles, boulders, and other large objects generally cannot be recovered from test borings, and they may be present in the ground even if they are not noted on the boring logs.

Determining the thickness of "topsoil" layers is usually limited, due to variations in topsoil definition, sample recovery, and other factors. Visual-manual description often relies on color for determination, and transitioning changes can account for significant variation in thickness judgment. Accordingly, the topsoil thickness presented on the logs should not be the sole basis for calculating topsoil stripping depths and volumes. If more accurate information is needed relating to thickness and topsoil quality definition, alternate methods of sample retrieval and testing should be employed.

A.3 CLASSIFICATION METHODS

Soil descriptions shown on the boring logs are based on the Unified Soil Classification (USC) system. The USC system is described in ASTM: D2487 and D2488. Where laboratory classification tests (sieve analysis or Atterberg Limits) have been performed, accurate classifications per ASTM: D2487 are possible. Otherwise, soil descriptions shown on the boring logs are visual-manual judgments. Charts are attached which provide information on the USC system, the descriptive terminology, and the symbols used on the boring logs.

The boring logs include descriptions of apparent geology. The geologic depositional origin of each soil layer is interpreted primarily by observation of the soil samples, which can be limited. Observations of the surrounding topography, vegetation, and development can sometimes aid this judgment.

A.4 WATER LEVEL MEASUREMENTS

The ground water level measurements are shown at the bottom of the boring logs. The following information appears under "Water Level Measurements" on the logs:

- Date and Time of measurement
- Sampled Depth: lowest depth of soil sampling at the time of measurement
- Casing Depth: depth to bottom of casing or hollow-stem auger at time of measurement
- Cave-in Depth: depth at which measuring tape stops in the borehole
- Water Level: depth in the borehole where free water is encountered
- Drilling Fluid Level: same as Water Level, except that the liquid in the borehole is drilling fluid

The true location of the water table at the boring locations may be different than the water levels measured in the boreholes. This is possible because there are several factors that can affect the water level measurements in the borehole. Some of these factors include: permeability of each soil layer in profile, presence of perched water, amount of time between water level readings, presence of drilling fluid, weather conditions, and use of borehole casing.

A.5 LABORATORY TEST METHODS

A.5.1 Water Content Tests
Conducted per AET Procedure 01-LAB-010, which is performed in general accordance with ASTM: D2216 and AASHTO: T265.

A.5.2 Atterberg Limits Tests
Conducted per AET Procedure 01-LAB-030, which is performed in general accordance with ASTM: D4318 and AASHTO: T89, T90.

A.5.3 Sieve Analysis of Soils (thru #200 Sieve)
Conducted per AET Procedure 01-LAB-040, which is performed in general conformance with ASTM: D6913, Method A.

A.5.4 Particle Size Analysis of Soils (with hydrometer)
Conducted per AET Procedure 01-LAB-050, which is performed in general accordance with ASTM: D422 and AASHTO: T88.

A.5.5 Unconfined Compressive Strength of Cohesive Soil
Conducted per AET Procedure 01-LAB-080, which is performed in general accordance with ASTM: D2166 and AASHTO: T208.

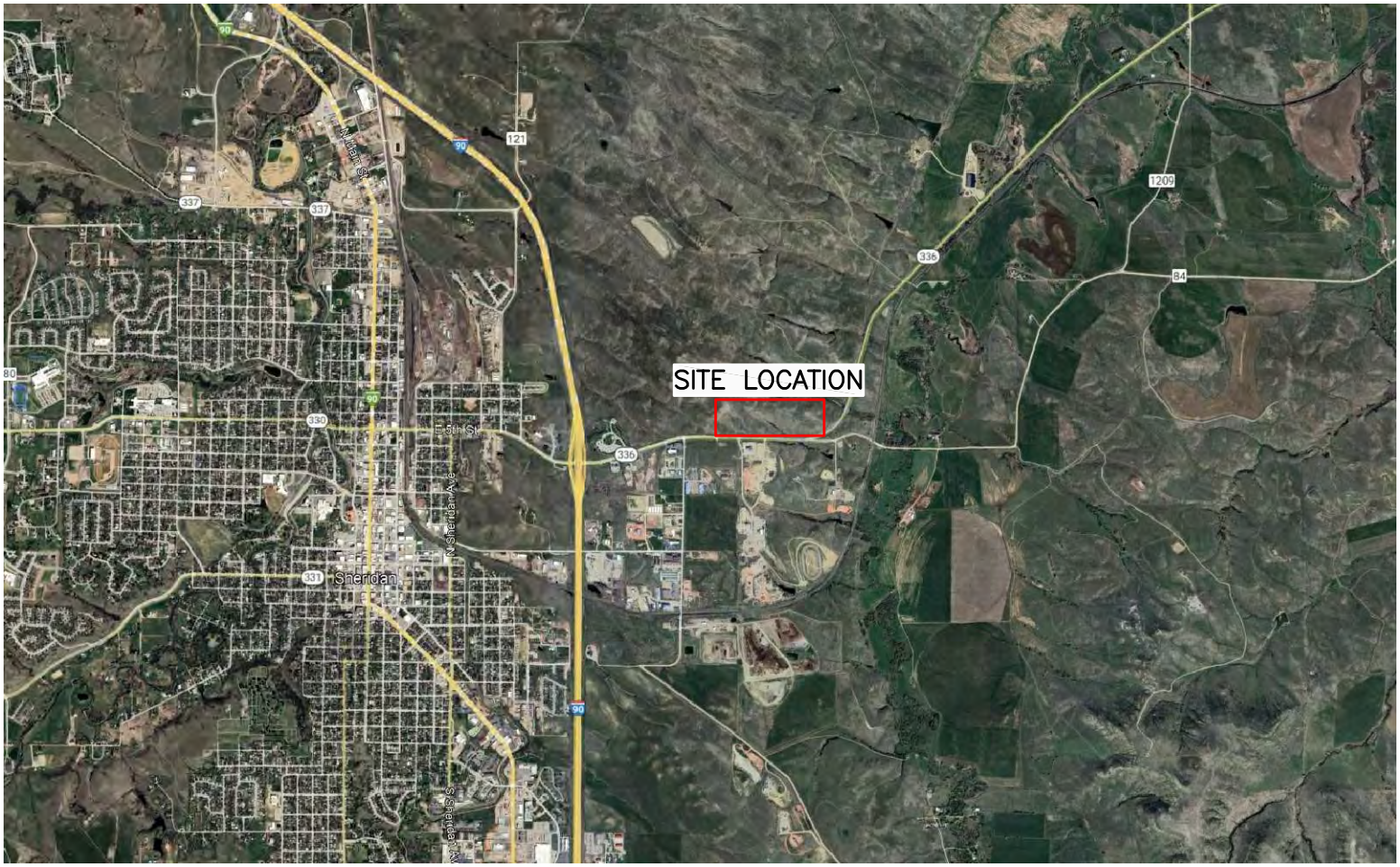
A.5.6 Laboratory Soil Resistivity using the Wenner Four-Electrode Method
Conducted per AET Procedure 01-LAB-090, which is performed using Soil Box apparatus in the laboratory in general accordance with ASTM: G57

A.6 TEST STANDARD LIMITATIONS

Field and laboratory testing is done in general conformance with the described procedures. Compliance with any other standards referenced within the specified standard is neither inferred nor implied.

A.7 SAMPLE STORAGE

Unless notified to do otherwise, we routinely retain representative samples of the soils recovered from the borings for a period of 30 days.

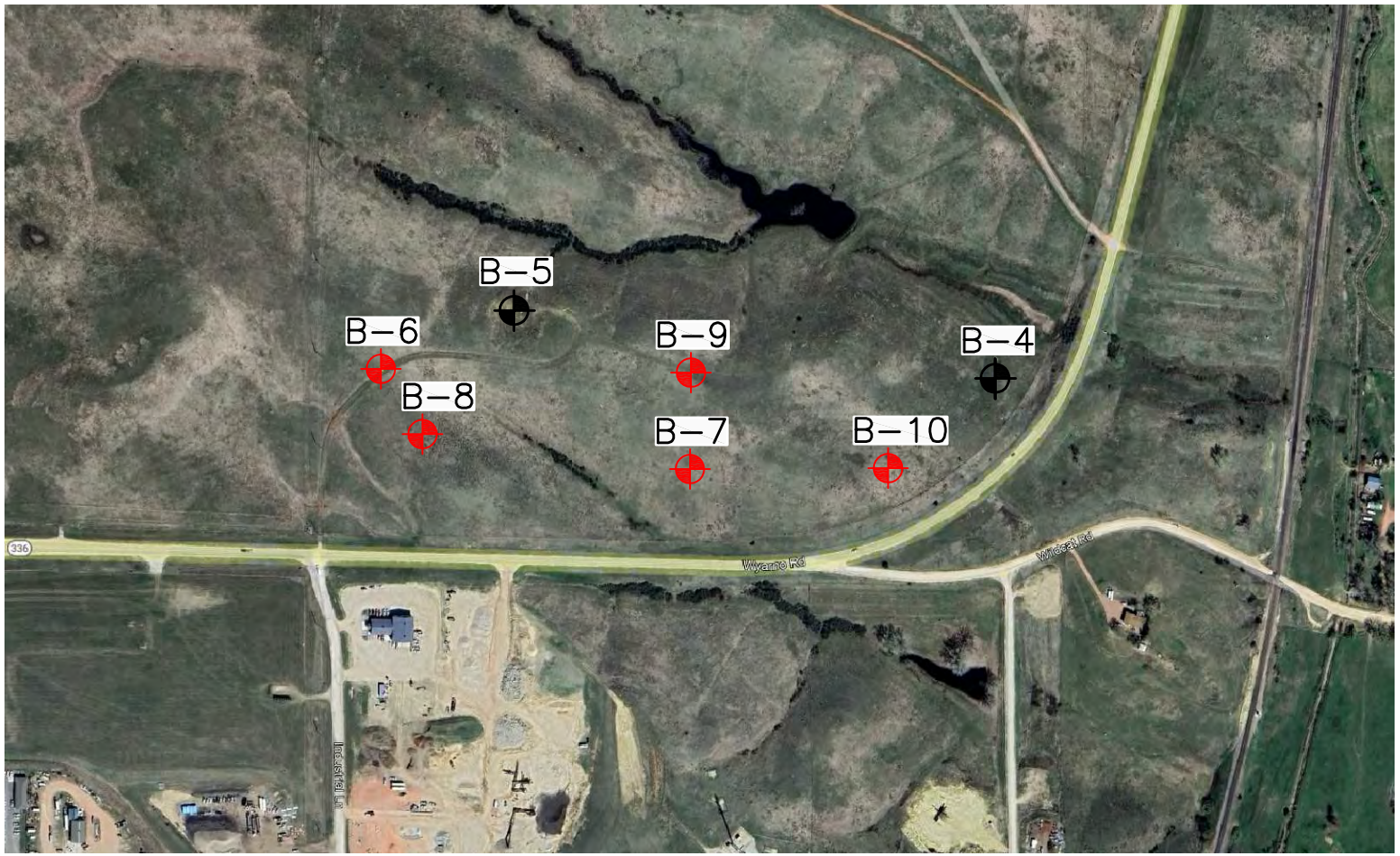


SCALE
(FEET)

0 4000

AMERICAN
ENGINEERING TESTING

PROJECT: STORY HOUSE VILLAGE PHASE I DEVELOPMENT– WYARNO ROAD SHERIDAN, WYOMING		PROJECT NO. P–0022564
SUBJECT: FIGURE 1: SITE LOCATION MAP		DATE: AUGUST 21, 2023
SCALE: 1 INCH = 4000 FEET	DRAWN BY: KK	REVIEWED BY: RT



SCALE (FEET)
0 600

BORINGS DRILLED 8/16/2023

BORINGS DRILLED 3/31/2022

AMERICAN ENGINEERING TESTING

PROJECT: STORY HOUSE VILLAGE PHASE I DEVELOPMENT, WYARNO ROAD SHERIDAN, WYOMING		PROJECT NO. P-0022564
SUBJECT: FIGURE 2: BORING LOCATION MAP		DATE: AUGUST 21, 2023
SCALE: 1 INCH = 600 FEET	DRAWN BY: KK	REVIEWED BY: RT

SUBSURFACE BORING LOG

AET No: **P-0010998** Log of Boring No. **B-4 (p. 1 of 1)**

Project: **Prairie Hills LLC; Wyarno Road - Sheridan, Wyoming**

DEPTH IN FEET	Surface Elevation **3842.0** MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
0	TOPSOIL, cobbles & boulders present										
1	CLAYEY SAND, brown, loose (SC)		10	M	SS						
2											
3	CLAYEY SAND, tan/gray, medium dense, blocky, trace gypsum (SC) (Weathered bedrock)		25	D/M	CAL		9		40	22	44.6
4											
5											
6			37	D/M	SS						
7											
8	CLAYEY SAND, tan, very dense (SC)		50/0.3	M	CAL		6				
9											
10	SILTY SAND, tan, very dense (SM)										
11			54	M	SS		12		29	24	46.3
12											
13			59	M	CAL						
14											
15			82/0.9								
16				M	SS						
17											
18											
19											
20	POORLY-GRADED SAND with clay, brown, very dense (SP)										
21			53	M	CAL		11				
	Bottom of Boring										

DEPTH:	DRILLING METHOD
21.5	**3.25" HSA**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
3/31/22	**9:00**	**21.5**	**20.0**	**NA**	**NA**	**None**
4/8/22	**8:00**	**21.5**	**20.0**	**NA**	**NA**	**None**

BORING COMPLETED: **3/31/22**

DR: **JS** LG: **CC** Rig: **D-50**

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP P-0010998 LOGS.GPJ AET+CPT+WELL.GDT 9/11/23

SUBSURFACE BORING LOG

AET No: **P-0010998** Log of Boring No. **B-5 (p. 1 of 1)**

Project: **Prairie Hills LLC; Wyarno Road - Sheridan, Wyoming**

Surface Elevation **3907.0**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
0	TOPSOIL										
1	CLAYEY SAND, brown, loose (SC)		5	M	SS						
3			9	M	CAL		8				
6			7	M	SS						
8			6	M	CAL						
10	Very dense at 10 feet		3	M	SS		15				16.8
13	CLAYEY SAND, brown, very dense (SC) (Weathered Bedrock)		86	M	CAL						
16			58	M	SS						
21			73	M	CAL		10				
	Bottom of Boring										

DEPTH: **21.5** DRILLING METHOD: **3.25" HSA**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
3/31/22	**10:45**	**21.5**	**20.0**	**NA**	**NA**	**None**
4/8/22	**8:00**	**21.5**	**20.0**	**NA**	**NA**	**None**

BORING COMPLETED: **3/31/22**

DR: **JS** LG: **CC** Rig: **D-50**

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP P-0010998 LOGS.GPJ AET+CPT+WELL.GDT 9/11/23

SUBSURFACE BORING LOG

AET No: **P-0022564** Log of Boring No. **B-6 (p. 1 of 1)**

Project: **Story House Village Phase I Development; Wyarno Road, Sheridan, Wyoming**

Surface Elevation **3922.0**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
1	**TOPSOIL** with cobblestones	TOPSOIL	7	M	SS	100					
2	**LEAN CLAY** with fine sand, trace organics,	ALLUVIUM									
3	brown, firm (CL)		7	M	MC	100					
4											
5	**CLAYEY SAND**, brown and light grey, loose										
6	(SC)		14	M	SS	100	14		44	21	
7	**LEAN CLAY** with gypsum, light grey and										
8	brown, stiff (CL)	WASATCH FORMATION	58	M	MC	100					
9											
10	**WEATHERED CLAYSTONE**, silty lean clay,										
11	trace gypsum, greyish brown, hard (CL)		42	M	SS	100	11	109	35	19	
12											
13	with red oxidation, trace fine sand, grey		62	M	MC	100					
14											
15											
16			57	M	SS	100	10	117			
17											
18	**CLAYSTONE**, silty lean clay with red										
19	oxidation, grey, hard (CL)										
20											
21			50/.75	M	MC	75					
22											
23											
24											
25											
26	with gypsum		100	M	SS	100	12	113			
27											
28											
29											
30											
31	lense of coal, black		50/.5	M	MC	50					
32											
33											
34											
35											
36			50/.5	M	SS	75					
37											
38											
39											
40											
41	with fine sand, tan		50/.5	M	MC	50					
42											
43											
44											
45											
46	dark brown		50/.5		SS						
47											
48											
49											
50											
51	lense of coal, dark brown		50/.5	M	MC	25					
	Bottom of Boring										

DEPTH:	DRILLING METHOD
50.0	**3.25" HSA**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
8/16/23	**10:50**	**51.5**	**50.0**	**NA**	**NA**	**None**
9/1/23		**51.5**	**50.0**	**NA**	**NA**	**None**

BORING COMPLETED: **8/16/23**

DR: **JS** LG: **CB** Rig: **99**

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP P-0022564 LOGS.GPJ AET+CPT+WELL.GDT 9/11/23

SUBSURFACE BORING LOG

AET No: **P-0022564** Log of Boring No. **B-7 (p. 1 of 1)**

Project: **Story House Village Phase I Development; Wyarno Road, Sheridan, Wyoming**

Surface Elevation **3890.0**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
1	**TOPSOIL** with cobblestones	TOPSOIL	7	M	SS	100	15		46	27	
2	**LEAN CLAY** with coarse sand, trace organics, dark brown, very stiff (CL)	ALLUVIUM									
3	with red oxidation, light brown		16	M	MC	100					
5	**SILTY SAND**, light tan, loose (SM)		9	M	SS	100	11	91			
8	**SILT**, light tan, stiff (ML)		11	M	MC	100					
10	**WEATHERED CLAYSTONE**, lean clay with trace fine sand, red oxidation, brown to dark brown, very stiff (CL)	WASATCH FORMATION	22	M	SS	100	17	101			
13			22	M	MC	100					
14	**COAL**, black, soft										
16			6	M	SS	100					
17	**CLAYSTONE**, lean clay, dark grey, hard (CL)										
21			50/.75	M	MC	80	14				
25	with red oxidation, grey		70	M	SS	100					
31			50/.5	M	MC	75					
35	light tan		50/.5	M	SS	30					
	Bottom of Boring										

DEPTH:	DRILLING METHOD
35.0	**3.25" HSA**

BORING COMPLETED: **8/16/23**

DR: **JS** LG: **CB** Rig: **99**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
8/16/23	**13:55**	**36.5**	**35.0**	**NA**	**NA**	**None**
9/1/23		**36.5**	**35.0**	**NA**	**NA**	**None**

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP P-0022564 LOGS.GPJ AET+CPT+WELL.GDT 9/11/23

SUBSURFACE BORING LOG

AET No: **P-0022564** Log of Boring No. **B-8 (p. 1 of 1)**

Project: **Story House Village Phase I Development; Wyarno Road, Sheridan, Wyoming**

DEPTH IN FEET	Surface Elevation **3920.0** MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
	TOPSOIL with cobblestones	TOPSOIL									
1	**SILTY LEAN CLAY** with trace gypsum, organics, light brown, stiff (CL)	ALLUVIUM	9	M	SS	100					
2	**SILTY SAND**, light brown, medium dense (SM)	WASATCH FORMATION									
3			25	M	MC	100	10	103			
4											
5	**WEATHERED CLAYSTONE**, silty lean clay with trace gypsum, light brown and reddish to greyish brown, very stiff (CL)										
6			22	M	SS	100					
7											
8	**WEATHERED CLAYSTONE**, lean clay with fine sand, light reddish brown, hard (CL)		63	M	MC	100	11	113	38	21	
9											
10											
11			36	M	SS	100					
	Bottom of Boring										

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
10.0	**3.25" HSA**	**8/16/23**	**15:40**	**11.5**	**10.0**	**NA**	**NA**	**None**
BORING COMPLETED: **8/16/23**								
DR: **JS** LG: **CB** Rig: **99**								

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP P-0022564 LOGS.GPJ AET+CPT+WELL.GDT 9/11/23

SUBSURFACE BORING LOG

AET No: **P-0022564** Log of Boring No. **B-9 (p. 1 of 1)**

Project: **Story House Village Phase I Development; Wyarno Road, Sheridan, Wyoming**

DEPTH IN FEET	Surface Elevation **3915.0** MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
	TOPSOIL with cobblestones	TOPSOIL									
1	**LEAN CLAY** with fine sand, trace gypsum, light brown, stiff (CL)	ALLUVIUM	12	M	SS	100					
2											
3			12	M	MC	100					
4											
5											
6			9	M	SS	100	12	104	44	23	
7	**WEATHERED CLAYSTONE**, silty lean clay with red oxidation, light greyish brown, very stiff (CL)	WASATCH FORMATION									
8			28	M	MC	100					
9											
10											
11			25	M	SS	100	14	113			41.1
	Bottom of Boring										

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
10.0	**3.25" HSA**	**8/16/23**	**16:25**	**11.5**	**10.0**	**NA**	**NA**	**None**
BORING COMPLETED: **8/16/23**								
DR: **JS** LG: **CB** Rig: **99**								

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP P-0022564 LOGS.GPJ AET+CPT+WELL.GDT 9/11/23

SUBSURFACE BORING LOG

AET No: **P-0022564** Log of Boring No. **B-10 (p. 1 of 1)**

Project: **Story House Village Phase I Development; Wyarno Road, Sheridan, Wyoming**

Surface Elevation **3884.0**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
	TOPSOIL with cobblestones	TOPSOIL									
1	**LEAN CLAY** with trace fine sand, organics, brown to light brown, stiff to very stiff (CL)	ALLUVIUM	10	M	SS	100					
2											
3	trace gypsum		17	M	MC	100	12	108	34	18	
4											
5	**CLAYEY SAND**, light brown, loose to medium dense (SC)										
6			10	M	SS	100					
7											
8			26	M	MC	100	9		29	16	26.8
9											
10											
11			16	M	SS	100					
	Bottom of Boring										

DEPTH:	DRILLING METHOD
10.0	**3.25" HSA**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
8/16/23	**17:10**	**11.5**	**10.0**	**NA**	**NA**	**None**

BORING COMPLETED: **8/16/23**

DR: **JS** LG: **CB** Rig: **99**

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP P-0022564 LOGS.GPJ AET+CPT+WELL.GDT 9/11/23

American Engineering Testing, Inc.
Sheridan
72 E Ridge Rd Unit D
Sheridan, WY 82801
(607) 675-1862
www.teamAET.com

Material Test Report

Report No: MAT:AET-128494-S4

Client: Story House Management, LLC **CC:**

Project: Story House Village PI, Sheridan, WY
GEO-23

Sheridan WY
Job No: P-0022564

Draft Report - Subject to change pending final review

Date of Issue: 8/28/2023

Sample Details

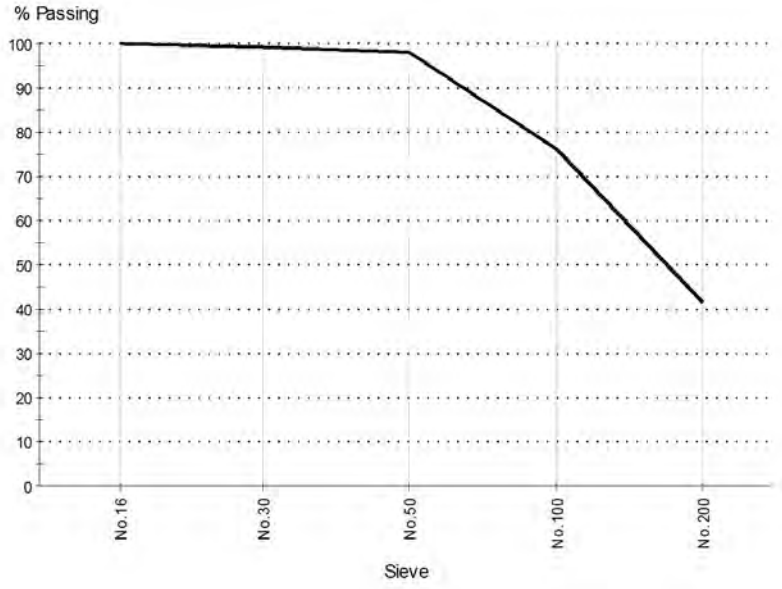
Sample ID	AET-128494-S4
Field Sample ID	
Date Sampled	8/16/2023
Source	
Material	Silty Sand
Specification	Gradation + Hydrometer
Sampling Method	
Location	Boring B-7 5'
Date Submitted	

Other Test Results

Description	Method	Result	Limits
Fineness Modulus	ASTM C 136, ASTM C 117	N/A	
Curvature Coefficient		N/A	
Uniformity Coefficient		N/A	

Particle Size Distribution

ASTM C 136, ASTM C 117



Date Tested:
Tested By:

Sieve Size	% Passing	Limits
No.16	99.9	
No.30	99.1	
No.50	97.9	
No.100	76.0	
No.200	41.6	

Comments

N/A

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Sheridan, WY 82801
(607) 675-1862
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Material Test Report

Report No: MAT:AET-128494-S5

Client: Story House Management, LLC **CC:**

Project: Story House Village PI, Sheridan, WY
GEO-23

Sheridan WY

Job No: P-0022564

Draft Report - Subject to change pending final review

Date of Issue: 8/28/2023

Sample Details

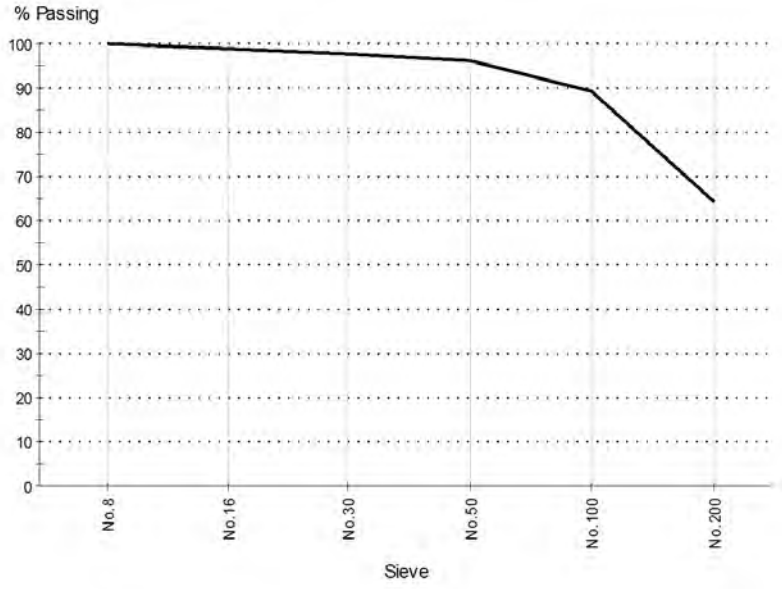
Sample ID	AET-128494-S5
Field Sample ID	B8 2.5'
Date Sampled	8/16/2023
Source	
Material	Sandy Clay
Specification	Gradation + Hydrometer
Sampling Method	
Location	Boring B-8 2.5'
Date Submitted	

Other Test Results

Description	Method	Result	Limits
Fineness Modulus	ASTM C 136, ASTM C 117	N/A	
Curvature Coefficient		N/A	
Uniformity Coefficient		N/A	

Particle Size Distribution

ASTM C 136, ASTM C 117



Date Tested:
Tested By:

Sieve Size	% Passing	Limits
No.8	99.9	
No.16	98.9	
No.30	97.6	
No.50	96.0	
No.100	89.4	
No.200	64.1	

Comments

N/A

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Sheridan, WY 82801
(607) 675-1862
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Material Test Report

Report No: MAT:AET-128494-S6

Client: Story House Management, LLC **CC:**

Project: Story House Village PI, Sheridan, WY
GEO-23

Sheridan WY

Job No: P-0022564

Draft Report - Subject to change pending final review

Date of Issue: 8/28/2023

Sample Details

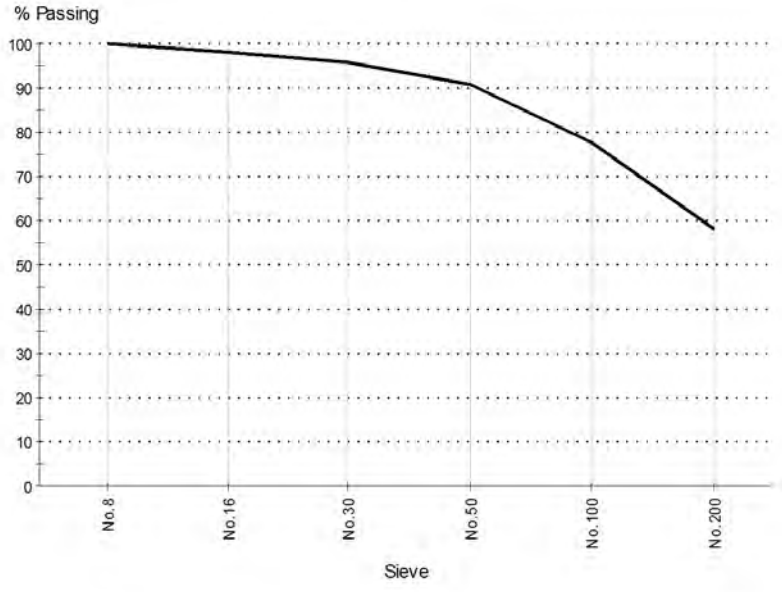
Sample ID	AET-128494-S6
Field Sample ID	
Date Sampled	8/16/2023
Source	
Material	Sandy Clay
Specification	Gradation + Hydrometer
Sampling Method	
Location	Boring B-8 7.5'
Date Submitted	

Other Test Results

Description	Method	Result	Limits
Fineness Modulus	ASTM C 136, ASTM C 117	N/A	
Curvature Coefficient		N/A	
Uniformity Coefficient		N/A	

Particle Size Distribution

ASTM C 136, ASTM C 117



Date Tested:
Tested By:

Sieve Size	% Passing	Limits
No.8	99.9	
No.16	98.2	
No.30	95.8	
No.50	90.9	
No.100	77.8	
No.200	58.1	

Comments

N/A

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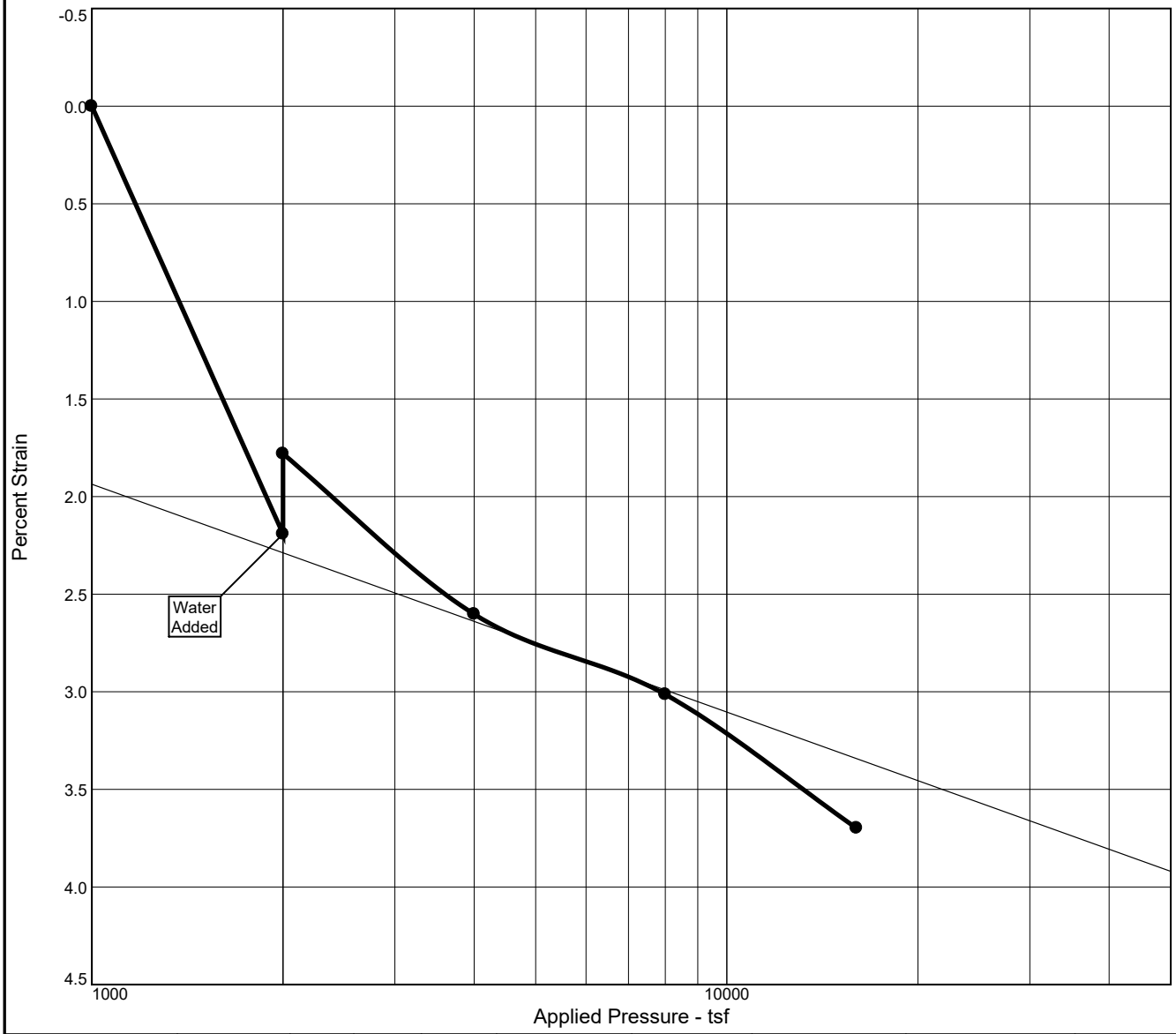
CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	e_o	Swell Press. (tsf)	Swell %	C_r
90.9 %	17.0 %	105.6			2.65	1000	0.496	2771.5	0.4	

MATERIAL DESCRIPTION	USCS	AASHTO
LEAN CLAY, TRACE FINE SAND, RED OXIDATION		

Project No. P-0022564 **Client:** WWC ENGINEERING

Project: Story House Village Phase I Development

Location: B7 **Depth:** 10 **Sample Number:** 5

Remarks:
SPLIT SPOON

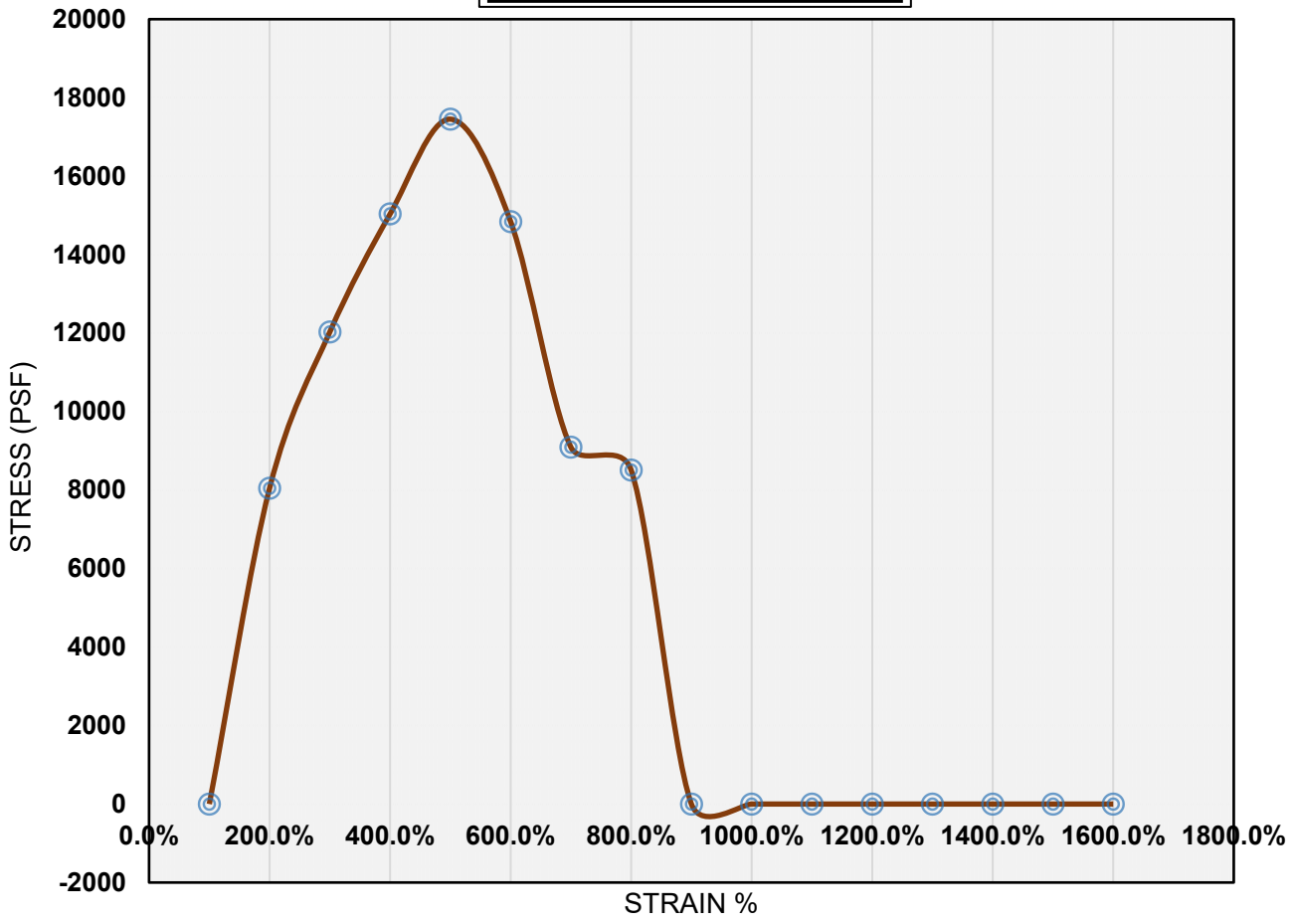
American Engineering Testing, Inc.

Gillette, WY

Figure

Tested By: EC

Stress vs. Strain



Test Results

Boring	Depth	L/D Ratio	Stress At Failure (psf)	Strain At Failure	Strain Rate (in/min)	Strain Rate (%/min)
B6	15'	1.72	17452	8.15%	0.04892	2.04%

Date Sampled	Sample Type	Dry Density (pcf)	Wet Density (pcf)	% Moisture	N Value
8/16/2023	Other	130.1	114.9	13.2%	NA

Sample Description Claystone- Silty Lean Clay (CL)

Notes/Remarks: SPLIT SPOON

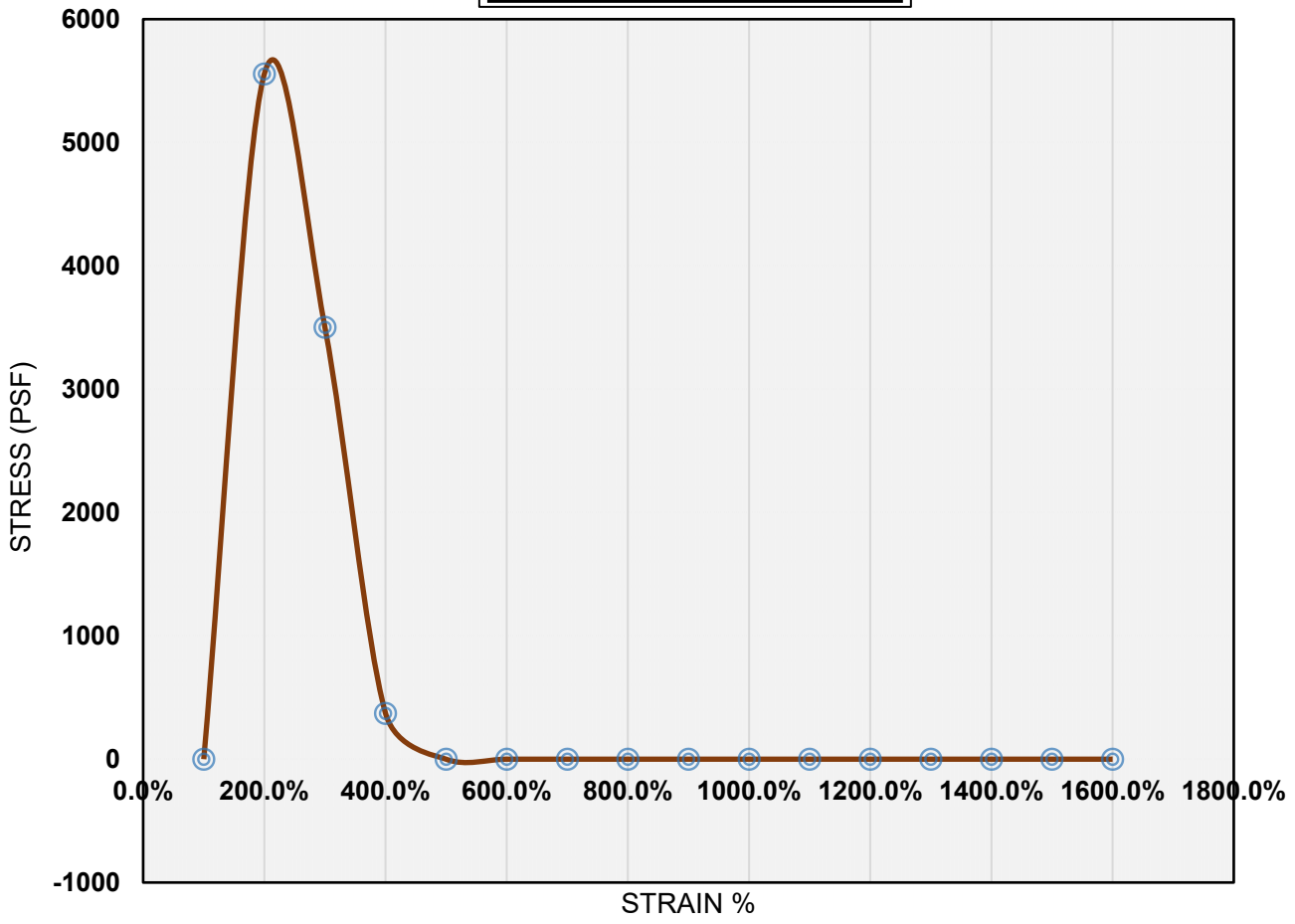
Project Information

Project:	Story House Village Phase I	**Job Number:**	P-0022564
Location:	Wyarno Road, Sheridan, WY	**Date Tested:**	8/22/2023

AMERICAN ENGINEERING TESTING

UNCONFINED COMPRESSION TEST RESULTS
(ASTM D2166)

Stress vs. Strain



Test Results

Boring	Depth	L/D Ratio	Stress At Failure (psf)	Strain At Failure	Strain Rate (in/min)	Strain Rate (%/min)
B7	20'	1.72	5556	1.48%	0.04892	1.48%

Date Sampled	Sample Type	Dry Density (pcf)	Wet Density (pcf)	% Moisture	N Value
8/16/2023	California Tube	128.8	110.2	16.8%	NA

Sample Description Claystone- Lean Clay (CL)

Notes/Remarks: SAMPLE HAD CRACKS PRESENT WHEN EXTRACTED FROM TUBE AND PRIOR TO TESTING

Project Information

Project:	Story House Village Phase I	**Job Number:**	P-0022564
Location:	Wyarno Road, Sheridan, WY	**Date Tested:**	8/22/2023

AMERICAN ENGINEERING TESTING

UNCONFINED COMPRESSION TEST RESULTS
(ASTM D2166)

American Engineering Testing, Inc.
Sheridan
72 E Ridge Rd Unit D
Sheridan, WY 82801
(607) 675-1862
www.teamAET.com

Proctor Report

Report No: PTR:AET-128494-S1

Client: Story House Management, LLC **CC:**

Project: Story House Village PI, Sheridan, WY
GEO-23

Sheridan WY

Job No: P-0022564

Draft Report - Subject to change pending final review

Date of Issue: 8/28/2023

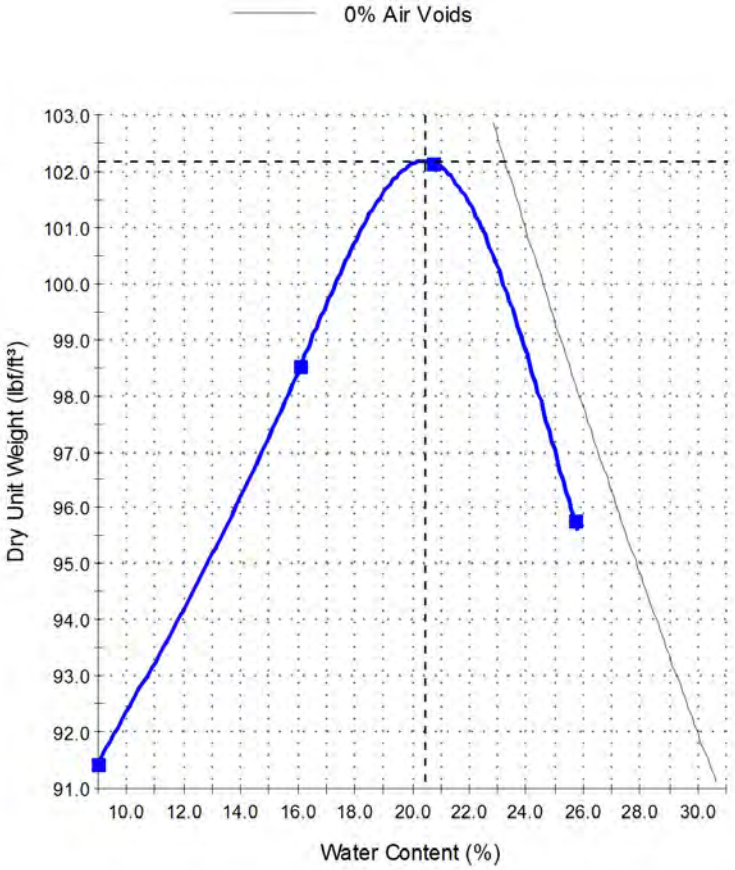
Sample Details

Sample ID: AET-128494-S1 **Field ID:** B6 BULK

Date Sampled: 8/16/2023

Location:

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D 698

Maximum Dry Unit Weight (lbf/ft³):	**102.2**
Optimum Water Content (%):	**20.4**
Method:	A
Preparation Method:	Moist
Specific Gravity (Fines):	2.65
Specific Gravity Method:	ASSUMED
Retained Sieve No 4 (4.75mm) (%):	0
Passing Sieve No 4 (4.75mm) (%):	100
Tested By:	
Date Tested:	

Comments

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Sheridan
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Sheridan, WY 82801
(607) 675-1862
www.teamAET.com

Proctor Report

Report No: PTR:AET-128494-S2

Client: Story House Management, LLC **CC:**

Project: Story House Village PI, Sheridan,WY
GEO-23

Sheridan WY

Job No: P-0022564

Draft Report - Subject to change pending final review

Date of Issue: 8/28/2023

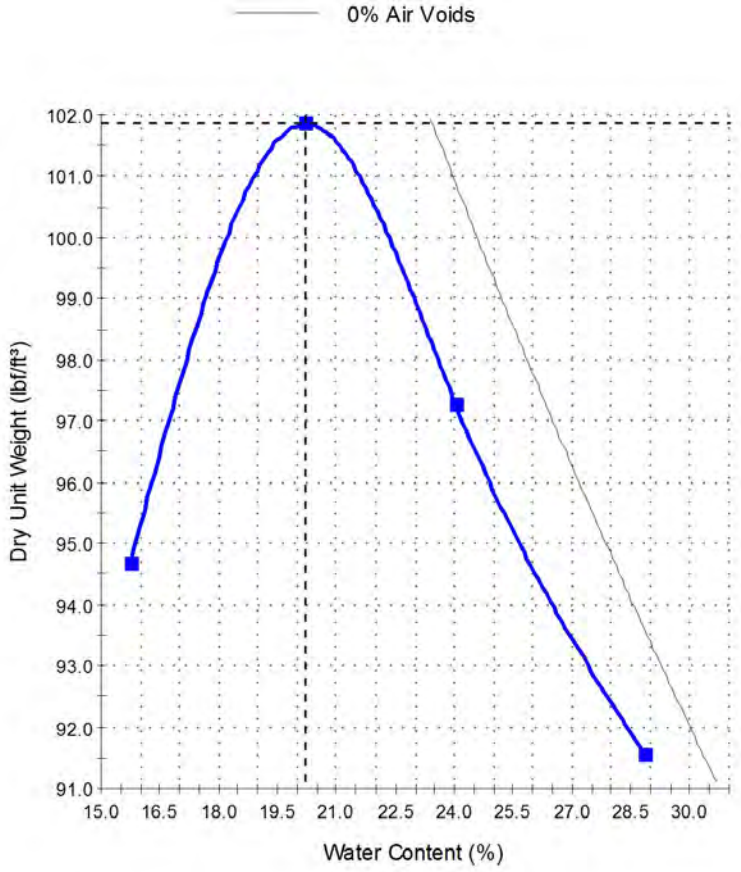
Sample Details

Sample ID: AET-128494-S2 **Field ID:** B9 BULK

Date Sampled: 8/16/2023

Location:

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D 698

Maximum Dry Unit Weight (lbf/ft³):	**101.9**
Optimum Water Content (%):	**20.2**
Method:	A
Preparation Method:	Moist
Specific Gravity (Fines):	2.65
Specific Gravity Method:	ASSUMED
Retained Sieve No 4 (4.75mm) (%):	1
Passing Sieve No 4 (4.75mm) (%):	99
Tested By:	
Date Tested:	

Comments

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Sheridan
72 E Ridge Rd Unit D
Sheridan, WY 82801
(607) 675-1862
www.teamAET.com

Proctor Report

Report No: PTR:AET-128494-S3

Client: Story House Management, LLC **CC:**

Project: Story House Village PI, Sheridan, WY
GEO-23

Sheridan WY

Job No: P-0022564

Draft Report - Subject to change pending final review

Date of Issue: 8/28/2023

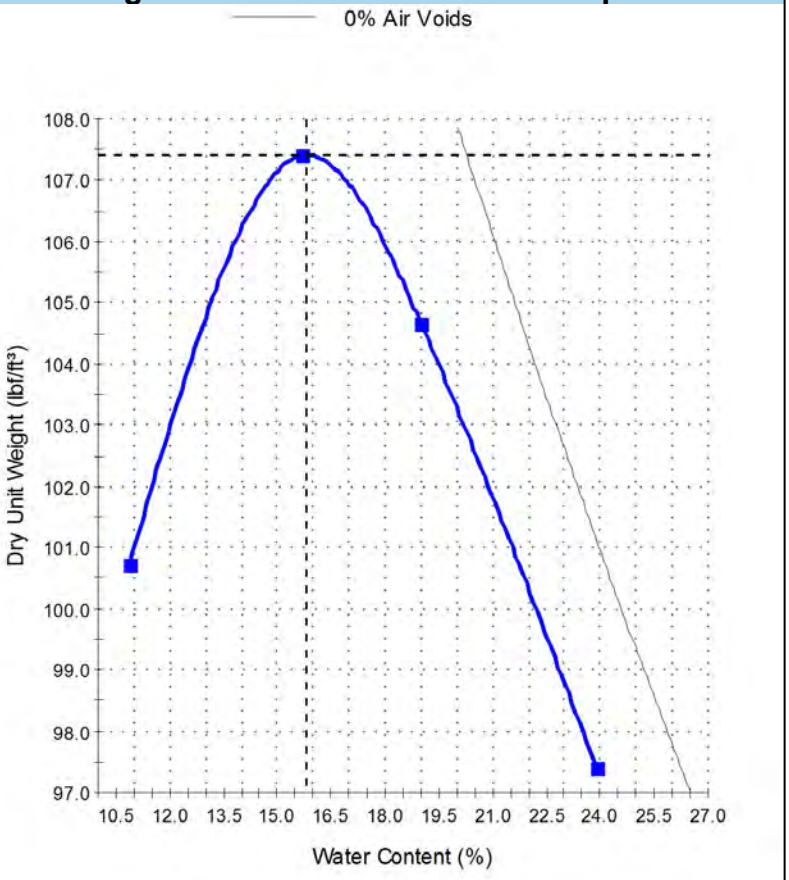
Sample Details

Sample ID: AET-128494-S3 **Field ID:** B10 BULK

Date Sampled: 8/16/2023

Location:

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D 698

Maximum Dry Unit Weight (lbf/ft³):	**107.4**
Optimum Water Content (%):	**15.8**
Method:	A
Preparation Method:	Moist
Specific Gravity (Fines):	2.65
Specific Gravity Method:	ASSUMED
Retained Sieve No 4 (4.75mm) (%):	0
Passing Sieve No 4 (4.75mm) (%):	100
Tested By:	
Date Tested:	

Comments

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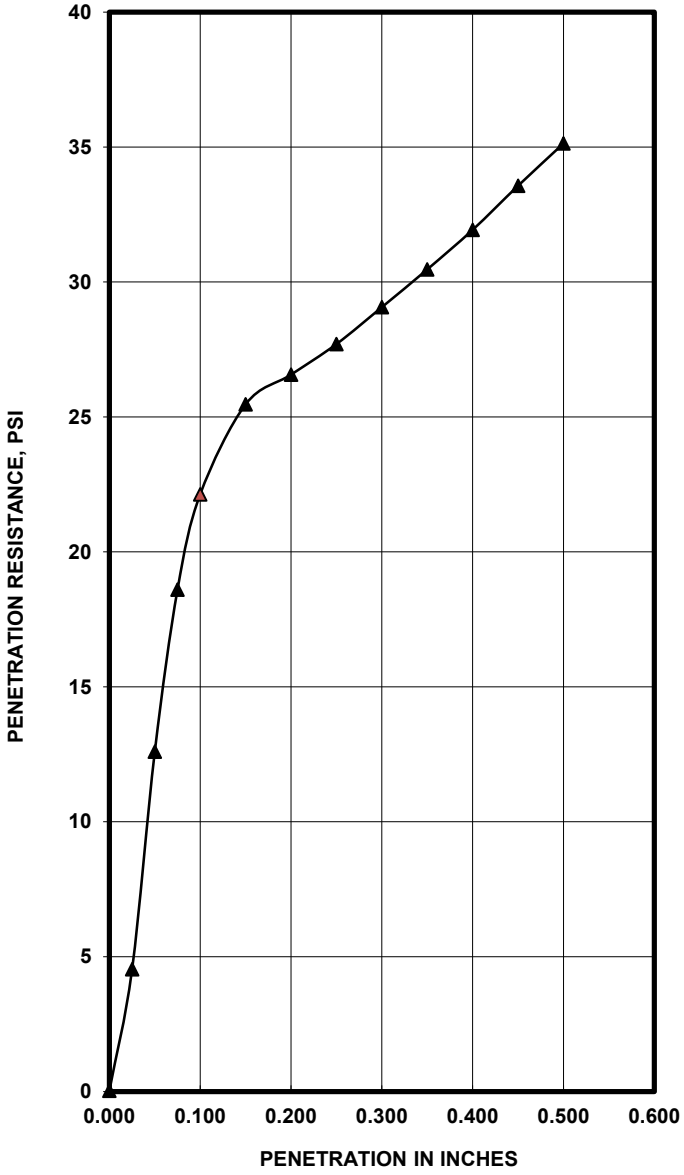
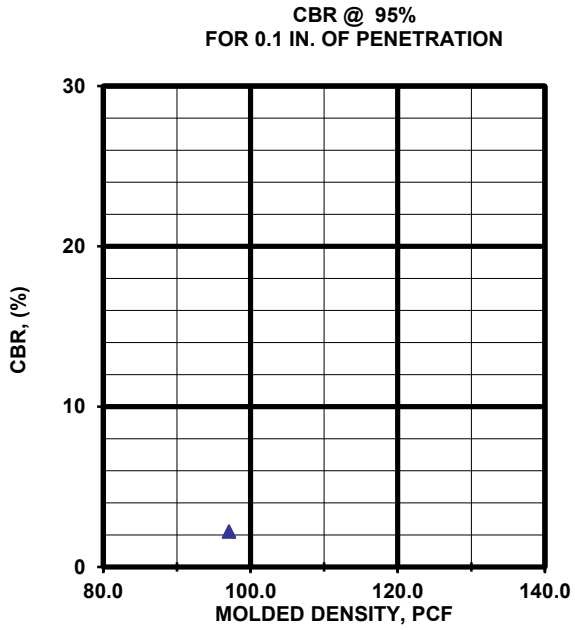
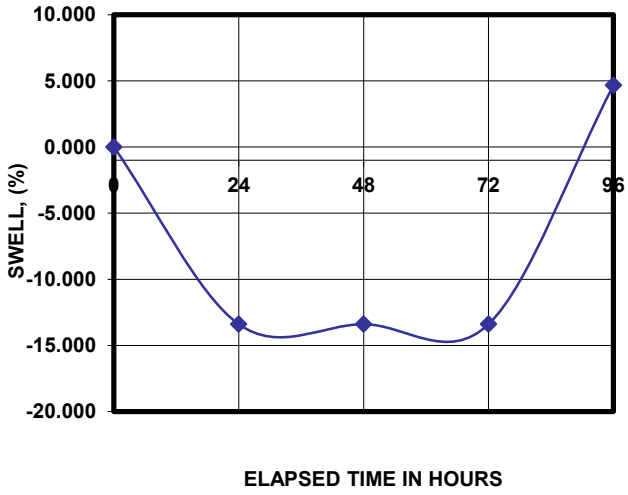






MOLDED			SOAKED			CBR	(%)	PEN.	SWELL
DENS.	% MAX	% MOIST.	DENS.	% MAX	% MOIST.	0.1 IN.	0.2 IN.	SURCHG	%
97.1	95.3	20.4	92.6	90.8	28.5	2.2	1.8	10	4.663

MATERIAL DESCRIPTION	USCS	MAX. DEN.	OPT. MOIST.	LL	PI
0	0	101.9	20.2	28	18

PROJECT #: P-0022564 **Boring No.** B9 Bulk

PROJECT: Story House Village PI

DATE: 8/30/2023

Test Descr. / Remarks

CBR PER ASTM D1883

PROCTOR PER ASTM D698

AMERICAN ENGINEERING TESTING

BEARING RATIO TEST REPORT

Appendix B

Geotechnical Report Limitations and Guidelines for Use

Appendix B
Geotechnical Report Limitations and Guidelines for Use
AET Project No. P-0022564

B.1 REFERENCE

This appendix provides information to help you manage your risks relating to subsurface problems which are caused by construction delays, cost overruns, claims, and disputes. This information was developed and provided by GBA[1], of which, we are a member firm.

B.2 RISK MANAGEMENT INFORMATION

B.2.1 Understand the Geotechnical Engineering Services Provided for this Report

Geotechnical engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical engineering services is typically a geotechnical engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

B.2.2 Geotechnical Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared solely for the client.

Likewise, geotechnical engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. If you are the least bit uncertain about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

1 Geoprofessional Business Association, 1300 Piccard Drive, LL14, Rockville, MD 20850
Telephone: 301/565-2733: www.geoprofessional.org, 2019

B.2.3 Read the Full Report

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. Read and refer to the report in full.

B.2.4 You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, always inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

B.2.5 Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

B.2.6 This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations only after observing actual subsurface conditions exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.

B.2.7 This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

B.2.8 Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical engineering report, along with any attachments or appendices, with your contract documents, but be certain to note conspicuously that you've included the material for information purposes only. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, only from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and be sure to allow enough time to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

B.2.9 Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials

with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.

B.2.10 Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical engineering study. For that reason, a geotechnical engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Unanticipated subsurface environmental problems have led to project failures. If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

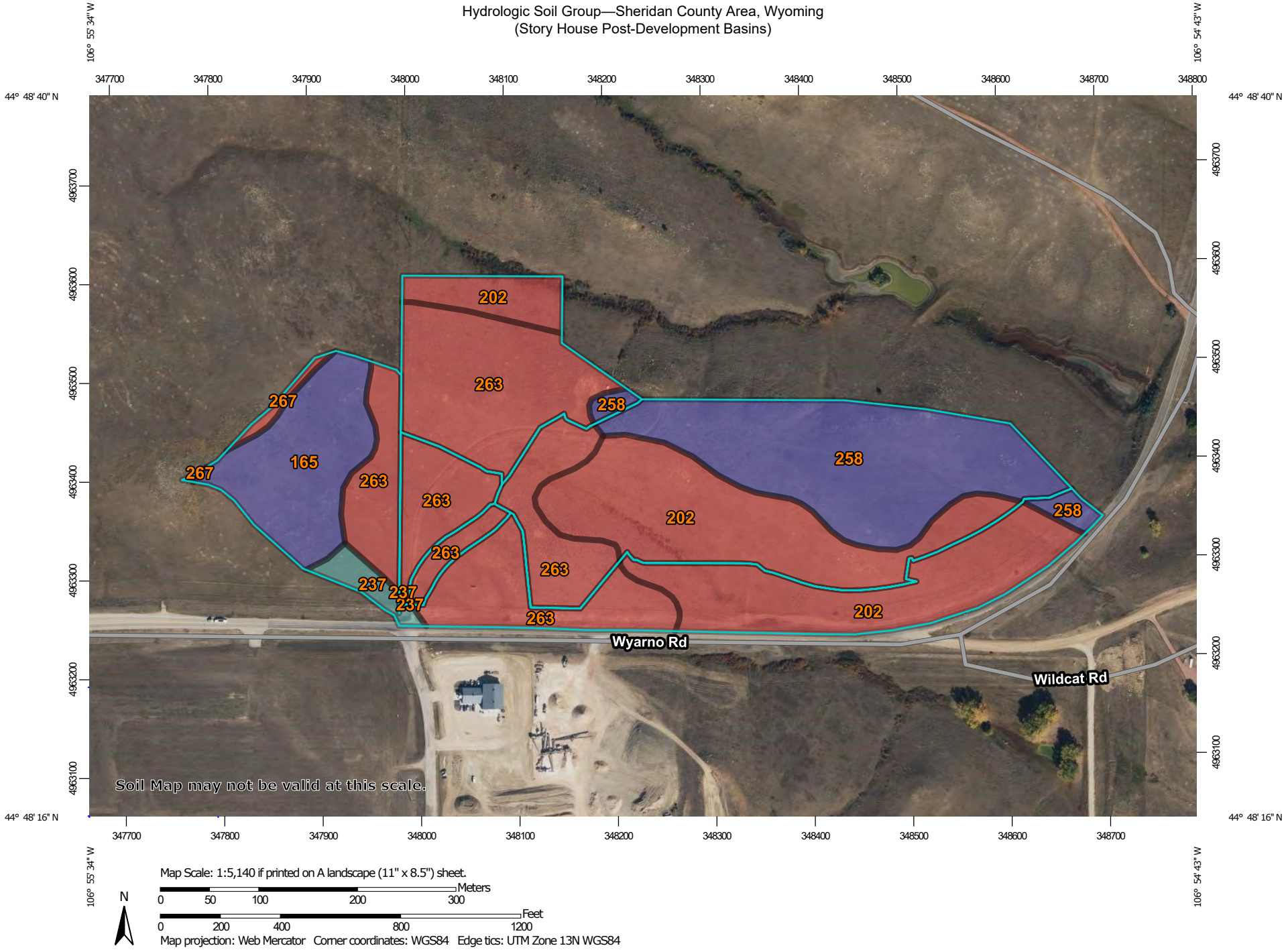
B.2.11 Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. Geotechnical engineers are not building-envelope or mold specialists.

APPENDIX C

Soil Data

Hydrologic Soil Group—Sheridan County Area, Wyoming
(Story House Post-Development Basins)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sheridan County Area, Wyoming
Survey Area Data: Version 24, Sep 6, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 21, 2021—Sep 27, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
165	Hiland-Bowbac association, moist, 3 to 15 percent slopes	B	5.1	10.1%
202	Parmleed-Bidman association, moist, 3 to 9 percent slopes	D	16.4	32.1%
237	Renohill, moist-Ulm association, 3 to 10 percent slopes	C	0.8	1.5%
258	Shingle-Nihill complex, moist, 3 to 80 percent slopes	B	10.7	21.0%
263	Shingle-Samday clay loams, moist, 3 to 55 percent slopes	D	17.7	34.7%
267	Shingle-Theedle loams, moist, 45 to 75 percent slopes	D	0.3	0.6%
Totals for Area of Interest			**51.0**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

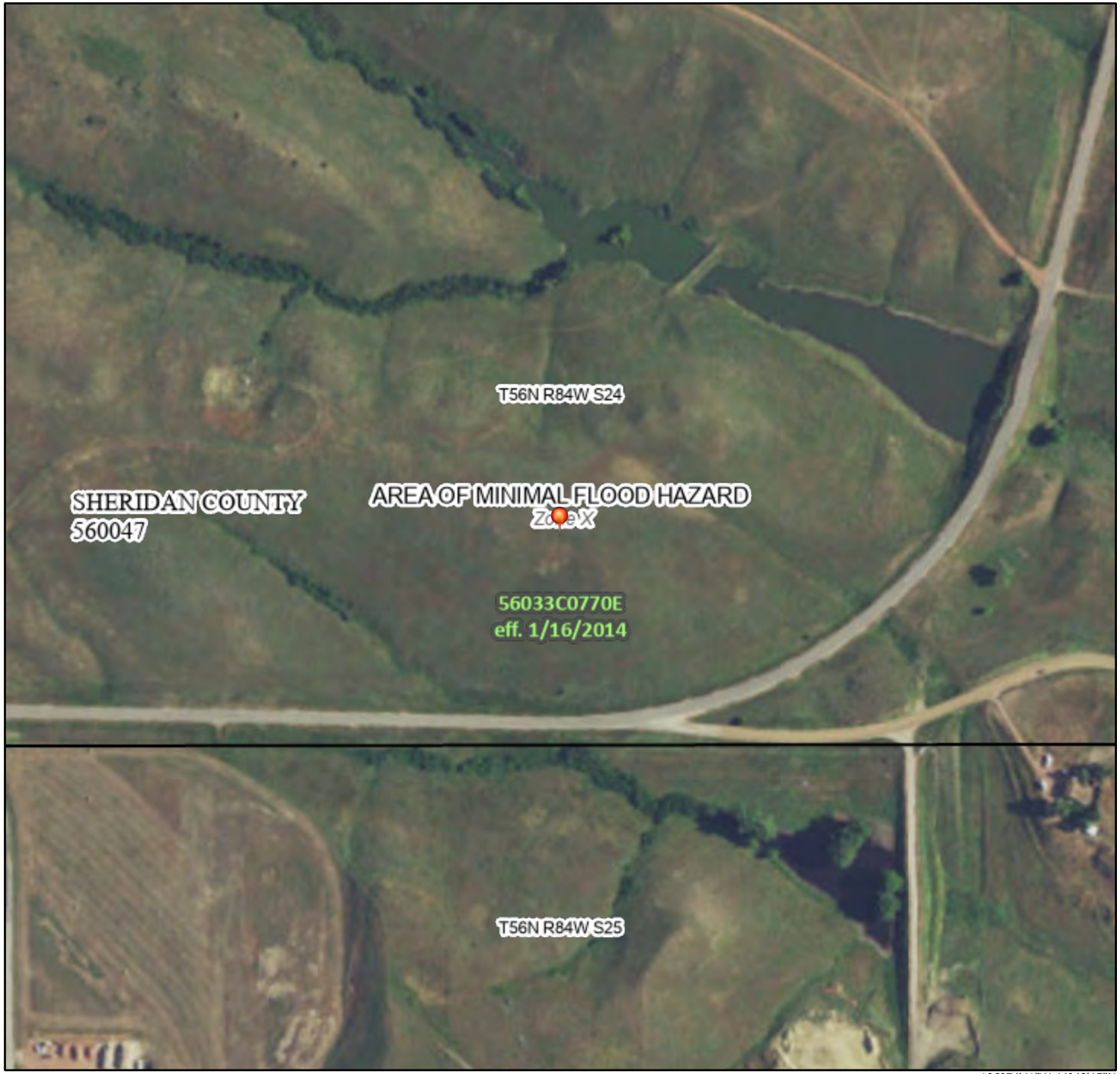
APPENDIX D

FEMA Information

National Flood Hazard Layer FIRMette

FEMA

106°55'19"W 44°48'40"N



106°54'41"W 44°48'15"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/18/2023 at 9:31 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX E

Geotech Report

Report of Geotechnical Exploration
Proposed Story House Village
Phase I Development

Wyarno Road
Sheridan, Wyoming

AET Project No. P-0022564

Date:
September 11, 2023
Revised December 15, 2023

Prepared for:
WWC Engineering
1849 Terra Avenue
Sheridan, Wyoming 82801

Geotechnical • Materials
Forensic • Environmental
Building Technology
Petrography/Chemistry

American Engineering Testing
72 E. Ridge Road, Unit D
Sheridan, Wyoming 82801
TeamAET.com • 307.675.1862

September 11, 2023
Revised December 15, 2023

WWC Engineering
1849 Terra Avenue
Sheridan, Wyoming 82801

Attn: Ms. Sarah Rohrer
srohrer@wwcengineering.com

RE: Report of Geotechnical Exploration
Proposed Story House Village
Phase I Development
Wyarno Road
Sheridan, Wyoming
AET Project No. P-0022564

Dear Ms. Rohrer:

American Engineering Testing, Inc. (AET) is pleased to present the results of our subsurface exploration program and geotechnical engineering review for the above referenced site on the northeast side of Sheridan Wyoming. These services were performed in general accordance with our proposal to you dated June 28, 2023 and WWC's written authorization to proceed provided on June 29, 2023. We are submitting one (1) electronic copy of the report to you.

Please contact me if you have any questions about the report. I can also be contacted for arranging observation and testing services during construction of the project. We highly recommend testing and observations be performed during construction at this site.

Sincerely,
American Engineering Testing, Inc.

Robert Temme PE
VP West Division Business Development
rtemme@teamaet.com
Phone: (605-391-5018)

72 E. Ridge Road, Unit D | Sheridan, WY 82801
Phone (307) 675-1862 | (800) 972-6364 | Fax (605) 388-0064 | teamAET.com | AA/EEO
This document shall not be reproduced, except in full, without written approval from American Engineering Testing, Inc.

SIGNATURE PAGE

Prepared for:

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Principal Engineer – West Division

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APPENDIX B

Geotechnical Report Limitations and Guidelines for Use

1.0 INTRODUCTION

We understand the construction of the Story House Village Phase I Development is being proposed along Wyarno Road, on the northeast side of Sheridan Wyoming. Please refer to the Site Location Map included in Appendix A of this report for the location of the project. To assist with the planning and design, American Engineering Testing, Inc. (AET) has been authorized to conduct a subsurface exploration program at the site, conduct soil laboratory testing, and perform a geotechnical engineering review for the project. This report presents the results of the above services and provides our engineering recommendations based on this data.

Note that AET provided a Preliminary Geotechnical Report for this site under AET Project No. P-0010998, dated April 22, 2022. Two of the borings drilled in that study, Borings B-4 and B-5, are located in the area of the current development. These two borings are included in this report and the data gained from them have been used in the preparation of this report.

2.0 SCOPE OF SERVICES

AET's services were performed in general accordance with our proposal dated June 28, 2023. The authorized scope consists of the following:

- Five (5) Standard Penetration Test (SPT) borings across the proposed subdivision project site to depths ranging from approximately 10 -50 feet below existing grade.
- Soil laboratory testing.
- Geotechnical engineering analysis based on the gained data and preparation of this report.

These services are intended for geotechnical purposes only. The scope is not intended to explore for the presence or extent of environmental contamination in the soil or groundwater.

3.0 PROJECT INFORMATION

Based on the information provided, we understand the Site is moving into a development phase. Preliminary plans indicates roads, lots and utilities to be constructed at the Site.

We have assumed cuts and fill depth will be 10 feet or less, roads/street grades will be set based on the final grading of the site, standard utility depths are anticipated and residential structures may contain basement levels and will be constructed on the specific lots.

The purpose of the geotechnical study was to determine the subsurface conditions at the site and to evaluate the suitability of the site soils for their use in the overall grading, construction of streets and residential structures. Our foundation design assumptions include a minimum factor of safety of 3 with respect to the ultimate bearing capacity.

The previously stated information represents our understanding of the proposed construction. This information is an integral part of our engineering review. It is important that you contact us if there are changes from that described so that we can evaluate whether modifications to our recommendations are appropriate.

4.0 SUBSURFACE EXPLORATION AND TESTING

4.1 Field Exploration Program

The subsurface exploration program conducted for the project consisted of five (5) standard penetration test (SPT) borings drilled on August 16, 2023. The borings were drilled at locations selected by WWC Engineering.

The logs of the borings and details of the methods used appear in Appendix A. The logs contain information concerning soil layering, soil classification, geologic origins, and moisture condition. A density description or consistency is also noted for the natural soils, which is based on the standard penetration resistance (N-value).

The approximate boring locations are shown on Figure 2: Boring Location Map, included in Appendix A. Surface elevations were determined from GoogleEarth.

4.2 Laboratory Testing

The laboratory test program included natural moisture content, dry density, Atterberg Limits, sieve analysis, percent passing the No. 200 sieve, swell-consolidation, standard Proctor and California Bearing Ratio (CBR) tests. The test results of the moisture content, dry density, Atterberg Limits and percent passing the No. 200 sieve appear in Appendix A on the individual boring logs adjacent to the samples upon which they were performed.

Results of the sieve analysis, unconfined compression, swell-consolidation, standard Proctor and CBR tests are presented on the data sheets following the logs.

The swell/consolidation test is commonly performed to evaluate the swell or consolidation potential of soils or bedrock for determining foundation and concrete slab-on-grade design criteria. In this test, relatively undisturbed samples obtained directly from the ring-lined barrel sampler are placed in a laboratory device and saturated under a predetermined load. The swell-index is the resulting amount of swell (+) as a percent of the sample's thickness after the saturation period. Conversely, the consolidation index is the amount of consolidation (-) as a percent of the sample's thickness after consolidation under the confining load. Test results are summarized as follows:

Boring	Depth, ft	Soil Type	Swell (+) or Consolidation (-) Potential, %	Swell Pressure, psf
B-7	10	Lean Clay (CL)	+0.4	2,270

The results for the swell-consolidation test is included within Appendix A. Our judgement of the swell test results is that the site clay soils have a low swell potential with corresponding low to moderate swell pressures.

Results of the standard Proctor and CBR tests are summarized below. The CBR test was remolded to approximately 95% of maximum dry density at the optimum moisture content for the specific boring/material.

Boring	Soil Classification	Optimum Moisture Content, % [1]	Maximum Dry Density, pcf [1]	CBR Value[2]
B-6	Lean Clay (CL)	20.4	102.2	-
B-9	Lean Clay (CL)	20.2	101.9	2.2
B-10	Lean Clay with a little Sand (CL)	15.8	107.4	-

[1] Based on ASTM D 698 (standard proctor) [2] Remolded to 95% of maximum dry density

It should be noted the bulk soil samples represents a mixture of the soils encountered within the upper 1 to 5 foot interval of the borehole. As such, the soil classification as presented on the Moisture-Density Relationship (Proctor) and CBR data sheets may differ from the classifications of the individual soil layers identified on the respective Subsurface Boring Log.

5.0 SITE CONDITIONS

5.1 Surface Observations

In general, the site primarily consisted of a ridge used mainly as undeveloped grazing land and bordered on the north by a drainage with a small reservoir and bordered on the south by Wyarno Road. The Site topography slopes from west to east, with relief ranging from approximately 3,922 feet above sea level on the west side to 3,842 feet on the east.

5.2 Subsurface Soils/Geology

In general, below a thin layer of topsoil, the subsurface soils encountered within the borings consisted of native site alluvial soils overlying weathered and weathered claystone bedrock of the Wasatch Formation. The alluvial soils consisted of layers of approximately 5 to as much as 11 feet of firm to very stiff lean clay with sand and/or loose to medium dense clayey to silty sand.

Below the alluvial soils, weathered and unweathered claystone bedrock (silty lean clay) was encountered to the final depths drilled of approximately 51 feet. The bedrock ranged from very stiff to hard in consistency.

The Subsurface Boring Logs included in Appendix A give a more detailed description of the soils encountered within the borings.

5.3 Groundwater

At the time of our field work, ground water was not encountered within boring depths explored during our subsurface exploration. Temporary piezometers were installed in Borings B-6 and B-7. Water levels were checked in the piezometers on September 1, 2023 and as before, groundwater was not measured in any of the borings. The temporary piezometers were plugged and abandoned.

The lack of groundwater noted at the boring locations should not be taken as an accurate representation of the actual groundwater levels. Groundwater levels can fluctuate due to varying seasonal and annual rainfall and snow melt amounts, as well as other factors. A long period of time may be required for groundwater to stabilize in the soils present at the site; this period of time is generally not available during a typical subsurface exploration program.

6.0 RECOMMENDATIONS

6.1 Discussion

Our recommendations in the following sections are intended to minimize, to varying degrees, movement related problems for the proposed foundations and floor slabs of the residential structures. Even if our recommendations are followed, we cannot guarantee that some movement will not occur. The present state of the art is such that the risk of movement cannot be accurately assessed. It depends on a number of uncontrolled variables such as climatic conditions during and after construction, long term fluctuations of the groundwater level, utility line leakage, landscaping, and other similar aspects. The risk of detrimental movement must be assumed by the project owner.

The following recommendations are based on the soil conditions observed, and in the samples collected from the soil borings advanced at the time of the field activities. The location of the borings and the recommendations provided, were based on the information available to AET at the time of our field work. The soils encountered at each boring location and the soils encountered during excavation and site grading may vary due to the surficial geology of the site. Further, changes in climatic conditions between the time of exploration and the time of construction may also affect subsurface conditions, particularly groundwater levels and the moisture content of the soils. Due to the potential variations, we recommend that AET be retained to verify the soil conditions encountered during excavations match the information gained during our field investigation.

Final grading such as cuts and fills made on the site during construction may have a direct impact on the performance of the streets, residential structures and the following recommendations. AET must be allowed to review the final grading plans of the site to verify the following recommendations will remain applicable and/or if additional recommendations apply. Also note that modifications made to the completed structures and site, such as future additions and grade and drainage changes, may result in a direct impact to the performance of the original structures and site and cannot be addressed at this time.

Also, the following recommendations must be verified and observed in the field by the geotechnical engineer during construction. As the cost associated with the construction observations and testing will vary depending on the size and complexity of the structures and site, AET must be allowed to provide a proposal for these services during construction. The costs associated with the observations and testing services need to be included in the overall project construction cost.

To reduce the risk of movement of the bearing strata, good drainage must be maintained during and after construction. We recommend the final site grading be designed with positive drainage away from the buildings for at least a distance of 10 feet. We also recommend the excavations be left open a minimal amount of time to reduce the possible amount of surface water to accumulate in the base of the excavation.

6.2 Surficial Reconnaissance

AET visited the Site on August 16, 2023 to perform a surficial reconnaissance of the Site prior to drilling operations. AET gained access through a gate located along the north side of Wyarno Road. The access gate is located at the high point of the proposed Site development. Two drainages run through the Site from west to east. A small reservoir is located along the north drainage. The site is characterized by short grasses and shrubs and occasional cobbles and boulders. The Site is currently utilized for grazing livestock. Five soil borings were located by WWC engineering and each boring was visited to check access conditions for the drill rig. Access was deemed suitable for drilling operations.

6.3 Site Preparation

We recommend existing topsoil and any organic matter be removed from within the construction limits of the new residential structures, project streets and all areas to receive fill. Topsoil may be stockpiled on site for reuse once grading is complete; however, any organic material, and any old construction debris encountered should be wasted from the site.

We anticipate that cuts and fills of varying depths will be required within the streets and building footprints. Where required, grading should continue to the desired construction elevations. All exposed subgrades need to be scarified to a depth of approximately 8 to 12-inches, the moisture content of the scarified soils adjusted to within ±3% of their optimum moisture content and the scarified soils compacted to at least 95% of the maximum standard Proctor dry density (ASTM D 698).

The excavated soils, cleaned of all unsuitable/organic materials and rocks greater than 3-inches in nominal size, may be used obtain final grades or stockpiled on-site and reused as utility trench backfill and overlot fill. We recommend the soils to be used as fill be moisture conditioned to within ±3% of optimum moisture and compacted to at least 95% of the maximum dry density (ASTM D698). Imported fill material, if required, should be approved by the geotechnical engineer prior to use.

To reduce the potential for movement related distress and to provide a uniform bearing surface, we recommend, the concrete slab-on-grade floors systems for the residential structures, bear on at least 1 foot of compacted granular engineered fill material. placed directly on the recompacted site soils.

The imported granular engineered fill should be pre-approved by the geotechnical engineer prior to its use. The granular engineered fill above the water table, should be a non-expansive material with a maximum size of 2-inches, 40% to 85% passing the #4 sieve, and no more than 20% passing the #200 sieve, with a liquid limit of less than 30. All granular engineered fill to be placed above the water table, whether from on-site or imported, should be placed in 8-inch thick maximum loose lifts; the moisture content should be conditioned to within ±3% of optimum moisture and compacted to at least 95% of maximum standard Proctor (ASTM D 698) dry density.

We recommend all final cut and fill slopes be constructed with 3H:1V slopes or flatter. It is our opinion temporary cut slopes can be cut to slopes of 2H:1V.

As noted, groundwater was not encountered across the site. Temporary dewatering of excavations will be necessary if groundwater is encountered, or surface drainage is allowed to accumulate in the excavations. Contractors working on the project should be prepared to have equipment on-site that will lower and maintain the groundwater level a minimum of two feet below the base of the excavations. We recommend that the groundwater levels be check prior to and during construction operations on site.

For more information on site preparation see the Standard Sheets section of this report.

6.4 Foundation Design

Based on the information obtained from the borings and laboratory testing, as well as our analysis, it is our opinion the residential structures may be founded on conventional spread footing foundation systems placed directly on the reconditioned site soils and/or claystone bedrock. We anticipate full depth basement levels will be 7 to 8 feet below final grades.

If a basement level is to be constructed, we recommend the placement of a perimeter drain system at the bottom outside edge of the basement footing excavation. The perimeter drain system should be routed to a sump pumping system to remove water from below the basement level.

Footings can be designed for an allowable bearing capacity of 2,000 pounds per square foot (psf). We recommend all footings be placed at least 42-inches below final grades for frost protection. As constructed, the above loading should provide a theoretical safety factor of three or more with respect to a general shear or base failure of the footings.

6.5 Basement Wall Design Considerations

If basement levels are constructed, the basement or lower-level walls will be subject to lateral earth pressure from the backfill. These types of walls are normally designed for the “at-rest” earth pressure condition because the walls are restrained from rotating. If the site soils are used as backfill, a value of 75 pounds per square foot, per foot of depth, should be used for the at-rest lateral earth pressure against the basement walls. The lateral earth pressure does not include any factor of safety and it not applicable for submerged conditions or hydrostatic loading

6.6 Floor Slab Design

Due to the presence of clay soils at the site, floor slabs should be placed on at least 1 foot of compacted granular engineered fill. Prior to placement we recommend the exposed subgrade be scarified to a depth of one foot and moisture conditioned to within ±3% of the optimum moisture content and compacted to at least 95% of maximum standard Proctor (ASTM D 698) dry density. We also recommend the floor slabs be constructed independent of the foundations in the event some movement does occur.

We also recommend providing a 6-inch thick continuous sand and/or gravel cushion layer directly below the floor slab to prevent capillary moisture rise to the slab. This free-draining granular fill should contain less than 12% by weight passing the #200 sieve, and less than 40% passing the #40 sieve. This 6-inch thick sand and/or gravel cushion layer can be incorporated into the 1 feet of engineered fill, where appropriate.

Refer to the "Floor Slab Moisture/Vapor Protection" document in the Standard Sheets section of this report for additional information.

6.7 Utility Trench and Exterior Backfill Considerations

It is our opinion utility trench backfill and exterior backfill around the addition may consist of the excavated alluvial soils. Based on the existing moisture content of the site soils, processing and drying of the material will very likely be required prior to re-use as backfill material.

All recommendations are based on the standard Proctor method (ASTM: D698).

1. All backfill should be free of deleterious/frozen material, and construction debris, and have a maximum aggregate size of 2-inches.
2. Site clays soils should be moisture conditioned to within -1 to +3% of the optimum moisture content. All granular backfill should be moisture conditioned to within ±3% of optimum moisture content prior to being placed.
3. All backfill should be placed in loose lift thicknesses of 8-inches or less. If hand-operated compaction equipment is used, the loose lift thickness should be reduced to 4-inches or less.
4. Each lift should be compacted to at least 95% of maximum proctor density. We recommend the final lift of backfill be compacted to at least 97% of the maximum dry density.
5. Compaction density tests should be performed on alternating lifts to ensure the minimum density is maintained.
6. Utility lines entering or exiting the structures should be leak tested prior to the placement of the slab.

6.8 Trench Excavation

If excavation faces are not retained, the excavations should maintain maximum allowable slopes in accordance with *OSHA Regulations (Standards 29 CFR), Part 1926, Subpart P, "Excavations"* (can be found on www.osha.gov). Even with the required OSHA sloping, water seepage or surface runoff can potentially induce side slope erosion or running which could require slope maintenance. For trench excavations, it is our opinion the site clays and sand soils, can be classified as Type C soils with recommended slope laybacks of 1.5H:1V. For the weathered and unweathered claystone formation, it is our opinion the soils can be classified as Type A soils with recommended slope laybacks of 3/4H:1V.

These classifications should be considered preliminary and should be verified in the field on a daily basis by the contractor and/or geotechnical engineer. Excavations deeper than 20 feet and/or in saturated soils or below the ground water table should be considered on an individual basis. Water levels, due to climatic conditions should be evaluated at the time of construction. If the above trench layback recommendations are not feasible, due to space limitations or other factors, the OSHA rules should be consulted for alternative trench stabilization methods. Trench boxes or shoring in compliance with OSHA rules may be acceptable alternatives.

6.9 Pavements

6.9.1 Considerations

The following pavement section was designed based on the City of Sheridan Standard Specifications and the procedures outlined in the 1993 AASHTO Empirical Equation for Flexible Pavements and Rigid Pavements.

It is anticipated that pavement subgrade soils will consist of sandy lean clay soils. Based on our laboratory results, a California Bearing Ratio (CBR) value of 2.2 was used in the pavement design analysis utilizing the site lean clay soils as the subgrade material. We have used a correlation of 1500 x CBR value to estimate the resilient modulus (MR).

A Traffic Impact Study report, prepared by Sustainable Traffic Solutions, was provided by WWC Engineering. Based on our review of the data contained in that report, we have assumed the proposed subdivision streets will be utilized by moderate traffic volumes consisting primarily of passenger trucks and cars with a smaller amount of truck related traffic such as seen from garbage and general delivery/service vehicles. Based on the subdivision layout, we have assumed the east half of the subdivision will be exposed to lighter traffic loads (residential) as the portion of the subdivision will be residential housing.

The west half of the subdivision, which will provide apartment and commercial space, will experience the higher traffic and truck related traffic. Therefore, an equivalent 20-year design 18-kip single axle load (ESAL) of 45,000 was utilized for the Phase I subdivision residential streets and an equivalent 20-year design 18-kip single axle load (ESAL) of 125,000 was utilized for the multi-family housing and commercial lots within the subdivision streets.

The 20-year design period is considered to be the interval over which, with proper maintenance, the pavement will not require major repairs. A continuing regular maintenance program should be implemented to maintain satisfactory serviceability over the design life. The maintenance program should include sealing cracks and repairing minor deficiencies. Please notify us if any of the parameters used in the pavement design do not adequately define the anticipated conditions.

6.9.2 Subgrade Preparation

Prior to placement of base course or any fill to obtain final subgrade elevations, the exposed subgrade soils should be scarified to a depth of 8-inches, the moisture content of the scarified soils adjusted to near optimum moisture content and the material compacted to at least 95% of maximum standard Proctor dry density (ASTM: D 698).

All prepared subgrades should be proof rolled to verify a firm and unyielding subgrade has been obtained prior to the placement of new fill and/or base course materials. To obtain a firm and unyielding subgrade, on which to construct the new pavement section, scarification and drying of the subgrade soils should be anticipated. If project schedules do not allow for sufficient time to dry the soil back to acceptable levels, use of a geo-textile stabilization/separation material can be incorporated in the design. The geo-textile should be placed on top of the graded subgrade and below the aggregate base course layer. Please note the pavement section, including base course thickness, may be subject to change if incorporating a geo-textile stabilization material into the design.

Prior to placement of the base course, an observed proof roll should be performed to confirm a firm and unyielding subgrade. Any areas that "pump" under the loaded dump truck should be evaluated by a geotechnical engineer, or their representative, to determine whether additional excavation and replacement with a coarse, clean rock or the use of a geo-textile fabric should be used to stabilize the subgrade. Once the subgrade has been proof rolled and approved by the engineer, base course may be placed.

6.9.3 Aggregate Base Course

Aggregate base course should be moisture conditioned to within ±3% of optimum and compacted to a minimum of 95% of maximum density as determined by the standard proctor method (ASTM: D698) and should meet the requirements as outlined in the City of Sheridan Standard Specifications.

6.9.4 Pavement Section Recommendations

Based on the above stated information and our analysis, we recommend the following pavement sections be used for this project:

Recommended Pavement Section Thickness (inches)				
Traffic Area	**Flexible (Asphalt), in.**	**Rigid (Concrete), in**	**Aggregate Base Course, in.**	**Total, in.**
Residential – Story House Lane, Baldwin Avenue, Mockingbird Lane, Canterbury Lane	4	--	9	13
	--	6	5	11
Blocks 1,2,3,8 of Story House Lane, Story House Village, Baldwin Lane	5	-	12	17
	-	6.5	5	11.5

Aggregate base course used in the pavement section can typically be reduced by about 25% when utilizing a geotextile separation/stabilization fabric or a geogrid. We recommend the geotextile manufacturer, such as Tensar or Mirafi, be contacted for design parameters and additional considerations for the pavement sections.

The asphalt should be obtained from an approved mix design within the City of Sheridan Standard Specifications. Mix designs should be submitted prior to construction to verify their adequacy. Asphalt material should be placed in maximum 3-inch lifts and compacted to the minimum standards outlined in the City of Sheridan Standard Specifications.

If Portland Cement Concrete (PCC) pavement is selected for use at this site, the concrete pavement should conform to City of Sheridan Standard Specifications. Longitudinal and transverse joints should be provided as needed in concrete pavements for expansion/contraction and isolation. The location and extent of joints should be based

upon the final pavement geometry. Sawed joints should be cut within 24-hours of concrete placement. All joints should be sealed to prevent entry of foreign material and dowelled where necessary for load transfer.

6.10 General Site Recommendations

6.10.1 Surface Water Management

Surface water runoff is important to the long-term performance of the foundation systems and paved surfaces. The site should slope away from all structures constructed on site, directing water away from all foundation elements. All hard surfacing should have a minimum slope of 1% to facilitate the rapid removal of water from these surfaces.
In landscaped areas, a minimum slope of 2% should be maintained, directing water away from any structures on site. Additionally, in landscaped areas, water should not be allowed to pond behind any curb and gutter systems on site. We recommend that a French drain be installed in areas where water would be likely to pond on landscaped areas.

6.10.2 Site Excavations and Deleterious Soils

We anticipate that the soils encountered on site, within the depths explored during our field services, will be able to be excavated using conventional earth moving equipment. If deleterious soils/material is encountered it should be removed from the construction limits, site soils cleaned of all deleterious substances may be used for backfilling, in areas where deleterious substances are encountered. The following are considered deleterious substances/soils; coal, lignite, organic material, construction debris, mud, site soils significantly disturbed by construction traffic, any material greater than 6 inches in diameter, and any site soils with moisture content greater than 6% above the optimum moisture as determined by ASTM D698. If coal or lignite is encountered during site excavations and grading the geotechnical engineer should be contacted to observe and assist in developing a plan for removal and replacement with suitable material.

During construction, operations care should be taken to avoid unnecessary disturbance of the site soils. Disturbance of the site soils may result in additional over excavation and replacement of the disturbed soils. Excessively disturbed soils may occur from construction traffic over unprotected soft or wet subgrades, excessive erosion, deposition and scouring from surface water runoff during construction. To mitigate potential disturbed soils during construction operations, we recommend that construction traffic be limited to the minimum necessary for construction of the project, and in areas where high construction traffic is anticipated we recommend that a temporary gravel/rock surfacing

be used to minimize potential damage to subgrade soils.

6.10.3 Site Landscaping Recommendations

We suggest avoiding the planting of deep rooted trees within 10 feet of the structure to minimize changes in the moisture content of the subsurface soils. We recommend that hard surfacing be placed directly against the structure extending a minimum of 5 feet away from foundation walls, and sloping away from the structure. Additionally, we recommend that any landscape sprinkler systems be designed so that no water from the sprinklers is spread within 5 feet of any structures on site.

7.0 CONSTRUCTION CONSIDERATIONS

7.1 Potential Difficulties

7.1.1 Soft Subgrade Soils

Depending on the time of year in which construction takes place, unstable subgrade soils could be encountered during the site and building grading operations. If encountered, additional conditioning of the soils may be required to obtain moisture contents which allow for firm and unyielding subgrade and/or compaction.

Localized areas of soft wet subgrades can be remedied with additional excavation to expose firmer soils, placement of coarse rock to provide a solid base on which to place additional fill and/or the use of geotextiles between the soft soils and the overlying fill and/or pavement sections. The appropriate means of subgrade stabilization should be evaluated by the geotechnical engineer at the time of construction.

7.1.2 Runoff Water in Excavation

Water can be expected to collect in the excavation bottom during times of inclement weather or snow melt. To allow observation of the excavation bottom, to reduce the potential for soil disturbance, and to facilitate filling operations, we recommend water be removed from within the excavation during construction. Based on the soils encountered, we anticipate the groundwater can be handled with conventional sump pumping.

7.1.3 Disturbance of Soils

The on-site soils can be disturbed under construction traffic, especially if the soils are wet. If soils become disturbed, they should be subcut to the underlying undisturbed soils. The subcut soils can then be dried and recompacted back into place, or they should be removed and replaced with drier imported fill.

7.2 Excavation Backsloping

If excavation faces are not retained, the excavations should maintain maximum allowable slopes in accordance with *OSHA Regulations (Standards 29 CFR), Part 1926, Subpart P, "Excavations"* (can be found on www.osha.gov). Even with the required OSHA sloping, water seepage or surface runoff can potentially induce sideslope erosion or sloughing which could require slope maintenance.

7.3 Observation and Testing

The recommendations in this report are based on the subsurface conditions found at our test boring locations. Since the soil conditions can be expected to vary away from the soil boring locations, we recommend on-site observation by a geotechnical engineer/technician during construction to evaluate these potential changes. Soil density testing should also be performed on new fill placed in order to document that project specifications for compaction have been satisfied.

8.0 LIMITATIONS

Within the limitations of scope, budget, and schedule, we have endeavored to provide our services according to generally accepted geotechnical engineering practices at this time and location. Other than this, no warranty, expressed or implied, is intended. Important information regarding risk management and proper use of this report is given in Appendix B entitled "Geotechnical Report Limitations and Guidelines for Use."

Standard Sheets

EXCAVATION AND REFILLING FOR STRUCTURAL SUPPORT

EXCAVATION

Excavations for structural support at soil boring locations should be taken to depths recommended in the geotechnical report. Since conditions can vary, recommended excavation depths between and beyond the boring location should be evaluated by geotechnical field personnel. If groundwater is present, the excavation should be dewatered to avoid the risk of unobservable poor soils being left in-place. Excavation base soils may become disturbed due to construction traffic, groundwater or other reasons. Such soils should be subcut to underlying undisturbed soils.

Soil stresses under footings spread out with depth. Therefore, the excavation bottom and subsequent fill system should be laterally oversized beyond footing edges to support the footing stresses. A lateral oversize equal to the depth of fill below the footing (i.e., 1:1 oversize) is usually recommended. The lateral oversize is usually increased to 1.5:1 where compressible organic soils are exposed on the excavation sides. Variations in oversize requirements may be recommended in the geotechnical report or can be evaluated by the geotechnical field personnel.

Unless the excavation is retained, the backslopes should be maintained in accordance with OSHA Regulations (Standards-29 CFR), Part 1926, Subpart P, "Excavations" (found on www.osha.gov). Even with the required OSHA sloping, groundwater can induce sideslope raveling or running which could require that flatter slopes or other approaches be used.

FILLING

Filling should proceed only after the excavation bottom has been approved by the geotechnical engineer/technician. Approved fill material should be uniformly compacted in thin lifts to the compaction levels specified in the geotechnical report. The lift thickness should be thin enough to achieve specified compaction through the full lift thickness with the compaction equipment utilized. Fine grained soils are moisture sensitive and are often wet (water content exceeds the "optimum moisture content" defined by a Proctor test). In this case, the soils should be scarified and dried to achieve a water content suitable for compaction. This drying process can be time consuming, labor intensive, and requires favorable weather.

Filling operations for structural support should be closely monitored for fill type and compaction by a geotechnical technician. Monitoring should be on a full-time basis in cases where vertical fill placement is rapid; during freezing weather conditions; where groundwater is present; or where sensitive bottom conditions are present.

EXCAVATION/REFILLING DURING FREEZING TEMPERATURES

Soils that freeze will heave and lose density. Upon thawing, these soils will not regain their original strength and density. The extent of heave and density loss depends on the soil type and moisture condition; and is most pronounced in clays and silts. Foundations, slabs, and other improvements should be protected from frost intrusion during freezing weather. For earthwork during freezing weather, the areas to be filled should be stripped of frozen soil, snow and ice prior to new fill placement. In addition, new fill should not be allowed to freeze during or after placement. For this reason, it may be preferable to do earthwork operations in small plan areas so grade can be quickly attained instead of large areas where much frost stripping may be needed.

FREEZING WEATHER EFFECTS ON BUILDING CONSTRUCTION

GENERAL

Because water expands upon freezing and soils contain water, soils which are allowed to freeze will heave and loose density. Upon thawing, these soils will not regain their original strength and density. The extent of heave and density/strength loss depends on the soil type and moisture condition. Heave is greater in soils with higher percentages of fines (silts/clays). High silt content soils are most susceptible, due to their high capillary rise potential which can create ice lenses. Fine grained soils generally heave about 1/4" to 3/8" for each foot of frost penetration. This can translate to 1" to 2" of total frost heave. This total amount can be significantly greater if ice lensing occurs.

DESIGN CONSIDERATIONS

Clayey and silty soils can be used as perimeter backfill, although the effect of their poor drainage and frost properties should be considered. Basement areas will have special drainage and lateral load requirements which are not discussed here. Frost heave may be critical in doorway areas. Stoops or sidewalks adjacent to doorways could be designed as structural slabs supported on frost footings with void spaces below. With this design, movements may then occur between the structural slab and the adjacent on-grade slabs. Non-frost susceptible granular soils (with less than 12% passing a #200 sieve) can be used below such areas. Depending on the function of surrounding areas, the granular soil layer may need a thickness transition away from the area where movement is critical. With granular soil placement over slower draining soils, subsurface drainage would be needed for the granular layer. High density extruded insulation could be used within the granular soils to reduce frost penetration, thereby reducing the granular soil thickness needed. We caution that insulation placed near the surface can increase the potential for ice glazing of the surface.

The possible effects of adfreezing should be considered if clayey or silty soils are used as backfill. Adfreezing occurs when backfill adheres to rough surfaced foundation walls and lifts the wall as it freezes and heaves. This occurrence is most common with masonry block walls, unheated or poorly heated building situations and clay backfill. The potential is also increased where backfill soils are poorly compacted and become saturated. The risk of adfreezing can be decreased by placing a low friction separating layer between the wall and backfill.

Adfreezing can occur on exterior piers (such as deck, fence or other similar pier footings), even if a smooth surface is provided. This is more likely in poor drainage situations where soils become saturated. Additional footing embedment and/or widened footings below the frost zones (which include tensile reinforcement) can be used to resist uplift forces. Specific designs would require individual analysis.

CONSTRUCTION CONSIDERATIONS

Foundations, slabs, and other improvements which may be affected by frost movements should be insulated from frost penetration during freezing weather. If filling takes place during freezing weather, all frozen soils, snow, and ice should be stripped from areas to be filled prior to new fill placement. The new fill should not be allowed to freeze during transit, placement, or compaction. This should be considered in the project scheduling, budgeting, and quantity estimating. It is usually beneficial to perform cold weather earthwork operations in small areas where grade can be attained quickly rather than working large areas where a greater amount of frost stripping may be needed. If slab subgrade areas freeze, we recommend the subgrade be thawed prior to floor slab placement. The frost action may also require reworking and recompaction of the thawed subgrade.

FLOOR SLAB MOISTURE/VAPOR PROTECTION

Floor slab design relative to moisture/vapor protection should consider the type and location of two elements, a granular layer and a vapor membrane (vapor retarder, water resistant barrier or vapor barrier). In the following sections, the pros and cons of the possible options regarding these elements will be presented, such that you and your specifier can make an engineering decision based on the benefits and costs of the choices.

GRANULAR LAYER

In American Concrete Institute (ACI) 302.1-96, a "base material" is recommended, rather than the conventional cleaner "sand cushion" material. The manual maintains that clean sand (common "cushion" sand) is difficult to compact and maintain until concrete placement is complete. ACI recommends a clean, fine graded material (with at least 10% to 30% of particles passing a #100 sieve) which is not contaminated with clay, silt or organic material. We refer you to ACI 302.1-96 for additional details regarding the requirements for the base material.

In cases where potential static water levels or significant perched water sources appear near or above the floor slab, an underfloor drainage system may be needed wherein a drain tile system is placed within a thicker clean sand or gravel layer. Such a system should be properly engineered depending on subgrade soil types and rate/head of water inflow.

VAPOR MEMBRANE

The need for a vapor membrane depends on whether the floor slab will have a vapor sensitive covering, will have vapor sensitive items stored on the slab, or if the space above the slab will be a humidity controlled area. If the project does not have this vapor sensitivity or moisture control need, placement of a vapor membrane may not be necessary. Your decision will then relate to whether to use the ACI base material or a conventional sand cushion layer. However, if any of the above sensitivity issues apply, placement of a vapor membrane is recommended. Some floor covering systems (adhesives and flooring materials) require a vapor membrane to maintain a specified maximum slab moisture content as a condition of their warranty.

VAPOR MEMBRANE/GRANULAR LAYER PLACEMENT

A number of issues should be considered when deciding whether to place the vapor membrane above or below the granular layer. The benefits of placing the slab on a granular layer, with the vapor membrane placed below the granular layer, include reduction of the following:

- Slab curling during the curing and drying process.
- Time of bleeding, which allows for quicker finishing.
- Vapor membrane puncturing.
- Surface blistering or delamination caused by an extended bleeding period.
- Cracking caused by plastic or drying shrinkage.

The benefits of placing the vapor membrane over the granular layer include the following:

- The moisture emission rate is achieved faster.
- Eliminates a potential water reservoir within the granular layer above the membrane.
- Provides a "slip surface", thereby reducing slab restraint and the associated random cracking.

If a membrane is to be used in conjunction with a granular layer, the approach recommended depends on slab usage and the construction schedule. The vapor membrane should be placed above the granular layer when:

- Vapor sensitive floor covering systems are used or vapor sensitive items will be directly placed on the slab.
- The area will be humidity controlled, but the slab will be placed before the building is enclosed and sealed from rain.
- Required by a floor covering manufacturer's system warranty.

The vapor membrane should be placed below the granular layer when:

- Used in humidity controlled areas (without vapor sensitive coverings/stored items), with the roof membrane in place, and the building enclosed to the point where precipitation will not intrude into the slab area. Consideration should be given to slight sloping of the membrane to edges where draintile or other disposal methods can alleviate potential water sources, such as pipe or roof leaks, foundation wall damp proofing failure, fire sprinkler system activation, etc.

Appendix A

Geotechnical Field Exploration and Testing
Boring Log Notes
Unified Soil Classification System
Figure 1: Site Location Map
Figure 2: Boring Location Map
Subsurface Boring Logs
Sieve Analysis Test Results
Swell-Consolidation Results

A.1 FIELD EXPLORATION

The subsurface conditions at the site were explored by drilling and sampling standard penetration test borings. The locations of the borings appear on Figure 2, preceding the Subsurface Boring Logs in this appendix.

A.2 SAMPLING METHODS

A.2.1 Split-Spoon Samples (SS) - Calibrated to N_{60} Values

Standard penetration (split-spoon) samples were collected in general accordance with ASTM: D1586 with one primary modification. The ASTM test method consists of driving a 2-inch O.D. split-barrel sampler into the in-situ soil with a 140-pound hammer dropped from a height of 30 inches. The sampler is driven a total of 18 inches into the soil. After an initial set of 6 inches, the number of hammer blows to drive the sampler the final 12 inches is known as the standard penetration resistance or N-value. Our method uses a modified hammer weight, which is determined by measuring the system energy using a Pile Driving Analyzer (PDA) and an instrumented rod.

In the past, standard penetration N-value tests were performed using a rope and cathead for the lift and drop system. The energy transferred to the split-spoon sampler was typically limited to about 60% of its potential energy due to the friction inherent in this system. This converted energy then provides what is known as an N_{60} blow count.

The most recent drill rigs incorporate an automatic hammer lift and drop system, which has higher energy efficiency and subsequently results in lower N-values than the traditional N_{60} values. By using the PDA energy measurement equipment, we are able to determine actual energy generated by the drop hammer. With the various hammer systems available, we have found highly variable energies ranging from 55% to over 100%. Therefore, the intent of AET's hammer calibrations is to vary the hammer weight such that hammer energies lie within about 60% to 65% of the theoretical energy of a 140-pound weight falling 30 inches. The current ASTM procedure acknowledges the wide variation in N-values, stating that N-values of 100% or more have been observed. Although we have not yet determined the statistical measurement uncertainty of our calibrated method to date, we can state that the accuracy deviation of the N-values using this method is significantly better than the standard ASTM Method.

A.2.2 Disturbed Samples (DS)/Spin-up Samples (SU)

Sample types described as "DS" or "SU" on the boring logs are disturbed samples, which are taken from the flights of the auger. Because the auger disturbs the samples, possible soil layering and contact depths should be considered approximate.

A.2.3 Sampling Limitations

Unless actually observed in a sample, contacts between soil layers are estimated based on the spacing of samples and the action of drilling tools. Cobbles, boulders, and other large objects generally cannot be recovered from test borings, and they may be present in the ground even if they are not noted on the boring logs.

Determining the thickness of "topsoil" layers is usually limited, due to variations in topsoil definition, sample recovery, and other factors. Visual-manual description often relies on color for determination, and transitioning changes can account for significant variation in thickness judgment. Accordingly, the topsoil thickness presented on the logs should not be the sole basis for calculating topsoil stripping depths and volumes. If more accurate information is needed relating to thickness and topsoil quality definition, alternate methods of sample retrieval and testing should be employed.

A.3 CLASSIFICATION METHODS

Soil descriptions shown on the boring logs are based on the Unified Soil Classification (USC) system. The USC system is described in ASTM: D2487 and D2488. Where laboratory classification tests (sieve analysis or Atterberg Limits) have been performed, accurate classifications per ASTM: D2487 are possible. Otherwise, soil descriptions shown on the boring logs are visual-manual judgments. Charts are attached which provide information on the USC system, the descriptive terminology, and the symbols used on the boring logs.

The boring logs include descriptions of apparent geology. The geologic depositional origin of each soil layer is interpreted primarily by observation of the soil samples, which can be limited. Observations of the surrounding topography, vegetation, and development can sometimes aid this judgment.

A.4 WATER LEVEL MEASUREMENTS

The ground water level measurements are shown at the bottom of the boring logs. The following information appears under "Water Level Measurements" on the logs:

- Date and Time of measurement
- Sampled Depth: lowest depth of soil sampling at the time of measurement
- Casing Depth: depth to bottom of casing or hollow-stem auger at time of measurement
- Cave-in Depth: depth at which measuring tape stops in the borehole
- Water Level: depth in the borehole where free water is encountered
- Drilling Fluid Level: same as Water Level, except that the liquid in the borehole is drilling fluid

The true location of the water table at the boring locations may be different than the water levels measured in the boreholes. This is possible because there are several factors that can affect the water level measurements in the borehole. Some of these factors include: permeability of each soil layer in profile, presence of perched water, amount of time between water level readings, presence of drilling fluid, weather conditions, and use of borehole casing.

A.5 LABORATORY TEST METHODS

A.5.1 Water Content Tests
Conducted per AET Procedure 01-LAB-010, which is performed in general accordance with ASTM: D2216 and AASHTO: T265.

A.5.2 Atterberg Limits Tests
Conducted per AET Procedure 01-LAB-030, which is performed in general accordance with ASTM: D4318 and AASHTO: T89, T90.

A.5.3 Sieve Analysis of Soils (thru #200 Sieve)
Conducted per AET Procedure 01-LAB-040, which is performed in general conformance with ASTM: D6913, Method A.

A.5.4 Particle Size Analysis of Soils (with hydrometer)
Conducted per AET Procedure 01-LAB-050, which is performed in general accordance with ASTM: D422 and AASHTO: T88.

A.5.5 Unconfined Compressive Strength of Cohesive Soil
Conducted per AET Procedure 01-LAB-080, which is performed in general accordance with ASTM: D2166 and AASHTO: T208.

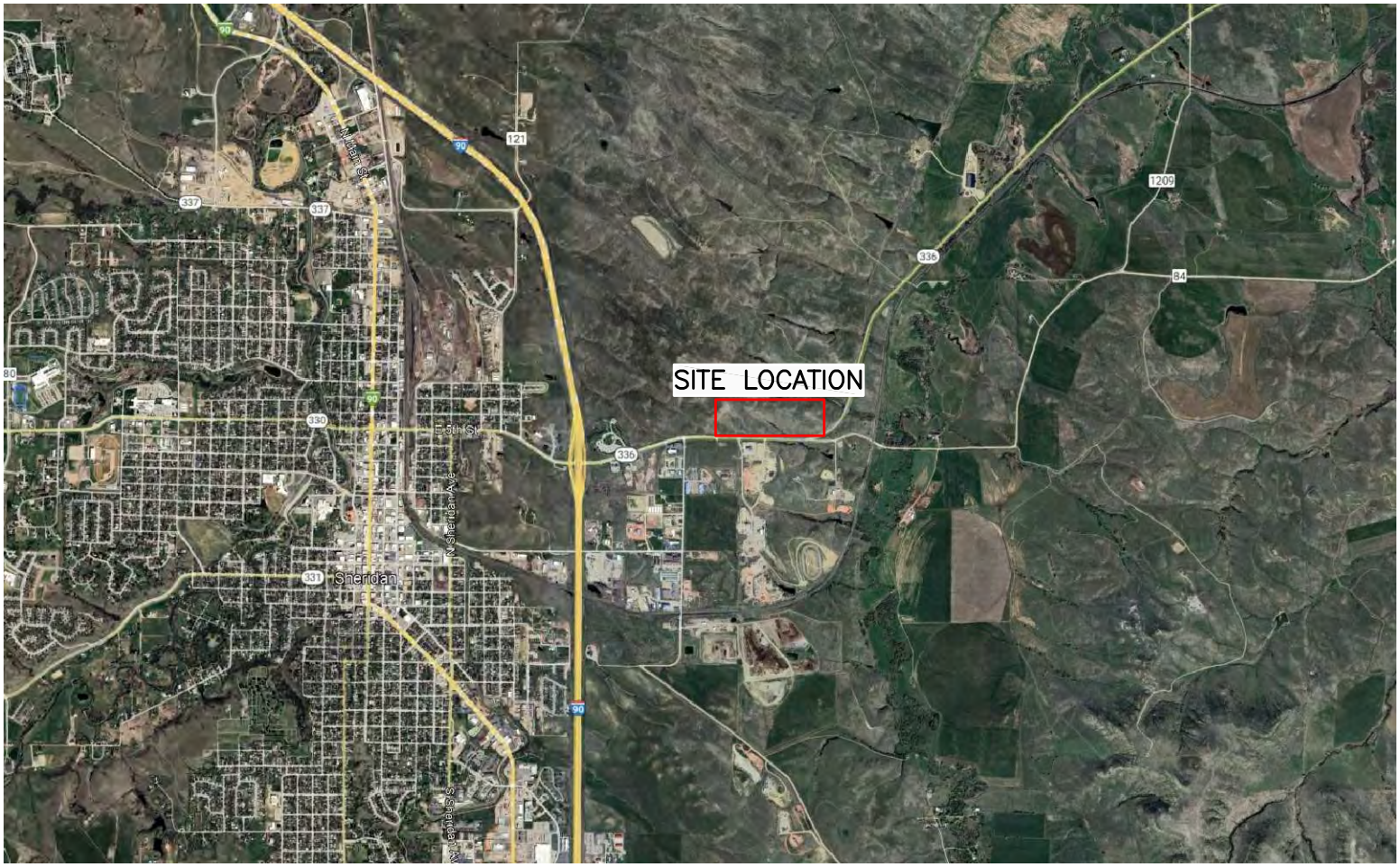
A.5.6 Laboratory Soil Resistivity using the Wenner Four-Electrode Method
Conducted per AET Procedure 01-LAB-090, which is performed using Soil Box apparatus in the laboratory in general accordance with ASTM: G57

A.6 TEST STANDARD LIMITATIONS

Field and laboratory testing is done in general conformance with the described procedures. Compliance with any other standards referenced within the specified standard is neither inferred nor implied.

A.7 SAMPLE STORAGE

Unless notified to do otherwise, we routinely retain representative samples of the soils recovered from the borings for a period of 30 days.

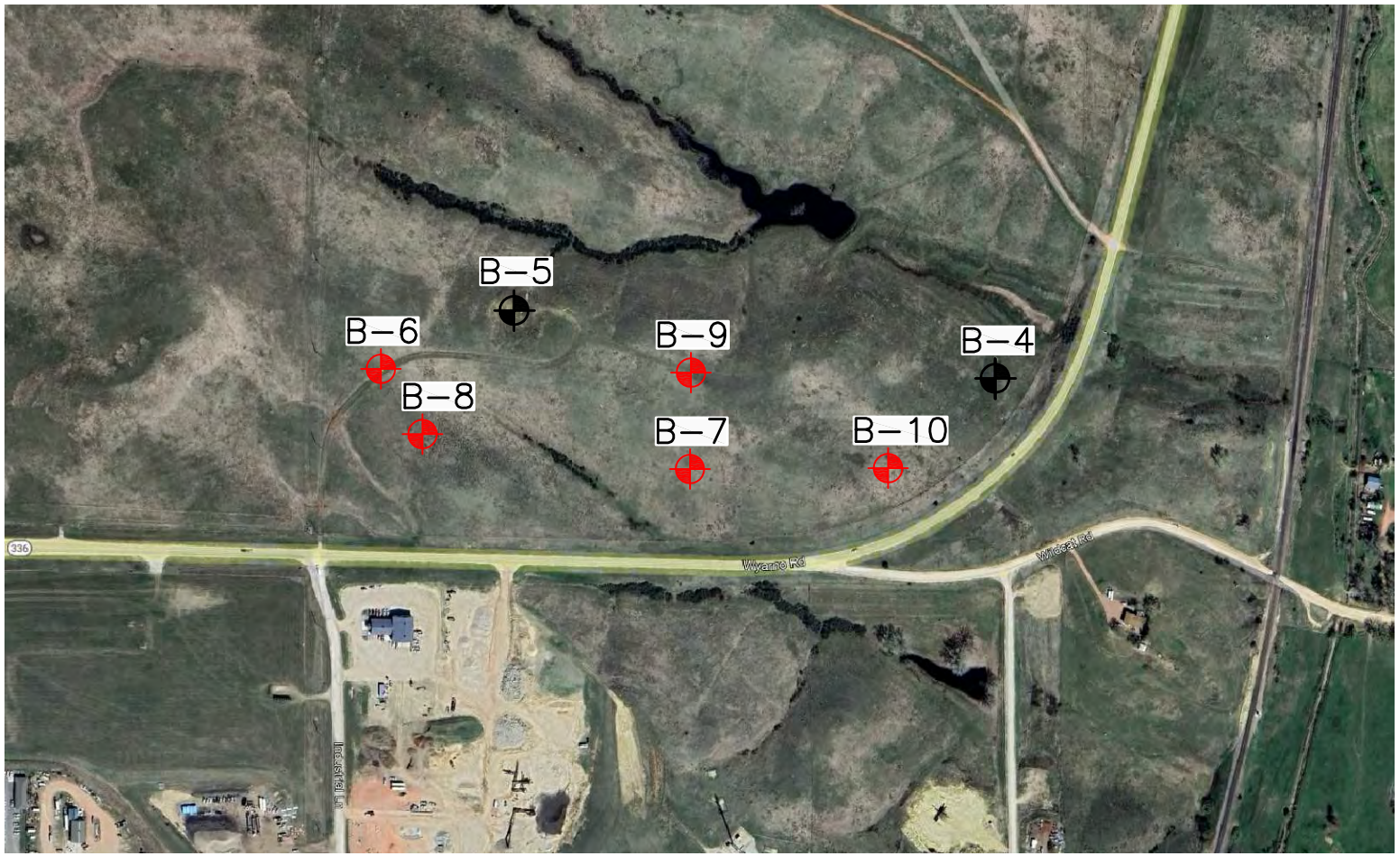


SCALE
(FEET)

0 4000

AMERICAN
ENGINEERING TESTING

PROJECT: STORY HOUSE VILLAGE PHASE I DEVELOPMENT– WYARNO ROAD SHERIDAN, WYOMING		PROJECT NO. P–0022564
SUBJECT: FIGURE 1: SITE LOCATION MAP		DATE: AUGUST 21, 2023
SCALE: 1 INCH = 4000 FEET	DRAWN BY: KK	REVIEWED BY: RT



SCALE (FEET)
0 600

BORINGS DRILLED 8/16/2023

BORINGS DRILLED 3/31/2022

AMERICAN ENGINEERING TESTING

PROJECT: STORY HOUSE VILLAGE PHASE I DEVELOPMENT, WYARNO ROAD SHERIDAN, WYOMING		PROJECT NO. P-0022564
SUBJECT: FIGURE 2: BORING LOCATION MAP		DATE: AUGUST 21, 2023
SCALE: 1 INCH = 600 FEET	DRAWN BY: KK	REVIEWED BY: RT

SUBSURFACE BORING LOG

AET No: **P-0010998** Log of Boring No. **B-4 (p. 1 of 1)**

Project: **Prairie Hills LLC; Wyarno Road - Sheridan, Wyoming**

DEPTH IN FEET	Surface Elevation **3842.0** MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
0	TOPSOIL, cobbles & boulders present										
1	CLAYEY SAND, brown, loose (SC)		10	M	SS						
2											
3	CLAYEY SAND, tan/gray, medium dense, blocky, trace gypsum (SC) (Weathered bedrock)		25	D/M	CAL		9		40	22	44.6
4											
5											
6			37	D/M	SS						
7											
8	CLAYEY SAND, tan, very dense (SC)		50/0.3	M	CAL		6				
9											
10	SILTY SAND, tan, very dense (SM)										
11			54	M	SS		12		29	24	46.3
12											
13			59	M	CAL						
14											
15			82/0.9								
16				M	SS						
17											
18											
19											
20	POORLY-GRADED SAND with clay, brown, very dense (SP)										
21			53	M	CAL		11				
	Bottom of Boring										

DEPTH:	DRILLING METHOD
21.5	**3.25" HSA**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
3/31/22	**9:00**	**21.5**	**20.0**	**NA**	**NA**	**None**
4/8/22	**8:00**	**21.5**	**20.0**	**NA**	**NA**	**None**

BORING COMPLETED: **3/31/22**

DR: **JS** LG: **CC** Rig: **D-50**

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP P-0010998 LOGS.GPJ AET+CPT+WELL.GDT 9/11/23

SUBSURFACE BORING LOG

AET No: **P-0010998** Log of Boring No. **B-5 (p. 1 of 1)**

Project: **Prairie Hills LLC; Wyarno Road - Sheridan, Wyoming**

Surface Elevation **3907.0**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
0	TOPSOIL										
1	CLAYEY SAND, brown, loose (SC)		5	M	SS						
3			9	M	CAL		8				
6			7	M	SS						
8			6	M	CAL						
10	Very dense at 10 feet		3	M	SS		15				16.8
13	CLAYEY SAND, brown, very dense (SC) (Weathered Bedrock)		86	M	CAL						
16			58	M	SS						
21			73	M	CAL		10				
	Bottom of Boring										

DEPTH: **21.5** DRILLING METHOD: **3.25" HSA**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
3/31/22	**10:45**	**21.5**	**20.0**	**NA**	**NA**	**None**
4/8/22	**8:00**	**21.5**	**20.0**	**NA**	**NA**	**None**

BORING COMPLETED: **3/31/22**

DR: **JS** LG: **CC** Rig: **D-50**

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP P-0010998 LOGS.GPJ AET+CPT+WELL.GDT 9/11/23

SUBSURFACE BORING LOG

AET No: **P-0022564** Log of Boring No. **B-6 (p. 1 of 1)**

Project: **Story House Village Phase I Development; Wyarno Road, Sheridan, Wyoming**

Surface Elevation **3922.0**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
1	**TOPSOIL** with cobblestones	TOPSOIL	7	M	SS	100					
2	**LEAN CLAY** with fine sand, trace organics,	ALLUVIUM									
3	brown, firm (CL)		7	M	MC	100					
4											
5	**CLAYEY SAND**, brown and light grey, loose										
6	(SC)		14	M	SS	100	14		44	21	
7	**LEAN CLAY** with gypsum, light grey and										
8	brown, stiff (CL)	WASATCH FORMATION	58	M	MC	100					
9											
10	**WEATHERED CLAYSTONE**, silty lean clay,										
11	trace gypsum, greyish brown, hard (CL)		42	M	SS	100	11	109	35	19	
12											
13	with red oxidation, trace fine sand, grey		62	M	MC	100					
14											
15											
16			57	M	SS	100	10	117			
17											
18	**CLAYSTONE**, silty lean clay with red										
19	oxidation, grey, hard (CL)										
20											
21			50/.75	M	MC	75					
22											
23											
24											
25											
26	with gypsum		100	M	SS	100	12	113			
27											
28											
29											
30											
31	lense of coal, black		50/.5	M	MC	50					
32											
33											
34											
35											
36			50/.5	M	SS	75					
37											
38											
39											
40											
41	with fine sand, tan		50/.5	M	MC	50					
42											
43											
44											
45											
46	dark brown		50/.5		SS						
47											
48											
49											
50											
51	lense of coal, dark brown		50/.5	M	MC	25					
	Bottom of Boring										

DEPTH:	DRILLING METHOD
50.0	**3.25" HSA**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
8/16/23	**10:50**	**51.5**	**50.0**	**NA**	**NA**	**None**
9/1/23		**51.5**	**50.0**	**NA**	**NA**	**None**

BORING COMPLETED: **8/16/23**

DR: **JS** LG: **CB** Rig: **99**

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP P-0022564 LOGS.GPJ AET+CPT+WELL.GDT 9/11/23

SUBSURFACE BORING LOG

AET No: **P-0022564** Log of Boring No. **B-7 (p. 1 of 1)**

Project: **Story House Village Phase I Development; Wyarno Road, Sheridan, Wyoming**

Surface Elevation **3890.0**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
1	**TOPSOIL** with cobblestones	TOPSOIL	7	M	SS	100	15		46	27	
2	**LEAN CLAY** with coarse sand, trace organics, dark brown, very stiff (CL)	ALLUVIUM									
3	with red oxidation, light brown		16	M	MC	100					
5	**SILTY SAND**, light tan, loose (SM)		9	M	SS	100	11	91			
8	**SILT**, light tan, stiff (ML)		11	M	MC	100					
10	**WEATHERED CLAYSTONE**, lean clay with trace fine sand, red oxidation, brown to dark brown, very stiff (CL)	WASATCH FORMATION	22	M	SS	100	17	101			
13			22	M	MC	100					
14	**COAL**, black, soft										
16			6	M	SS	100					
17	**CLAYSTONE**, lean clay, dark grey, hard (CL)										
21			50/.75	M	MC	80	14				
25	with red oxidation, grey		70	M	SS	100					
31			50/.5	M	MC	75					
35	light tan		50/.5	M	SS	30					
	Bottom of Boring										

DEPTH:	DRILLING METHOD
35.0	**3.25" HSA**

BORING COMPLETED: **8/16/23**

DR: **JS** LG: **CB** Rig: **99**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
8/16/23	**13:55**	**36.5**	**35.0**	**NA**	**NA**	**None**
9/1/23		**36.5**	**35.0**	**NA**	**NA**	**None**

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP P-0022564 LOGS.GPJ AET+CPT+WELL.GDT 9/11/23

SUBSURFACE BORING LOG

AET No: **P-0022564** Log of Boring No. **B-8 (p. 1 of 1)**

Project: **Story House Village Phase I Development; Wyarno Road, Sheridan, Wyoming**

DEPTH IN FEET	Surface Elevation **3920.0** MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
	TOPSOIL with cobblestones	TOPSOIL									
1	**SILTY LEAN CLAY** with trace gypsum, organics, light brown, stiff (CL)	ALLUVIUM	9	M	SS	100					
2	**SILTY SAND**, light brown, medium dense (SM)	WASATCH FORMATION									
3			25	M	MC	100	10	103			
4											
5	**WEATHERED CLAYSTONE**, silty lean clay with trace gypsum, light brown and reddish to greyish brown, very stiff (CL)										
6			22	M	SS	100					
7											
8	**WEATHERED CLAYSTONE**, lean clay with fine sand, light reddish brown, hard (CL)		63	M	MC	100	11	113	38	21	
9											
10											
11			36	M	SS	100					
	Bottom of Boring										

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
10.0	**3.25" HSA**	**8/16/23**	**15:40**	**11.5**	**10.0**	**NA**	**NA**	**None**
BORING COMPLETED: **8/16/23**								
DR: **JS** LG: **CB** Rig: **99**								

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP P-0022564 LOGS.GPJ AET+CPT+WELL.GDT 9/11/23

SUBSURFACE BORING LOG

AET No: **P-0022564** Log of Boring No. **B-9 (p. 1 of 1)**

Project: **Story House Village Phase I Development; Wyarno Road, Sheridan, Wyoming**

DEPTH IN FEET	Surface Elevation **3915.0** MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
	TOPSOIL with cobblestones	TOPSOIL									
1	**LEAN CLAY** with fine sand, trace gypsum, light brown, stiff (CL)	ALLUVIUM	12	M	SS	100					
2											
3			12	M	MC	100					
4											
5											
6			9	M	SS	100	12	104	44	23	
7	**WEATHERED CLAYSTONE**, silty lean clay with red oxidation, light greyish brown, very stiff (CL)	WASATCH FORMATION									
8			28	M	MC	100					
9											
10											
11			25	M	SS	100	14	113			41.1
	Bottom of Boring										

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
10.0	**3.25" HSA**	**8/16/23**	**16:25**	**11.5**	**10.0**	**NA**	**NA**	**None**
BORING COMPLETED: **8/16/23**								
DR: **JS** LG: **CB** Rig: **99**								

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP P-0022564 LOGS.GPJ AET+CPT+WELL.GDT 9/11/23

SUBSURFACE BORING LOG

AET No: **P-0022564** Log of Boring No. **B-10 (p. 1 of 1)**

Project: **Story House Village Phase I Development; Wyarno Road, Sheridan, Wyoming**

Surface Elevation **3884.0**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	%-#200
	TOPSOIL with cobblestones	TOPSOIL									
1	**LEAN CLAY** with trace fine sand, organics, brown to light brown, stiff to very stiff (CL)	ALLUVIUM	10	M	SS	100					
2											
3	trace gypsum		17	M	MC	100	12	108	34	18	
4											
5	**CLAYEY SAND**, light brown, loose to medium dense (SC)										
6			10	M	SS	100					
7											
8			26	M	MC	100	9		29	16	26.8
9											
10											
11			16	M	SS	100					
	Bottom of Boring										

DEPTH:	DRILLING METHOD
10.0	**3.25" HSA**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
8/16/23	**17:10**	**11.5**	**10.0**	**NA**	**NA**	**None**

BORING COMPLETED: **8/16/23**

DR: **JS** LG: **CB** Rig: **99**

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP P-0022564 LOGS.GPJ AET+CPT+WELL.GDT 9/11/23

American Engineering Testing, Inc.
Sheridan
72 E Ridge Rd Unit D
Sheridan, WY 82801
(607) 675-1862
www.teamAET.com

Material Test Report

Report No: MAT:AET-128494-S4

Client: Story House Management, LLC **CC:**

Project: Story House Village PI, Sheridan, WY
GEO-23

Sheridan WY
Job No: P-0022564

Draft Report - Subject to change pending final review

Date of Issue: 8/28/2023

Sample Details

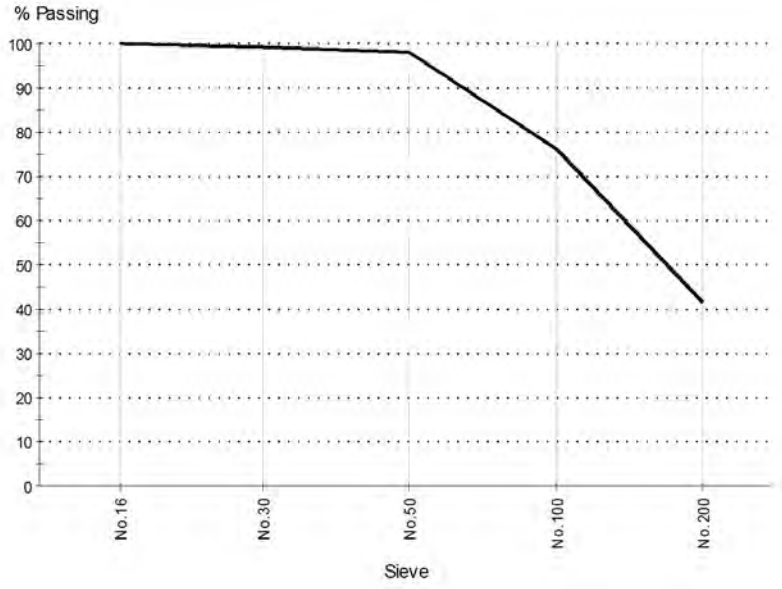
Sample ID	AET-128494-S4
Field Sample ID	
Date Sampled	8/16/2023
Source	
Material	Silty Sand
Specification	Gradation + Hydrometer
Sampling Method	
Location	Boring B-7 5'
Date Submitted	

Other Test Results

Description	Method	Result	Limits
Fineness Modulus	ASTM C 136, ASTM C 117	N/A	
Curvature Coefficient		N/A	
Uniformity Coefficient		N/A	

Particle Size Distribution

ASTM C 136, ASTM C 117



Date Tested:
Tested By:

Sieve Size	% Passing	Limits
No.16	99.9	
No.30	99.1	
No.50	97.9	
No.100	76.0	
No.200	41.6	

Comments

N/A

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(607) 675-1862
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Material Test Report

Report No: MAT:AET-128494-S5

Client: Story House Management, LLC **CC:**

Project: Story House Village PI, Sheridan, WY
GEO-23

Sheridan WY

Job No: P-0022564

Draft Report - Subject to change pending final review

Date of Issue: 8/28/2023

Sample Details

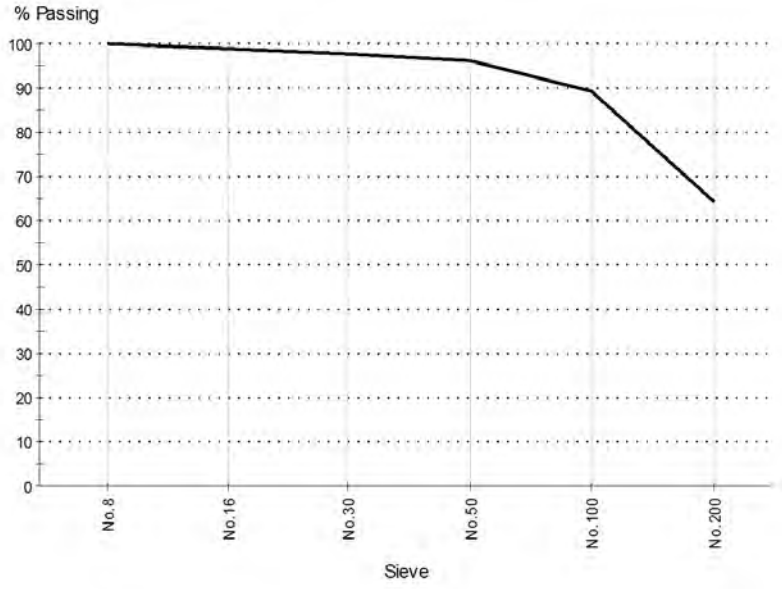
Sample ID	AET-128494-S5
Field Sample ID	B8 2.5'
Date Sampled	8/16/2023
Source	
Material	Sandy Clay
Specification	Gradation + Hydrometer
Sampling Method	
Location	Boring B-8 2.5'
Date Submitted	

Other Test Results

Description	Method	Result	Limits
Fineness Modulus	ASTM C 136, ASTM C 117	N/A	
Curvature Coefficient		N/A	
Uniformity Coefficient		N/A	

Particle Size Distribution

ASTM C 136, ASTM C 117



Date Tested:
Tested By:

Sieve Size	% Passing	Limits
No.8	99.9	
No.16	98.9	
No.30	97.6	
No.50	96.0	
No.100	89.4	
No.200	64.1	

Comments

N/A

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Sheridan, WY 82801
(607) 675-1862
www.teamAET.com

Material Test Report

Report No: MAT:AET-128494-S6

Client: Story House Management, LLC **CC:**

Project: Story House Village PI, Sheridan, WY
GEO-23

Sheridan WY

Job No: P-0022564

Draft Report - Subject to change pending final review

Date of Issue: 8/28/2023

Sample Details

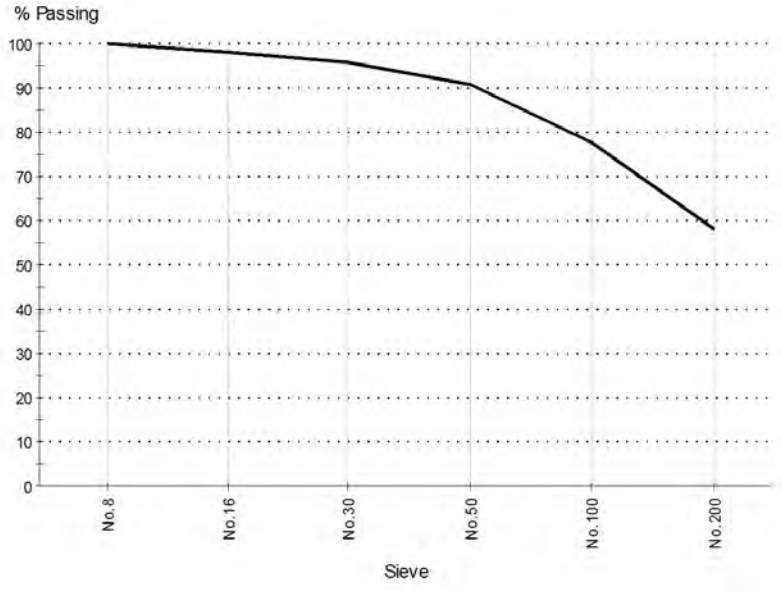
Sample ID	AET-128494-S6
Field Sample ID	
Date Sampled	8/16/2023
Source	
Material	Sandy Clay
Specification	Gradation + Hydrometer
Sampling Method	
Location	Boring B-8 7.5'
Date Submitted	

Other Test Results

Description	Method	Result	Limits
Fineness Modulus	ASTM C 136, ASTM C 117	N/A	
Curvature Coefficient		N/A	
Uniformity Coefficient		N/A	

Particle Size Distribution

ASTM C 136, ASTM C 117



Date Tested:
Tested By:

Sieve Size	% Passing	Limits
No.8	99.9	
No.16	98.2	
No.30	95.8	
No.50	90.9	
No.100	77.8	
No.200	58.1	

Comments

N/A

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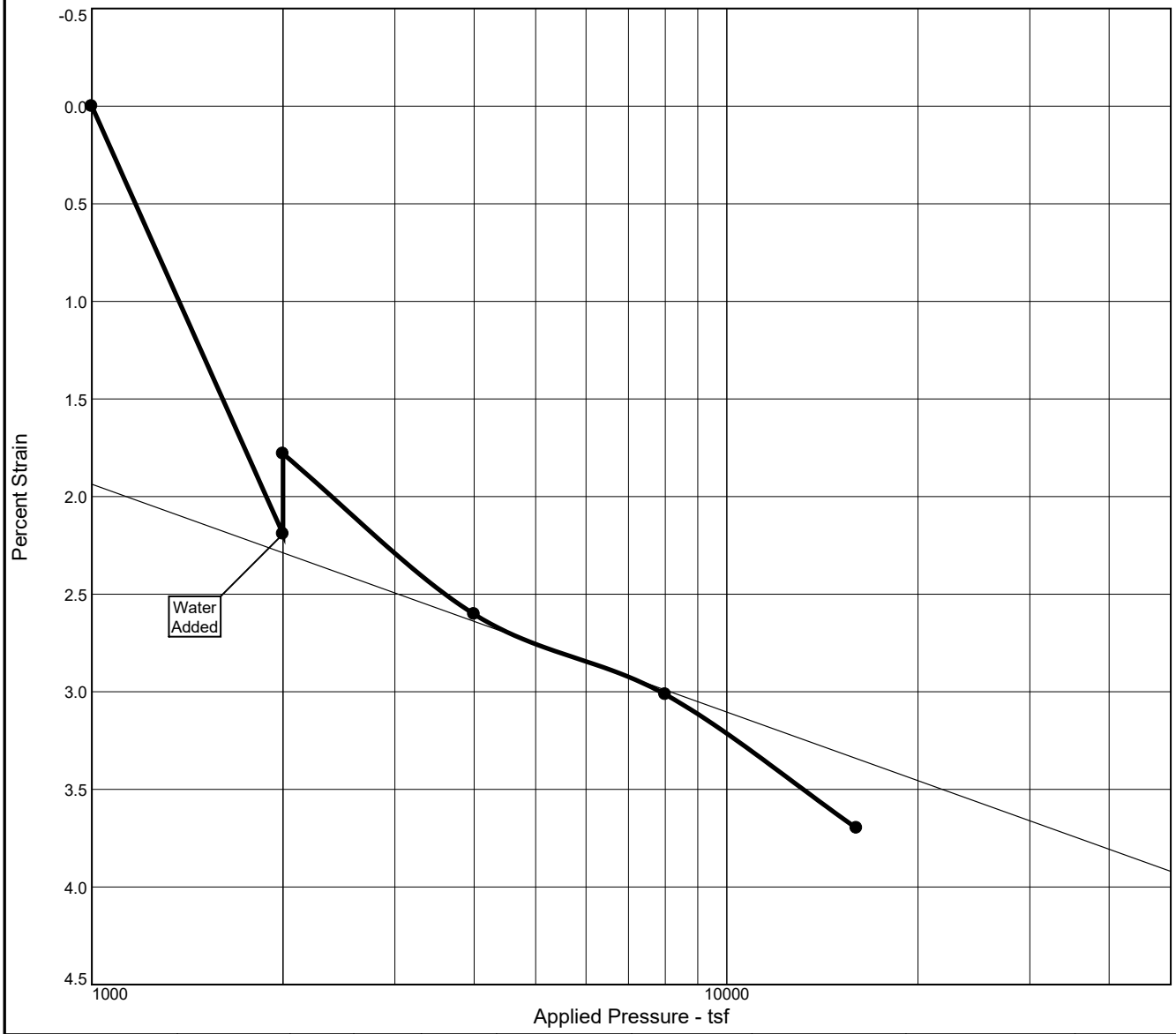
CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	e_o	Swell Press. (tsf)	Swell %	C_r
90.9 %	17.0 %	105.6			2.65	1000	0.496	2771.5	0.4	

MATERIAL DESCRIPTION	USCS	AASHTO
LEAN CLAY, TRACE FINE SAND, RED OXIDATION		

Project No. P-0022564 **Client:** WWC ENGINEERING

Project: Story House Village Phase I Development

Location: B7 **Depth:** 10 **Sample Number:** 5

Remarks:
SPLIT SPOON

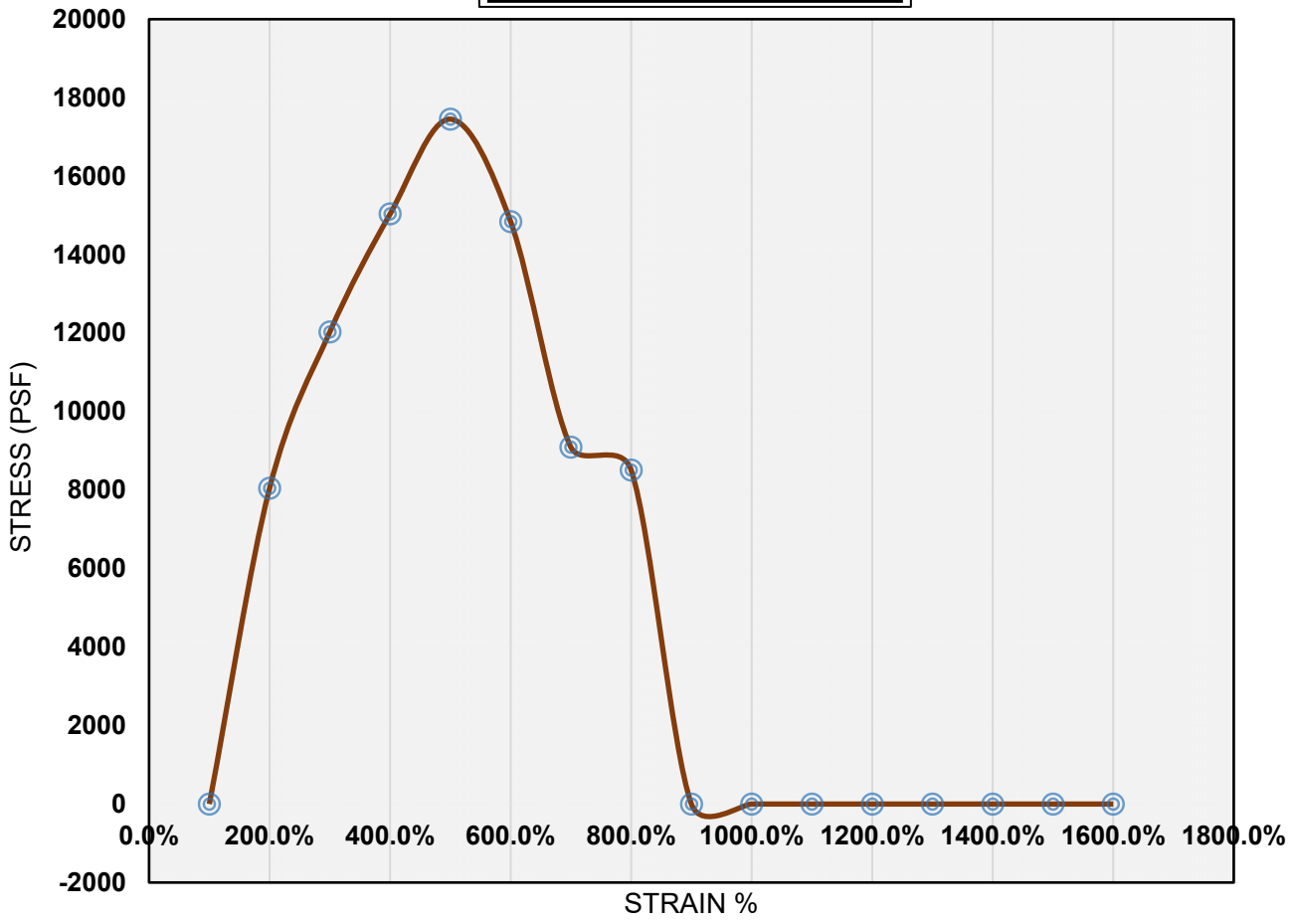
American Engineering Testing, Inc.

Gillette, WY

Figure

Tested By: EC

Stress vs. Strain



Test Results

Boring	Depth	L/D Ratio	Stress At Failure (psf)	Strain At Failure	Strain Rate (in/min)	Strain Rate (%/min)
B6	15'	1.72	17452	8.15%	0.04892	2.04%

Date Sampled	Sample Type	Dry Density (pcf)	Wet Density (pcf)	% Moisture	N Value
8/16/2023	Other	130.1	114.9	13.2%	NA

Sample Description Claystone- Silty Lean Clay (CL)

Notes/Remarks: SPLIT SPOON

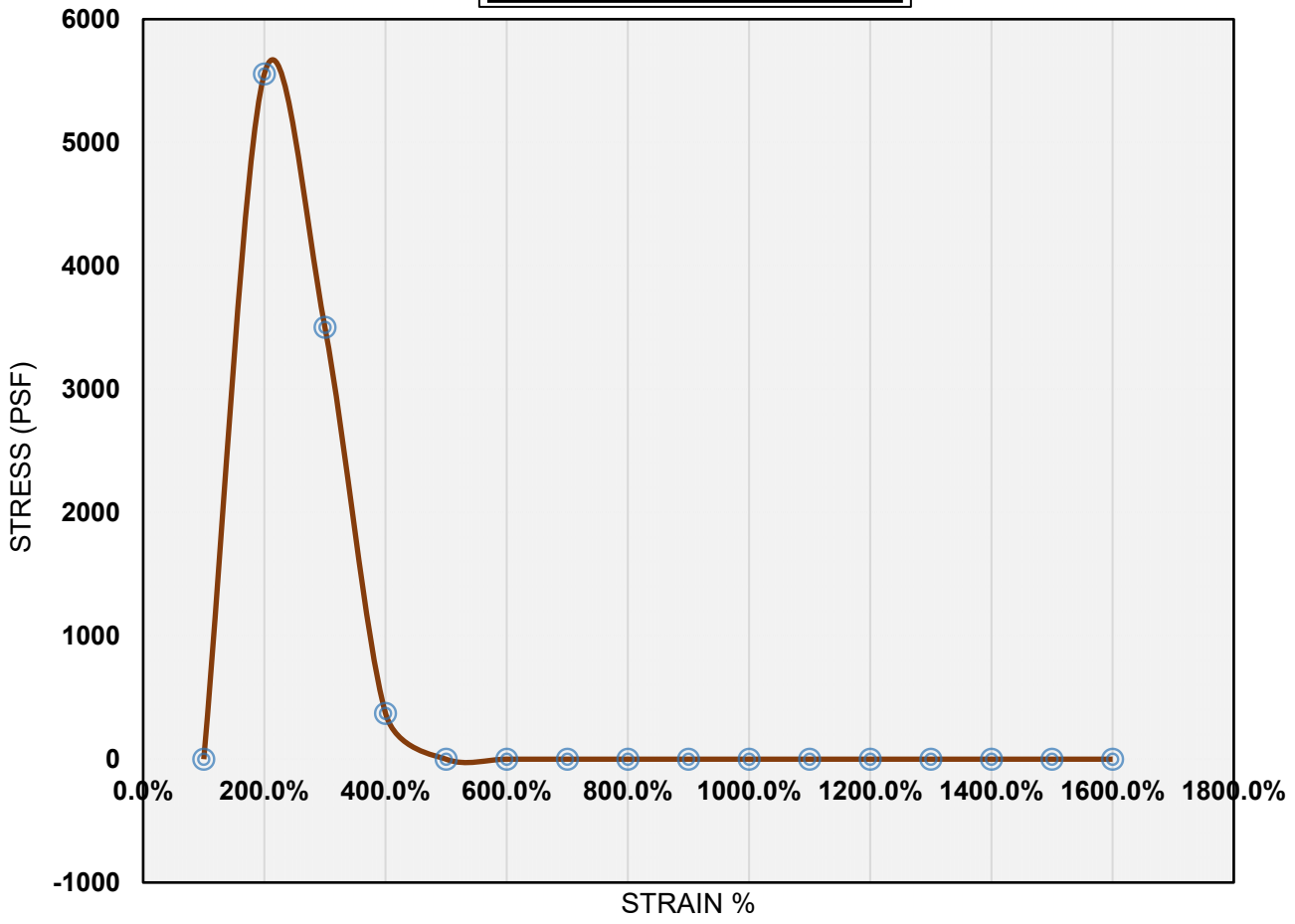
Project Information

Project:	Story House Village Phase I	**Job Number:**	P-0022564
Location:	Wyarno Road, Sheridan, WY	**Date Tested:**	8/22/2023

AMERICAN ENGINEERING TESTING

UNCONFINED COMPRESSION TEST RESULTS
(ASTM D2166)

Stress vs. Strain



Test Results

Boring	Depth	L/D Ratio	Stress At Failure (psf)	Strain At Failure	Strain Rate (in/min)	Strain Rate (%/min)
B7	20'	1.72	5556	1.48%	0.04892	1.48%

Date Sampled	Sample Type	Dry Density (pcf)	Wet Density (pcf)	% Moisture	N Value
8/16/2023	California Tube	128.8	110.2	16.8%	NA

Sample Description Claystone- Lean Clay (CL)

Notes/Remarks: SAMPLE HAD CRACKS PRESENT WHEN EXTRACTED FROM TUBE AND PRIOR TO TESTING

Project Information

Project:	Story House Village Phase I	**Job Number:**	P-0022564
Location:	Wyarno Road, Sheridan, WY	**Date Tested:**	8/22/2023

AMERICAN ENGINEERING TESTING

UNCONFINED COMPRESSION TEST RESULTS
(ASTM D2166)

American Engineering Testing, Inc.
Sheridan
72 E Ridge Rd Unit D
Sheridan, WY 82801
(607) 675-1862
www.teamAET.com

Proctor Report

Report No: PTR:AET-128494-S1

Client: Story House Management, LLC **CC:**

Project: Story House Village PI, Sheridan, WY
GEO-23

Sheridan WY

Job No: P-0022564

Draft Report - Subject to change pending final review

Date of Issue: 8/28/2023

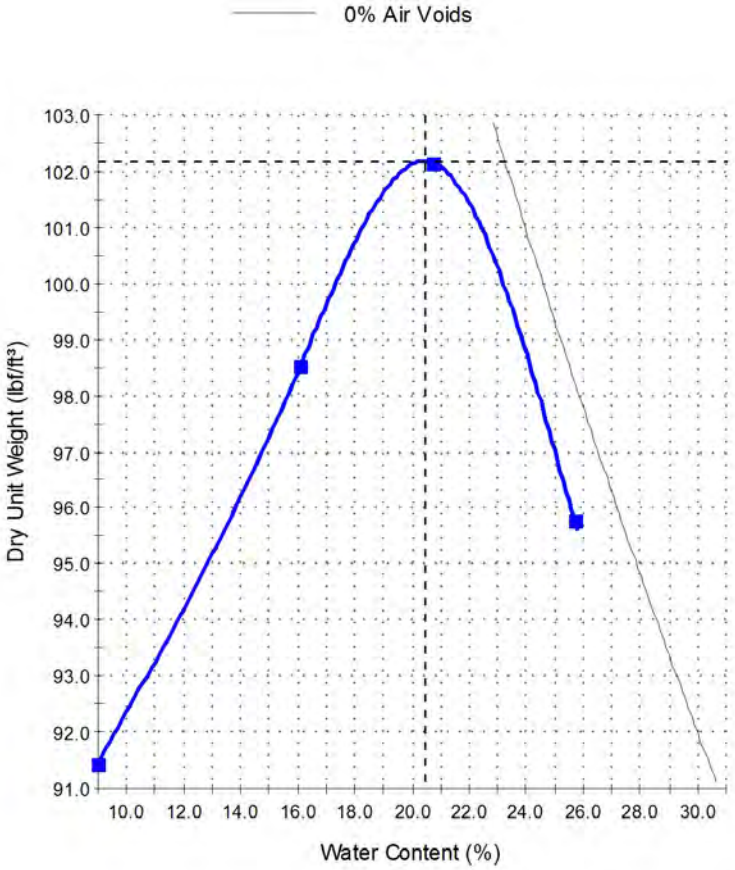
Sample Details

Sample ID: AET-128494-S1 **Field ID:** B6 BULK

Date Sampled: 8/16/2023

Location:

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D 698

Maximum Dry Unit Weight (lbf/ft³):	**102.2**
Optimum Water Content (%):	**20.4**
Method:	A
Preparation Method:	Moist
Specific Gravity (Fines):	2.65
Specific Gravity Method:	ASSUMED
Retained Sieve No 4 (4.75mm) (%):	0
Passing Sieve No 4 (4.75mm) (%):	100
Tested By:	
Date Tested:	

Comments

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Proctor Report

Report No: PTR:AET-128494-S2

Client: Story House Management, LLC **CC:**

Project: Story House Village PI, Sheridan,WY
GEO-23

Sheridan WY

Job No: P-0022564

Draft Report - Subject to change pending final review

Date of Issue: 8/28/2023

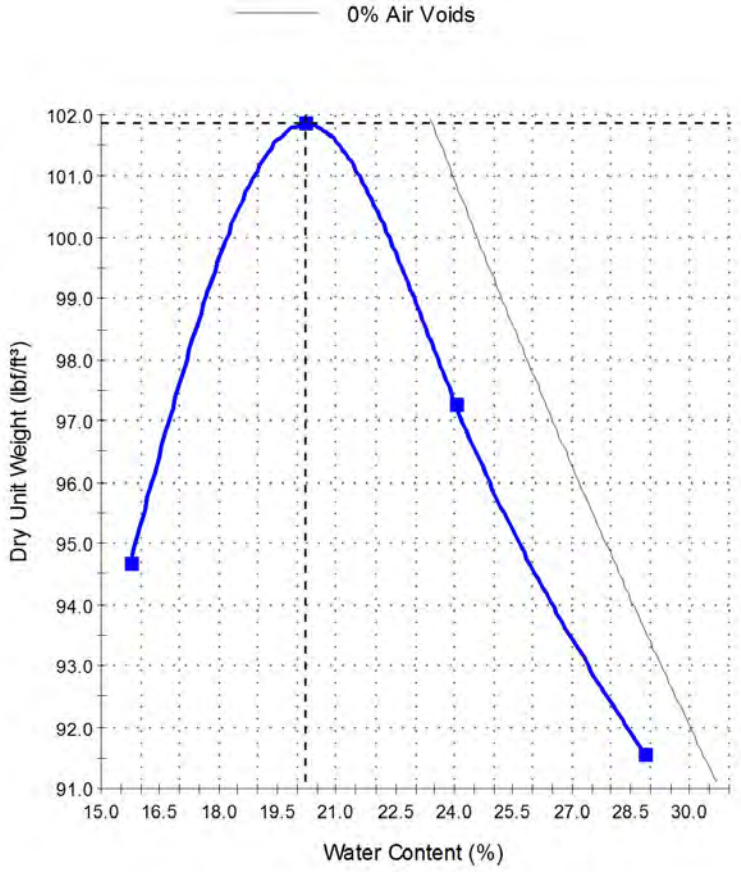
Sample Details

Sample ID: AET-128494-S2 **Field ID:** B9 BULK

Date Sampled: 8/16/2023

Location:

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D 698

Maximum Dry Unit Weight (lbf/ft³):	**101.9**
Optimum Water Content (%):	**20.2**
Method:	A
Preparation Method:	Moist
Specific Gravity (Fines):	2.65
Specific Gravity Method:	ASSUMED
Retained Sieve No 4 (4.75mm) (%):	1
Passing Sieve No 4 (4.75mm) (%):	99
Tested By:	
Date Tested:	

Comments

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Proctor Report

Report No: PTR:AET-128494-S3

Client: Story House Management, LLC **CC:**

Project: Story House Village PI, Sheridan, WY
GEO-23

Sheridan WY

Job No: P-0022564

Draft Report - Subject to change pending final review

Date of Issue: 8/28/2023

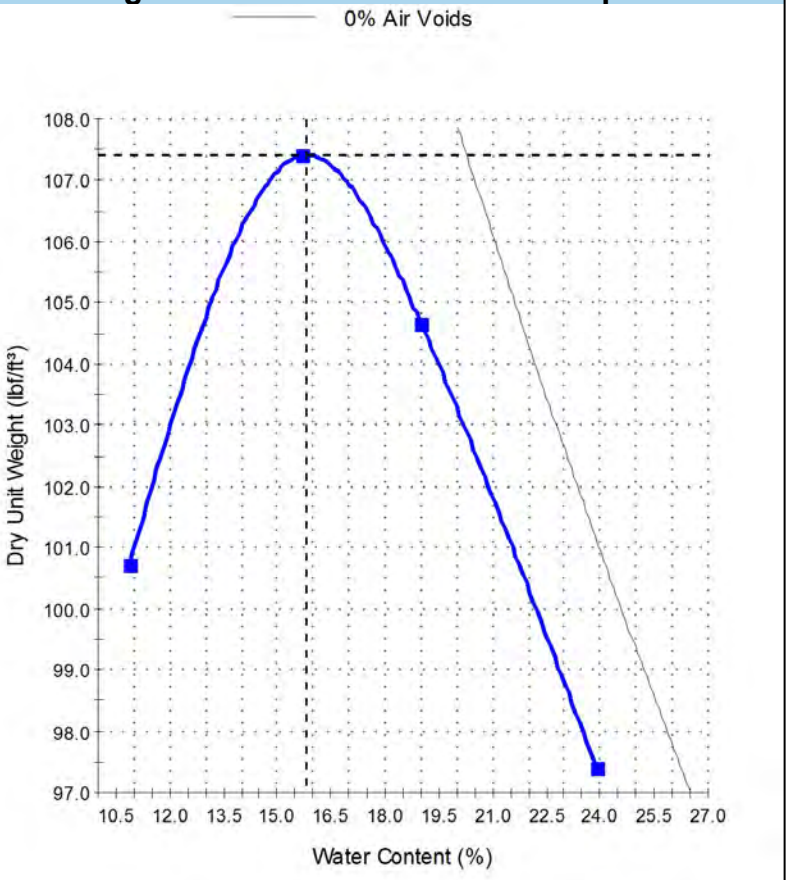
Sample Details

Sample ID: AET-128494-S3 **Field ID:** B10 BULK

Date Sampled: 8/16/2023

Location:

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D 698

Maximum Dry Unit Weight (lbf/ft³):	**107.4**
Optimum Water Content (%):	**15.8**
Method:	A
Preparation Method:	Moist
Specific Gravity (Fines):	2.65
Specific Gravity Method:	ASSUMED
Retained Sieve No 4 (4.75mm) (%):	0
Passing Sieve No 4 (4.75mm) (%):	100
Tested By:	
Date Tested:	

Comments

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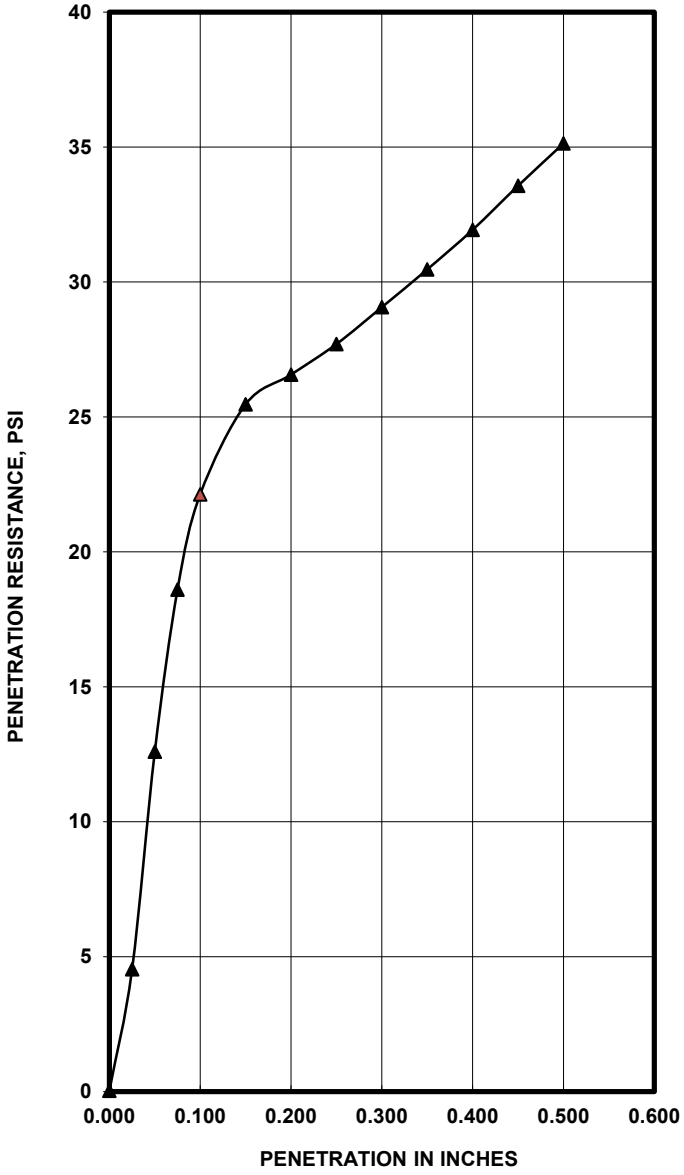

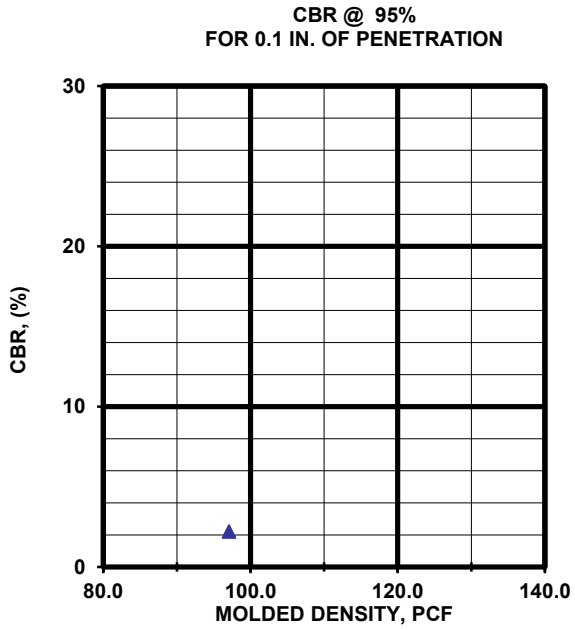

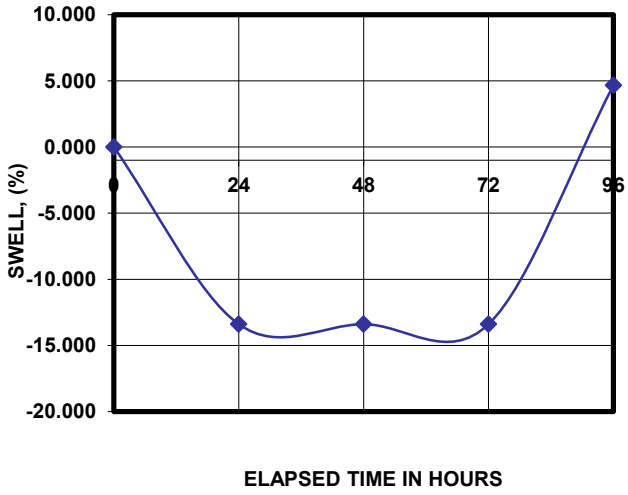

MOLDED			SOAKED			CBR	(%)	PEN.	SWELL
DENS.	% MAX	% MOIST.	DENS.	% MAX	% MOIST.	0.1 IN.	0.2 IN.	SURCHG	%
97.1	95.3	20.4	92.6	90.8	28.5	2.2	1.8	10	4.663

MATERIAL DESCRIPTION	USCS	MAX. DEN.	OPT. MOIST.	LL	PI
0	0	101.9	20.2	28	18

PROJECT #: P-0022564 **Boring No.** B9 Bulk

PROJECT: Story House Village PI

DATE: 8/30/2023

Test Descr. / Remarks

CBR PER ASTM D1883

PROCTOR PER ASTM D698

AMERICAN ENGINEERING TESTING

BEARING RATIO TEST REPORT

Appendix B

Geotechnical Report Limitations and Guidelines for Use

Appendix B
Geotechnical Report Limitations and Guidelines for Use
AET Project No. P-0022564

B.1 REFERENCE

This appendix provides information to help you manage your risks relating to subsurface problems which are caused by construction delays, cost overruns, claims, and disputes. This information was developed and provided by GBA[1], of which, we are a member firm.

B.2 RISK MANAGEMENT INFORMATION

B.2.1 Understand the Geotechnical Engineering Services Provided for this Report

Geotechnical engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical engineering services is typically a geotechnical engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

B.2.2 Geotechnical Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared solely for the client.

Likewise, geotechnical engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. If you are the least bit uncertain about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

1 Geoprofessional Business Association, 1300 Piccard Drive, LL14, Rockville, MD 20850
Telephone: 301/565-2733: www.geoprofessional.org, 2019

B.2.3 Read the Full Report

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. Read and refer to the report in full.

B.2.4 You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, always inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

B.2.5 Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

B.2.6 This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations only after observing actual subsurface conditions exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.

B.2.7 This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

B.2.8 Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical engineering report, along with any attachments or appendices, with your contract documents, but be certain to note conspicuously that you've included the material for information purposes only. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, only from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and be sure to allow enough time to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

B.2.9 Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials

with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.

B.2.10 Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical engineering study. For that reason, a geotechnical engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Unanticipated subsurface environmental problems have led to project failures. If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

B.2.11 Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. Geotechnical engineers are not building-envelope or mold specialists.

APPENDIX F

Traffic Report

Story House

Traffic Impact Study

WWC Engineering

Sheridan, Wyoming

October 6, 2023

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Story House

Traffic Impact Study

1.0 Introduction

The Story House project is a mixed use development that is planned east of I-90 on the north side of Wyarno Road (Wyoming 336). Figure 1 shows the location of the Story House project and a general layout is contained in Figure 2. The development is proposed in three phases as shown in Figure 2. For Phase I, the primary access will be through the west access that aligns with Industrial Lane. The internal street network will be developed in Phase II so that there will be two accesses to the development. The laneage and traffic control at the existing intersections is contained in Figure 3.

This study was completed based on WYDOT and the City of Sheridan requirements for traffic impact studies[1,2].

2.0 Study Assumptions

The following assumptions were utilized for this study.

Short-Term Horizons. The study assumes the following development horizons. Refer to Figure 2 for the portions of the development that are included in each phase.

- Phase I – Year 2026
- Phase II – Year 2031
- Phase III – Year 2034

Long-Term Horizon. The long-term horizon will be Year 2043 because it is 20 years in the future.

Growth in Background Traffic. An annual growth rate of 0.6% was calculated using Sheridan County population estimates that are contained in the Sheridan County Comprehensive Plan[3]. Through volumes on Wyarno Road and the volumes associated with Industrial Lane were inflated for each of the volume scenarios.

Saturation Flow Rate. The saturation flow rate was assumed to be 1,600 passenger cars / hour / lane recognizing Wyoming motorists' driving habits and data collected in Cheyenne during the Yellowstone Road corridor signal timing project.

1 Access Manual, 2014 Edition. Wyoming Department of Transportation, Traffic Program. January 6, 2014.

2 Public Infrastructure Standards. City of Sheridan Public works Department. 2017 Edition.

3 Sheridan County Comprehensive Plan. Sheridan County. Adopted February 4, 2020.

Peak Hour Factor (PHF). The PHF for the existing intersections was based on the data collected for the study. At the site accesses, the PHF was assumed to be 0.85 for all movements.

Truck Percentage. Vehicle classification data were collected with the turning movement count data and are summarized in Appendix A. Little, or no truck traffic was observed for most of the movements at the study area intersections, so the truck percentage was assumed to be 2% for these movements. Movements with higher truck percentages are highlighted in the tables. Those percentages were used in the analysis. Two percent trucks were assumed for all new movements associated with the development.

3.0 Existing Traffic Conditions

3.1 Traffic Counts

Turning movement count data were collected by WWC Engineering on average weekdays in July 2023. A summary of the data is included in Appendix A, and the existing peak hour volumes are contained in Figures 4 and 5. Existing and future daily volumes are summarized in Table 1.

3.2 Existing Peak Hour Level of Service

To evaluate the performance of the intersections within the study area, the level of service (LOS) was calculated using PTV VISTRO software. This software package utilizes criteria described in the Highway Capacity Manual[4]. LOS is a measure used to describe operational conditions at an intersection. LOS categories ranging from A to F are assigned based on the predicted delay in seconds per vehicle for the intersection as a whole, as well as for individual turning movements. LOS A indicates very good operations, and LOS F indicates poor, congested operations. Based on WYDOT standards, acceptable intersection operation is LOS C or better.

The results of the analysis are summarized in the following table. The analysis shows that the existing study area intersections are operating at acceptable levels of service. The level of service for intersections with side-street stop-control is determined by the movement with the highest delay value. Detailed analysis results are summarized in Table 2 and the VISTRO analysis results are contained in Appendix B.

Year 2023 Traffic Volumes

Intersection	Control	Peak Hour	
		AM	PM
1 - Wyarno Road / Industrial Lane / West Site Access	Side-Street Stop	B	A
2 - Wyarno Road / Wildcat Road	Side-Street Stop	A	A

[4] Highway Capacity Manual, 7th Edition. National Academy of Sciences, Engineering, and Medicine. 2022.

3.3 Crash Data

The most recent three years of crash data were requested from WYDOT for the study area intersections and for the sweeping curve along the frontage of the development. The data shows that there was one property damage only crash reported at the Industrial Lane intersection, and no crashes reported at the Wildcat Road intersection. Based on a conversation with Melinda Harmon at WYDOT, the sweeping curve along the frontage of the development begins at approximately MP 2. A review of the crash data shows that there were no crashes reported along the curve. The crash data are contained in Appendix C.

4.0 Trip Generation

In order to estimate the traffic impacts associated with this development, the amount of traffic generated by the project was calculated using trip generation rates contained in the Institute of Transportation Engineers Trip Generation manual[5]. The trip generation for the three phases of development is contained in Tables 3 through 5.

5.0 Trip Distribution and Assignment

The trips that are expected to be generated by the Story House development were distributed based on the existing traffic patterns in the vicinity of the site. These trips were then assigned to the network based on the trip distribution. The trip distribution is contained in Figure 6 and the trip assignment is contained in Figures 7 through 12.

6.0 Year 2026 Traffic Conditions

Phase I as shown in Figure 2 is expected to be completed in Year 2026. Background traffic volumes contained in Figures 13 and 14 were developed by inflating the existing traffic volumes by the annual growth rate that is discussed in Section 2.0. The total traffic volume scenarios were developed by adding the peak hour trip assignment to the background volumes (see Figures 15 and 16).

The results of the analysis of the background and total traffic volume scenarios are summarized in the following table. The analysis shows that both of the intersections are expected to operate at acceptable levels of service. The level of service for intersections with side-street stop-control is determined by the movement with the highest delay value. The laneage and traffic control that were assumed for the analysis are contained in Figure 17.

[5] Trip Generation, 11th Edition. Institute of Transportation Engineers. September 2021.

Year 2026 Traffic Conditions

Intersection	Control	Background		Total	
		AM	PM	AM	PM
1 - Wyarno Road / Industrial Lane / West Site Access	Side-Street Stop	A	A	C	C
2 - Wyarno Road / Wildcat Road	Side-Street Stop	A	A	A	A

Detailed analysis results are summarized in Table 2 and the VISTRO analysis results are contained in Appendix B.

7.0 Year 2031 Traffic Conditions

Phase II is expected to be completed in Year 2031. The volume scenarios for this horizon were completed in the same manner as the Year 2026 traffic volume scenarios (see Section 6.0). The background traffic volume scenarios are contained in Figures 18 and 19, and the total traffic volume scenarios are contained in Figures 20 and 21.

The results of the analysis of the background and total traffic volume scenarios are summarized in the following table. The analysis shows that the intersections are expected to operate at acceptable levels of service except for the Industrial Lane intersection in the total traffic volume scenarios. That intersection is expected to operate at LOS F during the morning and evening peak hours. The level of service for intersections with side-street stop-control is determined by the movement with the highest delay value.

Year 2031 Traffic Conditions

Intersection	Control	Background		Total	
		AM	PM	AM	PM
1 - Wyarno Road / Industrial Lane / West Site Access	Side-Street Stop	C	C	F	F
2 - Wyarno Road / Wildcat Road	Side-Street Stop	A	A	B	B
3 - Wyarno Road / East Access	Side-Street Stop	---		B	B

The detailed analysis results are summarized in Table 2 and the VISTRO analysis results are contained in Appendix B. The laneage and traffic control assumed in the analysis are contained in Figure 22.

8.0 Year 2034 Traffic Conditions

Phase III is expected to be completed in Year 2034. The volume scenarios for this horizon were completed in the same manner as the Year 2026 traffic volume scenarios (see Section 6.0). The background traffic volume scenarios are contained in Figures 23 and 24, and the total traffic volume scenarios are contained in Figures 25 and 26.

The results of the analysis of the background and total traffic volume scenarios are summarized in the following table. The analysis shows that the Industrial Lane intersection is expected to operate at LOS F during both peak hours in the background and total traffic volume scenarios. The other intersections are expected to operate at LOS B. The level of service for intersections with side-street stop-control is determined by the movement with the highest delay value. It isn't unusual for stop controlled approaches on arterial streets to operate poorly.

2034 Traffic Conditions

Intersection	Control	Background		Total	
		AM	PM	AM	PM
1 - Wyarno Road / Industrial Lane / West Site Access	Side-Street Stop	F	F	F	F
2 - Wyarno Road / Wildcat Road	Side-Street Stop	B	B	B	B
3 - Wyarno Road / East Access	Side-Street Stop	B	B	B	B

The detailed analysis results are summarized in Table 2 and the VISTRO analysis results are contained in Appendix B. The laneage and traffic control assumed in the analysis are contained in Figure 22.

9.0 Year 2043 Traffic Conditions

Traffic volume scenarios for the long-term horizon were completed in the same manner as the Year 2026 traffic volume scenarios (see Section 6.0). The background traffic volume scenarios are contained in Figures 27 and 28, and the total traffic volume scenarios are contained in Figures 29 and 30.

The results of the analysis of the background and total traffic volume scenarios are summarized in the following table. The analysis shows that the Industrial Lane intersection is expected to operate at LOS F during both peak hours in the total traffic volume scenarios. The other intersections are expected to operate at LOS A and LOS B. The level of service for intersections with side-street stop-control is determined by the movement with the highest delay value. It isn't unusual for stop controlled approaches on arterial streets to operate poorly.

2043 Traffic Conditions

Intersection	Control	Background		Total	
		AM	PM	AM	PM
1 - Wyarno Road / Industrial Lane / West Site Access	Side-Street Stop	B	A	F	F
2 - Wyarno Road / Wildcat Road	Side-Street Stop	A	A	B	B
3 - Wyarno Road / East Access	Side-Street Stop	---		B	B

The detailed analysis results are summarized in Table 2 and the VISTRO analysis results are contained in Appendix B. The laneage and traffic control assumed in the analysis are contained in Figure 22.

10.0 Auxiliary Lane Analysis

The need for left and right turn deceleration lanes on Wyarno Road was determined based on criteria contained in Chapter 18 of the WYDOT Traffic Studies Manual[6]. Figure 9-36 from A Policy on Geometric Design of Highways and Streets[7] was used to determine the need for left turn deceleration lanes. As shown in Table 6, an eastbound left turn lane will be warranted by development traffic at Industrial Lane and the east access. At Industrial Lane, the traffic from Phase I will warrant the left turn lane. At the east access, the traffic from Phase II will warrant the left turn lane. To review the need for right turn lanes, Figure 18-1 from the WYDOT Traffic Studies Manual was used. Figures 31, 32, and 33 contain a review of the need for right turn lanes. An eastbound right turn lane is currently warranted at Industrial Lane (see Figure 31). Westbound right turn lanes will not be warranted at either access (see Figures 32 and 33).

11.0 Traffic Signal Warrant Study

A traffic signal warrant study was performed to determine if a traffic signal will be warranted at Wyarno Road / Industrial Lane. The study was performed based on the requirements contained in the Manual on Uniform Traffic Control Devices[8]. The peak hour warrants were evaluated.

The following assumptions were used for the analysis.

Speed Limit. The posted speed limit is greater than 40 MPH on Wyarno Road.

Number of Main-Street Lanes. One lane was assumed in each direction on Wyarno Road.

Number of Side-Street Lanes. One side-street lane was assumed on the Industrial Lane approaches.

Side-Street Right Turning Traffic. 50% of the side-street right turning traffic was included in the warrant analysis because some vehicles will be able to turn into gaps in traffic without the aid of a traffic signal.

The analysis shows that a traffic signal is not expected to be warranted by the Year 2043 total traffic volumes. The signal warrant analysis is contained in Appendix D. Refer to the fourth page of the warrant analysis to see the results.

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6 WYDOT Traffic Studies Manual. Wyoming Department of Transportation. March 2011.

7 A Policy on Geometric Design of Highways and Streets, 7th Edition. American Association of Highways and Streets. 2018.

8 Manual on Uniform Traffic Control Devices. Federal Highway Administration. Revised July 2022.

12.0 Speed Study on Wyarno Road

A speed study was performed on Wyarno Road east of Industrial Lane based on the requirements in Chapter 13 of the WYDOT Traffic Studies Manual. The roadway has posted speed limits of 40 MPH west of Ridge Road and 70 MPH east of Ridge Road. A large radius curve along the frontage of the development has an advisory speed of 50 MPH. Figure 34 summarizes the data collection and the existing speed limits.

Speed data were collected at three locations along the roadway using Jamar radar data collection devices. The data collection locations and results of the data analysis are summarized in the following table. A summary of the speed data is contained in Appendix E.

Location	Data Collection		
	Days	Observations	
		EB	WB
E/O Industrial Lane	10	4,060	4,564
W/O Wildcat Road	2	511	543
E/O Large Radius Curve	2	440	417

While the data were collected with a machine rather than a visual study using a radar gun to only collect the speed of free flowing traffic, the traffic volumes on Wyarno Road are low enough that the majority of the data were collected on vehicles that were free flowing.

The 85th percentile speeds show that speeds are lower near Industrial Lane compared to the data collection locations to the east. The data were processed using the WYDOT Form RT-11 spreadsheet. All of the 85th percentile speeds and recommended speed limits are lower than the 70 MPH speed limit. Considering that the speed limit changes from 70 MPH to 40 MPH at Ridge Road and the 85th percentile speeds and recommended speeds are all lower than 70 MPH, STS recommends that the speed limit be lowered to 60 MPH east of Ridge Road. With the recommended change, the speed change will only be 20 MPH rather than 30 MPH and it will be in line with the 85th percentile speeds and recommended speeds. WYDOT will need to collect additional speed data farther east on Wyarno Road to determine the appropriate speed limit in the foothills.

13.0 Conclusions and Recommendations

The following conclusions were drawn based on the analysis performed for the study.

Intersection Operation.

- **Wyarno Road / Industrial Lane / Site Access.** This intersection is currently operating at LOS A and LOS B. Following the development of Phase I, it is

expected to operate at LOS C. The operation of the intersection is expected to degrade to LOS F following the completion of Phase II. This intersection is assumed to have side-street stop control because it is not expected to warrant signalization. The level of service for intersections with side-street stop-control is determined by the movement with the highest delay value. It isn't unusual for stop controlled approaches on arterial streets to operate poorly.

- **Wyarno Road / Wildcat Road.** This intersection is currently operating at LOS A. The operation of the intersection is expected to transition to LOS B as traffic volumes grow on Wyarno Road.
- **Wyarno Road / East Access.** This intersection is expected to operate at LOS B through the Year 2043 total traffic volume scenarios.

Auxiliary Lane Analysis. The need for auxiliary lanes was reviewed based on criteria contained in Chapter 18 of the WYDOT Traffic Studies Manual. An eastbound left turn lane will be warranted at Industrial Lane and the east access by the development of the Story House project. A right turn lane is currently warranted for eastbound Wyarno Road at Industrial Lane.

Traffic Signal Warrant Study. A traffic signal is not expected to be warranted at Wyarno Road / Industrial Lane through the Year 2043 total traffic volume scenarios.

Speed Study on Wyarno Road. Spot speed data were collected at three locations on Wyarno Road for the purpose of reviewing the 70 MPH speed limit east of Ridge Road. The 85th percentile speeds ranged from 56 MPH to 66 MPH and the recommended speed limits ranged from 55 MPH to 65 MPH. STS recommends that WYDOT lower the speed limit to 60 MPH east of Ridge Road.

Tables

Table 1 – Estimated Daily Volumes for Key Links in the Study Area
Table 2 – Intersection Operational Summary
Table 3 – Trip Generation Estimate – Phase I
Table 4 – Trip Generation Estimate – Phase I + II
Table 5 – Trip Generation Estimate – Phase I + II + III
Table 6 – Need for Left Turn Lanes on Wyarno Road

This table is formatted to be printed on 11" x 17" paper.

Table 1. Estimated Daily Volumes for Key Links in the Study Area

Link	Year 2023 [1]	Phase I Development	Year 2026 Background Traffic	Year 2026 Total Traffic	Phase I + II Development	Year 2031 Background Traffic	Year 2031 Total Traffic	Phase I + II + III Development	Year 2034 Background Traffic	Year 2034 Total Traffic	Year 2043 Background	Year 2043 Total
Wyarno Road west of Industrial Lane	1,970	2,930	2,010	4,940	7,030	2,070	9,100	7,510	2,100	9,610	2,220	9,730
Wyarno Road East of Industrial Lane	1,130	150	1,150	1,300	2,960	1,190	4,150	3,160	1,210	4,370	1,270	4,430
Wyarno Road west of the East Access	1,060	150	1,080	1,230	2,960	1,110	4,070	3,160	1,130	4,290	1,190	4,350
Wyarno Road east of the East Access	800	150	810	960	370	840	1,210	400	850	1,250	900	1,300
West Access north of Wyarno Road	0	3,090	0	3,090	4,440	0	4,440	4,750	0	4,750	0	4,750
East Access north of Wyarno Road	0	0	0	0	2,960	0	2,960	3,160	0	3,160	0	3,160
Industrial Lane south of Wyarno Road	900	0	920	920	0	940	940	0	960	960	1,010	1,010

1. The Year 2023 daily volumes were estimated using the peak hour to daily ratio for the evening peak hour.

Table 2. Intersection Operational Summary

Stop-Controlled Intersections [1]	Year 2021 Factored				Year 2026 Background				Year 2026 Total				Year 2031 Background				Year 2031 Total			
	Morning		Evening		Morning		Evening		Morning		Evening		Morning		Evening		Morning		Evening	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1 - Wyarno Road / Industrial Lane / West Site Access	10.20	B	9.80	A	10.00	A	9.70	A	18.40	C	18.10	C	18.50	C	18.30	C	156.50	F	66.00	F
	NBLT		NBLT		NBLT		NBLT		NBLT		NBLT		NBLT		NBLT		NBLT		NBLT	
2 - Wyarno Road / Wildcat Road	9.00	A	9.30	A	9.10	A	9.30	A	9.10	A	9.80	A	9.20	A	9.40	A	11.30	B	12.70	B
	NBLT		NBLT		NBLT		NBLT		NBLT		NBLT		NBLT		NBLT		NBLT		NBLT	
3 - Wyarno Road / East Access	---				---				---				---				12.30	B	11.30	B
																	EBLT		EBLT	

Stop-Controlled Intersections [1]	Year 2034 Background				Year 2034 Total				Year 2043 Background				Year 2043 Total			
	Morning		Evening		Morning		Evening		Morning		Evening		Morning		Evening	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1 - Wyarno Road / Industrial Lane / West Site Access	165.60	F	67.90	F	211.80	F	95.50	F	10.20	B	10.00	A	246.40	F	113.80	F
	NBLT		NBLT		NBLT		NBLT		NBLT		NBLT		NBLT		NBLT	
2 - Wyarno Road / Wildcat Road	11.30	B	12.70	B	11.50	B	13.10	B	9.10	A	9.40	A	11.60	B	13.20	B
	NBLT		NBLT		NBLT		NBLT		NBLT		NBLT		NBLT		NBLT	
3 - Wyarno Road / East Access	12.30	B	11.40	B	12.40	B	11.70	B	---				12.40	B	11.70	B
	EBLT		EBLT		EBLT		EBLT						EBLT		EBLT	

Notes

1. The level of service for intersections with side-street stop-control is determined by the movement with the highest delay value.

This table is formatted to be printed on 11" x 17" paper.

Table 3. Trip Generation Estimate - Phase I

Pad	Land Use	ITE Code [1]	Size	Unit	Average Daily Trips				Morning Peak Hour Trips				Evening Peak Hour Trips			
					Rate	Total	In	Out	Rate	Total	In	Out	Rate	Total	In	Out
1	Multifamily Housing (Mid-Rise)	221	171	DU	4.54	776	388	388	0.37	63	15	48	0.39	67	41	26
	Mini-Warehouse [2]	151	65.3	1,000 ft^2	1.45	94	47	47	0.09	5	3	2	0.15	10	5	5
2	Single-Family Attached Housing [3]	215	17.4	DU	7.2	126	63	63	0.48	8	2	6	0.57	10	6	4
	Strip Retail Plaza (<40k) [3]	822	8.7	1,000 ft^2	54.45	474	237	237	2.36	21	12	9	6.59	58	29	29
	General Office Building [3]	710	8.7	1,000 ft^2	10.84	94	47	47	1.52	13	12	1	1.44	13	2	11
3	Single-Family Attached Housing [3]	215	17.4	DU	7.2	124	62	62	0.48	8	2	6	0.57	10	6	4
	Strip Retail Plaza (<40k) [3]	822	8.7	1,000 ft^2	54.45	474	237	237	2.36	21	12	9	6.59	58	29	29
	General Office Building [3]	710	8.7	1,000 ft^2	10.84	94	47	47	1.52	13	12	1	1.44	13	2	11
4	Single-Family Detached Housing	210	14	DU	9.43	132	66	66	0.7	10	2	8	0.94	13	8	5
5	Single-Family Attached Housing	215	60	DU	7.2	432	216	216	0.48	29	7	22	0.57	34	20	14
6	Single-Family Attached Housing	215	48	DU	7.2	346	173	173	0.48	23	6	17	0.57	27	16	11
7	Single-Family Detached Housing	210	46	DU	9.43	434	217	217	0.7	32	8	24	0.94	43	27	16
	Single-Family Attached Housing	215	15	DU	7.2	108	54	54	0.48	7	2	5	0.57	9	5	4
8	General Office Building [3]	710	7.1	1,000 ft^2	10.84	78	39	39	1.52	11	10	1	1.44	10	2	8
---	Internal Capture [4]	---	---	---	---	-700	-350	-350	---	-26	-13	-13	---	-102	-51	-51
---	**Total**	**---**	**---**	**---**	**---**	**3,086**	**1,543**	**1,543**	**---**	**239**	**92**	**146**	**---**	**273**	**146**	**126**

Notes:

1. The trip generation estimate is based on rates contained in Trip Generation, 11th Edition (Institute of Transportation Engineers, September 2021).
2. A 0.75 FAR was assumed.
3. A 0.2 FAR was assumed. The second floor condos were assumed to be 1,000 ft^2.
4. The internal capture was estimated using the NCHRP 684 Internal Capture Estimation Tool.

Table 4. Trip Generation Estimate - Phase I + Phase II

Land Use	ITE Code [1]	Size	Unit	Average Daily Trips				Morning Peak Hour Trips				Evening Peak Hour Trips			
				Rate	Total	In	Out	Rate	Total	In	Out	Rate	Total	In	Out
Single-Family Detached Housing	210	12	DU	9.43	114	57	57	0.7	8	2	6	0.94	11	7	4
Single-Family Attached Housing	215	48	DU	7.2	346	173	173	0.48	23	6	17	0.57	27	16	11
Single Tenant Office Building	715	60	Employees	3.85	232	116	116	0.54	32	29	3	0.51	31	5	26
Single-Family Attached Housing	215	40	DU	7.2	288	144	144	0.48	19	5	14	0.57	23	13	10
General Light Industrial [2]	110	60.9	1,000 ft^2	4.87	298	149	149	0.74	45	40	5	0.65	40	6	34
Strip Retail Plaza (<40k) [3]	822	21.75	1,000 ft^2	54.45	1,184	592	592	2.36	51	31	20	6.59	144	72	72
General Office Building [3]	710	21.75	1,000 ft^2	10.84	236	118	118	1.52	33	29	4	1.44	31	5	26
Strip Retail Plaza (<40k) [3]	822	29.15	1,000 ft^2	54.45	1,588	794	794	2.36	69	41	28	6.59	192	96	96
Supermarket	850	10	1,000 ft^2	93.84	938	469	469	2.86	29	17	12	8.95	90	45	45
Hotel	320	100	Rooms	3.35	336	168	168	0.35	35	13	22	0.36	36	19	17
General Light Industrial [3]	110	191.4	1,000 ft^2	4.87	932	466	466	0.74	142	125	17	0.65	124	17	107
Phase 1	---	---	---	---	3,786	1,893	1,893	---	265	105	159	---	375	197	177
Internal Capture [4]	---	---	---	---	-2,878	-1,439	-1,439	---	-120	-60	-60	---	-444	-222	-222
Total	**---**	**---**	**---**	**---**	**7,401**	**3,700**	**3,700**	**---**	**631**	**383**	**247**	**---**	**680**	**276**	**403**

Notes:

1. The trip generation estimate is based on rates contained in Trip Generation, 11th Edition (Institute of Transportation Engineers, September 2021).

2. A 0.1 FAR was assumed.

3. A 0.2 FAR was assumed.

4. The internal capture was estimated using the NCHRP 684 Internal Capture Estimation Tool.

Table 5. Trip Generation Estimate - Phase I + Phase II + Phase III

Land Use	ITE Code [1]	Size	Unit	Average Daily Trips				Morning Peak Hour Trips				Evening Peak Hour Trips			
				Rate	Total	In	Out	Rate	Total	In	Out	Rate	Total	In	Out
Single Family Detached Housing	210	54	DU	9.43	510	255	255	0.7	38	9	29	0.94	51	32	19
Phase I + Phase II	---	---	---	---	7,401	3,700	3,700	---	631	383	247	---	680	276	403
Total	---	---	---	---	7,911	3,955	3,955	---	669	392	276	---	731	308	422

Notes:

1. The trip generation estimate is based on rates contained in Trip Generation, 10th Edition (Institute of Transportation Engineers, September 2017).

Table 6. Need for Left Turn Lanes on Wyarno Road

Industrial Lane

Peak Hour	Volume				EBLT Warranted?	WBLT Warranted?
	EBLT	EB Total	WBLT	WB Total		
2026 Total AM	87	230	0	59	Yes	No
2026 Total PM	139	307	0	42	Yes	No
2031 Total AM	218	494	0	158	Yes	No
2031 Total PM	157	192	0	189	Yes	No
2034 Total AM	223	505	0	170	Yes	No
2034 Total PM	176	382	0	202	Yes	No
2043 Total AM	223	516	0	180	Yes	No
2043 Total PM	176	388	0	209	Yes	No

East Access

Peak Hour	Volume		EBLT Warranted?
	EBLT	EB Total	
2031 Total AM	146	174	Yes
2031 Total PM	105	165	Yes
2034 Total AM	149	178	Yes
2034 Total PM	117	178	Yes
2043 Total AM	149	180	Yes
2043 Total PM	117	181	Yes

Figures

Figure 1 – Vicinity Map
Figure 2 – Site Plan
Figure 3 – Laneage and Traffic Control – Existing
Figure 4 – Existing Traffic Volumes – Morning Peak Hour
Figure 5 – Existing Traffic Volumes – Evening Peak Hour
Figure 6 – Trip Distribution
Figure 7 – Phase I Trip Assignment – Morning Peak Hour
Figure 8 – Phase I Trip Assignment – Evening Peak Hour
Figure 9 – Phase I + II Trip Assignment – Morning Peak Hour
Figure 10 – Phase I + II Trip Assignment – Evening Peak Hour
Figure 11 – Phase I + II + III Trip Assignment – Morning Peak Hour
Figure 12 – Phase I + II + III Trip Assignment – Evening Peak Hour
Figure 13 – Year 2026 Background Traffic Volumes – Morning Peak Hour
Figure 14 – Year 2026 Background Traffic Volumes – Evening Peak Hour
Figure 15 – Year 2026 Total Traffic Volumes – Morning Peak Hour
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Figure 17 – Laneage and Traffic Control – Year 2026
Figure 18 – Year 2031 Background Traffic Volumes – Morning Peak Hour
Figure 19 – Year 2031 Background Traffic Volumes – Evening Peak Hour
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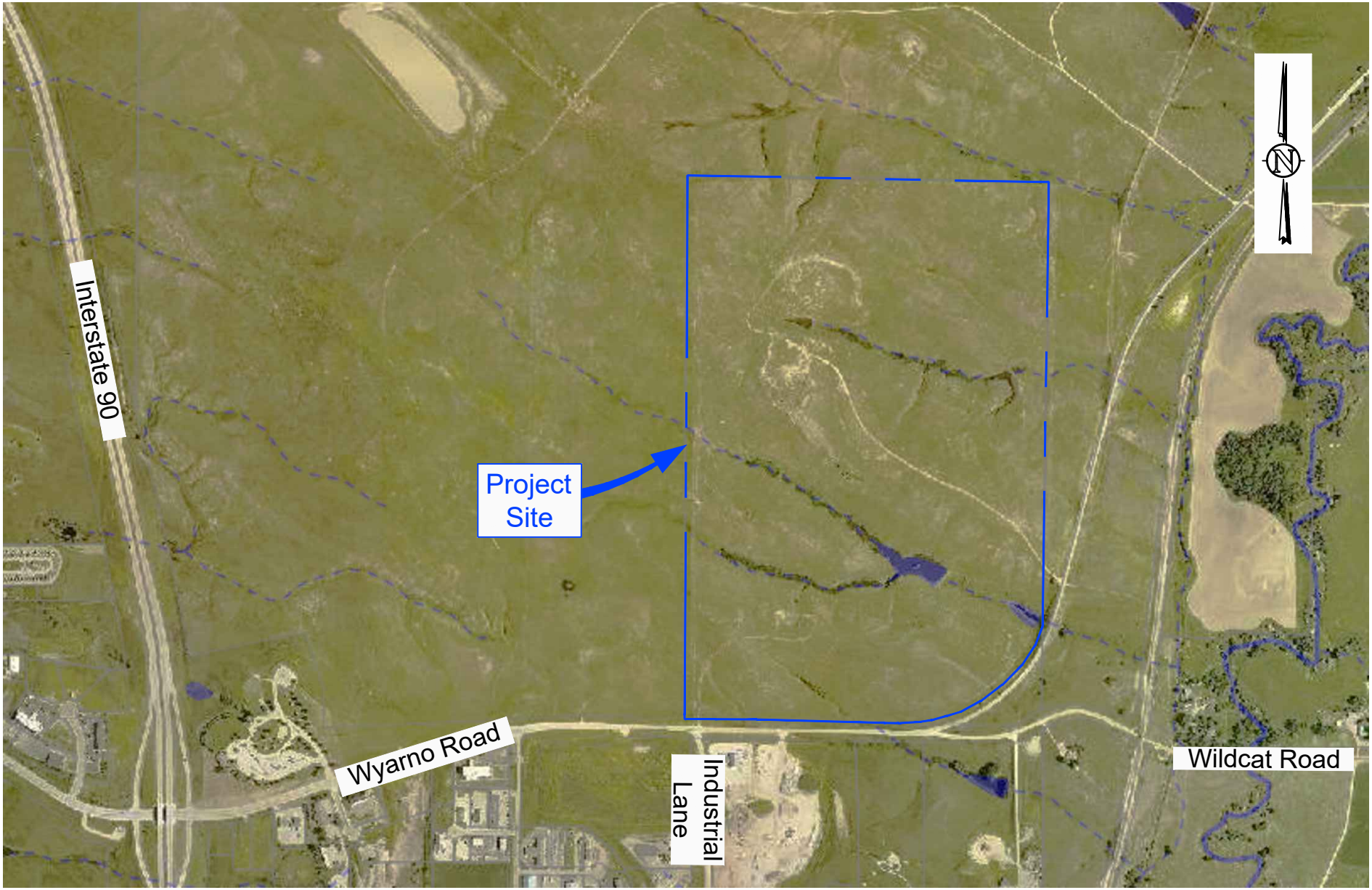
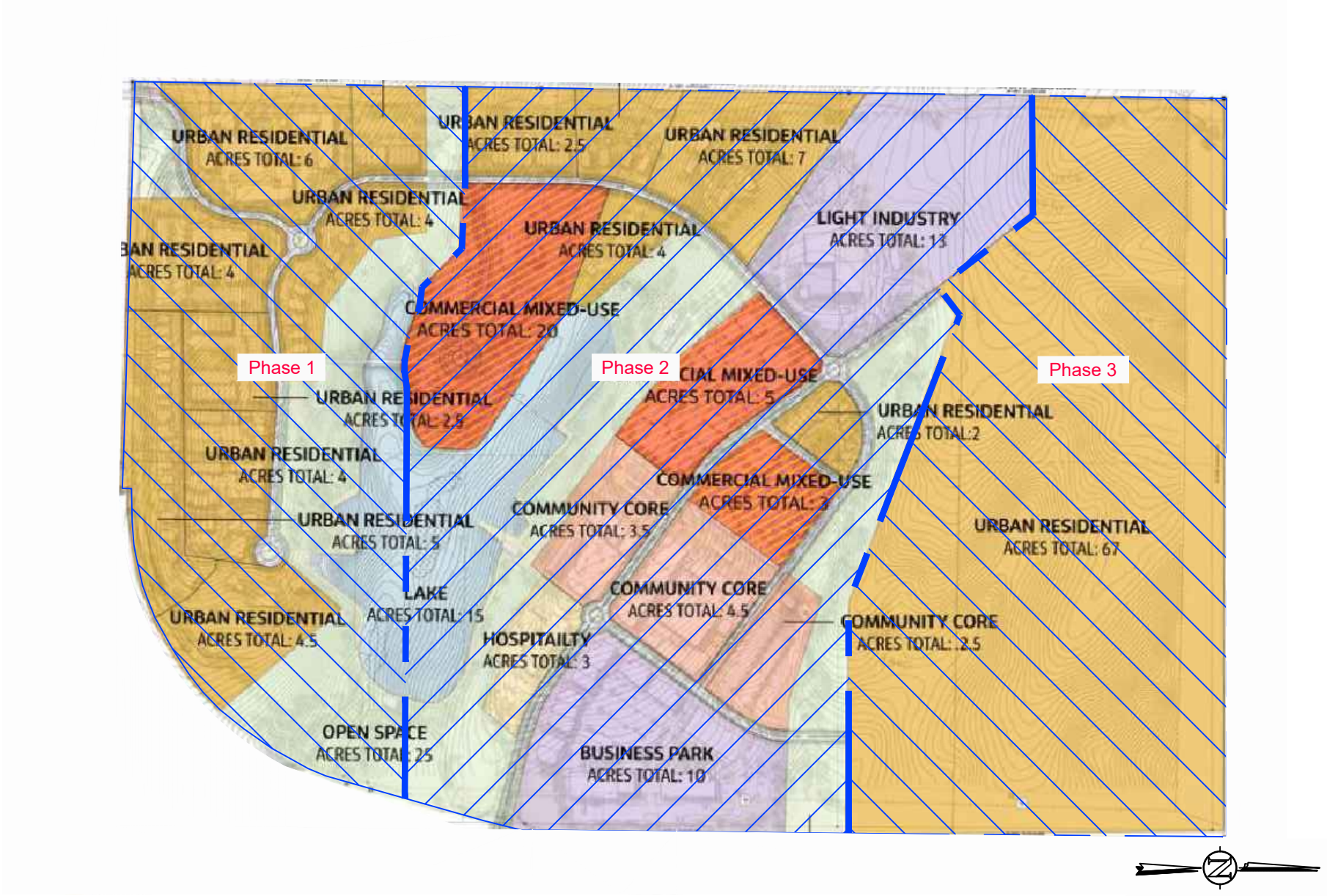
Figure 23 – Year 2034 Background Traffic Volumes – Morning Peak Hour
Figure 24 – Year 2034 Background Traffic Volumes – Evening Peak Hour
Figure 25 – Year 2034 Total Traffic Volumes – Morning Peak Hour
Figure 26 – Year 2034 Total Traffic Volumes – Evening Peak Hour
Figure 27 – Year 2043 Background Traffic Volumes – Morning Peak Hour
Figure 28 – Year 2043 Background Traffic Volumes – Evening Peak Hour
Figure 29 – Year 2043 Total Traffic Volumes – Morning Peak Hour
Figure 30 – Year 2043 Total Traffic Volumes – Evening Peak Hour

Figure 31 – Need for an Eastbound Right Turn Lane at Industrial Lane
Figure 32 – Need for a Westbound Right Turn Lane at Industrial Lane
Figure 33 – Need for a Westbound Right Turn Lane at the East Access
Figure 34 – Wyarno Road Speed Study



Story House Traffic Impact Study
VICINITY MAP

Scale	1" = 1,000'	Date	October 6, 2023	Drawn by	JLH	Job #	WWC Engineering	Figure	1



Story House Traffic Impact Study
SITE PLAN

Scale	NTS	Date	October 6, 2023	Drawn by	JLH	Job #	WWC Engineering	Figure	2

Figure 3 – Laneage and Traffic Control – Existing

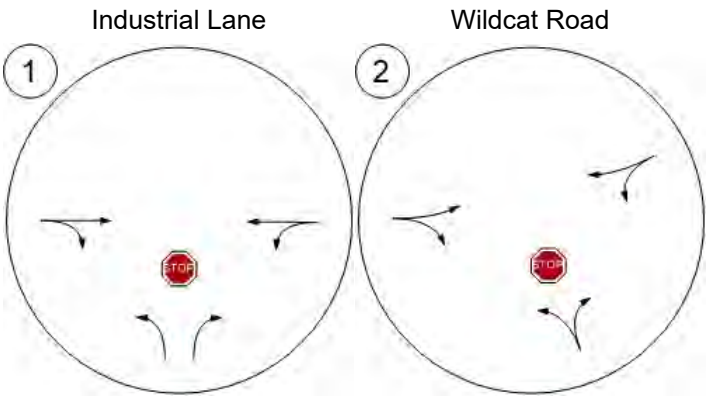


Figure 4 – Existing Traffic Volumes – Morning Peak Hour

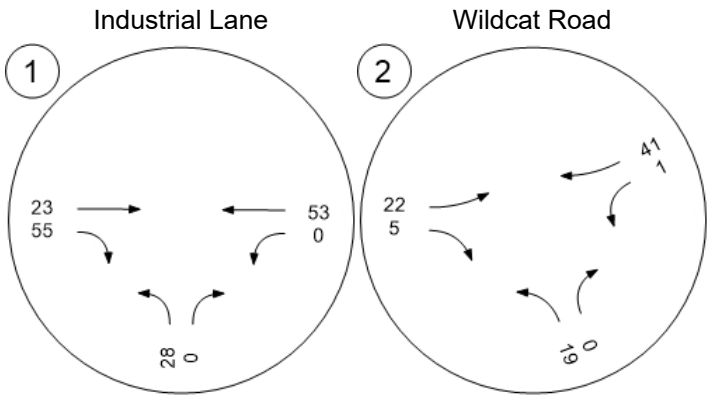
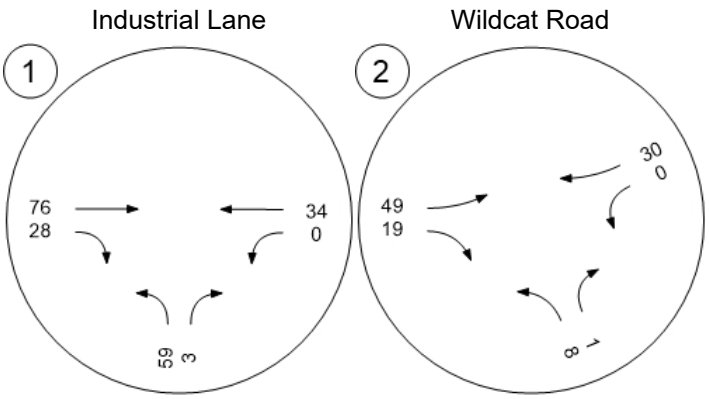
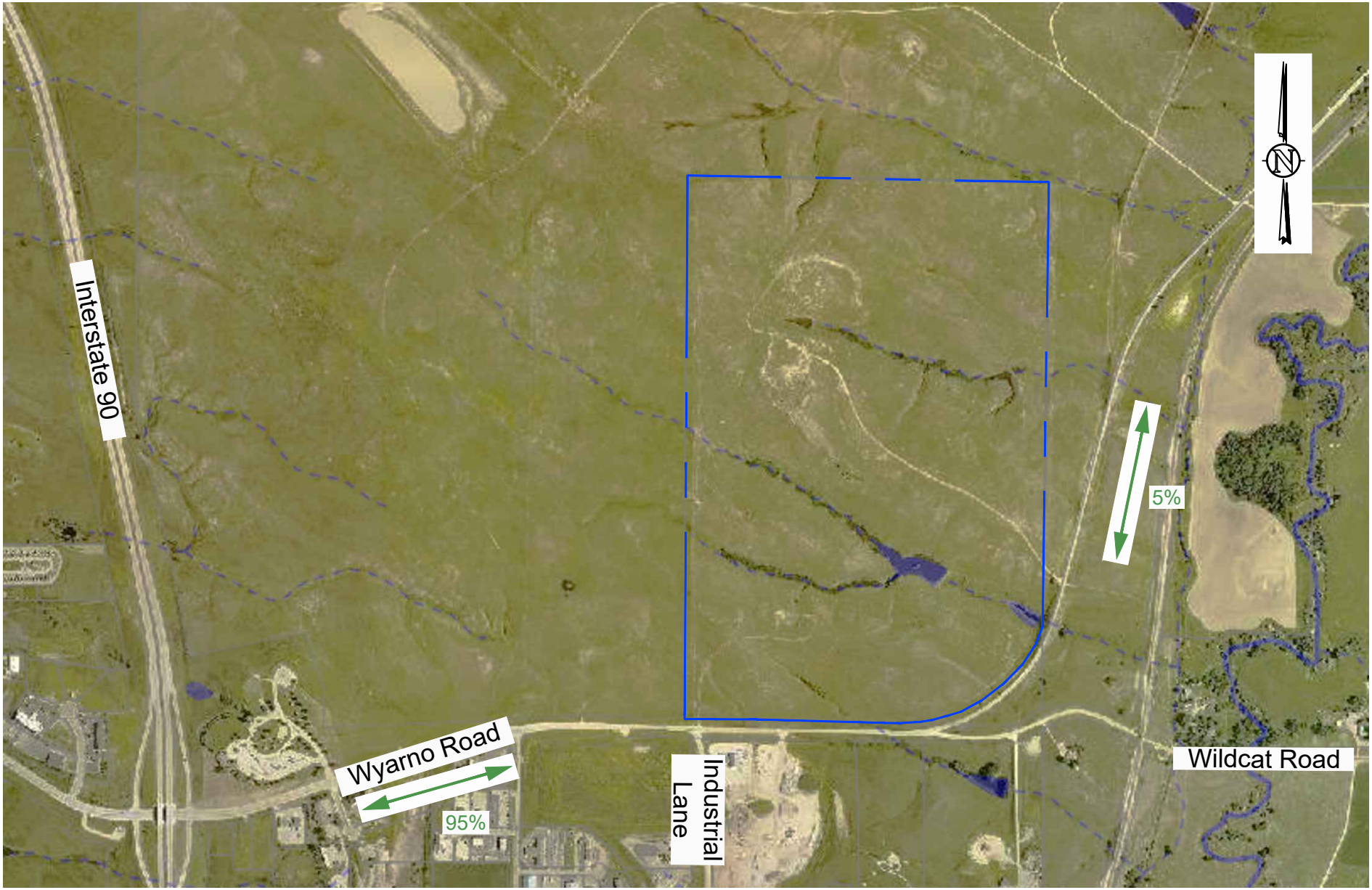


Figure 5 – Existing Traffic Volumes – Evening Peak Hour





Story House Traffic Impact Study
TRIP DISTRIBUTION

Scale	1" = 1,000'	Date	October 6, 2023	Drawn by	JLH	Job #	WWC Engineering	Figure	6

Figure 7 – Phase I Trip Assignment – Morning Peak Hour

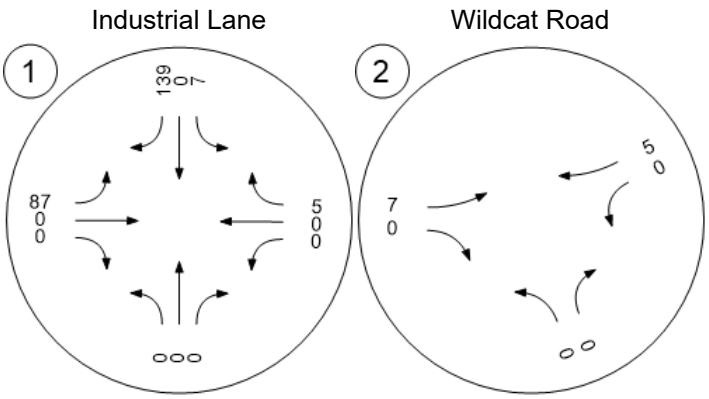


Figure 8 – Phase I Trip Assignment – Evening Peak Hour

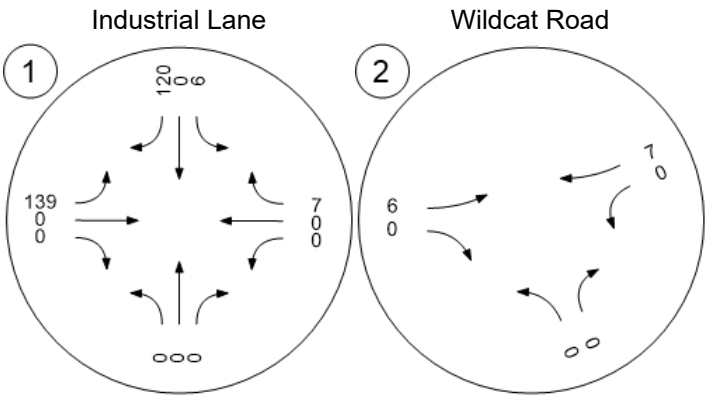


Figure 9 – Phase I + II Trip Assignment – Morning Peak Hour

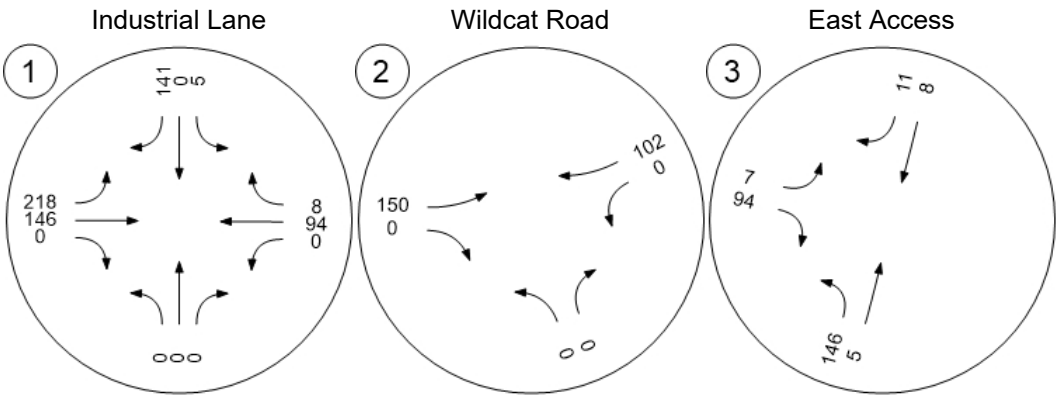


Figure 10 – Phase I + II Trip Assignment – Evening Peak Hour

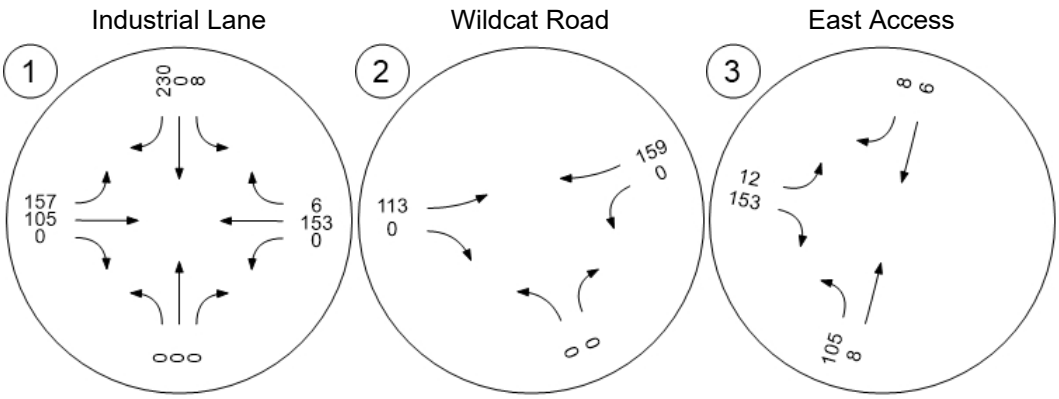


Figure 11 – Phase I + II + III Trip Assignment – Morning Peak Hour

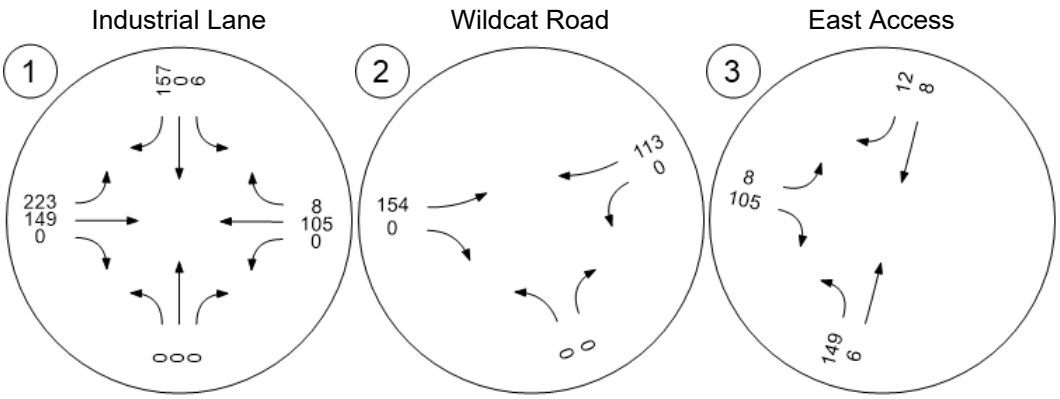


Figure 12 – Phase I + II + III Trip Assignment – Evening Peak Hour

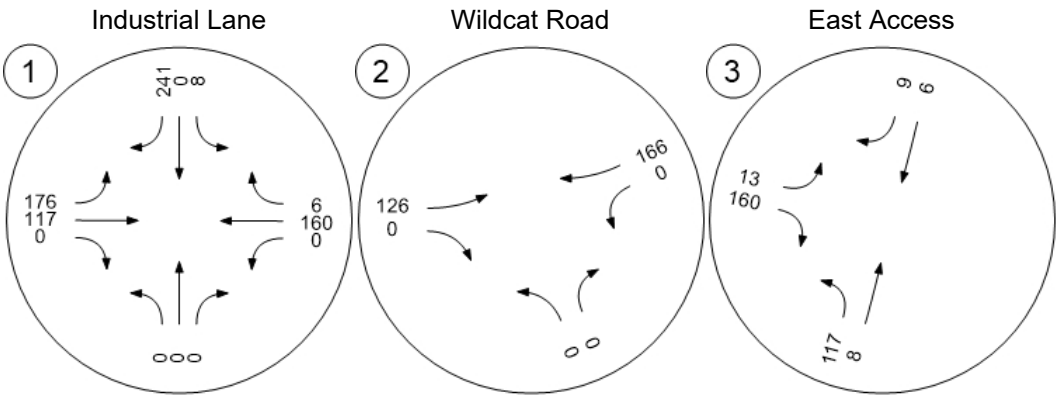


Figure 13 – Year 2026 Background Traffic Volumes – Morning Peak Hour

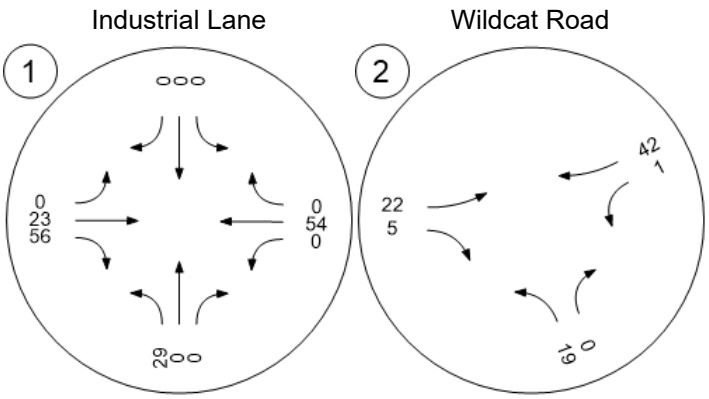


Figure 14 – Year 2026 Background Traffic Volumes – Evening Peak Hour

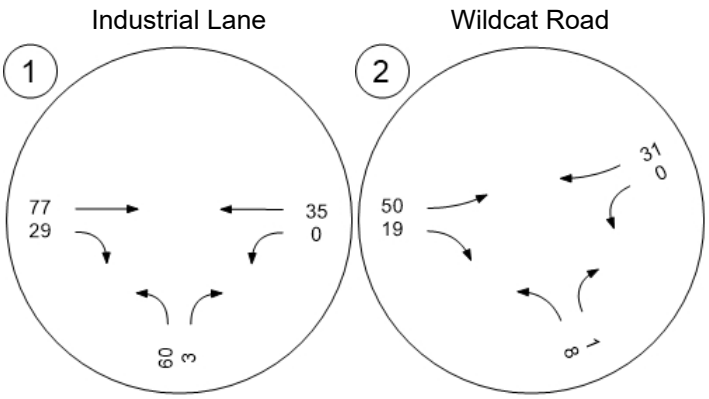


Figure 15 – Year 2026 Total Traffic Volumes – Morning Peak Hour

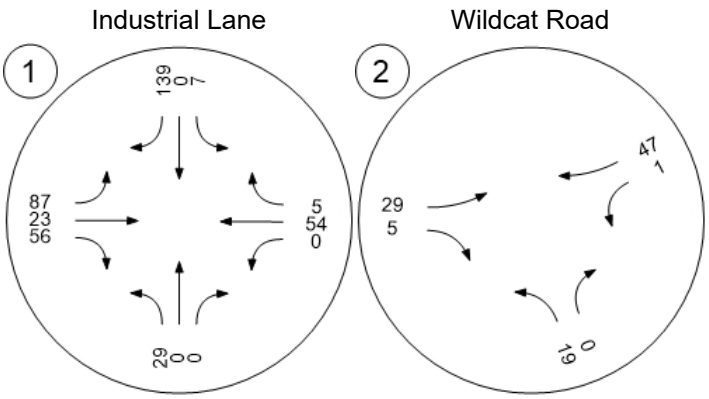


Figure 16 – Year 2026 Total Traffic Volumes – Evening Peak Hour

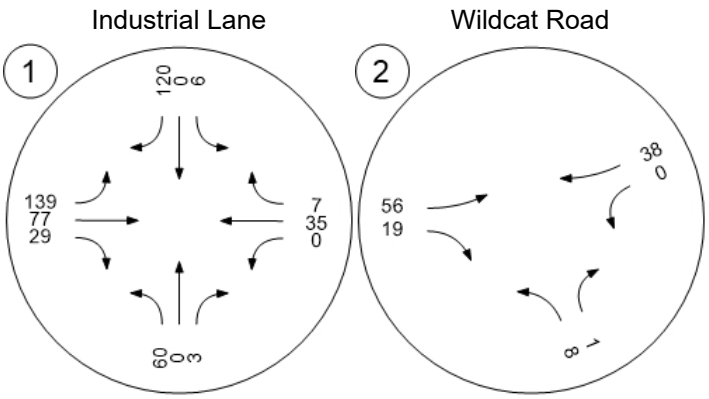


Figure 17 – Laneage and Traffic Control – Year 2026

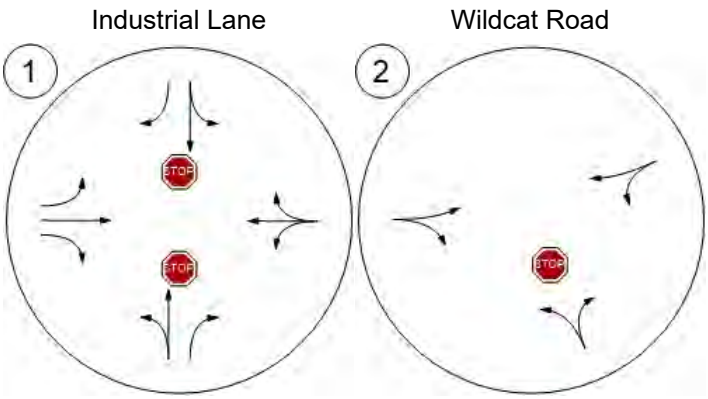


Figure 18 – Year 2031 Background Traffic Volumes – Morning Peak Hour

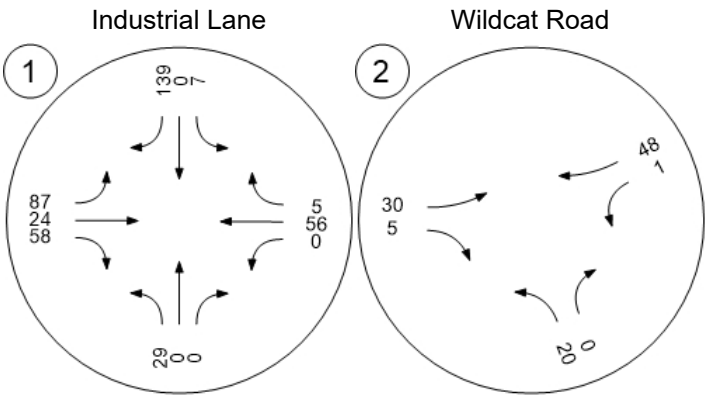


Figure 19 – Year 2031 Background Traffic Volumes – Evening Peak Hour

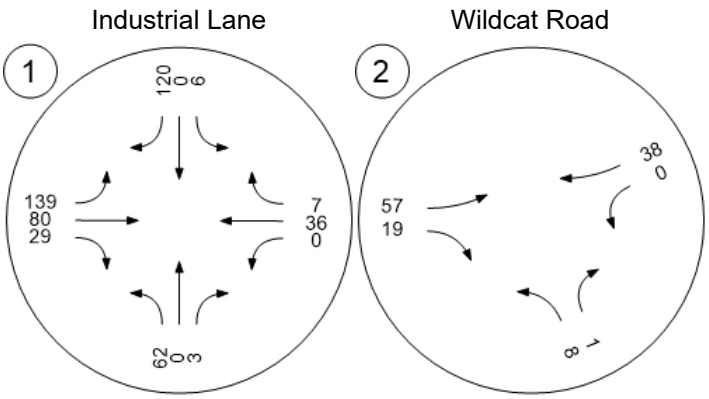


Figure 20 – Year 2031 Total Traffic Volumes – Morning Peak Hour

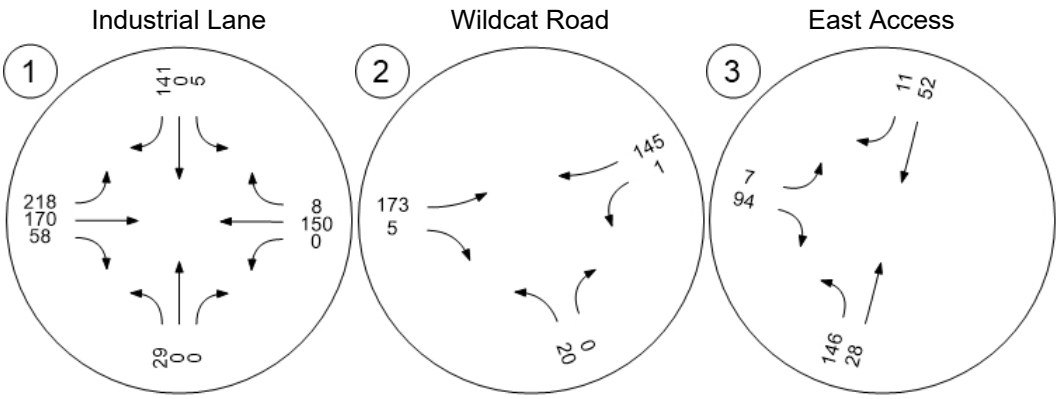


Figure 21 – Year 2031 Total Traffic Volumes – Evening Peak Hour

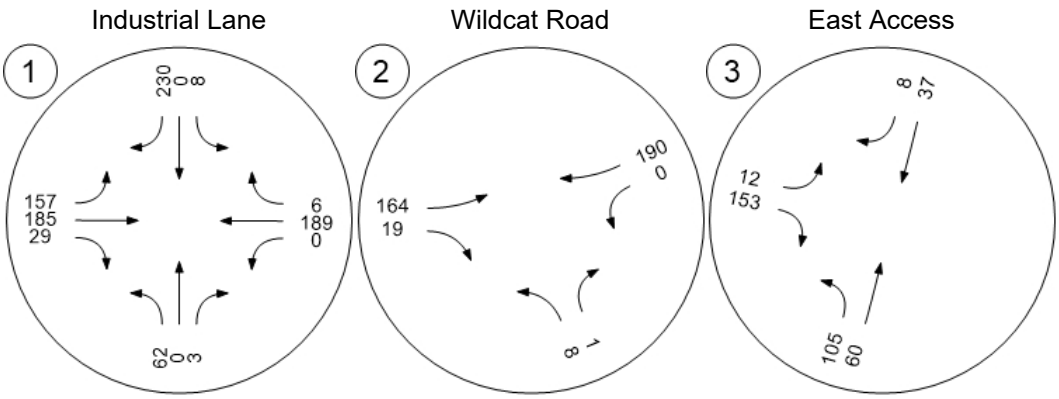


Figure 22 – Laneage and Traffic Control – Year 2031

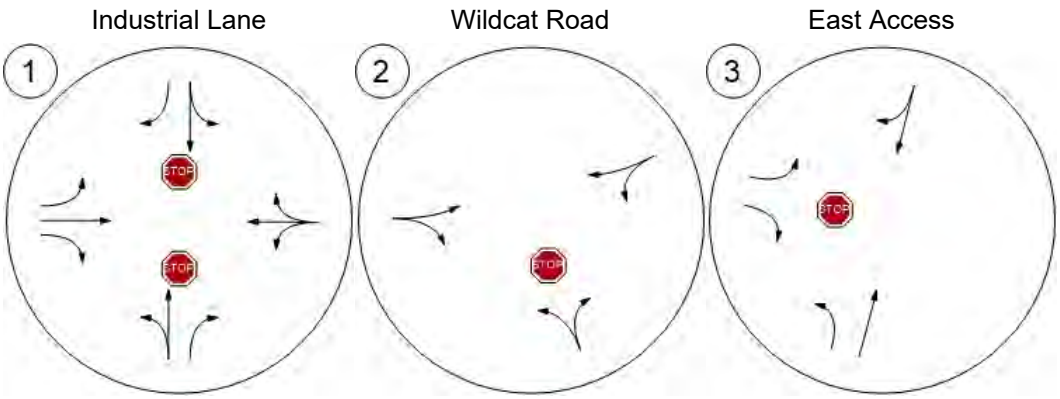


Figure 23 – Year 2034 Background Traffic Volumes – Morning Peak Hour

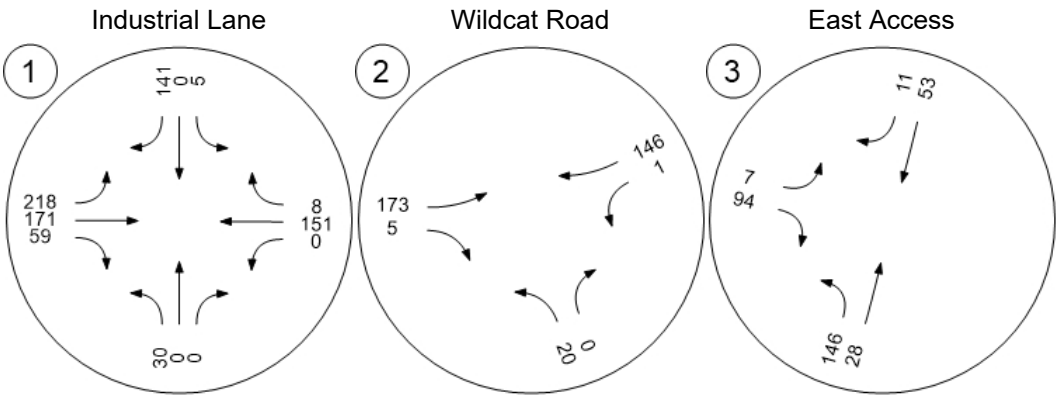


Figure 24 – Year 2034 Background Traffic Volumes – Evening Peak Hour

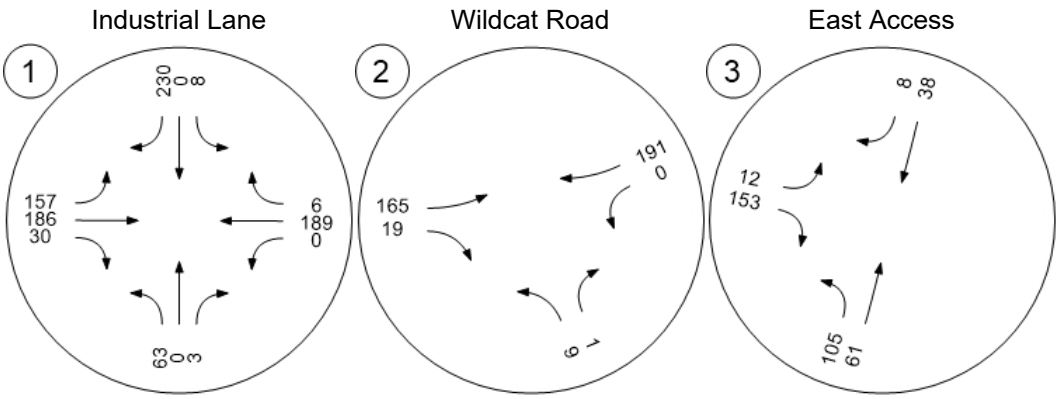


Figure 25 – Year 2034 Total Traffic Volumes – Morning Peak Hour

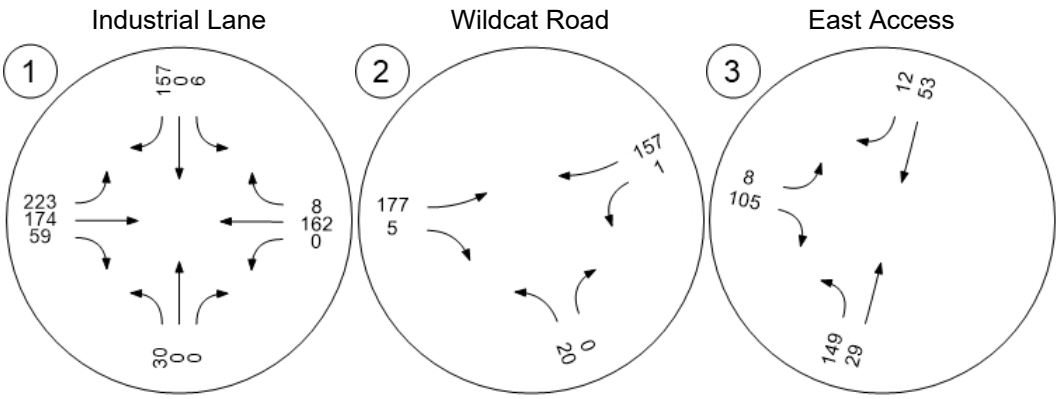


Figure 26 – Year 2034 Total Traffic Volumes – Evening Peak Hour

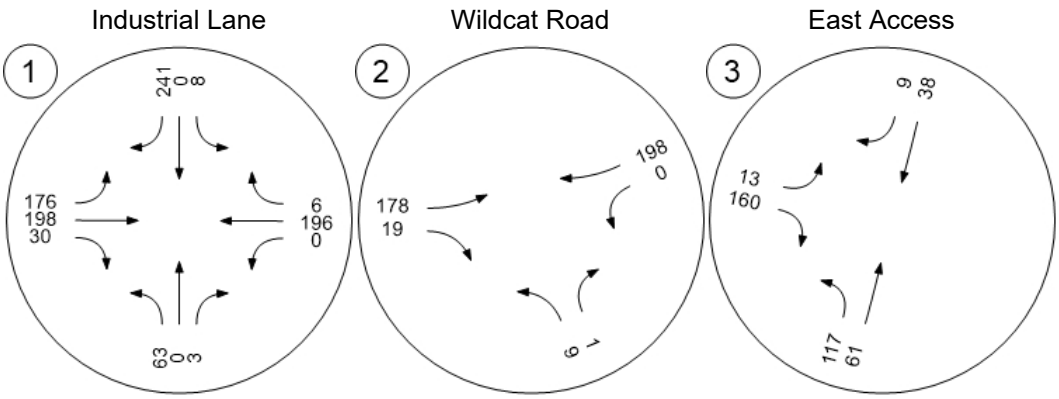


Figure 27 – Year 2043 Background Traffic Volumes – Morning Peak Hour

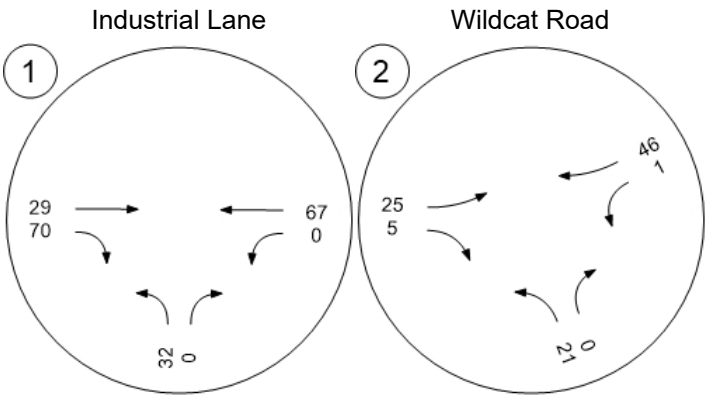


Figure 28 – Year 2043 Background Traffic Volumes – Evening Peak Hour

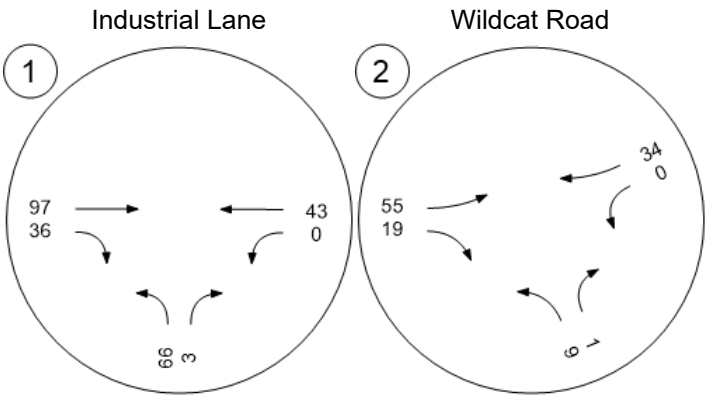


Figure 29 – Year 2043 Total Traffic Volumes – Morning Peak Hour

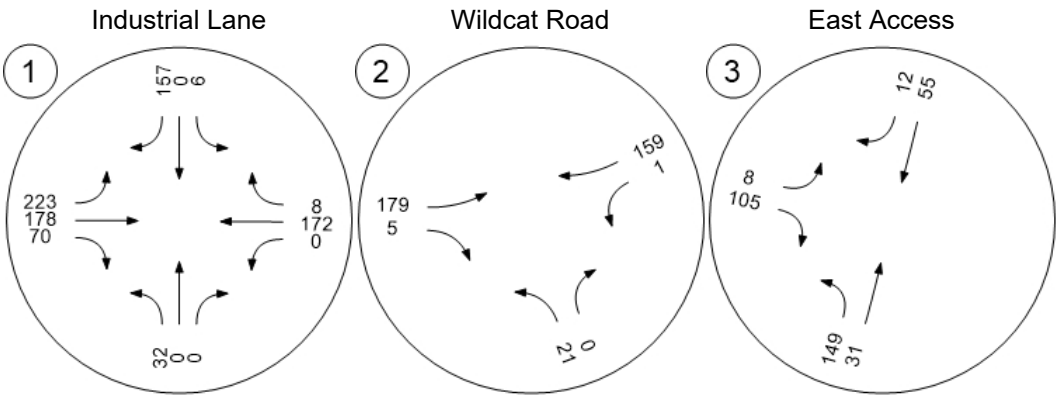


Figure 30 – Year 2043 Total Traffic Volumes – Evening Peak Hour

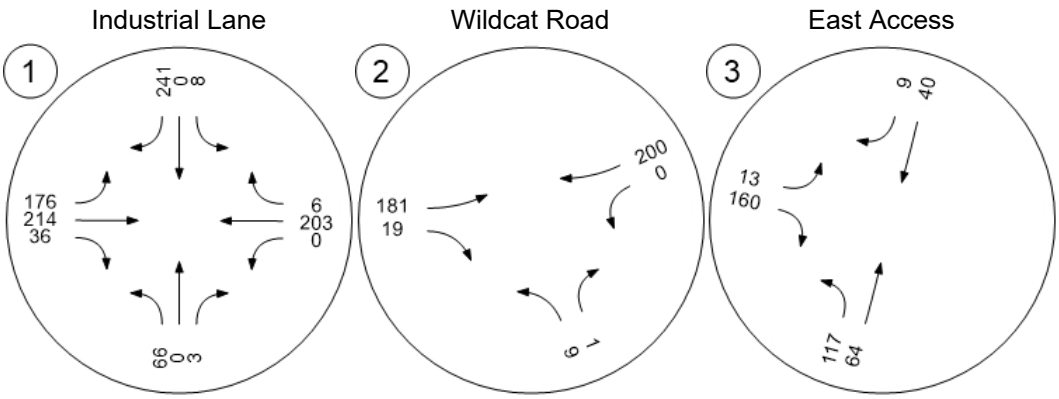
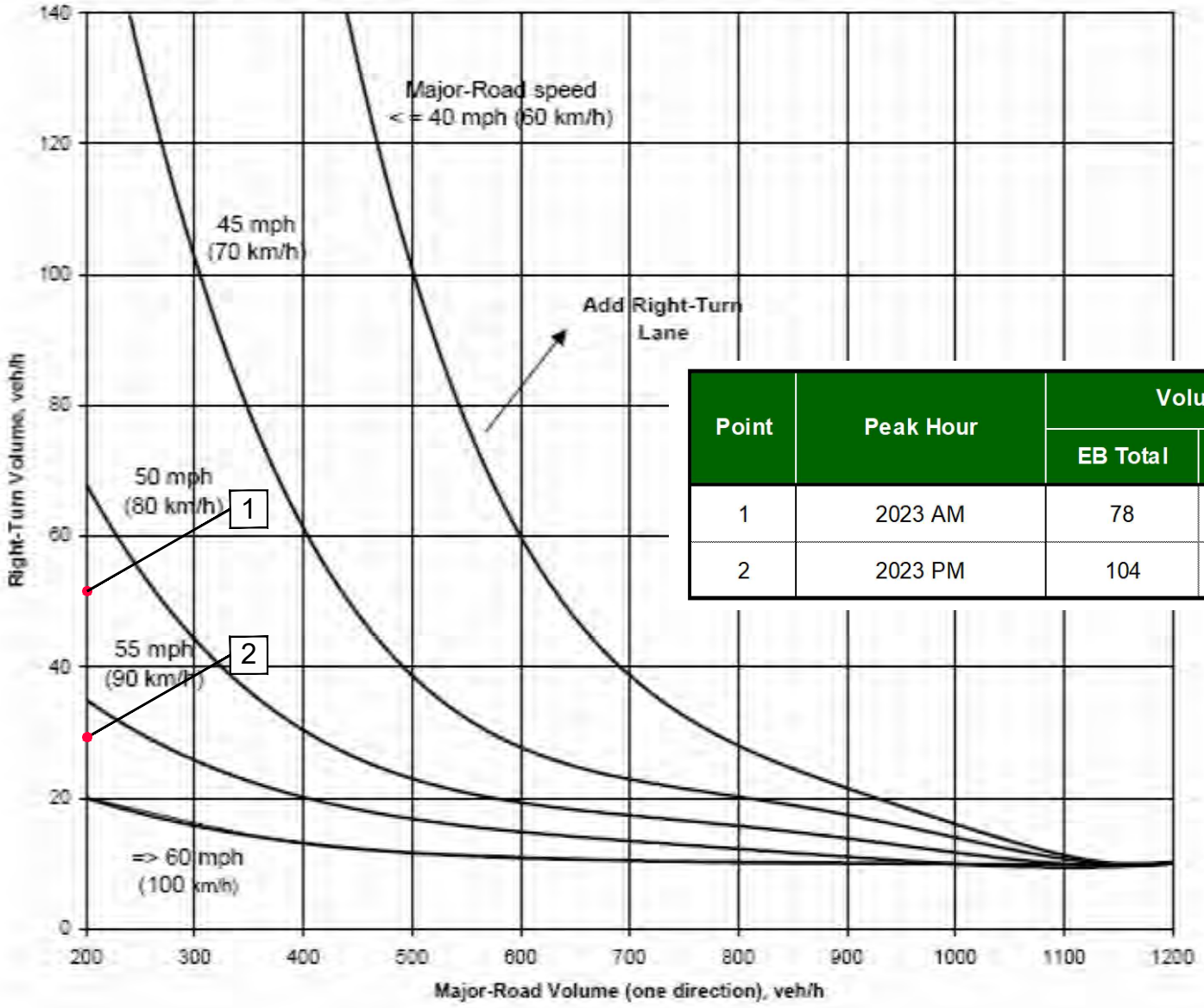


Figure 18-1 Right Turn Lane Guidelines for Two-Lane Highways

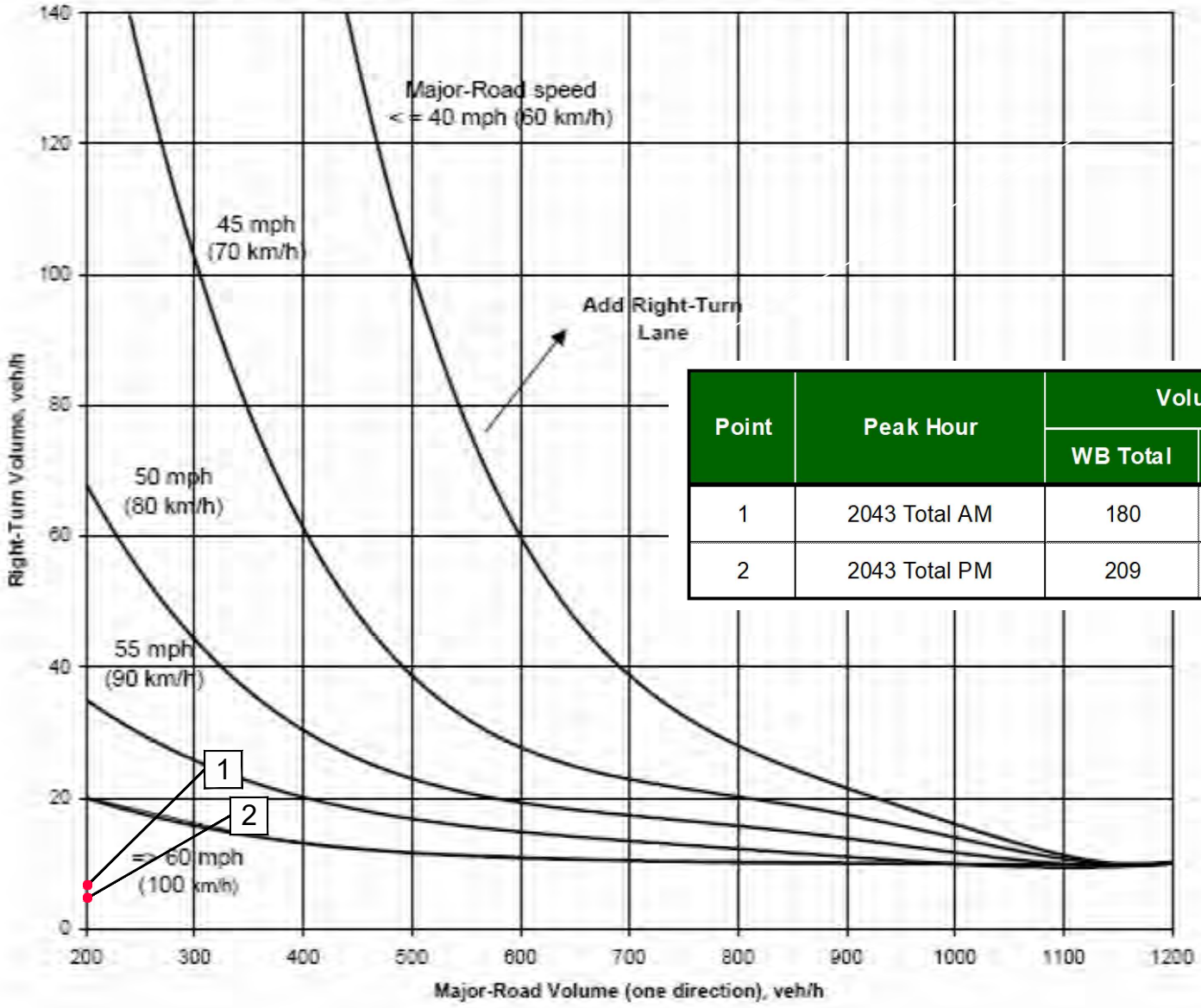


Point	Peak Hour	Volume	
		EB Total	EBRT
1	2023 AM	78	55
2	2023 PM	104	28

Story House Traffic Impact Study
NEED FOR AN EASTBOUND RIGHT TURN LANE AT INDUSTRIAL LANE

Scale	NTS	Date	October 6, 2023	Drawn by	JLH	Job #	WWC Engineering	Figure	31

Figure 18-1 Right Turn Lane Guidelines for Two-Lane Highways



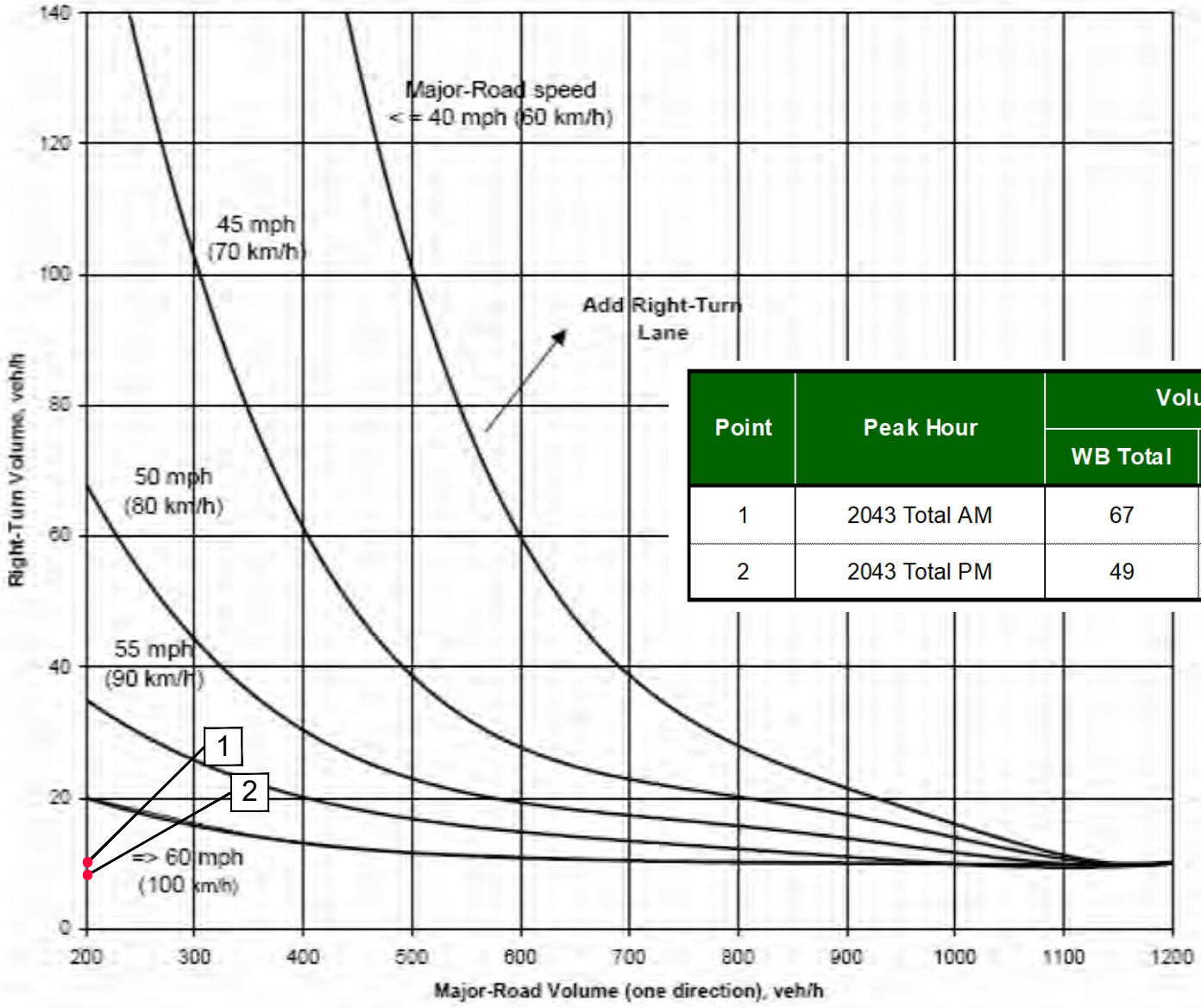
Point	Peak Hour	Volume	
		WB Total	WBRT
1	2043 Total AM	180	8
2	2043 Total PM	209	6

Story House Traffic Impact Study

NEED FOR A WESTBOUND RIGHT TURN LANE AT INDUSTRIAL LANE

Scale	NTS	Date	October 6, 2023	Drawn by	JLH	Job #	WWC Engineering	Figure	32

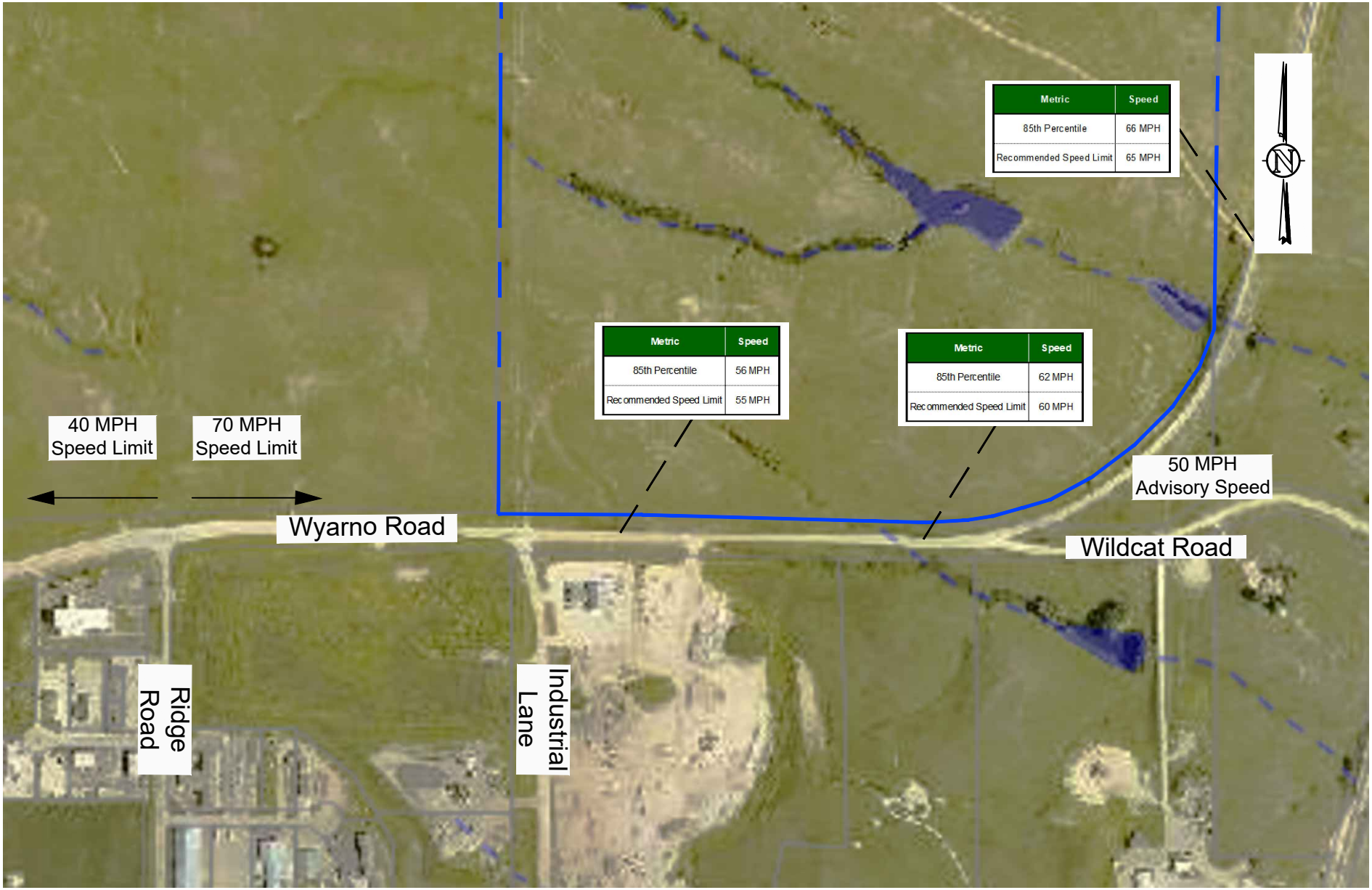
Figure 18-1 Right Turn Lane Guidelines for Two-Lane Highways



Point	Peak Hour	Volume	
		WB Total	WBRT
1	2043 Total AM	67	12
2	2043 Total PM	49	9

Story House Traffic Impact Study
NEED FOR A WESTBOUND RIGHT TURN LANE AT THE EAST ACCESS

Scale	NTS	Date	October 6, 2023	Drawn by	JLH	Job #	WWC Engineering	Figure	33



STS

Story House Traffic Impact Study
WYARNO ROAD SPEED STUDY

Scale	1" = 500'	Date	October 6, 2023	Drawn by	JLH	Job #	WWC Engineering	Figure	34

Appendix A

Traffic Count Data

Industrial Lane

Morning Peak Hour

Date: July 19, 2023 (Wednesday)

Interval Starts	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
6:30	3	0	0	0	0	0	0	8	22	0	9	0
6:45	4	0	0	0	0	0	0	8	24	0	15	0
7:00	8	0	0	0	0	0	0	2	4	0	12	0
7:15	13	0	0	0	0	0	0	5	5	0	17	0
Peak	**28**	**0**	**0**	**0**	**0**	**0**	**0**	**23**	**55**	**0**	**53**	**0**
PHF		**0.54**			**0.00**			**0.61**			**0.78**	

Evening Peak Hour

Date: July 19, 2023 (Wednesday)

Interval Starts	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
16:45	10	0	1	0	0	0	0	18	8	0	7	0
17:00	19	0	1	0	0	0	0	15	12	0	11	0
17:15	20	0	0	0	0	0	0	21	8	0	8	0
17:30	10	0	1	0	0	0	0	22	0	0	8	0
Peak	**59**	**0**	**3**	**0**	**0**	**0**	**0**	**76**	**28**	**0**	**34**	**0**
PHF		**0.78**			**0.00**			**0.90**			**0.77**	

Wildcat Road

Morning Peak Hour

Date: July 20, 2023 (Thursday)

Interval Starts	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
7:00	5	0	0	0	0	0	0	7	1	0	5	0
7:15	5	0	0	0	0	0	0	8	0	0	15	0
7:30	5	0	0	0	0	0	0	5	1	1	8	0
7:45	4	0	0	0	0	0	0	2	3	0	13	0
Peak	**19**	**0**	**0**	**0**	**0**	**0**	**0**	**22**	**5**	**1**	**41**	**0**
PHF		**0.95**			**0.00**			**0.84**			**0.70**	

Evening Peak Hour

Date: July 20, 2023 (Thursday)

Interval Starts	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
16:30	1	0	0	0	0	0	0	8	3	0	9	0
16:45	2	0	1	0	0	0	0	18	5	0	13	0
17:00	0	0	0	0	0	0	0	11	6	0	2	0
17:15	5	0	0	0	0	0	0	12	5	0	6	0
Peak	**8**	**0**	**1**	**0**	**0**	**0**	**0**	**49**	**19**	**0**	**30**	**0**
PHF		**0.45**			**0.00**			**0.74**			**0.58**	

Traffic Count Summary

Industrial Lane Morning Peak Hour

Interval Starts	Northbound			Southbound			Eastbound			Westbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
6:30	3	0	0	0	0	0	0	8	22	0	9	0	42
6:45	4	0	0	0	0	0	0	8	24	0	15	0	51
7:00	8	0	0	0	0	0	0	2	4	0	12	0	26
7:15	13	0	0	0	0	0	0	5	5	0	17	0	40
7:30	15	0	0	0	0	0	0	5	5	0	11	0	36
7:45	12	0	0	0	0	0	0	8	9	0	19	0	48
8:00	8	0	0	0	0	0	0	6	6	0	10	0	30
8:15	8	0	0	0	0	0	0	10	6	0	12	0	36
Light	35	0	0	0	0	0	0	51	64	0	105	0	
Medium	1	0	0	0	0	0	0	1	1	0	0	0	
Heavy	35	0	0	0	0	0	0	0	16	0	0	0	
% Med + Hvy	51%	0%	0%	0%	0%	0%	0%	2%	21%	0%	0%	0%	

Peak Hour Calculator				
6:30-7:15	6:45-7:30	7:00-7:45	7:15-8:00	7:30-8:15
159	153	150	154	150

Industrial Lane Evening Peak Hour

Interval Starts	Northbound			Southbound			Eastbound			Westbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00	7	0	0	0	0	0	0	15	5	0	16	0	43
4:15	1	0	0	0	0	0	0	11	7	0	9	0	28
4:30	8	0	0	0	0	0	0	14	8	0	7	0	37
4:45	10	0	1	0	0	0	0	18	8	0	7	0	44
5:00	19	0	1	0	0	0	0	15	12	0	11	0	58
5:15	20	0	0	0	0	0	0	21	8	0	8	0	57
5:30	10	0	1	0	0	0	0	22	0	0	8	0	41
5:45	2	0	0	0	0	0	0	11	1	0	6	0	20
Light	66	0	3	0	0	0	0	126	22	0	70	0	
Medium	0	0	0	0	0	0	0	0	0	0	1	0	
Heavy	11	0	0	0	0	0	0	1	27	0	1	0	
% Med + Hvy	14%	0%	0%	0%	0%	0%	0%	1%	55%	0%	3%	0%	

Peak Hour Calculator				
4:00-4:45	4:15-5:00	4:30-5:15	4:45-5:30	5:00-5:45
152	167	196	200	176

Traffic Count Summary

Wildcat Road Morning Peak Hour

Interval Starts	Northbound			Southbound			Eastbound			Westbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
6:30	2	0	0	0	0	0	0	4	3	0	6	0	15
6:45	3	0	0	0	0	0	0	3	2	0	10	0	18
7:00	5	0	0	0	0	0	0	7	1	0	5	0	18
7:15	5	0	0	0	0	0	0	8	0	0	15	0	28
7:30	5	0	0	0	0	0	0	5	1	0	8	1	20
7:45	4	0	0	0	0	0	0	2	3	0	13	0	22
8:00	4	0	1	0	0	0	0	6	0	0	6	0	17
8:15	1	0	1	0	0	0	0	6	2	0	7	0	17
Light	29	0	2	0	0	0	0	36	12	0	70	1	
Medium	0	0	0	0	0	0	0	5	0	0	0	0	
Heavy	0	0	0	0	0	0	0	0	0	0	0	0	
% Med + Hvy	0%	0%	0%	0%	0%	0%	0%	12%	0%	0%	0%	0%	

Peak Hour Calculator				
6:30-7:15	6:45-7:30	7:00-7:45	7:15-8:00	7:30-8:15
79	84	88	87	76

Wildcat Road Evening Peak Hour

Interval Starts	Northbound			Southbound			Eastbound			Westbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00	0	0	0	0	0	0	0	10	3	0	7	0	20
4:15	0	0	0	0	0	0	0	3	1	0	4	0	8
4:30	1	0	0	0	0	0	0	8	3	0	9	0	21
4:45	2	0	1	0	0	0	0	18	5	0	13	0	39
5:00	0	0	0	0	0	0	0	11	6	0	2	0	19
5:15	5	0	0	0	0	0	0	12	5	0	6	0	28
5:30	1	0	0	0	0	0	0	7	3	0	8	0	19
5:45	2	0	0	0	0	0	0	7	5	0	6	0	20
Light	11	0	1	0	0	0	0	74	30	0	51	0	
Medium	0	0	0	0	0	0	0	1	0	0	1	0	
Heavy	0	0	0	0	0	0	0	1	1	0	3	0	
% Med + Hvy	0%	0%	0%	0%	0%	0%	0%	3%	3%	0%	7%	0%	

Peak Hour Calculator				
4:00-4:45	4:15-5:00	4:30-5:15	4:45-5:30	5:00-5:45
88	87	107	105	86

Appendix B

VISTRO Analysis Results

Year 2023 Volumes

Story House TIS

Vistro File: C:\...\AM.vistro
Report File: C:\...\2023 AM.pdf

Scenario 1 2023 AM
10/5/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.070	10.2	B
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.022	9.0	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	10.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.070

Intersection Setup

Name	Industrial Lane		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		70.00		70.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Industrial Lane		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	28	0	23	55	0	53
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	51.00	2.00	2.00	21.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	0	23	55	0	53
Peak Hour Factor	0.5400	0.5400	0.6100	0.6100	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	0	9	23	0	17
Total Analysis Volume [veh/h]	52	0	38	90	0	68
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.24	8.69	0.00	0.00	7.47	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.23	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	5.67	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.24		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	2.15					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.022

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		70.00		70.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	19	0	22	5	1	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	12.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	19	0	22	5	1	41
Peak Hour Factor	0.9500	0.9500	0.8400	0.8400	0.7000	0.7000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	0	7	1	0	15
Total Analysis Volume [veh/h]	20	0	26	6	1	59
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.05	8.53	0.00	0.00	7.28	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.07	0.07	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.68	1.68	0.00	0.00	0.04	0.04
d_A, Approach Delay [s/veh]	9.05		0.00		0.12	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.68					
Intersection LOS	A					

Story House TIS

Vistro File: C:\...\PM.vistro
Report File: C:\...\2023 PM.pdf

Scenario 1 2023 PM
10/5/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.093	9.8	A
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.021	9.3	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	9.8
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.093

Intersection Setup

Name	Industrial Lane		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Industrial Lane		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	59	3	76	28	0	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	2.00	2.00	55.00	2.00	3.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	3	76	28	0	34
Peak Hour Factor	0.7800	0.7800	0.9000	0.9000	0.7700	0.7700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	1	21	8	0	11
Total Analysis Volume [veh/h]	76	4	84	31	0	44
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.83	8.78	0.00	0.00	7.44	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.30	0.01	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	7.62	0.32	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.78		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.27					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.021

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	8	1	49	19	0	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	3.00	3.00	2.00	7.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	1	49	19	0	30
Peak Hour Factor	0.4500	0.4500	0.7400	0.7400	0.5800	0.5800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	1	17	6	0	13
Total Analysis Volume [veh/h]	18	2	66	26	0	52
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.27	8.76	0.00	0.00	7.40	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.07	0.07	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.76	1.76	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.22		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.12					
Intersection LOS	A					

Year 2026 Traffic Volume Scenarios

Story House TIS

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Scenario 8 2026 Back AM
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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.070	10.0	B
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.022	9.1	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.070

Intersection Setup

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			70.00			70.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Base Volume Input [veh/h]	28	0	0	0	0	0	0	23	55	0	53	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	51.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	21.00	2.00	2.00	2.00
Growth Factor	1.0180	1.0180	1.0180	1.0000	1.0000	1.0000	1.0000	1.0180	1.0180	1.0180	1.0180	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	29	0	0	0	0	0	0	23	56	0	54	0
Peak Hour Factor	0.5400	0.5400	0.5400	0.8500	0.8500	0.8500	0.6100	0.6100	0.6100	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	0	0	0	0	0	0	9	23	0	17	0
Total Analysis Volume [veh/h]	54	0	0	0	0	0	0	38	92	0	69	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.04	9.95	8.48	9.42	10.17	8.62	7.35	0.00	0.00	7.47	0.00	0.00
Movement LOS	B	A	A	A	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.23	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	5.65	5.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.04			9.40			0.00			0.00		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	2.14											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.022

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		70.00		70.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	19	0	22	5	1	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	12.00	2.00	2.00	2.00
Growth Factor	1.0180	1.0000	1.0180	1.0000	1.0000	1.0180
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	19	0	22	5	1	42
Peak Hour Factor	0.9500	0.9500	0.8400	0.8400	0.7000	0.7000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	0	7	1	0	15
Total Analysis Volume [veh/h]	20	0	26	6	1	60
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.05	8.53	0.00	0.00	7.28	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.07	0.07	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.69	1.69	0.00	0.00	0.04	0.04
d_A, Approach Delay [s/veh]	9.05		0.00		0.12	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.67					
Intersection LOS	A					

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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.092	9.7	A
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.021	9.3	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.092

Intersection Setup

Name	Industrial Lane		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Industrial Lane		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	59	3	76	28	0	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	2.00	2.00	55.00	2.00	3.00
Growth Factor	1.0180	1.0180	1.0180	1.0180	1.0180	1.0180
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	3	77	29	0	35
Peak Hour Factor	0.7800	0.7800	0.9000	0.9000	0.7700	0.7700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	1	21	8	0	11
Total Analysis Volume [veh/h]	77	4	86	32	0	45
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.75	8.72	0.00	0.00	7.45	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.30	0.01	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	7.59	0.31	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.70		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.22					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.021

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	8	1	49	19	0	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	3.00	3.00	2.00	7.00
Growth Factor	1.0180	1.0000	1.0180	1.0000	1.0000	1.0180
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	1	50	19	0	31
Peak Hour Factor	0.4500	0.4500	0.7400	0.7400	0.5800	0.5800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	1	17	6	0	13
Total Analysis Volume [veh/h]	18	2	68	26	0	53
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.28	8.77	0.00	0.00	7.40	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.07	0.07	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.76	1.76	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.23		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.11					
Intersection LOS	A					

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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.168	18.4	C
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.022	9.1	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	18.4
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.168

Intersection Setup

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			70.00			70.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Base Volume Input [veh/h]	28	0	0	0	0	0	0	23	55	0	53	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	51.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	21.00	2.00	2.00	2.00
Growth Factor	1.0180	1.0180	1.0180	1.0000	1.0000	1.0000	1.0000	1.0180	1.0180	1.0180	1.0180	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	7	0	139	87	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	29	0	0	7	0	139	87	23	56	0	54	5
Peak Hour Factor	0.5400	0.5400	0.5400	0.8500	0.8500	0.8500	0.6100	0.6100	0.6100	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	0	0	2	0	41	36	9	23	0	17	2
Total Analysis Volume [veh/h]	54	0	0	8	0	164	143	38	92	0	69	6
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.17	0.00	0.00	0.02	0.00	0.17	0.09	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	18.43	14.61	8.48	12.69	13.40	9.36	7.61	0.00	0.00	7.47	0.00	0.00
Movement LOS	C	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.59	0.59	0.00	0.05	0.05	0.59	0.31	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	14.86	14.86	0.00	1.28	1.28	14.80	7.75	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	18.43			9.51			3.98			0.00		
Approach LOS	C			A			A			A		
d_I, Intersection Delay [s/veh]	6.48											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.022

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		70.00		70.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	19	0	22	5	1	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	12.00	2.00	2.00	2.00
Growth Factor	1.0180	1.0000	1.0180	1.0000	1.0000	1.0180
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	7	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	19	0	29	5	1	47
Peak Hour Factor	0.9500	0.9500	0.8400	0.8400	0.7000	0.7000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	0	9	1	0	17
Total Analysis Volume [veh/h]	20	0	35	6	1	67
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.14	8.57	0.00	0.00	7.30	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.07	0.07	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.72	1.72	0.00	0.00	0.04	0.04
d_A, Approach Delay [s/veh]	9.14		0.00		0.11	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.47					
Intersection LOS	A					

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Scenario 3 2026 Total PM
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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.219	18.1	C
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.022	9.4	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	18.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.219

Intersection Setup

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Base Volume Input [veh/h]	59	0	3	0	0	0	0	76	28	0	34	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	55.00	2.00	3.00	2.00
Growth Factor	1.0180	1.0180	1.0180	1.0000	1.0000	1.0000	1.0000	1.0180	1.0180	1.0180	1.0180	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	6	0	120	139	0	0	0	0	7
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	0	3	6	0	120	139	77	29	0	35	7
Peak Hour Factor	0.7800	0.7800	0.7800	0.8500	0.8500	0.8500	0.9000	0.9000	0.9000	0.7700	0.7700	0.7700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	0	1	2	0	35	39	21	8	0	11	2
Total Analysis Volume [veh/h]	77	0	4	7	0	141	154	86	32	0	45	9
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.22	0.00	0.00	0.02	0.00	0.14	0.10	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	18.11	15.76	8.72	12.99	13.31	9.10	7.58	0.00	0.00	7.45	0.00	0.00
Movement LOS	C	C	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.82	0.82	0.01	0.05	0.05	0.48	0.33	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	20.57	20.57	0.31	1.16	1.16	11.99	8.25	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	17.65			9.28			4.29			0.00		
Approach LOS	C			A			A			A		
d_I, Intersection Delay [s/veh]	7.15											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.022

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	8	1	49	19	0	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	3.00	3.00	2.00	7.00
Growth Factor	1.0180	1.0000	1.0180	1.0000	1.0000	1.0180
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	6	0	0	7
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	1	56	19	0	38
Peak Hour Factor	0.4500	0.4500	0.7400	0.7400	0.5800	0.5800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	1	19	6	0	16
Total Analysis Volume [veh/h]	18	2	76	26	0	66
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.41	8.82	0.00	0.00	7.42	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.07	0.07	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.81	1.81	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.35		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.99					
Intersection LOS	A					

Year 2031 Traffic Volume Scenarios

Story House TIS

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Scenario 9 2031 Back AM
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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.169	18.5	C
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.024	9.2	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	18.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.169

Intersection Setup

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			70.00			70.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Base Volume Input [veh/h]	28	0	0	0	0	0	0	23	55	0	53	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	51.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	21.00	2.00	2.00	2.00
Growth Factor	1.0490	1.0490	1.0490	1.0000	1.0000	1.0000	1.0000	1.0490	1.0490	1.0490	1.0490	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	7	0	139	87	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	29	0	0	7	0	139	87	24	58	0	56	5
Peak Hour Factor	0.5400	0.5400	0.5400	0.8500	0.8500	0.8500	0.6100	0.6100	0.6100	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	0	0	2	0	41	36	10	24	0	18	2
Total Analysis Volume [veh/h]	54	0	0	8	0	164	143	39	95	0	72	6
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.17	0.00	0.00	0.02	0.00	0.17	0.09	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	18.55	14.69	8.49	12.75	13.48	9.38	7.61	0.00	0.00	7.48	0.00	0.00
Movement LOS	C	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.60	0.60	0.00	0.05	0.05	0.59	0.31	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	14.99	14.99	0.00	1.29	1.29	14.87	7.77	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	18.55			9.53			3.93			0.00		
Approach LOS	C			A			A			A		
d_I, Intersection Delay [s/veh]	6.42											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.024

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		70.00		70.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	19	0	22	5	1	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	12.00	2.00	2.00	2.00
Growth Factor	1.0490	1.0000	1.0490	1.0000	1.0000	1.0490
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	7	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	0	30	5	1	48
Peak Hour Factor	0.9500	0.9500	0.8400	0.8400	0.7000	0.7000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	0	9	1	0	17
Total Analysis Volume [veh/h]	21	0	36	6	1	69
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.16	8.58	0.00	0.00	7.30	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.07	0.07	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.82	1.82	0.00	0.00	0.04	0.04
d_A, Approach Delay [s/veh]	9.16		0.00		0.10	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.50					
Intersection LOS	A					

Story House TIS

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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.227	18.3	C
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.022	9.4	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	18.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.227

Intersection Setup

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Base Volume Input [veh/h]	59	0	3	0	0	0	0	76	28	0	34	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	55.00	2.00	3.00	2.00
Growth Factor	1.0490	1.0490	1.0490	1.0000	1.0000	1.0000	1.0000	1.0490	1.0490	1.0490	1.0490	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	6	0	120	139	0	0	0	0	7
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	62	0	3	6	0	120	139	80	29	0	36	7
Peak Hour Factor	0.7800	0.7800	0.7800	0.8500	0.8500	0.8500	0.9000	0.9000	0.9000	0.7700	0.7700	0.7700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	0	1	2	0	35	39	22	8	0	12	2
Total Analysis Volume [veh/h]	79	0	4	7	0	141	154	89	32	0	47	9
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.23	0.00	0.00	0.02	0.00	0.14	0.10	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	18.35	15.96	8.73	13.05	13.37	9.11	7.58	0.00	0.00	7.45	0.00	0.00
Movement LOS	C	C	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.86	0.86	0.01	0.05	0.05	0.48	0.33	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	21.46	21.46	0.31	1.17	1.17	12.03	8.27	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	17.88			9.30			4.25			0.00		
Approach LOS	C			A			A			A		
d_I, Intersection Delay [s/veh]	7.17											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.022

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	8	1	49	19	0	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	3.00	3.00	2.00	7.00
Growth Factor	1.0490	1.0000	1.0490	1.0000	1.0000	1.0490
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	6	0	0	7
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	1	57	19	0	38
Peak Hour Factor	0.4500	0.4500	0.7400	0.7400	0.5800	0.5800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	1	19	6	0	16
Total Analysis Volume [veh/h]	18	2	77	26	0	66
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.41	8.82	0.00	0.00	7.42	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.07	0.07	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.81	1.81	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.35		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.99					
Intersection LOS	A					

Story House TIS

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Scenario 5 2031 Total AM
10/5/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.793	156.5	F
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.036	11.3	B
3	East Access	Two-way stop	HCM 7th Edition	EB Left	0.016	12.3	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	156.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.793

Intersection Setup

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			70.00			70.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Base Volume Input [veh/h]	28	0	0	0	0	0	0	23	55	0	53	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	51.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	21.00	2.00	2.00	2.00
Growth Factor	1.0490	1.0490	1.0490	1.0000	1.0000	1.0000	1.0000	1.0490	1.0490	1.0490	1.0490	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	5	0	141	218	146	0	0	94	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	29	0	0	5	0	141	218	170	58	0	150	8
Peak Hour Factor	0.5400	0.5400	0.5400	0.8500	0.8500	0.8500	0.6100	0.6100	0.6100	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	0	0	1	0	41	89	70	24	0	48	3
Total Analysis Volume [veh/h]	54	0	0	6	0	166	357	279	95	0	192	10
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.79	0.00	0.00	0.05	0.00	0.20	0.26	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	156.47	129.71	9.74	38.69	36.37	10.31	8.55	0.00	0.00	8.04	0.00	0.00
Movement LOS	F	F	A	E	E	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	3.71	3.71	0.00	0.17	0.17	0.73	1.05	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	92.65	92.65	0.00	4.16	4.16	18.20	26.22	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	156.47			11.30			4.18			0.00		
Approach LOS	F			B			A			A		
d_I, Intersection Delay [s/veh]	11.60											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	11.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.036

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		70.00		70.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	19	0	22	5	1	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	12.00	2.00	2.00	2.00
Growth Factor	1.0490	1.0000	1.0490	1.0000	1.0000	1.0490
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	150	0	0	102
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	0	173	5	1	145
Peak Hour Factor	0.9500	0.9500	0.8400	0.8400	0.7000	0.7000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	0	51	1	0	52
Total Analysis Volume [veh/h]	21	0	206	6	1	207
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.32	9.55	0.00	0.00	7.65	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.11	0.11	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	2.76	2.76	0.00	0.00	0.04	0.04
d_A, Approach Delay [s/veh]	11.32		0.00		0.04	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.56					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: East Access

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	Wyarno Road		Wyarno Road		East Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		70.00		70.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wyarno Road		Wyarno Road		East Access	
Base Volume Input [veh/h]	0	22	42	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	12.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0490	1.0490	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	146	5	8	11	7	94
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	146	28	52	11	7	94
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	8	15	3	2	28
Total Analysis Volume [veh/h]	172	33	61	13	8	111
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.00	0.00	0.00	0.02	0.11
d_M, Delay for Movement [s/veh]	7.79	0.00	0.00	0.00	12.26	9.07
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.40	0.00	0.00	0.00	0.05	0.38
95th-Percentile Queue Length [ft/ln]	9.96	0.00	0.00	0.00	1.21	9.38
d_A, Approach Delay [s/veh]	6.53		0.00		9.28	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.14					
Intersection LOS	B					

Story House TIS

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Scenario 5 2031 Total PM
10/5/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.596	66.0	F
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.037	12.7	B
3	East Access	Two-way stop	HCM 7th Edition	EB Left	0.024	11.3	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	66.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.596

Intersection Setup

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Base Volume Input [veh/h]	59	0	3	0	0	0	0	76	28	0	34	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	55.00	2.00	3.00	2.00
Growth Factor	1.0490	1.0490	1.0490	1.0000	1.0000	1.0000	1.0000	1.0490	1.0490	1.0490	1.0490	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	8	0	230	157	105	0	0	153	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	62	0	3	8	0	230	157	185	29	0	189	6
Peak Hour Factor	0.7800	0.7800	0.7800	0.8500	0.8500	0.8500	0.9000	0.9000	0.9000	0.7700	0.7700	0.7700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	0	1	2	0	68	44	51	8	0	61	2
Total Analysis Volume [veh/h]	79	0	4	9	0	271	174	206	32	0	245	8
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.60	0.00	0.00	0.04	0.00	0.34	0.13	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	66.04	52.03	9.33	19.74	19.19	11.92	8.16	0.00	0.00	7.71	0.00	0.00
Movement LOS	F	F	A	C	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	3.05	3.05	0.01	0.11	0.11	1.53	0.46	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	76.14	76.14	0.36	2.75	2.75	38.28	11.43	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	63.30			12.17			3.45			0.00		
Approach LOS	F			B			A			A		
d_I, Intersection Delay [s/veh]	9.81											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	12.7
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.037

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	8	1	49	19	0	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	3.00	3.00	2.00	7.00
Growth Factor	1.0490	1.0000	1.0490	1.0000	1.0000	1.0490
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	113	0	0	159
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	1	164	19	0	190
Peak Hour Factor	0.4500	0.4500	0.7400	0.7400	0.5800	0.5800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	1	55	6	0	82
Total Analysis Volume [veh/h]	18	2	222	26	0	328
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	12.68	9.77	0.00	0.00	7.73	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.12	0.12	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	3.07	3.07	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	12.38		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.42					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: East Access

Control Type:	Two-way stop	Delay (sec / veh):	11.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.024

Intersection Setup

Name	Wyarno Road		Wyarno Road		East Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wyarno Road		Wyarno Road		East Access	
Base Volume Input [veh/h]	0	50	30	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	2.00	7.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0490	1.0490	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	105	8	6	8	12	153
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	105	60	37	8	12	153
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	18	11	2	4	45
Total Analysis Volume [veh/h]	124	71	44	9	14	180
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.00	0.00	0.00	0.02	0.18
d_M, Delay for Movement [s/veh]	7.53	0.00	0.00	0.00	11.34	9.28
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.26	0.00	0.00	0.00	0.07	0.64
95th-Percentile Queue Length [ft/ln]	6.53	0.00	0.00	0.00	1.85	15.97
d_A, Approach Delay [s/veh]	4.79		0.00		9.43	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.25					
Intersection LOS	B					

Year 2034 Traffic Volume Scenarios

Story House TIS

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Scenario 10 2034 Back AM
10/5/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.828	165.6	F
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.036	11.3	B
3	East Access	Two-way stop	HCM 7th Edition	EB Left	0.016	12.3	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	165.6
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.828

Intersection Setup

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			70.00			70.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Base Volume Input [veh/h]	28	0	0	0	0	0	0	23	55	0	53	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	51.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	21.00	2.00	2.00	2.00
Growth Factor	1.0680	1.0680	1.0680	1.0000	1.0000	1.0000	1.0000	1.0680	1.0680	1.0680	1.0680	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	5	0	141	218	146	0	0	94	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	0	0	5	0	141	218	171	59	0	151	8
Peak Hour Factor	0.5400	0.5400	0.5400	0.8500	0.8500	0.8500	0.6100	0.6100	0.6100	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	0	0	1	0	41	89	70	24	0	48	3
Total Analysis Volume [veh/h]	56	0	0	6	0	166	357	280	97	0	194	10
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.83	0.00	0.00	0.05	0.00	0.20	0.26	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	165.56	138.59	9.74	38.94	36.62	10.32	8.56	0.00	0.00	8.05	0.00	0.00
Movement LOS	F	F	A	E	E	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	3.91	3.91	0.00	0.17	0.17	0.73	1.05	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	97.82	97.82	0.00	4.19	4.19	18.26	26.28	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	165.56			11.32			4.16			0.00		
Approach LOS	F			B			A			A		
d_I, Intersection Delay [s/veh]	12.24											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	11.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.036

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		70.00		70.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	19	0	22	5	1	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	12.00	2.00	2.00	2.00
Growth Factor	1.0680	1.0000	1.0680	1.0000	1.0000	1.0680
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	150	0	0	102
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	0	173	5	1	146
Peak Hour Factor	0.9500	0.9500	0.8400	0.8400	0.7000	0.7000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	0	51	1	0	52
Total Analysis Volume [veh/h]	21	0	206	6	1	209
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.33	9.56	0.00	0.00	7.65	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.11	0.11	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	2.77	2.77	0.00	0.00	0.04	0.04
d_A, Approach Delay [s/veh]	11.33		0.00		0.04	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.55					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: East Access

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	Wyarno Road		Wyarno Road		East Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		70.00		70.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wyarno Road		Wyarno Road		East Access	
Base Volume Input [veh/h]	0	22	42	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	12.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0680	1.0680	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	146	5	8	11	7	94
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	146	28	53	11	7	94
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	8	16	3	2	28
Total Analysis Volume [veh/h]	172	33	62	13	8	111
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.00	0.00	0.00	0.02	0.11
d_M, Delay for Movement [s/veh]	7.79	0.00	0.00	0.00	12.27	9.07
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.40	0.00	0.00	0.00	0.05	0.38
95th-Percentile Queue Length [ft/ln]	9.97	0.00	0.00	0.00	1.21	9.39
d_A, Approach Delay [s/veh]	6.53		0.00		9.29	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.13					
Intersection LOS	B					

Story House TIS

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Scenario 10 2034 Back PM
10/5/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.613	67.9	F
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.041	12.7	B
3	East Access	Two-way stop	HCM 7th Edition	EB Left	0.024	11.4	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	67.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.613

Intersection Setup

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Base Volume Input [veh/h]	59	0	3	0	0	0	0	76	28	0	34	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	55.00	2.00	3.00	2.00
Growth Factor	1.0680	1.0680	1.0680	1.0000	1.0000	1.0000	1.0000	1.0680	1.0680	1.0680	1.0680	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	8	0	230	157	105	0	0	153	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	63	0	3	8	0	230	157	186	30	0	189	6
Peak Hour Factor	0.7800	0.7800	0.7800	0.8500	0.8500	0.8500	0.9000	0.9000	0.9000	0.7700	0.7700	0.7700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	0	1	2	0	68	44	52	8	0	61	2
Total Analysis Volume [veh/h]	81	0	4	9	0	271	174	207	33	0	245	8
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.61	0.00	0.00	0.04	0.00	0.34	0.13	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	67.94	53.90	9.34	19.77	19.23	11.92	8.16	0.00	0.00	7.71	0.00	0.00
Movement LOS	F	F	A	C	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	3.17	3.17	0.01	0.11	0.11	1.53	0.46	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	79.29	79.29	0.36	2.76	2.76	38.28	11.43	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	65.18			12.17			3.43			0.00		
Approach LOS	F			B			A			A		
d_I, Intersection Delay [s/veh]	10.05											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	12.7
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.041

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	8	1	49	19	0	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	3.00	3.00	2.00	7.00
Growth Factor	1.0680	1.0000	1.0680	1.0000	1.0000	1.0680
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	113	0	0	159
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	1	165	19	0	191
Peak Hour Factor	0.4500	0.4500	0.7400	0.7400	0.5800	0.5800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	1	56	6	0	82
Total Analysis Volume [veh/h]	20	2	223	26	0	329
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	12.73	9.81	0.00	0.00	7.73	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.14	0.14	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	3.41	3.41	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	12.46		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.46					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: East Access

Control Type:	Two-way stop	Delay (sec / veh):	11.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.024

Intersection Setup

Name	Wyarno Road		Wyarno Road		East Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wyarno Road		Wyarno Road		East Access	
Base Volume Input [veh/h]	0	50	30	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	2.00	7.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0680	1.0680	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	105	8	6	8	12	153
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	105	61	38	8	12	153
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	18	11	2	4	45
Total Analysis Volume [veh/h]	124	72	45	9	14	180
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.00	0.00	0.00	0.02	0.18
d_M, Delay for Movement [s/veh]	7.53	0.00	0.00	0.00	11.36	9.29
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.26	0.00	0.00	0.00	0.07	0.64
95th-Percentile Queue Length [ft/ln]	6.54	0.00	0.00	0.00	1.85	15.99
d_A, Approach Delay [s/veh]	4.77		0.00		9.44	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.23					
Intersection LOS	B					

Story House TIS

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Scenario 6 2034 Total AM
10/5/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.939	211.8	F
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.037	11.5	B
3	East Access	Two-way stop	HCM 7th Edition	EB Left	0.018	12.4	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	211.8
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.939

Intersection Setup

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			70.00			70.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Base Volume Input [veh/h]	28	0	0	0	0	0	0	23	55	0	53	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	51.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	21.00	2.00	2.00	2.00
Growth Factor	1.0680	1.0680	1.0680	1.0000	1.0000	1.0000	1.0000	1.0680	1.0680	1.0680	1.0680	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	6	0	157	223	149	0	0	105	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	0	0	6	0	157	223	174	59	0	162	8
Peak Hour Factor	0.5400	0.5400	0.5400	0.8500	0.8500	0.8500	0.6100	0.6100	0.6100	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	0	0	2	0	46	91	71	24	0	52	3
Total Analysis Volume [veh/h]	56	0	0	7	0	185	366	285	97	0	208	10
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.94	0.00	0.00	0.07	0.00	0.22	0.27	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	211.80	179.45	9.77	42.00	39.26	10.60	8.65	0.00	0.00	8.06	0.00	0.00
Movement LOS	F	F	A	E	E	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	4.36	4.36	0.00	0.21	0.21	0.86	1.10	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	108.99	108.99	0.00	5.31	5.31	21.38	27.61	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	211.80			11.75			4.23			0.00		
Approach LOS	F			B			A			A		
d_I, Intersection Delay [s/veh]	14.24											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	11.5
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.037

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		70.00		70.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	19	0	22	5	1	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	12.00	2.00	2.00	2.00
Growth Factor	1.0680	1.0000	1.0680	1.0000	1.0000	1.0680
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	154	0	0	113
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	0	177	5	1	157
Peak Hour Factor	0.9500	0.9500	0.8400	0.8400	0.7000	0.7000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	0	53	1	0	56
Total Analysis Volume [veh/h]	21	0	211	6	1	224
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.51	9.60	0.00	0.00	7.66	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.11	0.11	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	2.84	2.84	0.00	0.00	0.04	0.04
d_A, Approach Delay [s/veh]	11.51		0.00		0.03	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.54					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: East Access

Control Type:	Two-way stop	Delay (sec / veh):	12.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.018

Intersection Setup

Name	Wyarno Road		Wyarno Road		East Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		70.00		70.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wyarno Road		Wyarno Road		East Access	
Base Volume Input [veh/h]	0	22	42	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	12.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0680	1.0680	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	149	6	8	12	8	105
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	149	29	53	12	8	105
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	9	16	4	2	31
Total Analysis Volume [veh/h]	175	34	62	14	9	124
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.00	0.00	0.00	0.02	0.12
d_M, Delay for Movement [s/veh]	7.80	0.00	0.00	0.00	12.38	9.14
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.41	0.00	0.00	0.00	0.06	0.43
95th-Percentile Queue Length [ft/ln]	10.17	0.00	0.00	0.00	1.38	10.65
d_A, Approach Delay [s/veh]	6.53		0.00		9.36	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.24					
Intersection LOS	B					

Story House TIS

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Scenario 6 2034 Total PM
10/5/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.726	95.5	F
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.043	13.1	B
3	East Access	Two-way stop	HCM 7th Edition	EB Left	0.027	11.7	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	95.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.726

Intersection Setup

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Base Volume Input [veh/h]	59	0	3	0	0	0	0	76	28	0	34	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	55.00	2.00	3.00	2.00
Growth Factor	1.0680	1.0680	1.0680	1.0000	1.0000	1.0000	1.0000	1.0680	1.0680	1.0680	1.0680	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	8	0	241	176	117	0	0	160	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	63	0	3	8	0	241	176	198	30	0	196	6
Peak Hour Factor	0.7800	0.7800	0.7800	0.8500	0.8500	0.8500	0.9000	0.9000	0.9000	0.7700	0.7700	0.7700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	0	1	2	0	71	49	55	8	0	64	2
Total Analysis Volume [veh/h]	81	0	4	9	0	284	196	220	33	0	255	8
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.73	0.00	0.00	0.04	0.00	0.36	0.15	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	95.47	77.92	9.41	21.83	20.99	12.24	8.26	0.00	0.00	7.74	0.00	0.00
Movement LOS	F	F	A	C	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	3.92	3.92	0.01	0.13	0.13	1.67	0.53	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	98.12	98.12	0.37	3.14	3.14	41.85	13.25	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	91.42			12.53			3.60			0.00		
Approach LOS	F			B			A			A		
d_I, Intersection Delay [s/veh]	11.98											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	13.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.043

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	8	1	49	19	0	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	3.00	3.00	2.00	7.00
Growth Factor	1.0680	1.0000	1.0680	1.0000	1.0000	1.0680
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	126	0	0	166
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	1	178	19	0	198
Peak Hour Factor	0.4500	0.4500	0.7400	0.7400	0.5800	0.5800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	1	60	6	0	85
Total Analysis Volume [veh/h]	20	2	241	26	0	341
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	13.06	9.94	0.00	0.00	7.78	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.14	0.14	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	3.56	3.56	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	12.78		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.45					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: East Access

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.027

Intersection Setup

Name	Wyarno Road		Wyarno Road		East Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wyarno Road		Wyarno Road		East Access	
Base Volume Input [veh/h]	0	50	30	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	2.00	7.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0680	1.0680	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	117	8	6	9	13	160
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	117	61	38	9	13	160
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	18	11	3	4	47
Total Analysis Volume [veh/h]	138	72	45	11	15	188
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.00	0.00	0.00	0.03	0.18
d_M, Delay for Movement [s/veh]	7.56	0.00	0.00	0.00	11.70	9.34
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.29	0.00	0.00	0.00	0.08	0.68
95th-Percentile Queue Length [ft/ln]	7.36	0.00	0.00	0.00	2.09	16.89
d_A, Approach Delay [s/veh]	4.97		0.00		9.51	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.34					
Intersection LOS	B					

Year 2043 Traffic Volume Scenarios

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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.078	10.2	B
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.025	9.1	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	10.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.078

Intersection Setup

Name	Industrial Lane		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		70.00		70.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Industrial Lane		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	28	0	23	55	0	53
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	51.00	2.00	2.00	21.00	2.00	2.00
Growth Factor	1.1270	1.1270	1.2700	1.2700	1.2700	1.2700
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	0	29	70	0	67
Peak Hour Factor	0.5400	0.5400	0.6100	0.6100	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	0	12	29	0	21
Total Analysis Volume [veh/h]	59	0	48	115	0	86
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.16	8.53	0.00	0.00	7.54	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.25	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	6.33	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.16		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	1.95					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.025

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		70.00		70.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	19	0	22	5	1	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	12.00	2.00	2.00	2.00
Growth Factor	1.1270	1.0000	1.1270	1.0000	1.0000	1.1270
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	0	25	5	1	46
Peak Hour Factor	0.9500	0.9500	0.8400	0.8400	0.7000	0.7000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	0	7	1	0	16
Total Analysis Volume [veh/h]	22	0	30	6	1	66
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.11	8.56	0.00	0.00	7.29	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.08	0.08	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.88	1.88	0.00	0.00	0.04	0.04
d_A, Approach Delay [s/veh]	9.11		0.00		0.11	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.66					
Intersection LOS	A					

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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.106	10.0	B
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.024	9.4	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.106

Intersection Setup

Name	Industrial Lane		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Industrial Lane		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	59	3	76	28	0	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	2.00	2.00	55.00	2.00	3.00
Growth Factor	1.1270	1.1270	1.2700	1.2700	1.2700	1.2700
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	3	97	36	0	43
Peak Hour Factor	0.7800	0.7800	0.9000	0.9000	0.7700	0.7700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	1	27	10	0	14
Total Analysis Volume [veh/h]	85	4	108	40	0	56
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.04	8.82	0.00	0.00	7.51	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.36	0.01	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	8.89	0.32	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.98		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.03					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.024

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	8	1	49	19	0	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	3.00	3.00	2.00	7.00
Growth Factor	1.1270	1.0000	1.1270	1.0000	1.0000	1.1270
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	1	55	19	0	34
Peak Hour Factor	0.4500	0.4500	0.7400	0.7400	0.5800	0.5800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	1	19	6	0	15
Total Analysis Volume [veh/h]	20	2	74	26	0	59
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.36	8.82	0.00	0.00	7.41	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.08	0.08	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.98	1.98	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.31		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.13					
Intersection LOS	A					

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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	1.032	246.4	F
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.039	11.6	B
3	East Access	Two-way stop	HCM 7th Edition	EB Left	0.018	12.4	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	246.4
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.032

Intersection Setup

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			70.00			70.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Base Volume Input [veh/h]	28	0	0	0	0	0	0	23	55	0	53	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	51.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	21.00	2.00	2.00	2.00
Growth Factor	1.1270	1.1270	1.1270	1.0000	1.0000	1.0000	1.0000	1.2700	1.2700	1.2700	1.2700	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	6	0	157	223	149	0	0	105	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	0	0	6	0	157	223	178	70	0	172	8
Peak Hour Factor	0.5400	0.5400	0.5400	0.8500	0.8500	0.8500	0.6100	0.6100	0.6100	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	0	0	2	0	46	91	73	29	0	55	3
Total Analysis Volume [veh/h]	59	0	0	7	0	185	366	292	115	0	221	10
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.03	0.00	0.00	0.07	0.00	0.23	0.27	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	246.44	212.36	9.82	44.05	41.39	10.72	8.71	0.00	0.00	8.13	0.00	0.00
Movement LOS	F	F	A	E	E	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	4.82	4.82	0.00	0.22	0.22	0.87	1.12	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	120.51	120.51	0.00	5.59	5.59	21.84	28.02	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	246.44			11.94			4.12			0.00		
Approach LOS	F			B			A			A		
d_I, Intersection Delay [s/veh]	15.95											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	11.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.039

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		70.00		70.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	19	0	22	5	1	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	12.00	2.00	2.00	2.00
Growth Factor	1.1270	1.0000	1.1270	1.0000	1.0000	1.1270
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	154	0	0	113
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	0	179	5	1	159
Peak Hour Factor	0.9500	0.9500	0.8400	0.8400	0.7000	0.7000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	0	53	1	0	57
Total Analysis Volume [veh/h]	22	0	213	6	1	227
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.57	9.62	0.00	0.00	7.67	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.12	0.12	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	3.00	3.00	0.00	0.00	0.04	0.04
d_A, Approach Delay [s/veh]	11.57		0.00		0.03	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.56					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: East Access

Control Type:	Two-way stop	Delay (sec / veh):	12.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.018

Intersection Setup

Name	Wyarno Road		Wyarno Road		East Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		70.00		70.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wyarno Road		Wyarno Road		East Access	
Base Volume Input [veh/h]	0	22	42	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	12.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.1270	1.1270	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	149	6	8	12	8	105
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	149	31	55	12	8	105
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	9	16	4	2	31
Total Analysis Volume [veh/h]	175	36	65	14	9	124
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.00	0.00	0.00	0.02	0.13
d_M, Delay for Movement [s/veh]	7.81	0.00	0.00	0.00	12.43	9.16
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.41	0.00	0.00	0.00	0.06	0.43
95th-Percentile Queue Length [ft/ln]	10.20	0.00	0.00	0.00	1.39	10.69
d_A, Approach Delay [s/veh]	6.47		0.00		9.38	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.18					
Intersection LOS	B					

Story House TIS

Vistro File: C:\...\PM.vistro
Report File: C:\...\2043 Total PM.pdf

Scenario 7 2043 Total PM
10/5/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Industrial Lane	Two-way stop	HCM 7th Edition	NB Left	0.802	113.8	F
2	Wildcat Road	Two-way stop	HCM 7th Edition	NB Left	0.043	13.2	B
3	East Access	Two-way stop	HCM 7th Edition	EB Left	0.027	11.7	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Industrial Lane

Control Type:	Two-way stop	Delay (sec / veh):	113.8
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.802

Intersection Setup

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Industrial Lane			West Access			Wyarno Road			Wyarno Road		
Base Volume Input [veh/h]	59	0	3	0	0	0	0	76	28	0	34	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	14.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	55.00	2.00	3.00	2.00
Growth Factor	1.1270	1.1270	1.1270	1.0000	1.0000	1.0000	1.0000	1.2700	1.2700	1.2700	1.2700	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	8	0	241	176	117	0	0	160	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	0	3	8	0	241	176	214	36	0	203	6
Peak Hour Factor	0.7800	0.7800	0.7800	0.8500	0.8500	0.8500	0.9000	0.9000	0.9000	0.7700	0.7700	0.7700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	0	1	2	0	71	49	59	10	0	66	2
Total Analysis Volume [veh/h]	85	0	4	9	0	284	196	238	40	0	264	8
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.80	0.00	0.00	0.04	0.00	0.37	0.15	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	113.80	95.12	9.52	22.71	21.80	12.37	8.29	0.00	0.00	7.80	0.00	0.00
Movement LOS	F	F	A	C	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	4.49	4.49	0.02	0.13	0.13	1.70	0.53	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	112.13	112.13	0.38	3.30	3.30	42.58	13.37	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	109.11			12.69			3.43			0.00		
Approach LOS	F			B			A			A		
d_I, Intersection Delay [s/veh]	13.34											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 2: Wildcat Road

Control Type:	Two-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.043

Intersection Setup

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wildcat Road		Wyarno Road		Wyarno Road	
Base Volume Input [veh/h]	8	1	49	19	0	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	3.00	3.00	2.00	7.00
Growth Factor	1.1270	1.0000	1.1270	1.0000	1.0000	1.1270
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	126	0	0	166
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	1	181	19	0	200
Peak Hour Factor	0.4500	0.4500	0.7400	0.7400	0.5800	0.5800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	1	61	6	0	86
Total Analysis Volume [veh/h]	20	2	245	26	0	345
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	13.15	9.97	0.00	0.00	7.79	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.14	0.14	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	3.59	3.59	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	12.86		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.44					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 3: East Access

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.027

Intersection Setup

Name	Wyarno Road		Wyarno Road		East Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wyarno Road		Wyarno Road		East Access	
Base Volume Input [veh/h]	0	50	30	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	2.00	7.00	2.00	2.00	2.00
Growth Factor	1.0000	1.1270	1.1270	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	117	8	6	9	13	160
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	117	64	40	9	13	160
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	19	12	3	4	47
Total Analysis Volume [veh/h]	138	75	47	11	15	188
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.00	0.00	0.00	0.03	0.19
d_M, Delay for Movement [s/veh]	7.57	0.00	0.00	0.00	11.74	9.35
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.29	0.00	0.00	0.00	0.08	0.68
95th-Percentile Queue Length [ft/ln]	7.37	0.00	0.00	0.00	2.10	16.94
d_A, Approach Delay [s/veh]	4.90		0.00		9.53	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.28					
Intersection LOS	B					

Appendix C

Crash Data

Gmail **Joe Henderson <thetrafficczar@gmail.com>**

Data Request

2 messages

Melinda Harmon <melinda.harmon1@wyo.gov> Thu, Oct 5, 2023 at 1:23 PM
To: Joe Henderson <joe@sustainabletrafficsolutions.com>
Cc: Keri Bohlmann <keri.bohlmann@wyo.gov>, Kari Fictum <kari.fictum1@wyo.gov>

Hello Joe,

Attached are your requested data reports.
Please let me know if you have any questions or concerns.

Thank you
Sincerely,
Melinda Harmon
Records and Data Management Analyst

WYDOT HIGHWAY SAFETY
P (307) 777-3910 F (307) 777--3853
5300 Bishop Blvd. Cheyenne, WY 82009-3340

E-Mail to and from me, in connection with the transaction of public business, is subject to the Wyoming Public Records Act and may be disclosed to third parties.

3 attachments

Intersection History Report - 5th St-WY 336 & Wyarno RD (ID104704) 2020-2022.pdf
51K

Intersection History Report - Wildcat Rd & Wyarno RD (ID104316) 2020-2022.pdf
45K

Segment History Report - Wyarno Rd (ML1704B) MP 0-11.52 2020-2022.pdf
58K

Joe Henderson <joe@sustainabletrafficsolutions.com> Thu, Oct 5, 2023 at 1:29 PM
To: Melinda Harmon <melinda.harmon1@wyo.gov>
Cc: Keri Bohlmann <keri.bohlmann@wyo.gov>, Kari Fictum <kari.fictum1@wyo.gov>

Melinda,

The request that I submitted for the big sweeping curve east of Wildcat Road. Are those crashes included in these reports? if so, how would I identify them?

Joe
[Quoted text hidden]
--
Joseph L. Henderson, PE, PTOE
Principal
Sustainable Traffic Solutions, Inc.
823 West 124th Drive
Westminster, CO 80234
303.589.6875
joe@sustainabletrafficsolutions.com

sustainabletrafficsolutions.com

Licensed in CO, WY, and IA

INTERSECTION CRASH HISTORY REPORT FOR 5TH ST/WY 336 & INDUSTRIAL LANE (ID104704) FOR THE YEARS 2020 - 2022

DATE	TIME	ID #	CRASH STEET	CROSS STREET	JUNCTION RELATION	INTERSECTION TYPE	MANNER OF COLLISION	CRASH SEVERITY	FATAL INJURY	FIRST HARMFUL EVENT (FHE)	FHE LOCATION	#	VEHICLE DIRECTION	VEHICLE MANEUVER	DRIVER ACTION	PERSON TYPE	SAFETY EQUIPMENT USED	INJURY STATUS	LIGHTING	WEATHER CONDITION	ROAD CONDITION	ALCOHOL INVOLVED	DRUGS INVOLVED	LATITUDE	LONGITUDE	CRASH CASE #
2021																										
06/08/2021	1812	104704	INDUSTRIAL LN	5TH ST | WY 336	Intersection	T Intersection	Angle (Front to Side), Opposing Direction	PROPERTY DAMAGE ONLY	0	0	Motor Vehicle in Transport on Roadway	On Roadway	1	West	Straight Ahead	1	No Improper Driving	1	Driver	Shoulder and Lap Belt	No Apparent Injury	Daylight	Clear	Dry	N	N	44.806426	-106.922159	21-0006006
													2	West	Turning Left	2	Failed to Yield ROW	2	Driver	Shoulder and Lap Belt	No Apparent Injury							

REPORT SUMMARY

TOTAL CRASHES: 1

FATAL CRASHES: 0 **TOTAL FATALITIES:** 0

INJURY CRASHES: 0 **TOTAL INJURIES:** 0

PDO CRASHES: 1

	CRASH COUNTS				SEVERITY COUNTS			INJURY COUNTS				
YEAR	FATAL CRASHES	INJURY CRASHES	PDO CRASHES	TOTAL CRASHES	CRITICAL CRASHES*	SERIOUS CRASHES*	DAMAGE CRASHES*	FATAL INJURIES	SERIOUS INJURIES	MINOR INJURIES	POSSIBLE INJURIES	NO INJURIES
2021	0	0	1	1	0	0	1	0	0	0	0	2
	0	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**2**

* PDO = Property Damage Only Crashes
* Critical Crashes = Fatal & Suspected Serious Injury Crashes
* Serious Crashes = Suspected Minor Injury & Possible Injury Crashes
* Damage Crashes = No Apparent Injury & Unknown Injury Crashes

INTERSECTION CRASH HISTORY REPORT FOR WILDCAT RD & WYARNO RD (ID104316) FOR THE YEARS 2020 - 2022

DATE	TIME	ID #	CRASH STEET	CROSS STREET	JUNCTION RELATION	INTERSECTION TYPE	MANNER OF COLLISION	CRASH SEVERITY	FATAL INJURY	FIRST HARMFUL EVENT (FHE)	FHE LOCATION	#	VEHICLE DIRECTION	VEHICLE MANEUVER	DRIVER ACTION	PERSON TYPE	SAFETY EQUIPMENT USED	INJURY STATUS	LIGHTING	WEATHER CONDITION	ROAD CONDITION	ALCOHOL INVOLVED	DRUGS INVOLVED	LATITUDE	LONGITUDE	CRASH CASE #

REPORT SUMMARY

TOTAL CRASHES: 0

FATAL CRASHES: 0 **TOTAL FATALITIES:**

INJURY CRASHES: 0 **TOTAL INJURIES:**

PDO CRASHES: 0

* PDO = Property Damage Only Crashes
* Critical Crashes = Fatal & Suspected Serious Injury Crashes
* Serious Crashes = Suspected Minor Injury & Possible Injury Crashes
* Damage Crashes = No Apparent Injury & Unknown Injury Crashes

SEGMENT CRASH HISTORY REPORT FOR WYARNO RD (ML1704B) MP 0-11.52 FOR THE YEARS 2020 - 2022

LRS ID	CRASH STREET	MILE POST	CROSS STREET	DATE	TIME	CRASH SEVERITY	FATAL	INJURY	FIRST HARMFUL EVENT (FHE)	FHE LOCATION	MANNER OF COLLISION	JUNCTION RELATION	VEHICLE #	VEHICLE DIRECTION	VEHICLE MANEUVER	DRIVER ACTION	PERSON TYPE	SAFETY EQUIPMENT USED	INJURY STATUS	LIGHTING	WEATHER CONDITION	ROAD CONDITION	ALCOHOL INVOLVED	DRUGS INVOLVED	LATITUDE	LONGITUDE	CRASH CASE #
ML1704B	5TH ST | WY 336	0.012		01/25/2022	647	PROPERTY DAMAGE ONLY	0	0	Motor Vehicle in Transport on Roadway	On Roadway	Rear End (Front to Rear)	Intersection Related	1	West	Straight Ahead	1 Other Improper Action	1 Driver	Unknown	No Apparent Injury	Dawn	Snowing	Ice/Frost	N	N	44.806858	-106.955460	22P000561
													2	West	Stopped in Traffic	2 No Improper Driving	2 Driver	Unknown	No Apparent Injury								
ML1704B	5TH ST | WY 336	0.012		07/06/2021	1540	POSSIBLE INJURY	0	3	Motor Vehicle in Transport on Roadway	On Roadway	Rear End (Front to Rear)	Intersection Related	1	West	Slowing	1 Other Improper Action	1 Driver	Shoulder and Lap Belt	No Apparent Injury	Daylight	Clear	Dry	N	N	44.806858	-106.955460	21P005478
													2	West	Stopped in Traffic	2 No Improper Driving	2 Driver	Shoulder and Lap Belt	Possible Injury								
													3	West	Stopped in Traffic	3 No Improper Driving	2 Passenger	Shoulder and Lap Belt	Possible Injury								
																	3 Driver	Shoulder and Lap Belt	Possible Injury								
ML1704B	5TH ST | WY 336	0.016		03/22/2022	1540	PROPERTY DAMAGE ONLY	0	0	Motor Vehicle in Transport on Roadway	On Roadway	Rear End (Front to Rear)	Intersection Related	1	West	Straight Ahead	1 Following too Close	1 Driver	Unknown	No Apparent Injury	Daylight	Clear	Dry	N	N	44.806884	-106.955376	22P002097
													2	West	Stopped in Traffic	2 No Improper Driving	2 Driver	Unknown	No Apparent Injury								
ML1704B	5TH ST | WY 336	0.124		07/09/2021	1537	SUSPECTED MINOR INJURY	0	1	Motor Vehicle in Transport on Roadway	On Roadway	Sideswipe Opposite Direction (Meeting)	Non-Junction	1	West	Straight Ahead	1 Erratic/Reckless/Careless/Aggressive	1 Driver	None Used	Suspected Minor Injury	Daylight	Clear	Dry	N	N	44.806849	-106.953175	21P005579
													2	East	Straight Ahead	2 No Improper Driving	1 Passenger	None Used	No Apparent Injury								
																	2 Driver	Unknown	No Apparent Injury								
ML1704B	5TH ST | WY 336	0.158		02/04/2020	754	PROPERTY DAMAGE ONLY	0	0	Motor Vehicle in Transport on Roadway	On Roadway	Rear End (Front to Rear)	Intersection Related	1	West	Slowing	1 Drove too Fast for Conditions	1 Driver	Unknown	No Apparent Injury	Daylight	Clear	Ice/Frost	N	N	44.806842	-106.952466	20P000911
													2	West	Straight Ahead	2 No Improper Driving	2 Driver	Unknown	No Apparent Injury								
													3	West	Straight Ahead	3 No Improper Driving	3 Driver	Unknown	No Apparent Injury								
ML1704B	5TH ST | WY 336	0.169		04/09/2021	1437	PROPERTY DAMAGE ONLY	0	0	Motor Vehicle in Transport on Roadway	On Roadway	Rear End (Front to Rear)	Intersection Related	1	East	Straight Ahead	1 Following too Close	1 Driver	Shoulder and Lap Belt	No Apparent Injury	Daylight	Clear	Dry	N	N	44.806838	-106.952225	21P002768
													2	East	Stopped in Traffic	2 No Improper Driving	2 Driver	Shoulder and Lap Belt	No Apparent Injury								
													3	East	Stopped in Traffic	3 No Improper Driving	3 Driver	Shoulder and Lap Belt	No Apparent Injury								
ML1704B	5TH ST | WY 336	0.208		06/29/2022	802	PROPERTY DAMAGE ONLY	0	0	Motor Vehicle in Transport on Roadway	On Roadway	Rear End (Front to Rear)	Intersection Related	1	West	Straight Ahead	1 Following too Close	1 Driver	Shoulder and Lap Belt	No Apparent Injury	Daylight	Clear	Dry	N	N	44.806862	-106.951436	22P005338
													2	West	Slowing	2 No Improper Driving	2 Driver	Shoulder and Lap Belt	No Apparent Injury								
ML1704B	5TH ST | WY 336	0.362		10/07/2021	1448	SUSPECTED MINOR INJURY	0	1	Motor Vehicle in Transport on Roadway	On Roadway	Rear End (Front to Rear)	Intersection Related	1	West	Straight Ahead	1 Failed to Yield ROW	1 Driver	Unknown	No Apparent Injury	Daylight	Clear	Dry	N	N	44.806845	-106.948266	21P008760
													2	West	Stopped in Traffic	2 No Improper Driving	2 Driver	Unknown	No Apparent Injury								
																	2 Passenger	Unknown	Suspected Minor Injury								
ML1704B	5TH ST | WY 336	0.364		07/15/2020	1614	PROPERTY DAMAGE ONLY	0	0	Motor Vehicle in Transport on Roadway	On Roadway	Rear End (Front to Rear)	Intersection Related	1	West	Straight Ahead	1 Following too Close	1 Driver	Shoulder and Lap Belt	No Apparent Injury	Daylight	Clear	Dry	N	N	44.806833	-106.948219	20P005296
													2	West	Stopped in Traffic	2 No Improper Driving	2 Driver	Shoulder and Lap Belt	No Apparent Injury								
																	2 Passenger	Shoulder and Lap Belt	No Apparent Injury								
																	2 Passenger	Shoulder and Lap Belt	No Apparent Injury								
																	2 Passenger	None Used	No Apparent Injury								
ML1704B	5TH ST | WY 336	0.478		01/04/2021	1535	PROPERTY DAMAGE ONLY	0	0	Motor Vehicle in Transport on Roadway	On Roadway	Rear End (Front to Rear)	Intersection Related	1	East	Straight Ahead	1 Following too Close	1 Driver	Unknown	Unknown	Dusk	Clear	Dry	N	N	44.806836	-106.945882	21P000080
													2	East	Stopped in Traffic	2 No Improper Driving	2 Driver	Shoulder and Lap Belt	No Apparent Injury								

LRS ID	CRASH STREET	MILE POST	CROSS STREET	DATE	TIME	CRASH SEVERITY	FATAL	INJURY	FIRST HARMFUL EVENT (FHE)	FHE LOCATION	MANNER OF COLLISION	JUNCTION RELATION	#	VEHICLE DIRECTION	VEHICLE MANEUVER	#	DRIVER ACTION	#	PERSON TYPE	SAFETY EQUIPMENT USED	INJURY STATUS	LIGHTING	WEATHER CONDITION	ROAD CONDITION	ALCOHOL INVOLVED	DRUGS INVOLVED	LATITUDE	LONGITUDE	CRASH CASE #
ML1704B	5TH ST | WY 336	0.492		02/11/2021	1508	PROPERTY DAMAGE ONLY	0	0	Motor Vehicle in Transport on Roadway	On Roadway	Sideswipe Same Direction (Passing)	Intersection Related	1	West	Straight Ahead	1	Drove too Fast for Conditions	1	Driver	Unknown	No Apparent Injury	Daylight	Clear	Ice/Frost	N	N	44.806836	-106.945589	21P001063
													2	West	Slowing	2	No Improper Driving	2	Driver	Unknown	No Apparent Injury								
																		2	Passenger	Unknown	No Apparent Injury								
ML1704B	5TH ST | WY 336	0.546		02/19/2021	1509	PROPERTY DAMAGE ONLY	0	0	Motor Vehicle in Transport on Roadway	On Roadway	Rear End (Front to Rear)	Driveway Related	1	West	Straight Ahead	1	Erratic/Reckless/Careless/Aggressive	1	Driver	Shoulder and Lap Belt	No Apparent Injury	Daylight	Clear	Dry	N	N	44.806868	-106.944466	21P001297
													2	West	Slowing	2	No Improper Driving	2	Driver	Shoulder and Lap Belt	No Apparent Injury								
ML1704B	5TH ST | WY 336	0.552		07/09/2021	2145	SUSPECTED MINOR INJURY	0	1	Parked Motor Vehicle	Shoulder	Rear End (Front to Rear)	Non-Junction	1	West	Straight Ahead	1	Avoiding Non-Motorist	1	Driver	Unknown	Suspected Minor Injury	Darkness Lighted	Clear	Dry	N	N	44.806851	-106.944352	21P005587
													2	West	Parked	1	Failed to Keep Proper Lane												
ML1704B	5TH ST | WY 336	0.749		05/07/2022	2055	PROPERTY DAMAGE ONLY	0	0	Deer	On Roadway			1		Negotiating a Curve	1	No Improper Driving	1	Driver	Shoulder and Lap Belt	No Apparent Injury	Darkness Lighted	Clear	Dry			44.805607	-106.940742	22-00044084
ML1704B	5TH ST | WY 336	0.939		07/20/2020	1630	PROPERTY DAMAGE ONLY	0	0	Motor Vehicle in Transport on Roadway	On Roadway	Rear End (Front to Rear)	Non-Junction	1	East	Straight Ahead	1	Following too Close	1	Driver	Shoulder and Lap Belt	No Apparent Injury	Daylight	Clear	Dry	N	N	44.804694	-106.937145	200720S04
													2	East	Stopped in Traffic	2	No Improper Driving	2	Driver	Shoulder and Lap Belt	No Apparent Injury								
ML1704B	WY 336	3.101		08/31/2020	1710	PROPERTY DAMAGE ONLY	0	0	Deer	On Roadway			1		Straight Ahead	1	No Improper Driving	1	Driver	Shoulder and Lap Belt	No Apparent Injury	Daylight	Clear	Dry			44.819247	-106.903624	P2020118377
ML1704B	WY 336	4.757		08/28/2022	2100	FATAL INJURY	1	0	Other Non-Collision (MC Loss of Control)	Off Roadway	Not a Collision w/2 Vehicles in Transport	Non-Junction	1	East	Negotiating a Curve	1	Ran Off Road	1	Driver	None Used	Fatal Injury	Darkness Unlighted	Clear	Dry	Y	N	44.834898	-106.877954	22-00093766
ML1704B	WY 336	5.344		06/21/2021	1930	PROPERTY DAMAGE ONLY	0	0	Other Traffic Sign Support	Off Roadway	Not a Collision w/2 Vehicles in Transport	Non-Junction	1	Unknown	Straight Ahead	1	Ran Off Road	1	Driver	Unknown	No Apparent Injury	Unknown	Unknown	Unknown	N	N	44.836579	-106.866123	21P004957
ML1704B	WY 336	6.264		12/12/2020	1730	PROPERTY DAMAGE ONLY	0	0	Deer	On Roadway			1		Straight Ahead	1	No Improper Driving	1	Driver	Shoulder and Lap Belt	No Apparent Injury	Darkness Unlighted	Snowing	Ice/Frost			44.838645	-106.847498	20-00168340
ML1704B	WY 336	9.375		11/22/2021	1550	PROPERTY DAMAGE ONLY	0	0	Deer	On Roadway			1		Straight Ahead	1	No Improper Driving	1	Driver	Shoulder and Lap Belt	No Apparent Injury	Daylight	Clear	Dry			44.822381	-106.788802	21-00133806
																		1	Passenger	Shoulder and Lap Belt	No Apparent Injury								
ML1704B	WY 336	9.518		09/22/2022	1946	PROPERTY DAMAGE ONLY	0	0	Deer	On Roadway			1		Straight Ahead	1	No Improper Driving	1	Driver	Unknown	No Apparent Injury	Darkness Unlighted	Clear	Wet			44.821355	-106.786240	220922S06
																		1	Passenger	Unknown	No Apparent Injury								

LRS ID	CRASH STREET	MILE POST	CROSS STREET	DATE	TIME	CRASH SEVERITY	FATAL	INJURY	FIRST HARMFUL EVENT (FHE)	FHE LOCATION	MANNER OF COLLISION	JUNCTION RELATION	#	VEHICLE DIRECTION	VEHICLE MANEUVER	DRIVER ACTION	PERSON TYPE	SAFETY EQUIPMENT USED	INJURY STATUS	LIGHTING	WEATHER CONDITION	ROAD CONDITION	ALCOHOL INVOLVED	DRUGS INVOLVED	LATITUDE	LONGITUDE	CRASH CASE #

REPORT SUMMARY

TOTAL CRASHES:	21		
FATAL CRASHES:	1	**TOTAL FATALITIES:**	1
INJURY CRASHES:	4	**TOTAL INJURIES:**	6
PDO CRASHES:	16		

* PDO = Property Damage Only Crashes
* Critical Crashes = Fatal & Suspected Serious Injury Crashes
* Serious Crashes = Suspected Minor Injury & Possible Injury Crashes
* Damage Crashes = No Apparent Injury & Unknown Injury Crashes

	CRASH COUNTS				SEVERITY COUNTS			INJURY COUNTS				
YEAR	FATAL CRASHES	INJURY CRASHES	PDO CRASHES	TOTAL CRASHES	CRITICAL CRASHES*	SERIOUS CRASHES*	DAMAGE CRASHES*	FATAL INJURIES	SERIOUS INJURIES	MINOR INJURIES	POSSIBLE INJURIES	NO INJURIES
2020	0	0	5	5	0	0	5	0	0	0	0	12
2021	0	4	6	10	0	4	6	0	0	3	3	18
2022	1	0	5	6	1	0	5	1	0	0	0	9
	1	**4**	**16**	**21**	**1**	**4**	**16**	**1**	**0**	**3**	**3**	**39**

Appendix D

Traffic Signal Warrant Study

Traffic Signal Warrant Analysis

Project Name	**Story House**
Project/File #	**WWC Engineering**
Scenario	**Year 2043 Total - AM Peak**

Intersection Information	
Major Street Name	Wyarno Road
North/South or East/West	E/W
Speed Limit	45 mph or greater
# of Approach Lanes	1
% of Right Turn Traffic to Include	100%
Minor Street Name	Industrial Lane
# of Approach Lanes	1
% of Right Turn Traffic to Include	50%
Isolated Community < 10,000 pop	No

What Additional Warrants to Consider?	
Warrant 3, Peak Hour (A - Vol. and Delay)	Yes
Warrant 4, Pedestrian Volume	No
Warrant 5, School Crossing	No
Warrant 6, Coordinated Signal System	No
Warrant 7, Crash Experience	No
Warrant 8, Roadway Network	No
Warrant 9, Intersection Near a Grade Crossing	No
All-Way Stop Warrant	No

Sustainable Traffic Solutions, Inc.

Traffic Signal Warrant Analysis

Wyarno Road (Major Street) Volume

Eastbound Volume by Hour				
Time	Left Turns	Through	Right Turns	Peds/Bikes
12 - 1 AM				
1 - 2 AM				
2 - 3 AM				
3 - 4 AM				
4 - 5 AM				
5 - 6 AM				
6 - 7 AM				
7 - 8 AM	223	178	70	
8 - 9 AM				
9 - 10 AM				
10 - 11 AM				
11 - 12 PM				
12 - 1 PM				
1 - 2 PM				
2 - 3 PM				
3 - 4 PM				
4 - 5 PM				
5 - 6 PM				
6 - 7 PM				
7 - 8 PM				
8 - 9 PM				
9 - 10 PM				
10 - 11 PM				
11 - 12 AM				
Total Vehicles (unadjusted)			471	0

Westbound Volume by Hour				
Time	Left Turns	Through	Right Turns	Peds/Bikes
12 - 1 AM				
1 - 2 AM				
2 - 3 AM				
3 - 4 AM				
4 - 5 AM				
5 - 6 AM				
6 - 7 AM				
7 - 8 AM	0	172	8	
8 - 9 AM				
9 - 10 AM				
10 - 11 AM				
11 - 12 PM				
12 - 1 PM				
1 - 2 PM				
2 - 3 PM				
3 - 4 PM				
4 - 5 PM				
5 - 6 PM				
6 - 7 PM				
7 - 8 PM				
8 - 9 PM				
9 - 10 PM				
10 - 11 PM				
11 - 12 AM				
Total Vehicles (unadjusted)			180	0

Industrial Lane (Minor Street) Volume

Northbound Volume by Hour				
Time	Left Turns	Through	Right Turns	Peds/Bikes
12 - 1 AM				
1 - 2 AM				
2 - 3 AM				
3 - 4 AM				
4 - 5 AM				
5 - 6 AM				
6 - 7 AM				
7 - 8 AM	32	0	0	
8 - 9 AM				
9 - 10 AM				
10 - 11 AM				
11 - 12 PM				
12 - 1 PM				
1 - 2 PM				
2 - 3 PM				
3 - 4 PM				
4 - 5 PM				
5 - 6 PM				
6 - 7 PM				
7 - 8 PM				
8 - 9 PM				
9 - 10 PM				
10 - 11 PM				
11 - 12 AM				
Total Vehicles (unadjusted)			32	0

Southbound Volume by Hour				
Time	Left Turns	Through	Right Turns	Peds/Bikes
12 - 1 AM				
1 - 2 AM				
2 - 3 AM				
3 - 4 AM				
4 - 5 AM				
5 - 6 AM				
6 - 7 AM				
7 - 8 AM	6	0	157	
8 - 9 AM				
9 - 10 AM				
10 - 11 AM				
11 - 12 PM				
12 - 1 PM				
1 - 2 PM				
2 - 3 PM				
3 - 4 PM				
4 - 5 PM				
5 - 6 PM				
6 - 7 PM				
7 - 8 PM				
8 - 9 PM				
9 - 10 PM				
10 - 11 PM				
11 - 12 AM				
Total Vehicles (unadjusted)			163	0

Traffic Signal Warrant Analysis

Additional Inputs for Warrants 3 to 9 and the Multi-Way Stop Warrants

Warrant 3: Peak Hour Delay Additional Information	
T-intersection or 4-legged?	4
Peak Hour Reviewed?	PM Peak
Wyarno Road (Major Street) Data	
Combined Approach Volume	651
Industrial Lane (Minor Street) Data	
High Volume Side Volume	163
High Volume Side Average Delay (Sec.)	11.49
High Volume Side # of Approach Lanes	1
Low Volume Side Volume (leave blank if T)	0

Warrant 4: Pedestrian Volume Additional Information	
Include Right Turn Reduction for Vehicular Volume?	No
300 feet or more to nearest traffic control signal or STOP sign controlling the street that pedestrians desire to cross?	No
If no, will a traffic control signal restrict the progressive movement of traffic?*	N/A
15th-percentile crossing speed of pedestrians less than 3.5 feet per second?**	No
If yes, then percent reduction to apply to crossing volume? (up to 50%)	N/A

* Include supporting documentation of no progressive movement impact.

** Not common. Include supporting documentation of low crossing speed.

Warrant 5: School Crossing	
Schoolchildren (elementary through high school) crossing the major street (Wyarno	No
Consideration given to other remedial measures (warning signs/flashers, school speed zones, school crossing guards, or a grade-separated crossing)?	No
300 feet or more to nearest traffic control signal or STOP sign controlling the street that pedestrians desire to cross?	No
If no, will a traffic control signal restrict the progressive movement of traffic?*	N/A
Minimum of 20 schoolchildren crossing during the highest crossing hour?	No
Engineering Study completed showing the number of adequate gaps in the traffic stream during the period when schoolchildren are using the crossing is less than the number of minutes in the same period?**	No

* Include supporting documentation of no progressive movement impact.

** May need to include supporting documentation of inadequate gaps in traffic.

Warrant 6: Coordinated Signal System	
One-way or Two-way Street?	Two-Way
Adjacent traffic control signals do not provide the necessary degree of platooning, but will collectively provide a progressive operation with the proposed traffic control signal?	No
Resultant spacing of traffic control signals 1,000 feet or more?	No

Warrant 7: Crash Experience	
Number of reportable crashes (*types susceptible to correction by a traffic control signal*) within a 12-month period?*	4 or less
Adequate trial of alternatives with satisfactory observance and enforcement failed to reduce crash frequency?**	No
Include Right Turn Reduction for Vehicular Volume?	No

* May need to include supporting documentation of crash details.

** May need to include supporting documentation of alternative trail(s) and results.

Warrant 8: Roadway Network	
Common intersection of two major routes?*	No
Projected entering volume of at least 1,000 vehicles per hour during the peak hour of a typical weekday?	No
5-Year projected traffic volumes meet one or more of Warrants 1, 2, and 3 during an average weekday?	No
Total existing or immediately projected entering volume of at least 1,000 vehicles per hour for each of any 5 hours of a non-normal business day (Saturday or Sunday)?	No

* Major Route defined as:

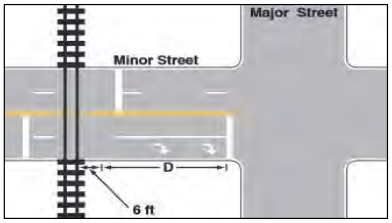
- Part of the street or highway system that serves as the principal roadway network for through traffic flow.
- Rural or suburban highways outside, entering, or traversing a city.
- Appears as a major route on an official plan, such as a major street plan in an urban area traffic and transportation study.

Warrant 9: Intersection Near a Grade Crossing	
Tracks cross which Industrial Lane approach?	Southbound
Consideration given to other alternatives/trial of alternative failed to alleviate the safety concerns?*	No
Distance between STOP or YIELD controlled approach and center of track nearest to the intersection within 140 feet?	No
Clear storage distance (Distance D) between the tracks and the intersection? (See Below)	70 feet
Number of approach lanes at the crossing?	2 or more
Rail traffic per day?	3-5
Percentage of high-occupancy buses?**	0%
Percentage of Tractor-Trailer Trucks?	7.6%-12.5%

* Alternatives to consider or try should include:

- Providing additional pavement that would enable vehicles to clear the track or provide space for an evasive maneuver.
- Reassigning the stop controls at the intersection to make the approach across the track non-stopping.

** High-occupancy is defined as a bus occupied by at least 20 people.



Multi-Way Stop Warrant Additional Information	
Traffic control signal warranted & justified with existing traffic?	No
Number of *correctable* crashes* in 12-month period?	4
Peak Hour high volume approach average delay (Sec.)	11.49

* Crashes include right-turn and left-turn collisions as well as right-angle collisions.

Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Story House
Project/File #	WWC Engineering
Scenario	Year 2043 Total - AM Peak

Intersection Information			
Major Street (E/W Road)	Wyarno Road	Minor Street (N/S Road)	Industrial Lane
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	651 vehicles	Total Approach Volume	195 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	50 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

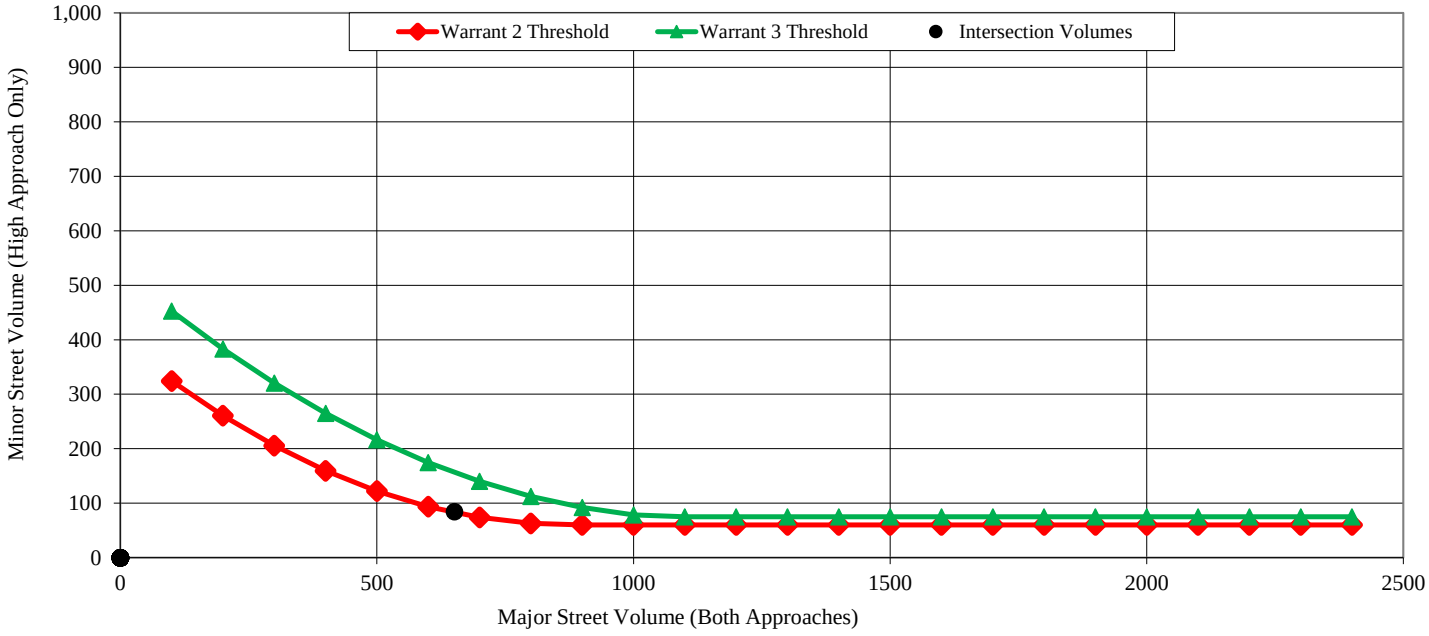
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	350	525	280 (Cond. A) & 420 (Cond. B)
Criteria - Minor Street (veh/hr)	105	53	84 (Cond. A) & 42 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**
Required values reached for	814 total, 163 minor, 0.5 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



Pedestrian Crossing Volume

Traffic Signal Warrant Analysis

Project Name	**Story House**
Project/File #	**WWC Engineering**
Scenario	**Year 2043 Total - PM Peak**

Intersection Information	
Major Street Name	Wyarno Road
North/South or East/West	E/W
Speed Limit	45 mph or greater
# of Approach Lanes	1
% of Right Turn Traffic to Include	100%
Minor Street Name	Industrial Lane
# of Approach Lanes	1
% of Right Turn Traffic to Include	50%
Isolated Community < 10,000 pop	No

What Additional Warrants to Consider?	
Warrant 3, Peak Hour (A - Vol. and Delay)	Yes
Warrant 4, Pedestrian Volume	No
Warrant 5, School Crossing	No
Warrant 6, Coordinated Signal System	No
Warrant 7, Crash Experience	No
Warrant 8, Roadway Network	No
Warrant 9, Intersection Near a Grade Crossing	No
All-Way Stop Warrant	No

Sustainable Traffic Solutions, Inc.

Traffic Signal Warrant Analysis

Wyarno Road (Major Street) Volume

Eastbound Volume by Hour				
Time	Left Turns	Through	Right Turns	Peds/Bikes
12 - 1 AM				
1 - 2 AM				
2 - 3 AM				
3 - 4 AM				
4 - 5 AM				
5 - 6 AM				
6 - 7 AM				
7 - 8 AM				
8 - 9 AM				
9 - 10 AM				
10 - 11 AM				
11 - 12 PM				
12 - 1 PM				
1 - 2 PM				
2 - 3 PM				
3 - 4 PM				
4 - 5 PM				
5 - 6 PM	176	214	36	
6 - 7 PM				
7 - 8 PM				
8 - 9 PM				
9 - 10 PM				
10 - 11 PM				
11 - 12 AM				
Total Vehicles (unadjusted)			426	0

Westbound Volume by Hour				
Time	Left Turns	Through	Right Turns	Peds/Bikes
12 - 1 AM				
1 - 2 AM				
2 - 3 AM				
3 - 4 AM				
4 - 5 AM				
5 - 6 AM				
6 - 7 AM				
7 - 8 AM				
8 - 9 AM				
9 - 10 AM				
10 - 11 AM				
11 - 12 PM				
12 - 1 PM				
1 - 2 PM				
2 - 3 PM				
3 - 4 PM				
4 - 5 PM				
5 - 6 PM	0	203	6	
6 - 7 PM				
7 - 8 PM				
8 - 9 PM				
9 - 10 PM				
10 - 11 PM				
11 - 12 AM				
Total Vehicles (unadjusted)			209	0

Industrial Lane (Minor Street) Volume

Northbound Volume by Hour				
Time	Left Turns	Through	Right Turns	Peds/Bikes
12 - 1 AM				
1 - 2 AM				
2 - 3 AM				
3 - 4 AM				
4 - 5 AM				
5 - 6 AM				
6 - 7 AM				
7 - 8 AM				
8 - 9 AM				
9 - 10 AM				
10 - 11 AM				
11 - 12 PM				
12 - 1 PM				
1 - 2 PM				
2 - 3 PM				
3 - 4 PM				
4 - 5 PM				
5 - 6 PM	66	0	3	
6 - 7 PM				
7 - 8 PM				
8 - 9 PM				
9 - 10 PM				
10 - 11 PM				
11 - 12 AM				
Total Vehicles (unadjusted)			69	0

Southbound Volume by Hour				
Time	Left Turns	Through	Right Turns	Peds/Bikes
12 - 1 AM				
1 - 2 AM				
2 - 3 AM				
3 - 4 AM				
4 - 5 AM				
5 - 6 AM				
6 - 7 AM				
7 - 8 AM				
8 - 9 AM				
9 - 10 AM				
10 - 11 AM				
11 - 12 PM				
12 - 1 PM				
1 - 2 PM				
2 - 3 PM				
3 - 4 PM				
4 - 5 PM				
5 - 6 PM	8	0	241	
6 - 7 PM				
7 - 8 PM				
8 - 9 PM				
9 - 10 PM				
10 - 11 PM				
11 - 12 AM				
Total Vehicles (unadjusted)			249	0

Traffic Signal Warrant Analysis

Additional Inputs for Warrants 3 to 9 and the Multi-Way Stop Warrants

Warrant 3: Peak Hour Delay Additional Information	
T-intersection or 4-legged?	4
Peak Hour Reviewed?	PM Peak
Wyarno Road (Major Street) Data	
Combined Approach Volume	635
Industrial Lane (Minor Street) Data	
High Volume Side Volume	249
High Volume Side Average Delay (Sec.)	12.69
High Volume Side # of Approach Lanes	1
Low Volume Side Volume (leave blank if T)	69

Warrant 4: Pedestrian Volume Additional Information	
Include Right Turn Reduction for Vehicular Volume?	No
300 feet or more to nearest traffic control signal or STOP sign controlling the street that pedestrians desire to cross?	No
If no, will a traffic control signal restrict the progressive movement of traffic?*	N/A
15th-percentile crossing speed of pedestrians less than 3.5 feet per second?**	No
If yes, then percent reduction to apply to crossing volume? (up to 50%)	N/A

* Include supporting documentation of no progressive movement impact.

** Not common. Include supporting documentation of low crossing speed.

Warrant 5: School Crossing	
Schoolchildren (elementary through high school) crossing the major street (Wyarno	No
Consideration given to other remedial measures (warning signs/flashers, school speed zones, school crossing guards, or a grade-separated crossing)?	No
300 feet or more to nearest traffic control signal or STOP sign controlling the street that pedestrians desire to cross?	No
If no, will a traffic control signal restrict the progressive movement of traffic?*	N/A
Minimum of 20 schoolchildren crossing during the highest crossing hour?	No
Engineering study completed showing the number of adequate gaps in the traffic stream during the period when schoolchildren are using the crossing is less than the number of minutes in the same period?**	No

* Include supporting documentation of no progressive movement impact.

** May need to include supporting documentation of inadequate gaps in traffic.

Warrant 6: Coordinated Signal System	
One-way or Two-way Street?	Two-Way
Adjacent traffic control signals do not provide the necessary degree of platooning, but will collectively provide a progressive operation with the proposed traffic control signal?	No
Resultant spacing of traffic control signals 1,000 feet or more?	No

Warrant 7: Crash Experience	
Number of reportable crashes (*types susceptible to correction by a traffic control signal*) within a 12-month period?*	4 or less
Adequate trial of alternatives with satisfactory observance and enforcement failed to reduce crash frequency?**	No
Include Right Turn Reduction for Vehicular Volume?	No

* May need to include supporting documentation of crash details.

** May need to include supporting documentation of alternative trail(s) and results.

Warrant 8: Roadway Network	
Common intersection of two major routes?*	No
Projected entering volume of at least 1,000 vehicles per hour during the peak hour of a typical weekday?	No
5-Year projected traffic volumes meet one or more of Warrants 1, 2, and 3 during an average weekday?	No
Total existing or immediately projected entering volume of at least 1,000 vehicles per hour for each of any 5 hours of a non-normal business day (Saturday or Sunday)?	No

* Major Route defined as:

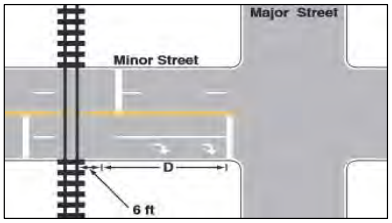
- Part of the street or highway system that serves as the principal roadway network for through traffic flow.
- Rural or suburban highways outside, entering, or traversing a city.
- Appears as a major route on an official plan, such as a major street plan in an urban area traffic and transportation study.

Warrant 9: Intersection Near a Grade Crossing	
Tracks cross which Industrial Lane approach?	Southbound
Consideration given to other alternatives/trial of alternative failed to alleviate the safety concerns?*	No
Distance between STOP or YIELD controlled approach and center of track nearest to the intersection within 140 feet?	No
Clear storage distance (Distance D) between the tracks and the intersection? (See Below)	70 feet
Number of approach lanes at the crossing?	2 or more
Rail traffic per day?	3-5
Percentage of high-occupancy buses?**	0%
Percentage of Tractor-Trailer Trucks?	7.6%-12.5%

* Alternatives to consider or try should include:

- Providing additional pavement that would enable vehicles to clear the track or provide space for an evasive maneuver.
- Reassigning the stop controls at the intersection to make the approach across the track non-stopping.

** High-occupancy is defined as a bus occupied by at least 20 people.



Multi-Way Stop Warrant Additional Information	
Traffic control signal warranted & justified with existing traffic?	No
Number of *correctable* crashes* in 12-month period?	4
Peak Hour high volume approach average delay (Sec.)	12.69

* Crashes include right-turn and left-turn collisions as well as right-angle collisions.

Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Story House
Project/File #	WWC Engineering
Scenario	Year 2043 Total - PM Peak

Intersection Information			
Major Street (E/W Road)	Wyarno Road	Minor Street (N/S Road)	Industrial Lane
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	635 vehicles	Total Approach Volume	318 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	50 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

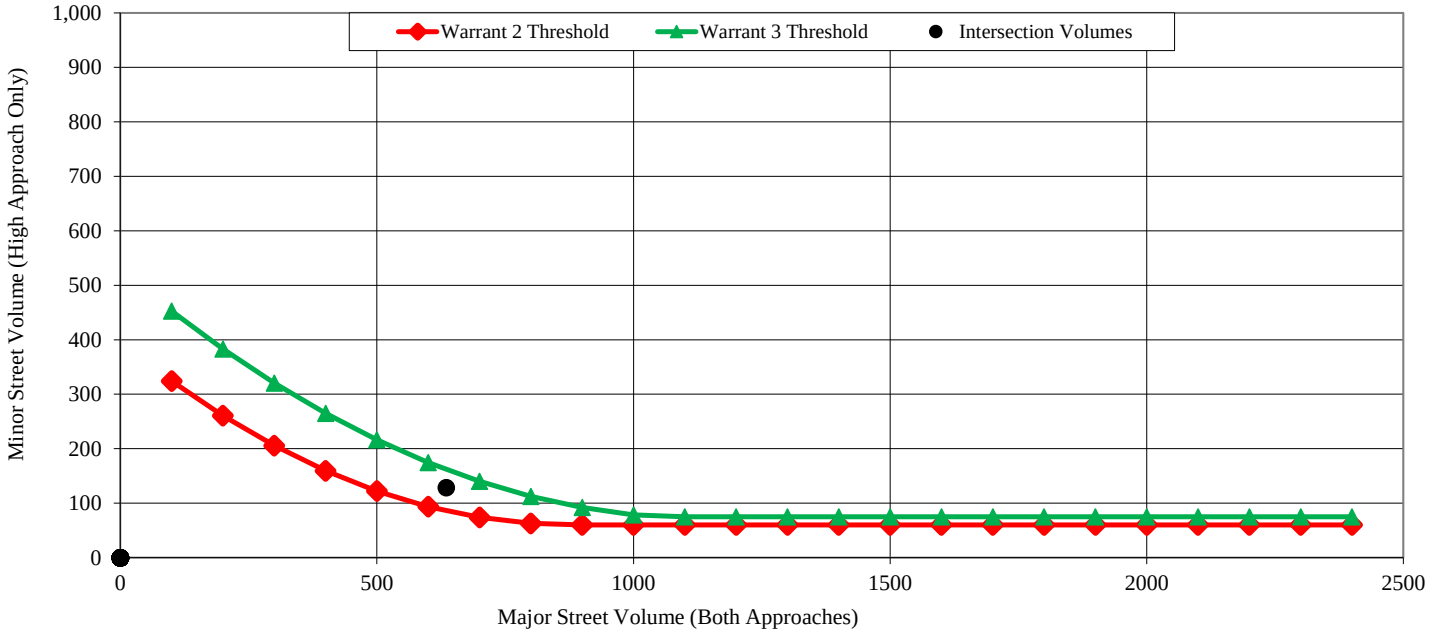
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	1 hour	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	350	525	280 (Cond. A) & 420 (Cond. B)
Criteria - Minor Street (veh/hr)	105	53	84 (Cond. A) & 42 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**
Required values reached for	953 total, 249 minor, 0.9 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



Pedestrian Crossing Volume

Appendix E

Wyarno Road Speed Data Summary

Form TR-11

Revised 3/4/11

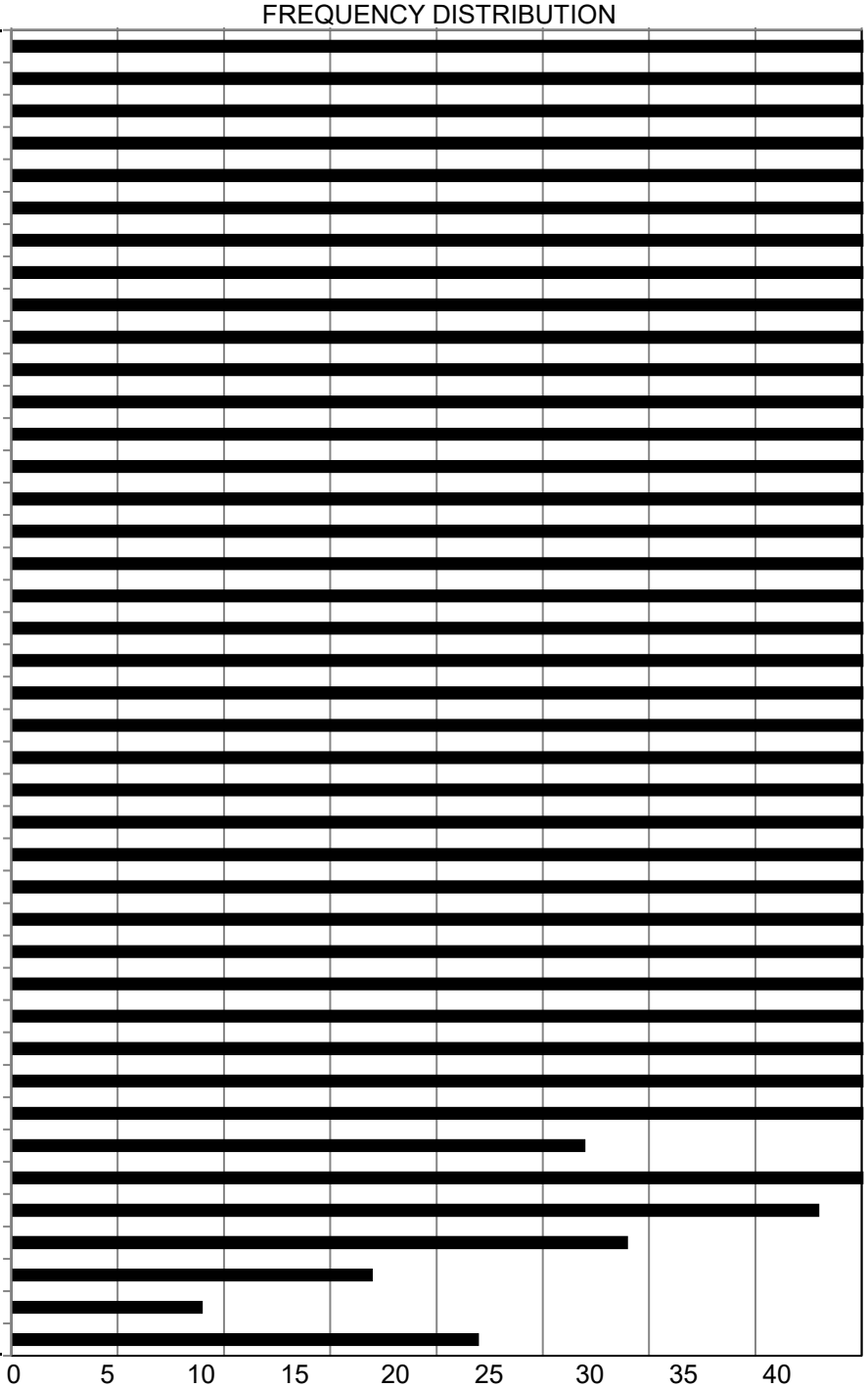
SPEED STUDY

Wyoming Department of Transportation

CITY: Sheridan
COUNTY: Sheridan
ROUTE: Wyarno Road
SPEED LIMIT: 70 MPH
DIRECTION: EB/WB Comb.
LOCATION: E/O Industrial Lane
OBSERVER: JAMAR Radar Device
START TIME: 0
WEATHER: Summer
######
END TIME: 0
COMMENTS: Location 1

SPEED	FREQUENCY	ACUM TOTAL	ACUM %
30	122	122	1.4
31	47	169	2.0
32	111	280	3.2
33	53	333	3.9
34	145	478	5.5
35	212	690	8.0
36	127	817	9.5
37	272	1089	12.6
38	125	1214	14.1
39	311	1525	17.7
40	394	1919	22.3
41	211	2130	24.7
42	497	2627	30.5
43	464	3091	35.8
44	237	3328	38.6
45	538	3866	44.8
46	277	4143	48.0
47	566	4709	54.6
48	504	5213	60.4
49	217	5430	63.0
50	431	5861	68.0
51	226	6087	70.6
52	396	6483	75.2
53	371	6854	79.5
54	167	7021	81.4
55	284	7305	84.7
56	145	7450	86.4
57	240	7690	89.2
58	236	7926	91.9
59	83	8009	92.9
60	161	8170	94.7
61	60	8230	95.4
62	96	8326	96.5
63	93	8419	97.6
64	27	8446	97.9
65	63	8509	98.7
66	38	8547	99.1
67	29	8576	99.4
68	17	8593	99.6
69	9	8602	99.7
70	22	8624	100

FREQUENCY DISTRIBUTION



AVERAGE SPEED = 47.0
50th PERCENTILE = 47
67th PERCENTILE = 50
85th PERCENTILE = 56
95th PERCENTILE = 61

PACE SPEED = 39 to 48
VEHICLES IN PACE = 3999
% IN PACE = 46
% BELOW PACE = 14
% ABOVE PACE = 40

STANDARD DEVIATION = 8.04
% EXCEEDING POSTED LIMIT = 0

RECOMMENDED SPEED LIMIT = 55

Form TR-11

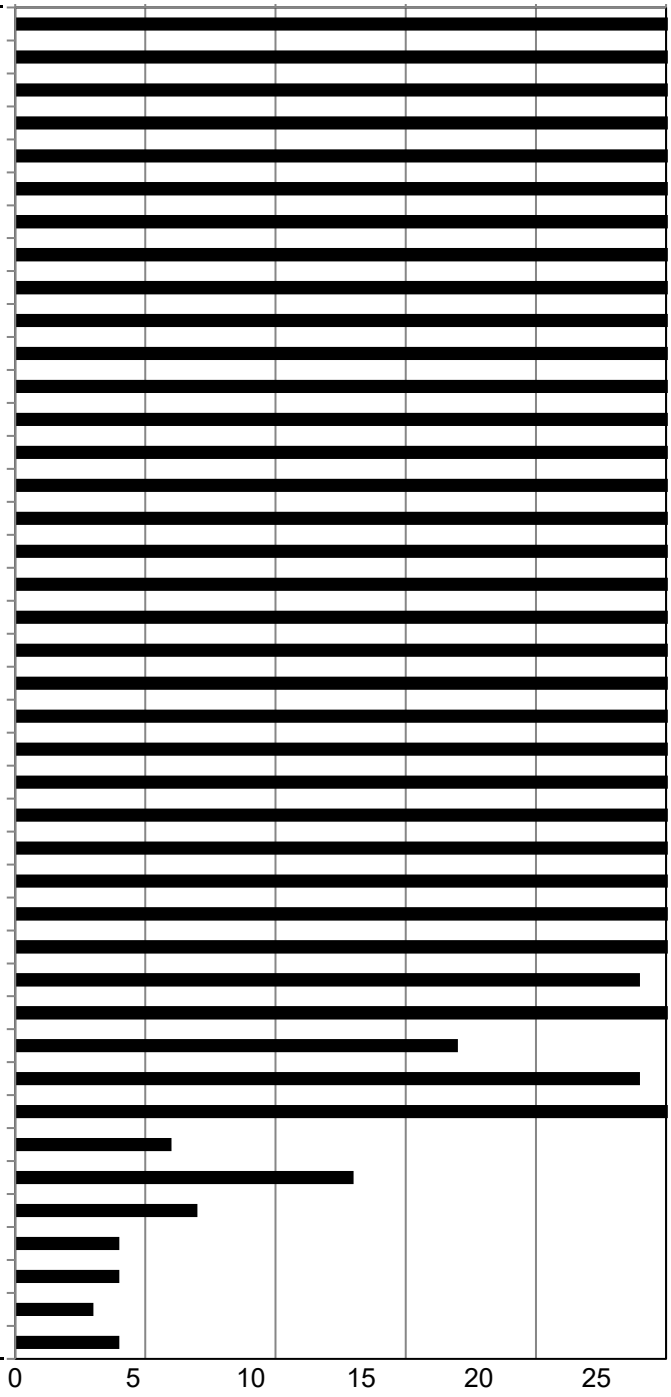
Revised 3/4/11

SPEED STUDY

Wyoming Department of Transportation

CITY: Sheridan
COUNTY: Sheridan
ROUTE: Wyarno Road
SPEED LIMIT: 70 MPH
DIRECTION: Eastbound
LOCATION: E/O Industrial Lane
OBSERVER: JAMAR Radar Device
START TIME:
WEATHER: Summer
DATE: 7/16/23-7/25/23
END TIME:
COMMENTS: Location 1

SPEED	FREQUENCY	ACUM TOTAL	ACUM %
30	88	88	2.2
31	36	124	3.1
32	79	203	5.0
33	34	237	5.8
34	97	334	8.2
35	147	481	11.8
36	82	563	13.9
37	183	746	18.4
38	76	822	20.2
39	192	1014	25.0
40	231	1245	30.7
41	124	1369	33.7
42	285	1654	40.7
43	253	1907	47.0
44	122	2029	50.0
45	276	2305	56.8
46	117	2422	59.7
47	257	2679	66.0
48	218	2897	71.4
49	97	2994	73.7
50	171	3165	78.0
51	91	3256	80.2
52	153	3409	84.0
53	120	3529	86.9
54	48	3577	88.1
55	89	3666	90.3
56	48	3714	91.5
57	79	3793	93.4
58	83	3876	95.5
59	24	3900	96.1
60	46	3946	97.2
61	17	3963	97.6
62	24	3987	98.2
63	32	4019	99.0
64	6	4025	99.1
65	13	4038	99.5
66	7	4045	99.6
67	4	4049	99.7
68	4	4053	99.8
69	3	4056	99.9
70	4	4060	100



AVERAGE SPEED = 44.8
50th PERCENTILE = 45
67th PERCENTILE = 48
85th PERCENTILE = 53
95th PERCENTILE = 58

PACE SPEED = 39 to 48
VEHICLES IN PACE = 2075
% IN PACE = 51
% BELOW PACE = 20
% ABOVE PACE = 29

STANDARD DEVIATION = 7.67
% EXCEEDING POSTED LIMIT = 0

RECOMMENDED SPEED LIMIT = 55

Form TR-11

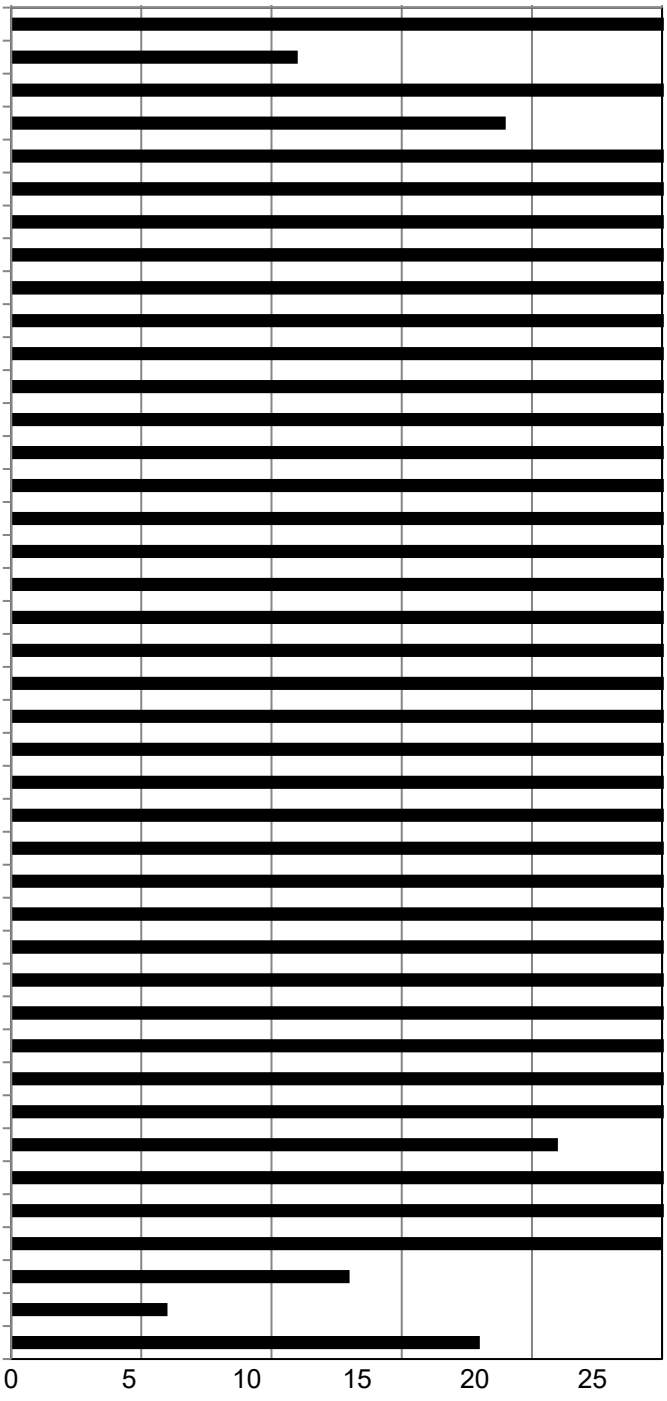
Revised 3/4/11

SPEED STUDY

Wyoming Department of Transportation

CITY: Sheridan
COUNTY: Sheridan
ROUTE: Wyarno Road
SPEED LIMIT: 70 MPH
DIRECTION: Westbound
LOCATION: E/O Industrial Lane
OBSERVER: JAMAR Radar Device
START TIME:
WEATHER: Summer
DATE: 7/16/23-7/25/23
END TIME:
COMMENTS: Location 1

SPEED	FREQUENCY	ACUM TOTAL	ACUM %
30	34	34	0.7
31	11	45	1.0
32	32	77	1.7
33	19	96	2.1
34	48	144	3.2
35	65	209	4.6
36	45	254	5.6
37	89	343	7.5
38	49	392	8.6
39	119	511	11.2
40	163	674	14.8
41	87	761	16.7
42	212	973	21.3
43	211	1184	25.9
44	115	1299	28.5
45	262	1561	34.2
46	160	1721	37.7
47	309	2030	44.5
48	286	2316	50.7
49	120	2436	53.4
50	260	2696	59.1
51	135	2831	62.0
52	243	3074	67.4
53	251	3325	72.9
54	119	3444	75.5
55	195	3639	79.7
56	97	3736	81.9
57	161	3897	85.4
58	153	4050	88.7
59	59	4109	90.0
60	115	4224	92.6
61	43	4267	93.5
62	72	4339	95.1
63	61	4400	96.4
64	21	4421	96.9
65	50	4471	98.0
66	31	4502	98.6
67	25	4527	99.2
68	13	4540	99.5
69	6	4546	99.6
70	18	4564	100



AVERAGE SPEED = 48.9
50th PERCENTILE = 48
67th PERCENTILE = 52
85th PERCENTILE = 57
95th PERCENTILE = 62

PACE SPEED = 45 to 54
VEHICLES IN PACE = 2145
% IN PACE = 47
% BELOW PACE = 28
% ABOVE PACE = 25

STANDARD DEVIATION = 7.87
% EXCEEDING POSTED LIMIT = 0

RECOMMENDED SPEED LIMIT = 55

Sheridan Police Department
JAMAR Speed Study

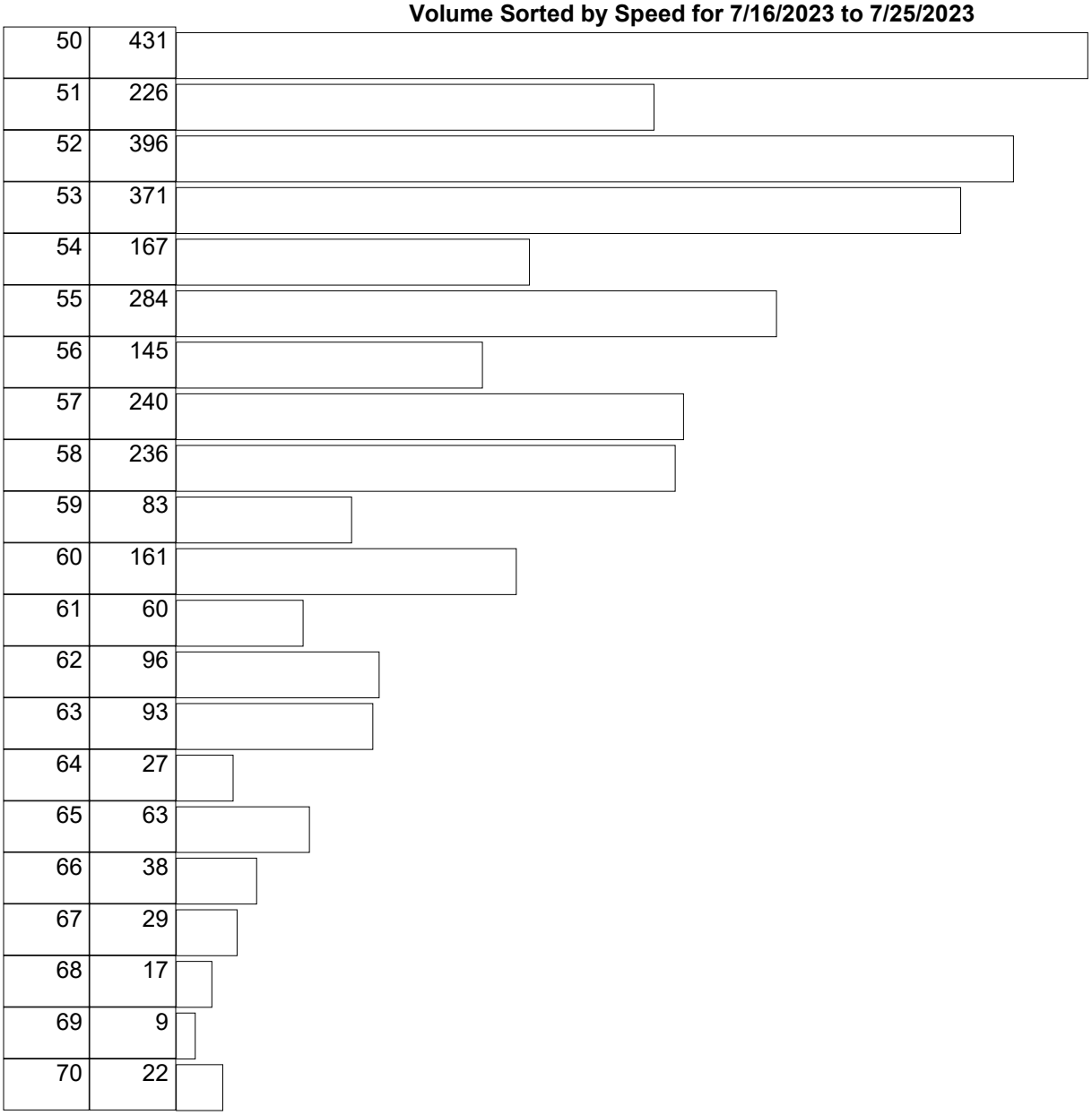
Volume Sorted by Speed for 7/16/2023 to 7/25/2023

Combined

Speed (MPH)	Volume
20	13
21	30
22	24
23	19
24	40
25	67
26	35
27	57
28	31
29	74
30	122
31	47
32	111
33	53
34	145
35	212
36	127
37	272
38	125
39	311
40	394
41	211
42	497
43	464
44	237
45	538
46	277
47	566
48	504
49	217

Sheridan Police Department
JAMAR Speed Study

Volume Sorted by Speed for 7/16/2023 to 7/25/2023



50	431
51	226
52	396
53	371
54	167
55	284
56	145
57	240
58	236
59	83
60	161
61	60
62	96
63	93
64	27
65	63
66	38
67	29
68	17
69	9
70	22

Sheridan Police Department
JAMAR Speed Study

Eastbound

Volume Sorted by Speed for 7/16/2023 to 7/25/2023

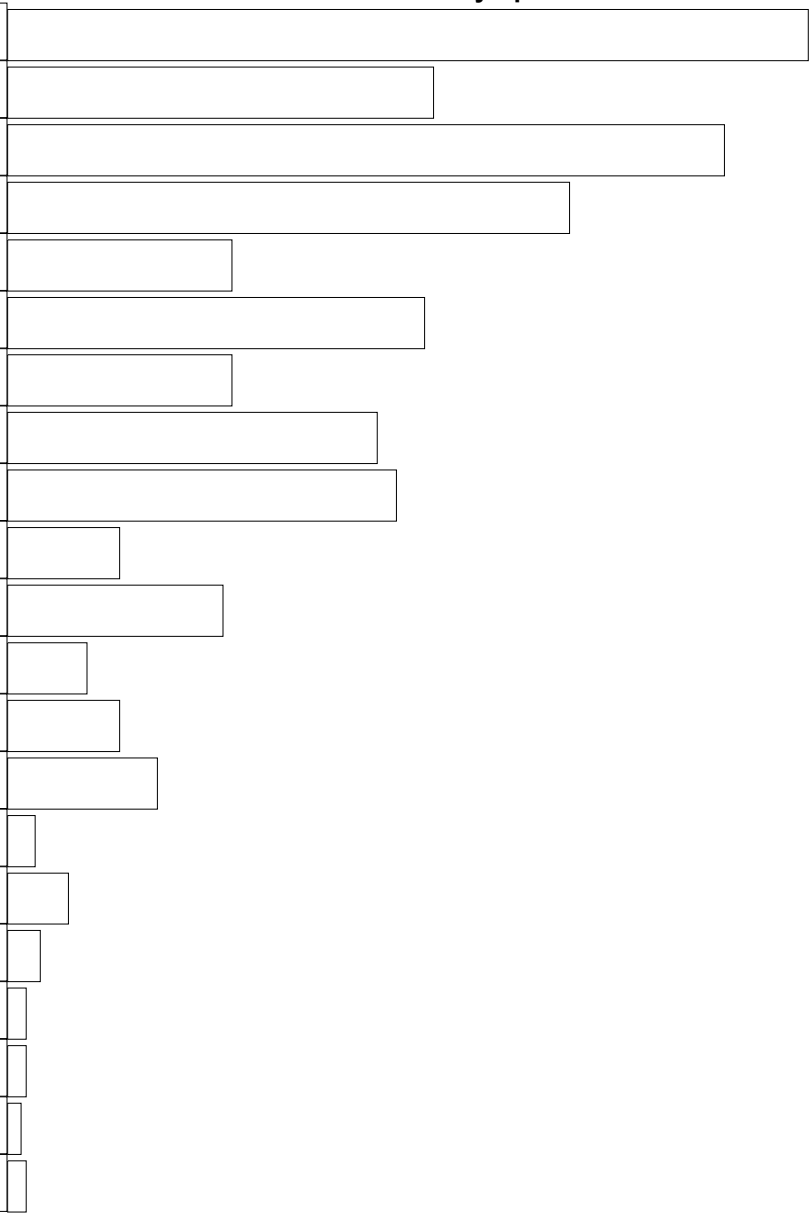
Direction X, Lane 1

Speed (MPH)	Volume
20	3
21	7
22	12
23	7
24	20
25	27
26	21
27	35
28	27
29	59
30	88
31	36
32	79
33	34
34	97
35	147
36	82
37	183
38	76
39	192
40	231
41	124
42	285
43	253
44	122
45	276
46	117
47	257
48	218
49	97

Sheridan Police Department
JAMAR Speed Study

Volume Sorted by Speed for 7/16/2023 to 7/25/2023

50	171
51	91
52	153
53	120
54	48
55	89
56	48
57	79
58	83
59	24
60	46
61	17
62	24
63	32
64	6
65	13
66	7
67	4
68	4
69	3
70	4



Sheridan Police Department
JAMAR Speed Study

Westbound

Volume Sorted by Speed for 7/16/2023 to 7/25/2023

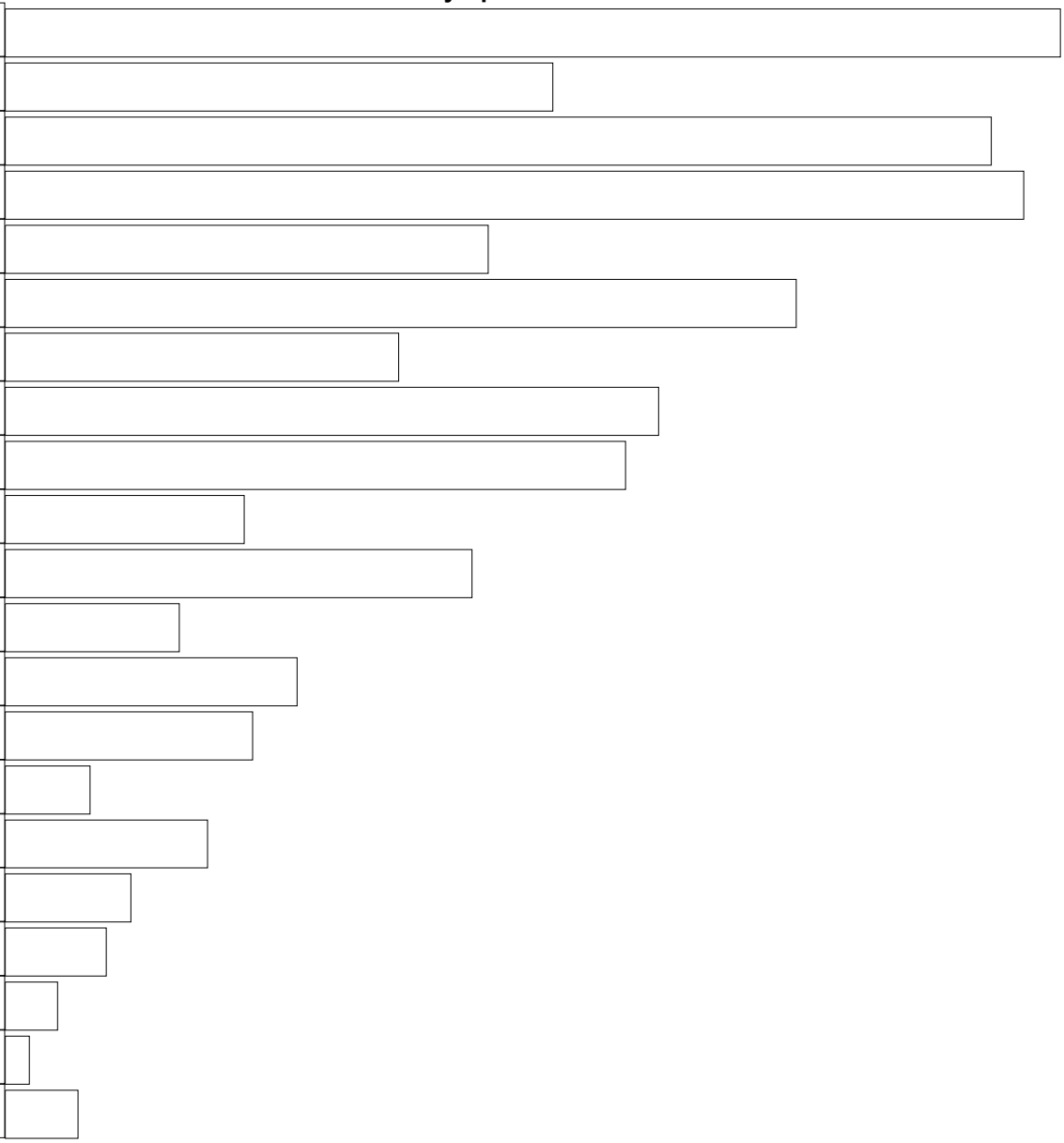
Direction X, Lane 2

Speed (MPH)	Volume
20	10
21	23
22	12
23	12
24	20
25	40
26	14
27	22
28	4
29	15
30	34
31	11
32	32
33	19
34	48
35	65
36	45
37	89
38	49
39	119
40	163
41	87
42	212
43	211
44	115
45	262
46	160
47	309
48	286
49	120

Sheridan Police Department
JAMAR Speed Study

Volume Sorted by Speed for 7/16/2023 to 7/25/2023

50	260
51	135
52	243
53	251
54	119
55	195
56	97
57	161
58	153
59	59
60	115
61	43
62	72
63	61
64	21
65	50
66	31
67	25
68	13
69	6
70	18



Form TR-11

Revised 3/4/11

SPEED STUDY

Wyoming Department of Transportation

CITY: Sheridan
SPEED LIMIT: 70 MPH
OBSERVER: 0
######

COUNTY: Sheridan
DIRECTION: EB/WB Comb.
START TIME: 0
END TIME: 0

ROUTE: Wyarno Road
LOCATION: W/O Wildcat Road
WEATHER: Summer
COMMENTS: Location 2

SPEED	FREQUENCY	ACUM TOTAL	ACUM %
30	5	5	0.5
31	1	6	0.6
32	3	9	0.9
33	2	11	1.0
34	3	14	1.3
35	3	17	1.6
36	4	21	2.0
37	10	31	2.9
38	2	33	3.1
39	9	42	4.0
40	12	54	5.1
41	5	59	5.6
42	26	85	8.1
43	29	114	10.8
44	16	130	12.3
45	33	163	15.5
46	15	178	16.9
47	56	234	22.2
48	51	285	27.0
49	24	309	29.3
50	57	366	34.7
51	31	397	37.7
52	70	467	44.3
53	81	548	52.0
54	35	583	55.3
55	61	644	61.1
56	25	669	63.5
57	62	731	69.4
58	55	786	74.6
59	29	815	77.3
60	47	862	81.8
61	14	876	83.1
62	61	937	88.9
63	35	972	92.2
64	13	985	93.5
65	20	1005	95.4
66	20	1025	97.2
67	7	1032	97.9
68	8	1040	98.7
69	6	1046	99.2
70	8	1054	100

FREQUENCY DISTRIBUTION

AVERAGE SPEED = 53.3
50th PERCENTILE = 53
67th PERCENTILE = 57
85th PERCENTILE = 62
95th PERCENTILE = 65

PACE SPEED = 50 to 59
VEHICLES IN PACE = 506
% IN PACE = 48
% BELOW PACE = 29
% ABOVE PACE = 23

STANDARD DEVIATION = 7.60
% EXCEEDING POSTED LIMIT = 0

RECOMMENDED SPEED LIMIT = 60

Form TR-11

Revised 3/4/11

SPEED STUDY

Wyoming Department of Transportation

CITY: Sheridan
COUNTY: Sheridan
ROUTE: Wyarno Road
SPEED LIMIT: 70 MPH
DIRECTION: Eastbound
LOCATION: W/O Wildcat Road
OBSERVER:
START TIME:
WEATHER: Summer
DATE: 8/8/23-8/9/23
END TIME:
COMMENTS: Location 2

SPEED	FREQUENCY	ACUM TOTAL	ACUM %
30	4	4	0.8
31	1	5	1.0
32	2	7	1.4
33	2	9	1.8
34	0	9	1.8
35	2	11	2.2
36	3	14	2.7
37	4	18	3.5
38	1	19	3.7
39	6	25	4.9
40	8	33	6.5
41	3	36	7.0
42	13	49	9.6
43	12	61	11.9
44	8	69	13.5
45	17	86	16.8
46	5	91	17.8
47	37	128	25.0
48	26	154	30.1
49	13	167	32.7
50	35	202	39.5
51	16	218	42.7
52	35	253	49.5
53	45	298	58.3
54	14	312	61.1
55	31	343	67.1
56	14	357	69.9
57	28	385	75.3
58	27	412	80.6
59	11	423	82.8
60	17	440	86.1
61	7	447	87.5
62	25	472	92.4
63	14	486	95.1
64	4	490	95.9
65	7	497	97.3
66	6	503	98.4
67	2	505	98.8
68	2	507	99.2
69	3	510	99.8
70	1	511	100

AVERAGE SPEED = 52.3
50th PERCENTILE = 53
67th PERCENTILE = 55
85th PERCENTILE = 60
95th PERCENTILE = 63

PACE SPEED = 47 to 56
VEHICLES IN PACE = 266
% IN PACE = 52
% BELOW PACE = 18
% ABOVE PACE = 30

STANDARD DEVIATION = 7.41
% EXCEEDING POSTED LIMIT = 0

RECOMMENDED SPEED LIMIT = 60

Form TR-11

Revised 3/4/11

SPEED STUDY

Wyoming Department of Transportation

CITY: Sheridan
COUNTY: Sheridan
ROUTE: Wyarno Road
SPEED LIMIT: 70 MPH
DIRECTION: Westbound
LOCATION: W/O Wildcat Road
OBSERVER:
START TIME:
WEATHER: Summer
DATE: 8/8/23-8/9/23
END TIME:
COMMENTS: Location 2

SPEED	FREQUENCY	ACUM TOTAL	ACUM %
30	1	1	0.2
31	0	1	0.2
32	1	2	0.4
33	0	2	0.4
34	3	5	0.9
35	1	6	1.1
36	1	7	1.3
37	6	13	2.4
38	1	14	2.6
39	3	17	3.1
40	4	21	3.9
41	2	23	4.2
42	13	36	6.6
43	17	53	9.8
44	8	61	11.2
45	16	77	14.2
46	10	87	16.0
47	19	106	19.5
48	25	131	24.1
49	11	142	26.2
50	22	164	30.2
51	15	179	33.0
52	35	214	39.4
53	36	250	46.0
54	21	271	49.9
55	30	301	55.4
56	11	312	57.5
57	34	346	63.7
58	28	374	68.9
59	18	392	72.2
60	30	422	77.7
61	7	429	79.0
62	36	465	85.6
63	21	486	89.5
64	9	495	91.2
65	13	508	93.6
66	14	522	96.1
67	5	527	97.1
68	6	533	98.2
69	3	536	98.7
70	7	543	100

AVERAGE SPEED = 54.3
50th PERCENTILE = 55
67th PERCENTILE = 58
85th PERCENTILE = 62
95th PERCENTILE = 66

PACE SPEED = 51 to 60
VEHICLES IN PACE = 258
% IN PACE = 48
% BELOW PACE = 30
% ABOVE PACE = 22

STANDARD DEVIATION = 7.66
% EXCEEDING POSTED LIMIT = 0

RECOMMENDED SPEED LIMIT = 60

Sheridan Police Department
JAMAR Speed Study

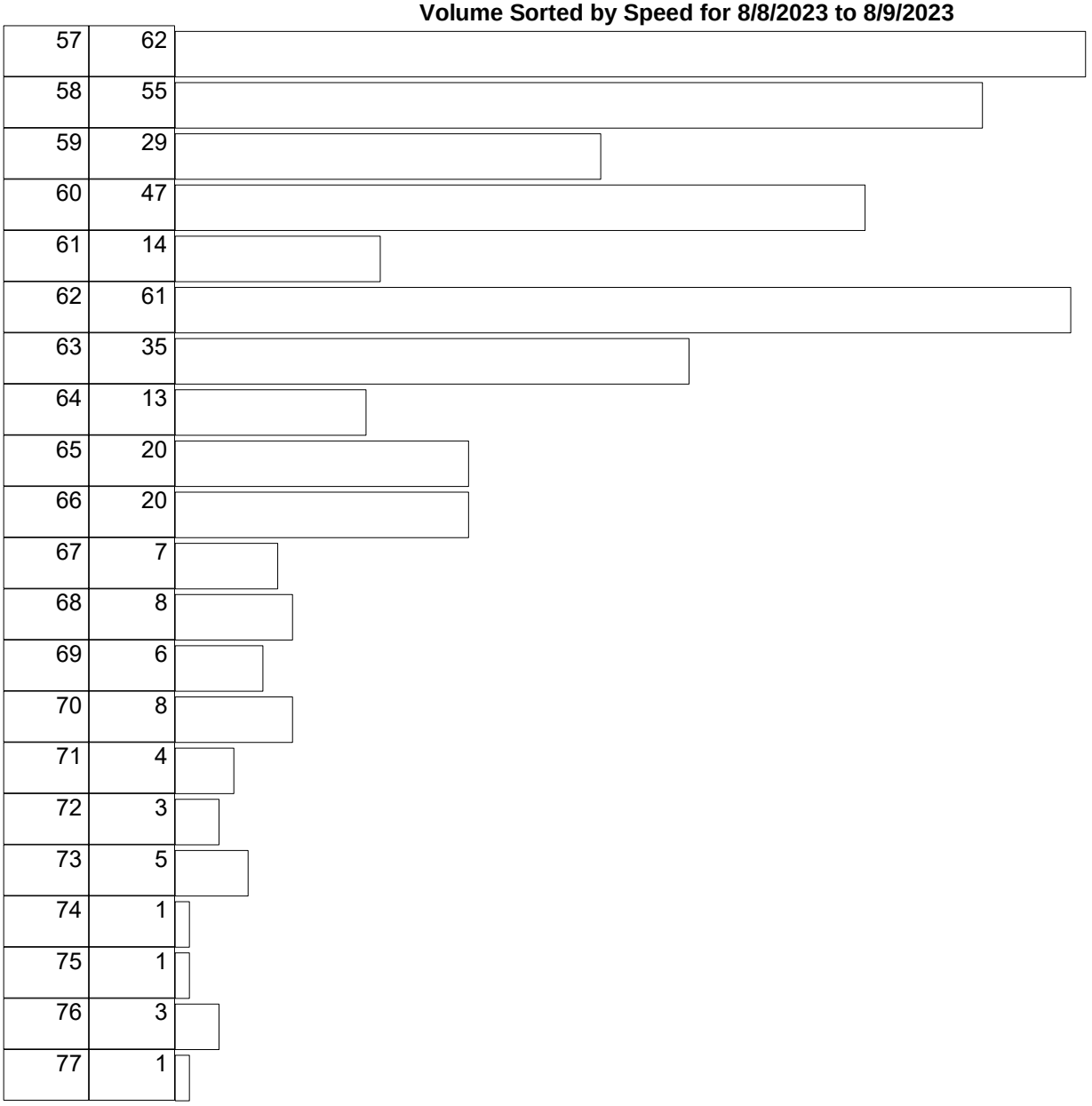
Volume Sorted by Speed for 8/8/2023 to 8/9/2023

Combined

Speed (MPH)	Volume
27	1
28	0
29	3
30	5
31	1
32	3
33	2
34	3
35	3
36	4
37	10
38	2
39	9
40	12
41	5
42	26
43	29
44	16
45	33
46	15
47	56
48	51
49	24
50	57
51	31
52	70
53	81
54	35
55	61
56	25

Sheridan Police Department
JAMAR Speed Study

Volume Sorted by Speed for 8/8/2023 to 8/9/2023



57	62
58	55
59	29
60	47
61	14
62	61
63	35
64	13
65	20
66	20
67	7
68	8
69	6
70	8
71	4
72	3
73	5
74	1
75	1
76	3
77	1

Sheridan Police Department
JAMAR Speed Study

Eastbound

Volume Sorted by Speed for 8/8/2023 to 8/9/2023

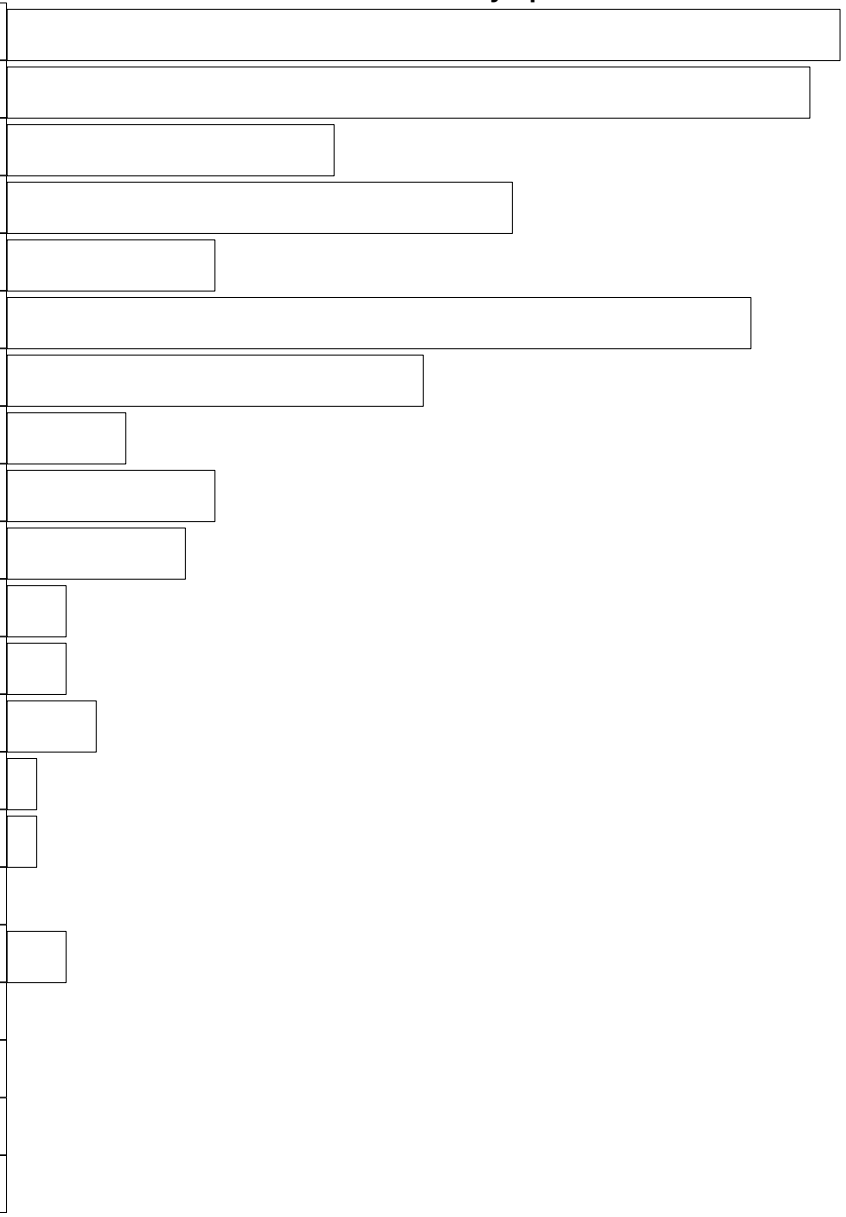
Direction X, Lane 1

Speed (MPH)	Volume
27	1
28	0
29	2
30	4
31	1
32	2
33	2
34	0
35	2
36	3
37	4
38	1
39	6
40	8
41	3
42	13
43	12
44	8
45	17
46	5
47	37
48	26
49	13
50	35
51	16
52	35
53	45
54	14
55	31
56	14

Sheridan Police Department
JAMAR Speed Study

Volume Sorted by Speed for 8/8/2023 to 8/9/2023

57	28
58	27
59	11
60	17
61	7
62	25
63	14
64	4
65	7
66	6
67	2
68	2
69	3
70	1
71	1
72	0
73	2
74	0
75	0
76	0
77	0



Sheridan Police Department
JAMAR Speed Study

Westbound

Volume Sorted by Speed for 8/8/2023 to 8/9/2023

Direction X, Lane 2

Speed (MPH)	Volume
27	0
28	0
29	1
30	1
31	0
32	1
33	0
34	3
35	1
36	1
37	6
38	1
39	3
40	4
41	2
42	13
43	17
44	8
45	16
46	10
47	19
48	25
49	11
50	22
51	15
52	35
53	36
54	21
55	30
56	11

Sheridan Police Department
JAMAR Speed Study

Volume Sorted by Speed for 8/8/2023 to 8/9/2023

57	34
58	28
59	18
60	30
61	7
62	36
63	21
64	9
65	13
66	14
67	5
68	6
69	3
70	7
71	3
72	3
73	3
74	1
75	1
76	3
77	1

Form TR-11

Revised 3/4/11

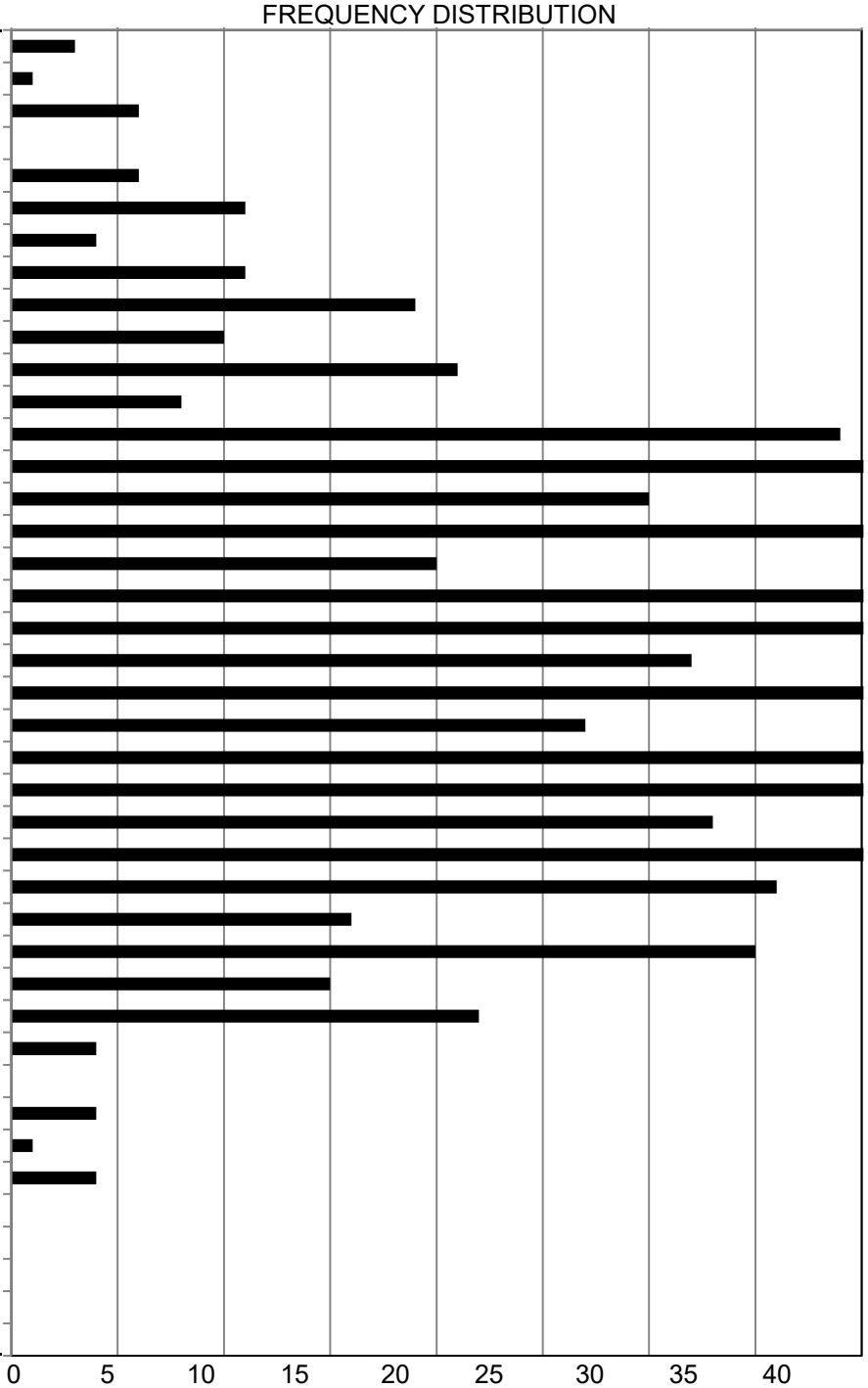
SPEED STUDY

Wyoming Department of Transportation

CITY: Sheridan
COUNTY: Sheridan
ROUTE: Wyarno Road
SPEED LIMIT: 70 MPH
DIRECTION: WB/EB Comb.
LOCATION: E/O Wildcat Road
OBSERVER: JAMAR Radar Device
START TIME: 0
WEATHER: Summer
######
END TIME: 0
COMMENTS: Location 3

SPEED	FREQUENCY	ACUM TOTAL	ACUM %
40	3	3	0.4
41	1	4	0.5
42	6	10	1.2
43	0	10	1.2
44	6	16	1.9
45	11	27	3.2
46	4	31	3.6
47	11	42	4.9
48	19	61	7.1
49	10	71	8.3
50	21	92	10.7
51	8	100	11.7
52	39	139	16.2
53	46	185	21.6
54	30	215	25.1
55	49	264	30.8
56	20	284	33.1
57	45	329	38.4
58	81	410	47.8
59	32	442	51.6
60	64	506	59.0
61	27	533	62.2
62	53	586	68.4
63	57	643	75.0
64	33	676	78.9
65	44	720	84.0
66	36	756	88.2
67	16	772	90.1
68	35	807	94.2
69	15	822	95.9
70	22	844	98.5
71	4	848	98.9
72	0	848	98.9
73	4	852	99.4
74	1	853	99.5
75	4	857	100.0
76	0	857	100.0
77	0	857	100.0
78	0	857	100.0
79	0	857	100.0
80	0	857	100

FREQUENCY DISTRIBUTION



AVERAGE SPEED = 58.9
50th PERCENTILE = 59
67th PERCENTILE = 62
85th PERCENTILE = 66
95th PERCENTILE = 69

PACE SPEED = 57 to 66
VEHICLES IN PACE = 472
% IN PACE = 55
% BELOW PACE = 33
% ABOVE PACE = 12

STANDARD DEVIATION = 6.51
% EXCEEDING POSTED LIMIT = 2

RECOMMENDED SPEED LIMIT = 65

Form TR-11

Revised 3/4/11

SPEED STUDY

Wyoming Department of Transportation

CITY: Sheridan
COUNTY: Sheridan
ROUTE: Wyarno Road
SPEED LIMIT: 70 MPH
DIRECTION: Westbound
LOCATION: E/O Wildcat Road
OBSERVER: JAMAR Radar Device
START TIME:
WEATHER: Summer
DATE: 8/9/23-8/10/23
END TIME:
COMMENTS: Location 3

SPEED	FREQUENCY	ACUM TOTAL	ACUM %
40	1	1	0.2
41	0	1	0.2
42	2	3	0.7
43	0	3	0.7
44	2	5	1.2
45	6	11	2.6
46	1	12	2.9
47	7	19	4.6
48	7	26	6.2
49	6	32	7.7
50	7	39	9.4
51	3	42	10.1
52	14	56	13.4
53	20	76	18.2
54	12	88	21.1
55	21	109	26.1
56	6	115	27.6
57	23	138	33.1
58	41	179	42.9
59	13	192	46.0
60	27	219	52.5
61	11	230	55.2
62	28	258	61.9
63	31	289	69.3
64	20	309	74.1
65	22	331	79.4
66	22	353	84.7
67	9	362	86.8
68	25	387	92.8
69	8	395	94.7
70	16	411	98.6
71	1	412	98.8
72	0	412	98.8
73	3	415	99.5
74	0	415	99.5
75	2	417	100.0
76	0	417	100.0
77	0	417	100.0
78	0	417	100.0
79	0	417	100.0
80	0	417	100

AVERAGE SPEED = 59.8
50th PERCENTILE = 60
67th PERCENTILE = 63
85th PERCENTILE = 67
95th PERCENTILE = 70

PACE SPEED = 57 to 66
VEHICLES IN PACE = 238
% IN PACE = 57
% BELOW PACE = 28
% ABOVE PACE = 15

STANDARD DEVIATION = 6.52
% EXCEEDING POSTED LIMIT = 1

RECOMMENDED SPEED LIMIT = 65

Form TR-11

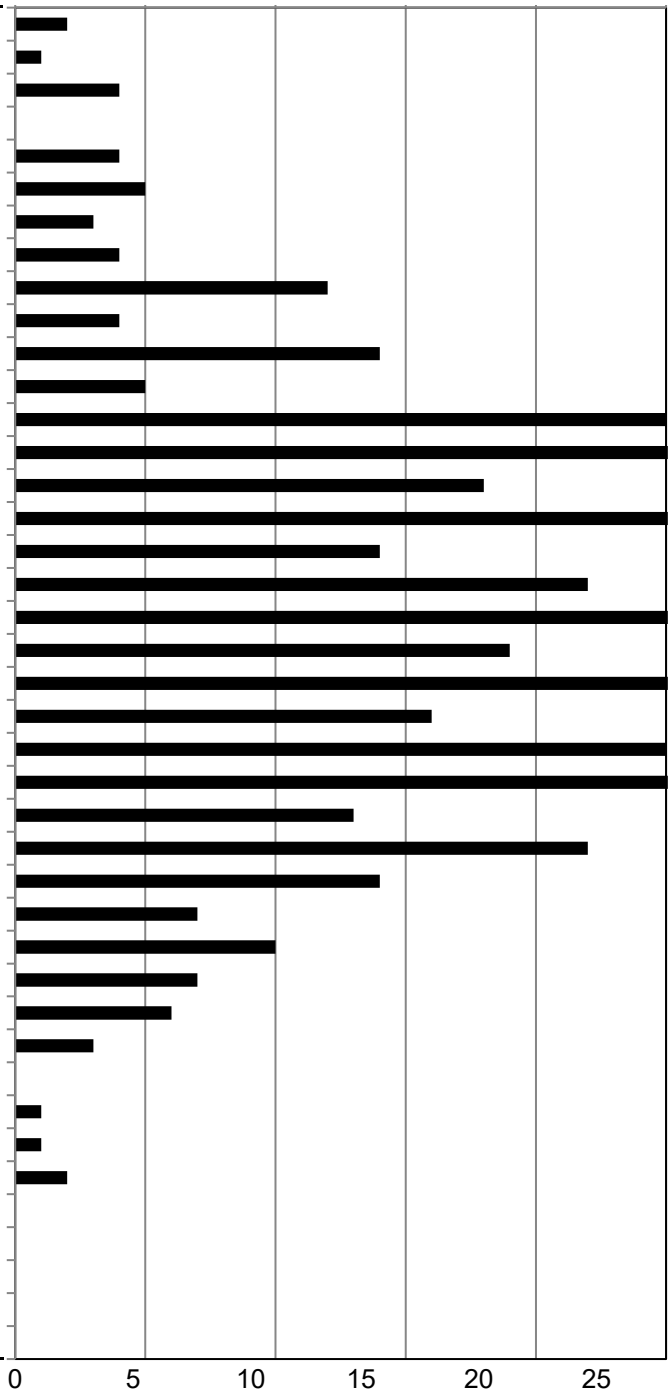
Revised 3/4/11

SPEED STUDY

Wyoming Department of Transportation

CITY: Sheridan
COUNTY: Sheridan
ROUTE: Wyarno Road
SPEED LIMIT: 70 MPH
DIRECTION: Eastbound
LOCATION: E/O Wildcat Road
OBSERVER: JAMAR Radar Device
START TIME:
WEATHER: Summer
DATE: 8/9/23-8/10/23
END TIME:
COMMENTS: Location 3

SPEED	FREQUENCY	ACUM TOTAL	ACUM %
40	2	2	0.5
41	1	3	0.7
42	4	7	1.6
43	0	7	1.6
44	4	11	2.5
45	5	16	3.6
46	3	19	4.3
47	4	23	5.2
48	12	35	8.0
49	4	39	8.9
50	14	53	12.0
51	5	58	13.2
52	25	83	18.9
53	26	109	24.8
54	18	127	28.9
55	28	155	35.2
56	14	169	38.4
57	22	191	43.4
58	40	231	52.5
59	19	250	56.8
60	37	287	65.2
61	16	303	68.9
62	25	328	74.5
63	26	354	80.5
64	13	367	83.4
65	22	389	88.4
66	14	403	91.6
67	7	410	93.2
68	10	420	95.5
69	7	427	97.0
70	6	433	98.4
71	3	436	99.1
72	0	436	99.1
73	1	437	99.3
74	1	438	99.5
75	2	440	100.0
76	0	440	100.0
77	0	440	100.0
78	0	440	100.0
79	0	440	100.0
80	0	440	100



AVERAGE SPEED = 58.1
50th PERCENTILE = 58
67th PERCENTILE = 61
85th PERCENTILE = 65
95th PERCENTILE = 68

PACE SPEED = 52 to 61
VEHICLES IN PACE = 245
% IN PACE = 56
% BELOW PACE = 13
% ABOVE PACE = 31

STANDARD DEVIATION = 6.40
% EXCEEDING POSTED LIMIT = 2

RECOMMENDED SPEED LIMIT = 65

Sheridan Police Department
JAMAR Speed Study

Volume Sorted by Speed for 8/9/2023 to 8/10/2023

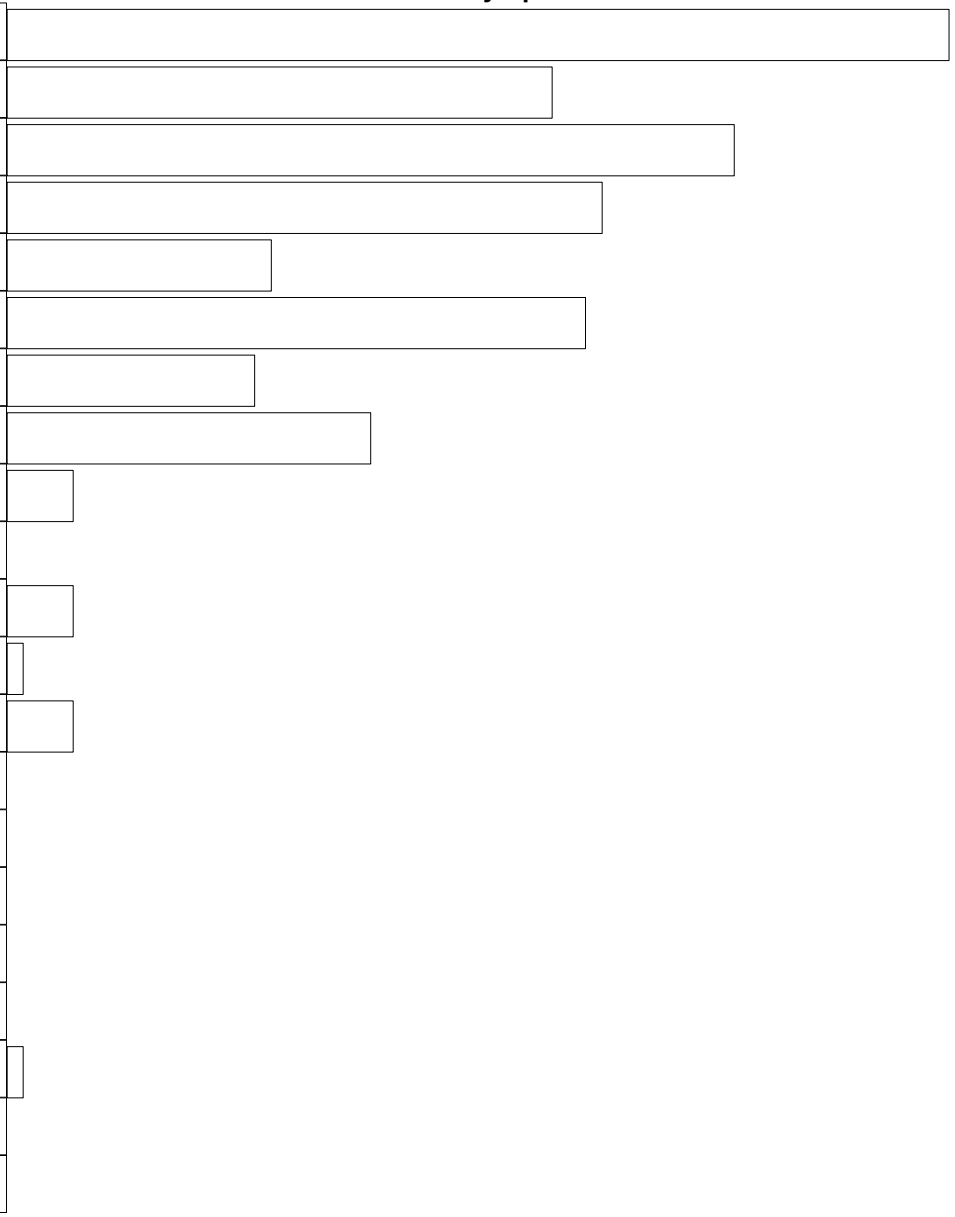
Combined

Speed (MPH)	Volume
33	0
34	0
35	1
36	0
37	2
38	0
39	0
40	3
41	1
42	6
43	0
44	6
45	11
46	4
47	11
48	19
49	10
50	21
51	8
52	39
53	46
54	30
55	49
56	20
57	45
58	81
59	32
60	64
61	27
62	53

Sheridan Police Department
JAMAR Speed Study

Volume Sorted by Speed for 8/9/2023 to 8/10/2023

63	57
64	33
65	44
66	36
67	16
68	35
69	15
70	22
71	4
72	0
73	4
74	1
75	4
76	0
77	0
78	0
79	0
80	0
81	1
82	0
83	0



Sheridan Police Department
JAMAR Speed Study

Westbound

Volume Sorted by Speed for 8/9/2023 to 8/10/2023

Direction X, Lane 1

Speed (MPH)	Volume
33	0
34	0
35	0
36	0
37	1
38	0
39	0
40	1
41	0
42	2
43	0
44	2
45	6
46	1
47	7
48	7
49	6
50	7
51	3
52	14
53	20
54	12
55	21
56	6
57	23
58	41
59	13
60	27
61	11
62	28

Sheridan Police Department
JAMAR Speed Study

Volume Sorted by Speed for 8/9/2023 to 8/10/2023

63	31
64	20
65	22
66	22
67	9
68	25
69	8
70	16
71	1
72	0
73	3
74	0
75	2
76	0
77	0
78	0
79	0
80	0
81	1
82	0
83	0

Sheridan Police Department
JAMAR Speed Study

Eastbound

Volume Sorted by Speed for 8/9/2023 to 8/10/2023

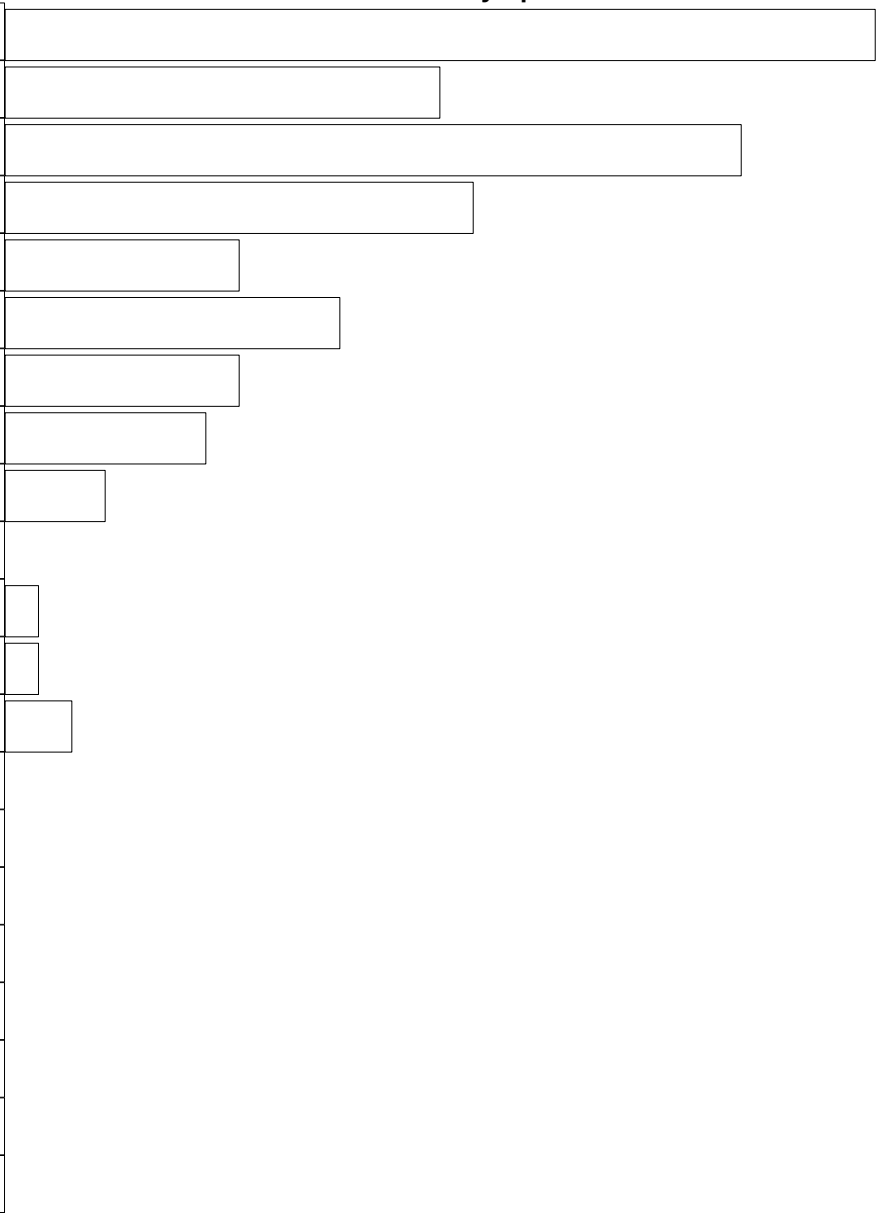
Direction X, Lane 2

Speed (MPH)	Volume
33	0
34	0
35	1
36	0
37	1
38	0
39	0
40	2
41	1
42	4
43	0
44	4
45	5
46	3
47	4
48	12
49	4
50	14
51	5
52	25
53	26
54	18
55	28
56	14
57	22
58	40
59	19
60	37
61	16
62	25

Sheridan Police Department
JAMAR Speed Study

Volume Sorted by Speed for 8/9/2023 to 8/10/2023

63	26
64	13
65	22
66	14
67	7
68	10
69	7
70	6
71	3
72	0
73	1
74	1
75	2
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0



WWC ENGINEERING

1849 TERRA AVE, SHERIDAN, WY 82801 | 307.672.0761

December 20, 2023

City of Sheridan
55 Grinnell Street
Sheridan, WY 82801

Re: Variance Request – Radius

Engineering Department:

On behalf of the applicant, Story House Property Company, LLC, WWC Engineering is formally requesting a variance for the Story House Village Phase 1 planned unit development (PUD), specifically related to the centerline curve radius for the roads along Baldwin Ave. The variance being sought is for a 100’ radius, as opposed to the required 150’ radius outlined in Appendix B Section 505(D) of the City of Sheridan Municipal Code.

This request is grounded in the fact that Baldwin Ave is designated for residential use only, and all commercial traffic in Block 1, 2, 3, and 8 will be accessed from Story House Village Road. The proposed 100' radius aligns with the specifications outlined in Appendix B for a 36' road within a 60' right of way. Additionally, we have taken proactive measures to address concerns related to parking and road width. Specifically, 50' bulb outs have been incorporated to facilitate parking for corner lots and to widen the road in the areas adjacent to the radius.

These adjustments aim to enhance safety and convenience within the development, catering to the specific needs of a residential area. The 36’ streets, coupled with on-street parking, are designed not only to accommodate residents but also to naturally reduce traffic speed. As a further measure, the proposed speed limit within the development is set at 25 mph, contributing to a safer and more controlled traffic environment.

In summary, the requested variance for a 100' radius along Baldwin Ave aligns with the nature of the area designated for residential use. The proposed modifications, including bulb outs, are intended to mitigate any potential concerns while ensuring the overall functionality and safety of Story House Village Phase 1.

Thank you for your time and consideration. We look forward to working collaboratively with the City of Sheridan to achieve a successful outcome for all parties involved.

Sincerely,

Sarah Rohrer

Sarah Rohrer, P.E.
Project Manager

CITY OF SHERIDAN, WYOMING

55 Grinnell Street, P.O. Box 848, Sheridan Wyoming 82801
Ph (307) 674-6483 Fax (307) 674-2195

Clerk

MEMORANDUM

RE: Consideration of Two (2) Year City Prosecutor Appointment to Zachary Leininger
From: Cecilia Good, City Clerk
To: City Council
CC: City Administrator Stuart McRae
Date: 01/08/2024

Recommendation:

Staff recommends that the Governing Body approve the City Prosecutor Contract with Zachary Leininger at a rate of $175 per hour billed in 15 minute increments.

Background:

The City Prosecuting Attorney has ended her contract with the City of Sheridan as of January 2024. In order to provide essential legal services required of the municipal court, the City must appoint another Prosecuting Attorney in a timely manner. Zachary Leininger has been selected to fill the role, with the consideration and approval of the Governing Body.

Attachments

City Prosecutor Contract 2024

Professional Services Appointment

City of Sheridan Prosecuting Attorney

This Appointment is made by the City of Sheridan (hereinafter the "City") and accepted by Zachary Leininger (referred to herein as the "City Prosecutor"), who, for mutual consideration, the parties agree as follows:

1. Services. The City Prosecutor shall provide all of the professional legal services required of the municipal court of the City of Sheridan. The City Prosecutor shall, in accordance with Wyoming Statute, City Code and Rules of Professional Conduct, prosecute criminal citations issued for the City Municipal Court. Additionally, the City Prosecutor shall meet with relevant City staff regarding the enforcement of City Code, provide legal analysis and research regarding the enforcement of City Code and such other Services as may be requested. The Services will be provided on a Part-Time only basis, without a fixed or definite schedule at the time of this Appointment. The Services required of the City Prosecutor will change from time to time as may be needed. Nothing in this Contract will be deemed to prohibit the City Prosecutor from performing other private legal services.

2. Prosecuting Attorney. Beginning on February 1, 2024, City Prosecutor is duly appointed and designated as the primary provider of the Services required as the City Prosecutor by the Mayor of the City of Sheridan and was approved by the Sheridan City Council as provided under Wyoming law and that appointment is continuing in nature. If the City Prosecutor is unavailable from time to time or identifies a conflict of interest, he will engage the services of another attorney acceptable to the City of Sheridan, to provide such Services as their alternate.

3. Term; Appointment. The initial term of this Appointment shall be two (2) years, commencing with the effective date of February 1, 2024 (unless mutually agreed by the City and the City Prosecutor to commence earlier), and ending on June 30, 2026. The City Prosecutor is appointed by the Mayor, with the consent of the Sheridan City Council.

4. Compensation. The City Prosecutor agrees to accept, and the City agrees to pay the City Prosecutor for the Services provided hereunder at the rate of $175 per hour billed in 15 minute increments. The City Prosecutor shall invoice the City for Services at the end of each calendar month during the term of this Appointment. The City will pay within 45 days, subject to the City's voucher procedures. Expenses incurred for the purposes of prosecution shall only be paid by the City if said cost is preapproved by the City. Expenses incurred by the City Prosecutor will be included in the monthly fee, unless otherwise agreed in advance by the parties.

a. The City Prosecutor shall provide his own copy of the Wyoming Rules of Evidence and Wyoming Statute.

DRAFT

b. The City shall provide an official copy of the adopted City Code, technical codes, adopted regulations and policies and any other adopted City policies or procedures necessary for prosecution. The City shall also provide a City email address.

5. Relationship Between Parties. The City Prosecutor shall perform the Services as an independent contractor and not as an employee of the City, and nothing herein contained shall be construed to be inconsistent with this relationship or status. The City shall not make any withholdings as compensation. The City Prosecutor agrees to pay all employment taxes, insurance, and other expenses as should arise in the day to day fulfillment of this Appointment, as is consistent with an independent contractor relationship. The relationship with the City Prosecutor is nonexclusive – City Prosecutor may perform other jobs and duties for other clients as City Prosecutor shall, in their discretion, deem appropriate.

a. The Contract Manager for the City shall be the City Clerk unless otherwise directed by the City Administrator.

6. Termination. Should this Agreement not be renewed, the Agreement shall continue per its terms and conditions on a month-to-month basis until such time that either party provides notice of termination.

a. Either party may terminate this Agreement upon providing written notice to the other 90 days prior to termination. Notice may be given in writing by email or mail. The City shall not terminate this Agreement without consent of the City Council.

7. Governmental Immunity; Insurance. To the maximum extent permitted by the law, the City Prosecutor shall share in the governmental immunity provided to the City of Sheridan for all of the Services provided by the City Prosecutor pursuant to this Appointment. Likewise, to the maximum extent permitted by the City of Sheridan insurance coverage, the City Prosecutor shall share in the insurance coverage provided to the City of Sheridan for all of the Services provided by the City Prosecutor pursuant to the Appointment.

IN WITNESS WHEREOF, this Appointment is dated the 15th day of January, 2024.

City of Sheridan:

_____

Mayor Richard Bridger

City Prosecutor:

_____

Zachary Leininger

Attest:

_____

City Clerk

DRAFT

CITY OF SHERIDAN, WYOMING
55 Grinnell Street, P.O. Box 848, Sheridan Wyoming 82801
Ph (307) 674-6483 Fax (307) 674-2195

Public Works

MEMORANDUM

RE: Final Acceptance of Public Infrastructure for VOA Life House Fire Hydrant
From: Hanns Mercer, Public Works Director
To: City Council
CC:
Date: 12/29/2023

Recommendation:

Staff recommends that the Mayor and Council approve final acceptance infrastructure for VOA Life House Fire Hydrant. Further, that the Utilities Director be authorized to sign the necessary Permit Transfer Request Form in compliance with Wyoming DEQ Rules and Regulations.

By signing the Permit Transfer Request Form, the City accepts ownership and future operation/maintenance of the Infrastructure associated with VOA Life House Fire Hydrant. Approximately:

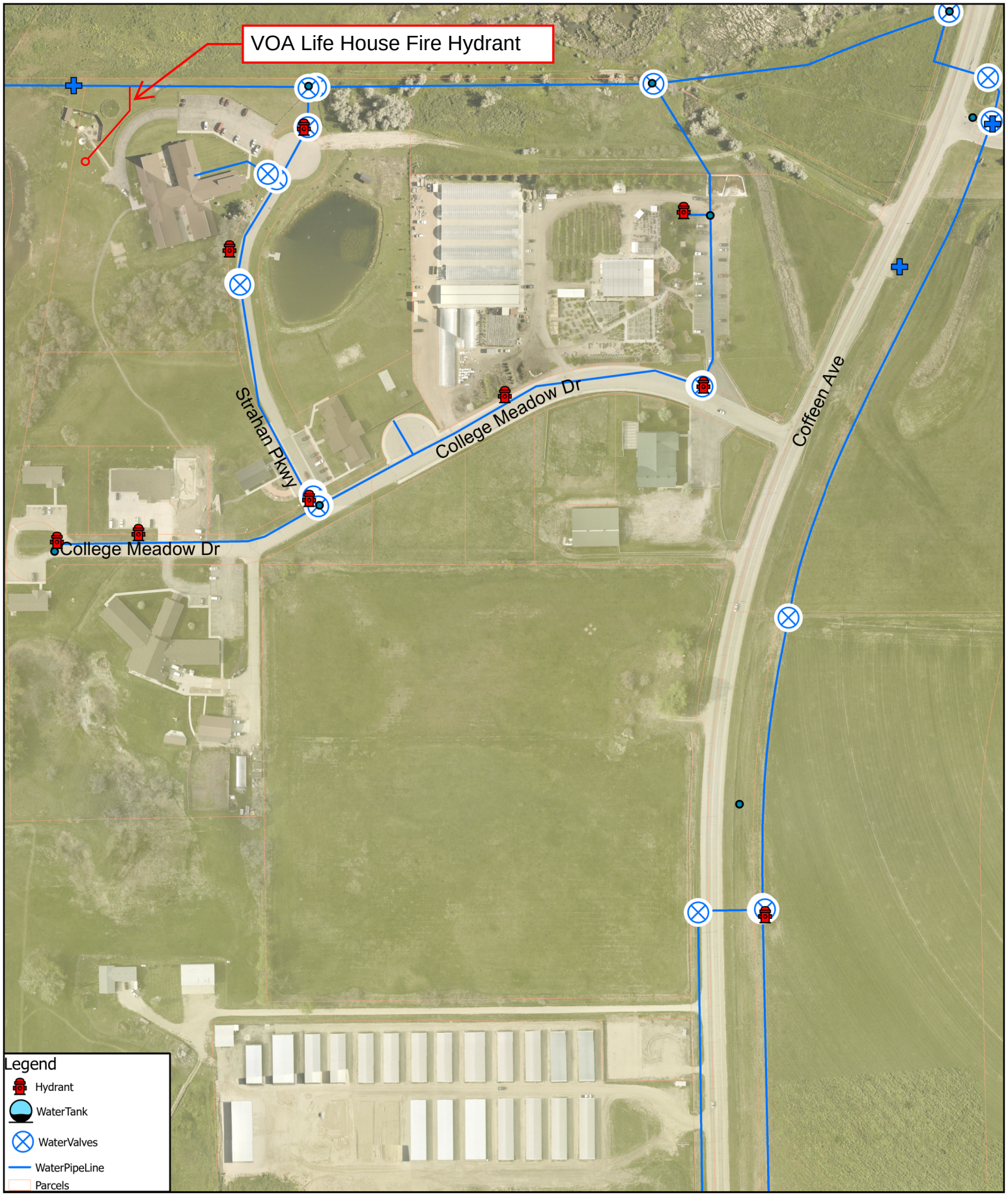
- 200 feet of 6-inch waterline and a fire hydrant. The hydrant provides fire suppression capability to the building addition on the VOA Life House.

Background:

The infrastructure associated with this project was installed per City of Sheridan Standard Specifications and Details for Utility Construction. As part of the request for final acceptance, the City will receive all required information from the developer's consulting engineer to prepare to accept ownership of the infrastructure, and to ensure that all work has been completed satisfactorily.

Attachments

Aerial
Record Drawing



CITY OF Sheridan WYOMING

VOA Life House Fire Hydrant

N

LIFEHOUSE
ADDITION
FFE = 3814.30

3813
3814
3812
107
1+00
2+00
2+50
0+00
S45°00'00"W
171.99'
S0°03'04"E
78.01
NEW FIRE HYDRANT LINE
6" C900 CLASS 235 PVC
(6' MIN. BURY DEPTH)
20'
EASEMENT
30'
EX. EASEMENT

20 10 0 20 40
HORIZ. SCALE IN FEET
4 2 0 4 8
VERT. SCALE IN FEET

RECORD DRAWINGS

EXISTING GROUND PROFILE
FINISHED GROUND PROFILE
6'-0" MIN.
BURY DEPTH
6" C900 CLASS 235 PVC
6" C900 CLASS 235 PVC
STA 0+25.00
CONNECT TO EX. WATER W/ 6" LIVE TAP
STA 0+30.04
6" GATE VALVE
STA 0+78.01
NEW 6"x45° BEND
STA 2+21.87
FIRE HYDRANT

3830
3820
3810
3800
3790
0+00
1+00
2+00
2+50

CITY OF SHERIDAN, WYOMING
55 Grinnell Street, P.O. Box 848, Sheridan Wyoming 82801
Ph (307) 674-6483 Fax (307) 674-2195

Executive

MEMORANDUM

RE: Appointment of Brandy Campbell to the Planning Commission to fill the remainder of Evelyn Gernaat's term expiring 7/1/24.

From: Richard Bridger, Mayor

To: City Council

CC:

Date: 01/15/2024

Recommendation:

I would like to recommend the appointment of Brandy Campbell to the Planning Commission to fill the remainder of Evelyn Gernaat's term expiring 7/1/24.

CITY OF SHERIDAN, WYOMING
55 Grinnell Street, P.O. Box 848, Sheridan Wyoming 82801
Ph (307) 674-6483 Fax (307) 674-2195

Clerk

MEMORANDUM

RE: **Minutes of Regular Council Meeting January 2, 2024**
From: Cecilia Good, City Clerk
To: City Council
CC:
Date:

Discussion:
See attached draft minutes

Attachments

Minutes

CITY OF SHERIDAN, WYOMING

MINUTES OF REGULAR COUNCIL MEETING

COUNCIL CHAMBERS **7:00 P.M.** **January 2, 2024**

1. Mayor Bridger called the meeting to order at 7:00 P.M.

2. Mayor Bridger led the Pledge of Allegiance to the Flag.

3. The invocation was led by Phil Wold, Trinity Lutheran Church

4. The meeting was called to order with a quorum as follows: Mayor Bridger presiding with Councilmembers Greg Luhman, Andrew Patceg, Terry Weitzel, and Kristen Jennings. Councilmembers Shawn Day and Steve Brantz were absent. Members of staff attending included City Clerk/Strategy Director Cecilia Good and City Administrator Stuart McRae.

5. Councilmember Jennings moved, seconded by Councilmember Weitzel, to approve the agenda.

Voice vote: unanimous.

Mayor Rich Bridger	Aye
Kristen Jennings	Aye
Shawn Day	Absent
Steven Brantz	Absent
Andrew Patceg	Aye
Greg Luhman	Aye
Terry Weitzel	Aye

6. Community Update

A. Jill Benson, Executive Director of SAGE Community Arts and Administrator for Sheridan Public Arts Committee (SPAC) provided an update.

7. Comments from the Public

A. Noll Roberts spoke regarding board appointments.

8. Consent Agenda

A. Reappointment of Peter Veinbergs to the Tree Board for a 2-year term expiring on December 31, 2026
B. Reappointment of John Dick to the Sheridan Public Arts Committee (SPAC) for a 3-year term expiring on December 31, 2027
C. Appointment of Sasha Johnston to the Sheridan County Attainable Housing Council (SCAHC) to fill the remainder of Bob Utter's term expiring December 31, 2025 – Moved to New Business
D. Establishment of the Employee Relations Ordinance Committee and Assignment of Committee Members: Mayor Richard Bridger and Councilors Kristen Jennings and Terry Weitzel.
E. Minutes of Regular Council Meeting December 18, 2023
F. Claim

Vendor	Description	Invoice Net
A & B Buildings & Supplies	Landfill Building - Pay App#6 Retainage	$7,864.17
A dba of: Ferguson Enterprises Inc	chlorine test kits	$170.87
A Plus Plumbers & Appliance Repair LLC	Plumb in equipment washer in fire station 12-7-202	$700.50
Ace Hardware-Newkirk	Trimmer repairs for KGC.	$200.58
Ace Hardware-Newkirk	Misc Parts - Service Center	$4.16
Ace Hardware-Newkirk	Misc Supplies - Signs	$12.64
Ace Hardware-Newkirk	Bathroom Fan Repairs - Streets	$8.14
Ace Hardware-Newkirk	Tape Measure / Water - Signs	$35.96
Ace Hardware-Newkirk	Janitorial supplies for KGC	$50.18
Ace Hardware-Newkirk	Mini lamp replacement bulb	$3.59
Ace Hardware-Newkirk	Chain loop for KGC	$29.99
Advance Fence	Wire ties for chain link fence repair	$47.00
Alina M Gaona	Janitorial charge for Parks Department	$500.00
AlphaGraphics of Wyoming	Parking signs for South Park	$170.23
AlphaGraphics of Wyoming	Juniper Heights entrance sign for SMC	$1,566.47
AlphaGraphics of Wyoming	Snow - odd/even & snow route door hangers	$1,415.20
Altitude Recycling Equipment LLC	Baling Wire	$5,760.00
Amazon Capital Services #A33MIR27FEZN42	seat covers, cargo bar, tool box, bed liner	$576.64
Amazon Capital Services #A33MIR27FEZN42	calendar, planner, envelopes, stickers	$93.01
Amazon Capital Services #A33MIR27FEZN42	markers, card holder, staple puller, copier paper	$188.37
Amazon Capital Services #A33MIR27FEZN42	wireless keyboards	$51.98
Amazon Capital Services #A33MIR27FEZN42	ipad holder	$36.48
Amazon Capital Services #A33MIR27FEZN42	phone case	$39.35
Amazon Capital Services #A33MIR27FEZN42	towel roll, strobe lights, paper towels	$540.67
Amazon Capital Services #A33MIR27FEZN42	air freshener, keychains, plastic spoons	$137.35
Amazon Capital Services #A33MIR27FEZN42	Wireless mouse	$34.98
Amazon Capital Services #A33MIR27FEZN42	dummy rounds, coaxial, pens, pencils, batteries	$337.80
Amazon Capital Services #A33MIR27FEZN42	solenoids	$88.81
Amazon Capital Services #A33MIR27FEZN42	head lamp, work gloves, flashlights	$176.19
Amazon Capital Services #A33MIR27FEZN42	VGA adapter, HDMI adapter, HDMI cables	$162.26
Amazon Capital Services #A33MIR27FEZN42	adhesive label kit	$108.00
Amazon Capital Services #A33MIR27FEZN42	computer stand, markers	$37.75
Amazon Capital Services #A33MIR27FEZN42	audio cable	$16.98
Amazon Capital Services #A33MIR27FEZN42	ITEM: Panasonic KX-TG6500 Cordless Phone Battery	$15.35
Amazon Capital Services #A33MIR27FEZN42	notebooks, pens, wall clock, organizer, clips	$99.01
Amazon Capital Services #A33MIR27FEZN42	credit processed twice	$109.99
American Maid	Public restroom cleaning Dec 2023	$650.00
American Maid	City Hall cleaning Dec 2023	$2,000.00
Big Horn Sanitation	Malcolm Wallop Sanitation chrage	$126.50
Big Horn Sanitation	Sanitation charges for Malcolm Wallop, SCG and Lyo	$208.12
Bighorn Design Studio LLC	Sweatshirts - Streets & Signs	$939.00
Bighorn Design Studio LLC	Sweatshirts - Service Center	$156.00
Brian's Boot & Shoe Company	Work Boots - Signs	$175.45
C & K Equipment Sales Inc	ww381 - seal + freight	$82.88
C & K Equipment Sales Inc	Brushes for cemetery Toolcat broom	$782.38
Carolina Software	Software Support Quarter Ending 12/31/23	$550.00
Carquest Auto Parts	Mini Blade - Service Center	$12.96
CDG Engineers Inc	W. 5th St. Bridge - Prof Svcs 11/1/23 - 11/30/23	$8,780.50
CDG Engineers Inc	S. Downtown - Prof. Svcs. 11/1/23 - 11/30/23	$37,735.00
CDW-G	Switch Replacement	$7,127.25
CDW-G	Switch Replacement	$3,591.99
CH Diagnostics and Consulting	Giardia and Crypto sample analysis invoice	$635.00
Collection Professionals Inc	CPI Accts #1885 & #2799 - 11/1-11/30/2023	$392.84
Crescent Electric Supply Co	Lights - Service Center	$416.16
Croell Inc	Concrete Work - Streets	$351.26
DOWL LLC	NE Transmission Line & Sewer Capacity 5th St	$2,200.00
DOWL LLC	Brooks Street Modeling	$690.00
DOWL LLC	E. 5th St Corr & Rail Crossing 11/19/23 - 12/16/23	$1,177.50
DOWL LLC	ACOE G.I. Study - Lewis St. realignment concepts	$762.50
DOWL LLC	NE Transmission - Prof. Svcs. 11/19/23 - 12/16/23	$18,544.00
Econowash LLC	Laundry - Service Center	$54.00
Econowash LLC	Laundry Service - Service Center	$45.00
Employ LLC	temporary labor for recycling	$4,838.86
Energy Laboratories Inc	WY5600052- TP01-SP01 and TP02-SP02 (SOC) sample an	$385.00
Energy Laboratories Inc	WY5600052- TOC sample analysis invoice	$212.80
Ferguson Waterworks #1701	3/4inch meters	$13,600.00
Fremont Motor Sheridan Inc	UM26 - hose assy	$28.79
Grainger Inc	Safety Glasses, Air Filters	$211.86
Granicus	RockSolid Citizen App Subscription Renewal	$6,066.90
Greensky Commercial Cleaning	Cleaning - Streets	$1,240.00
Hach Company	Electrodes	$2,276.00
Hach Company	Electrode, PH (8362)	$1,052.00
Hach Company	WWTP Lab Supplies	$944.39
Harken Supply Inc	Freon Disposal	$850.00
Hawkins Inc	Azone and Soda Ash	$3,605.07
Heartland Kubota LLC	GC491 - seat cover + freight	$86.47
Home Depot Credit Services	Shop Repairs - Service Center	$8.79
Home Depot Credit Services	FD32 - dimmable halogen light bulbs	$19.94
Home Depot Credit Services	Ladder - Snow/Ice	$279.00
Home Depot Credit Services	Wood handle; electrical tape; LED lights 12-14-202	$64.59
Home Depot Credit Services	screws	$8.00
Home Depot Credit Services	Misc. Supplies - Signs	$191.93
Humdinger Equipment LTD	Labor from Cummins to Troubleshoot Fault Codes on	$4,507.50
In-Yarak Construction Inc.	City Hall - installed art deco hook trim	$4,468.00
InfoSend Inc	service fee/email fee - Nov 2023	$138.30
InfoSend Inc	Everbridge Notification Mailings	$1,200.81
Interstate Engineering Inc	GIS & Planning Svcs. thru 12/9/2023	$1,045.00
Interstate Engineering Inc	Kendrick Pool - Prof. Svcs. thru 12/09/2023	$148,488.00
John Deere Financial #1111308145	(4) Pair of Jeans for Aspen Tompkins	$204.96
John Deere Financial #1111308145	Tank vent for Community Forestry	$10.99
John Deere Financial #1111308145	Brushes and chains for KGC.	$31.18
John Deere Financial #1111308145	Forestry supplies for KGC.	$151.19
John Deere Financial #1111308145	Diesel treat, chain	$137.94
John Deere Financial #1111308145	SNE913 - rear light	$24.99
John Deere Financial #1111308145	Grease for Parks Grounds Maintenance.	$11.98
John Deere Financial #1111308145	Grease gun for parks maintenance.	$229.99
John Deere Financial #1111308145	Staff uniform	$64.99
Kenny L Rolfe Matco Tools	Plastic Creeper - Service Center	$160.01
Kenny L Rolfe Matco Tools	Belt - Service Center	$48.25
Kerns & Bunting LLC	Prosecution Fees 11.27 - 12.22	$5,321.25
Kilpatrick Creations Inc	pens and stickers	$362.54
Kilpatrick Creations Inc	Uniforms	$171.00
Kilpatrick Creations Inc	Pullover sweatshirts for Drozdowski, Eisenman, and	$158.50

L J Wright Ironworks & Design Inc SNE911 - drilled & tapped hardox plate $2,060.00
Mathew Hansen Repair to basement women's bathroom door handle at $730.00
MC2 Engineering & Construction Brundage Island Crossing Agreement $2,228.75
MC2 Engineering & Construction Thorne Rider Bathrooms - Grant Application $148.75
MC2 Engineering & Construction N. Heights Ph II - CA 10/22/23 - 12/2/23 $26,560.00
MC2 Engineering & Construction Beltway Ph I Grant Efforts - 10/22/23 - 12/11/23 $1,785.00
MC2 Engineering & Construction Blacktooth Park Ph 3 - CA 10/22/23 - 12/2/23 $3,840.00
Midland Implement Co Inc Turfco spinners for KGC. $182.70
Midland Implement Co Inc Bedknives for mowers at KGC. $1,089.17
Midland Implement Co Inc Tools for KGC shop. $64.31
Mike's Electric Inc Add receptacle and fuses and cut out existing pipe $345.40
Modern Electric Co E 5th St Rail Crossing - Retainafge Payment $8,354.50
Montana Dakota Utilities Co Electric & Gas $25,722.52
Mullinax Concrete Service & Irrigation Top soil for KGC $194.40
Mullinax Concrete Service & Irrigation Washed Sand - Snow/Ice $3,386.94
Nancy Jane Trangmoe Embroidery for Stan Schwabauer and Brandon Weiher $60.00
Nancy Jane Trangmoe Embroidery for Stan Schwabauer, Aspen Tomkins and $30.00
Napa Auto Parts Electronic Cleaner - Service Center $28.98
Napa Auto Parts Car Ramp - Service Center $71.49
Napa Auto Parts return of invoices 753797 and 755306 ($90.00)
Napa Auto Parts return of invoice 754175 ($108.00)
Napa Auto Parts return of invoice 749278 ($72.00)
Napa Auto Parts $20.69
Napa Auto Parts Relay for Toolcat $82.76

Napa Auto Parts Shop Supplies - Service Center $109.06
Napa Auto Parts shop grease $29.96
Norco Inc Trash bags for city hall $66.58
Norco Inc Welding Stuff - Snow/Ice $76.45
Norco Inc Oil Absorbent Pads $56.31
Norco Inc Bomber Jacket for Stan Schwabauer and Disposable G $115.56
Norco Inc (6) Touch Free Soap Dispensers for New Recycling C $210.00
O'Dell Construction Inc 1-Box of 2x2 Vinyl Rock Tiles for fire station 12- $116.60
Office Shop Inc Engineering copier costs $137.97
Office Shop Inc UM copier charges $52.46
Office Shop Inc Copier Charges $113.52
One-Time Customer Refund Vendor WW-23-136 Refund: Recoup being refunded to owner. $1,975.00
One-Time Employee Reimbursement Vendor Wellness Participation Reimbursement: Jon Syring $152.31
One-Time Employee Reimbursement Vendor Wellness Participation Reimbursement: Jon Snoozy $200.00
One-Time Employee Reimbursement Vendor SHRM Membership $244.00
One-Time Employee Reimbursement Vendor Distribution Level I testing $100.00
Otis Elevator Company Yearly Maintenance $3,258.36
Pace Analytical Services LLC SAWS Coliform Test 11 Knode Rd $79.00
Pace Analytical Services LLC SAWS Coliform Test 27 PINE LN $79.00
Pace Analytical Services LLC WY5600052: Bac-T Samplye analysis invoice $511.00
Pace Analytical Services LLC WY5600052: Bac-T sample analysis invoice $457.00
Porter Muirhead Cornia & Howard year end audit consulting $7,099.00
Powder River Power of Sheridan Inc Wash Bay Repairs - Service Center $26.42
Powder River Power of Sheridan Inc WC320 - hyd hoses, fittings & sleeves $124.67
Powder River Power of Sheridan Inc WC713 - hyd hoses & fittings $135.85
Powder River Power of Sheridan Inc Adapter Fitting - Snow/Ice $28.16
ProPet Distributors Inc Dog station supplies for Parks $3,496.60
Quill LLC Employee Recognition certificates, notebook for me $88.64
Rhonda M Gould Seamstress $20.00
Rhonda M Gould seamstress $20.00
Rocky Mountain Sign Design & Print 48x72 Christmas Light Recycling Banner $120.00
Rocky Mountain Sign Design & Print 48x48 Christmas Tree Recycling Banners $160.00
Rodney Alermatt Drywall installation and finish 820 Kroe Lane $360.00
Servall Uniform & Linen Supply Clean Rugs for SFR 12-21-2023 $35.32
Servall Uniform & Linen Supply UM rug cleaning $104.19
Servall Uniform & Linen Supply Bi Weekly Rug Cleaning for Landfill $260.28
Servall Uniform & Linen Supply Bi Weekly Rug Cleaning for Recycling Center $40.56
Servall Uniform & Linen Supply Rug Cleaning $195.64
Servall Uniform & Linen Supply Rugs, Mops, etc. - Streets $196.93
Severson Supply Co Inc Misc. Parts - Snow/Ice $380.00
Sheridan Commercial Co Screws for Tree Recycling Banners $17.99
Sheridan Commercial Co Flashlight $40.47
Sheridan Commercial Co Broom & Dustpan - Streets $14.48
Sheridan Commercial Co Screwdriver - Signs $20.32
Sheridan Commercial Co Rubber Undercoating - Snow/Ice $10.32
Sheridan Commercial Co White Board Cleaner - Streets $10.39
Sheridan Commercial Co Eng. - forks & plates $10.75
Sheridan Commercial Co Lab Samples UPS Shipping Outgoing $139.26
Sheridan Commercial Co Lab Samples UPS Shipping Outgoing $26.19
Sheridan Commercial Co Lab Samples UPS Shipping Outgoing $29.16
Sheridan Commercial Co WWTP supplies $747.93
Sheridan Commercial Co tape $18.95
Sheridan Commercial Co Black Sharpies, HP Natural Corn Broom $15.27
Sheridan Commercial Co ST301 sander - steel rod, fasteners & anchors $67.63
Sheridan Commercial Co Fasteners & Anchors - Service Center $19.88
Sheridan County Public Health immunizations $350.00
Sheridan Econ-O-Wash Laundry WWTP Econ-o-wash Laundry Services $30.00
Sheridan Econ-O-Wash Laundry WWTP Econ-o-wash Laundry Services $52.00
Sheridan Lock & Key Marion House Repairs - changed door locks $474.43
Sheridan Media Fall Leaf Collection Colored Ad 11/07/23 $198.00
Sheridan Newspapers Inc Notice of Liquor License Renewals for 2024 $290.64
Sheridan Newspapers Inc Notice of RFB for Household Hazardous Waste $81.00
Sheridan Newspapers Inc Notice of three remaining Liquor License Renewals $54.00
Sheridan Newspapers Inc Notice of Planning Commission Opening $109.15

Sheridan Newspapers Inc City Council Minutes Nov. 6, 2023 $1,485.00
Sheridan Newspapers Inc City Council Minutes Nov. 20, 2023 $1,093.50
Sheridan Newspapers Inc PLN - LPO 41221 CC Notice Dry Ranch Rd Rezone $22.53
Sheridan Newspapers Inc PLN - LPO 41223 - Notice of BOA Mtg. N. Gould Jeff $71.77
Sheridan Newspapers Inc PLN - LPO 41225 - CC Notice The Villages, Wrench R $62.30
Sheridan Newspapers Inc PLN - LPO 41231 - BOA Mtg. N. Gould Jefferson $70.20
Sheridan Newspapers Inc Hume Draw - Public Meeting Advertisement $75.60
Site Industries LLC Annual license fee $6,780.00
Stantec Consulting Services Inc (SCSI) Main St. Const Obsrv thru 12/8/2023 $15,238.50

Star Playgrounds Rubber mulch for Blacktooth Park $5,475.00
Star Playgrounds Fibar for Parks playgrounds $2,191.00
Summit Sound Technologies, LLC Gun Suppressors $18,564.21
T-O Engineers LLC On-Call GIS Services 11/1/23 - 11/30/23 $6,948.75
Tire Rama PL176 - new tires installed (4) $855.28
Tire Rama wc - spare drive tires $1,595.50
Top Office Products Inc Printer Paper/Desk Calendar - Streets $37.35
Top Office Products Inc Copy Charge for Admin and Station Copiers for Dece $182.72
Torgerson's LLC STL403 - united pro strip broom $727.00
Toro NSN December Toro software charge for KGC $175.00
Tricor Direct Inc Safety posters SWTP & BG $558.35
Tyler Technologies Inc Utility Billing Implementation $2,608.00
Tyler Technologies Inc conversion for utility billing $7,650.00
USABluebook Ricca Deionized Water (3 remaining shipped, 0 rema $81.90
USABluebook Ricca Deionized Water (3rd shipped, 3 remaining) $27.30
USABluebook Deionized Water & Freight $158.92
VRM Inc 500 Hour Service on Track Loader LF4003 $920.00
VRM Inc Replaced Roller on Recycling Sort Line Bin $385.00
VRM Inc 1,000 Hour Service for Loader LF486 $655.00
Wareings Sheridan Chevrolet Front Bumper Replacement - Streets $1,301.80
Water & Environmental Technologies Inc Hume Draw Prof. Svcs. 11/1/23 - 11/30/23 $4,874.75
Winsupply of Sheridan Wy Co Misc parts - Snow/Ice $9.25
WY Law Enforcement Academy Training Cost $124.00
Wyoming First Aid & Safety Supply LLC First aid resotock UM $53.27
Wyoming Machinery Company Landfill - SOS kits for Case units $892.50
Wyoming Machinery Company filter rerturn ($275.16)
Wyoming Water Quality & Pollution Control Assoc WWQPCA Annual Membership Fees $540.00
Yonkee & Toner LLP Judge Kessner November Hours $625.00
Zencity Technologies US, IncSoftware subscription $15,300.00
Zowada Plumbing & Heating Inc Fix 2nd floor toilet and water fountain filter at $220.00
Comtronix Burglar alarm maintenance and replacement keypad $890.66
Comtronix UL Fire Monitoring City Hall$126.00
Carter-Isakson Appraisals IncNE Transmission - Easement Appraisal$7,500.00
Amazon Capital Services #A33MIR27FEZN42 ITEM: Jobsite Boot Scrubber - Outdoor Shoe Scrape $550.76
Amazon Capital Services #A33MIR27FEZN42 ITEM: 12 Fine Tip Dry Erase Markers - Whiteboard $52.87
Amazon Capital Services #A33MIR27FEZN42 ITEM: Umbra Sticks Multi Hook Coat Rack – Modern, $40.99
Amazon Capital Services #A33MIR27FEZN42 ITEM: Solar-X Replacement 50 Watt Solar Panel Can $364.00
Amazon Capital Services #A33MIR27FEZN42 ITEM: Amazon Basics RJ45 Cat-6 Ethernet Patch Cab $13.98
American Maid Monthly Cleaning Service for Landfill Office $375.00
American Maid Monthly Cleaning Service for Recycling Center $375.00
American Maid Monthly Cleaning Service for Scale House $187.50
Carquest Auto Parts Coupling for Compost Machine $21.78
FDL Architecture and Drafting BGWTP Upgrades - Porch Design $1,000.00
Galls LLC Mens L & S undervest 2 ea $200.82
Kerns & Bunting LLC Attorney Fees $12,480.00
Les Schwab Group Holdings LLC WW381 - 1000R-20 Ironman I-181 tires (2) $1,003.36
Rocky Mountain Equipment Brokers Inc Utilities #UTE902 - SnowEx Renegade Spreader$10,710.30

Rocky Mountain Scale Works Landfill Scale - scale rental 11/25/23 - 12/12/23$3,000.00
Rocky Mountain Scale Works Landfill Scale - molding + S&H $450.00
Sheridan Recreation District FY24 support $55,800.00

Councilmember Weitzel moved, seconded by Councilmember Luhman, to approve the consent agenda, vote: unanimous. Councilmember Patceg removed Item C from the consent agenda.

Mayor Rich Bridger	Aye
Kristen Jennings	Aye
Shawn Day	Absent
Steven Brantz	Absent
Andrew Patceg	Aye
Greg Luhman	Aye
Terry Weitzel	Aye

OLD BUSINESS

No Old Business

NEW BUSINESS

Councilmember Weitzel moved, seconded by Councilmember Luhman, to approve the Appointment of Sasha Johnston to the Sheridan County Attainable Housing Council (SCAHC) to fill the remainder of Bob Utter's term expiring December 31, 2025, vote: unanimous.

Mayor Rich Bridger	Aye
Kristen Jennings	Aye
Shawn Day	Absent
Steven Brantz	Absent
Andrew Patceg	Aye
Greg Luhman	Aye
Terry Weitzel	Aye

9. Council Comments and Requests for Future Agenda Items
   A. Mayor Bridger discussed boards and commissions.
   B. City Clerk Cecilia Good reminded the Council that the Gala for City Hall Art will be held from 5 P.M. to 7 P.M. before the January 15th City Council meeting.

10. Mayor Bridger adjourned the meeting at 7:35 P.M.

APPROVED:

_____

Richard Bridger, Mayor

ATTEST:

_____

City Clerk, Cecilia Good

CITY OF SHERIDAN, WYOMING
55 Grinnell Street, P.O. Box 848, Sheridan Wyoming 82801
Ph (307) 674-6483 Fax (307) 674-2195

Treasurer

MEMORANDUM

RE:	**Claims**
From:	Karen Burtis, City Treasurer
To:	City Council
CC:	
Date:	

Discussion:

See attached claims list.

Attachments

Claims

Vendor	Description	Invoice Net
A & M Service & Supply Inc	Toner for Scale House Printer	$141.00
A & M Service & Supply Inc	HP401A Set Toner	$566.75
A dba of: Ferguson Enterprises Inc	2x5 3/4 pumper cap	$107.28
Ace Hardware-Newkirk	Nylon elbow	$9.16
Ace Hardware-Newkirk	Velcro - Snow/Ice	$35.51
Ace Hardware-Newkirk	Shop supplies for KGC	$249.13
Alina M Gaona	Janitorial Services for Parks Dept.	$375.00
Amazon Capital Services #A33MIR27FEZN42	calendars	$19.97
Amazon Capital Services #A33MIR27FEZN42	ITEM: RecycleBoxBin Triple Recycling Bin - Large	$312.80
Amazon Capital Services #A33MIR27FEZN42	ITEM: MR.SIGA Non-Scratch Cellulose Scrub Sponge,	$161.55
Amazon Capital Services #A33MIR27FEZN42	book tablet stand	$40.58
Amazon Capital Services #A33MIR27FEZN42	toner cartridges	$92.78
Amazon Capital Services #A33MIR27FEZN42	copy paper	$919.80
Amazon Capital Services #A33MIR27FEZN42	return of metal locker	($269.97)
Amazon Capital Services #A33MIR27FEZN42	wireless keyboard/mouse x4	$109.90
Amazon Capital Services #A33MIR27FEZN42	organizational items, wireless keyboard	$34.46
Amazon Capital Services #A33MIR27FEZN42	organizational items, wireless keyboard	$269.99
Amazon Capital Services #A33MIR27FEZN42	holder, shower curtain, soap, mount, rod	$392.39
Amazon Capital Services #A33MIR27FEZN42	trash can	$119.99
Amazon Capital Services #A33MIR27FEZN42	metal locker	$403.78
Amazon Capital Services #A33MIR27FEZN42	binder	$34.05
Amazon Capital Services #A33MIR27FEZN42	vinyl, transfer tape, zip ties, brochure holder	$123.39
American Welding & Gas Inc	Welding Helmet - Snow/Ice	$399.19
American Welding & Gas Inc	Welding Supplies	$138.74
AT&T Mobility	MDC Aircard charges	$480.48
Ayres Associates Inc	DDD Zoning - Prof. Svcs. thru 12/30/2023	$11,964.99
Ayres Associates Inc	Sheridan M1 Zone District Analysis thru 12/30/23	$1,194.00
B&B Leasing Company	Sharp Copier Model No BP50C26, Serial No 25059278	$157.43
Big Horn Sanitation	South Park sanitation fee	$441.00
Bighorn Design Studio LLC	apparel for Municipal Clerk	$139.92
Bighorn Design Studio LLC	Shirts - Signs	$170.00
Bighorn Design Studio LLC	Jacket & Vest - Streets	$24.00
Bronc Builders	2023 R&O misc. - painted fire hyds Sept 2023	$1,550.00
Buggy Bath Unlimited LLC	Monthly Truck Washing	$313.56
C & K Equipment Sales Inc	Oil for Weed and Pest Toolcat	$49.92
Carolina Software	WasteWorks Support Quarter Ending 03/31/23	$550.00
Carquest Auto Parts	Return Brake Pads	($39.64)
Carquest Auto Parts	PS Fluid for Fuel Truck LF288	$8.54
Carquest Auto Parts	by pass lube, fuel spin on, air filter	$123.86
Carquest Auto Parts	oil and air filter	$12.94
Carquest Auto Parts	headlight	$13.94
Carquest Auto Parts	Various dept fleet supplies/parts	$25.66
Carquest Auto Parts	powerrated blt	$73.55
Carquest Auto Parts	hydraulic element	$278.58
Carquest Auto Parts	fuel filter	$18.19
Carquest Auto Parts	cabin air element	$38.49
Carquest Auto Parts	lube	$14.34
Carquest Auto Parts	by pass lube, fuel spin on, fuel/water seperator	$162.35
Carquest Auto Parts	oil, cabin and air filter	$29.50
Carquest Auto Parts	air filter	$10.32
Carquest Auto Parts	trim panel retainer	$5.19
Carquest Auto Parts	fuel spin on, fuel filter, lube	$78.55
Carquest Auto Parts	oil and air filter	$11.29
Carquest Auto Parts	lube, air	$53.88
Carquest Auto Parts	oil and air filter	$12.94
Carquest Auto Parts	turn signal flasher	$24.68
Carquest Auto Parts	stt lamp	$39.94

Carquest Auto Parts	fuse	$1.02
Carquest Auto Parts	Air Intake Cleaner x1	$8.54
CED- Consolidated Electrical Distributers Inc	Wire butt splices	$32.26
Cedars Health LLC	Occupational Health Testing for December	$297.00
Clark Throssell	KGC end of year assessment.	$1,838.64
CMI-Teco	WC - spare injectors for Mack trucks	$414.69
Croell Redi-Mix Inc	Concrete Repair - Streets	$338.00
Croell Redi-Mix Inc	Grout to repair 16th and Demple	$1,410.00
Dog and Cat Shelter Inc	FY24 Quarterly Support	$25,000.00
DOWL LLC	WWTP Clarifier - Prof. Svcs. 11/19/23 - 12/23/23	$343.50
DryFireMag LLC	Dry Fire Mag	$356.36
Econowash LLC	Laundry - Service Center	$38.00
Econowash LLC	Laundry - Service Center	$31.50
Employ LLC	temporary labor for recycling	$3,073.59
Employ LLC	temporary labor for Recycling	$4,843.67
Employ LLC	temporary labor for recycling	$3,670.03
Employers Council	Workplace Investigation	$1,720.00
Enviro-Clean Equipment Inc	ST343 - hose, nozzle, divide block, belt + S&H	$742.97
Fastenal Company	Screw - Signs	$2.51
Floyd's Truck Center WY	WC316 - drums & slack adjusters	$496.34
Floyd's Truck Center WY	ST345 - bushings, 3 leaf parabolic, hardware	$1,313.77
Floyd's Truck Center WY	return of nitrogen sensor	($318.75)
Floyd's Truck Center WY	WC316 - brakes, drums, slack adjusters	$1,591.04
Floyd's Truck Center WY	ST345 - suspension bushings & hardware	$117.55
Floyd's Truck Center WY	RC363 - rocker switch	$95.68
Floyd's Truck Center WY	RC363 - selector assy + freight	$942.75
Galls LLC	Uniform Gear	$22.46
Galls LLC	Uniform Gear	$71.32
Granicus	Video Streaming Services (Swagit) FY24	$1,295.00
Greenfold Services LLC	Janitorial Services	$1,960.00
Hach Company	Manver pwd 50mls	$66.38
Hawkins Inc	Azone 15, Soda Ash and Aqua Hawk	$5,237.57
Hawkins Inc	Azone 15 x 570 gallons & freight	$3,294.50
Hawkins Inc	Calcium Hypochlorite tablets	$774.16
Home Depot Credit Services	Totes - Signs	$71.96
Home Depot Credit Services	Totes - Signs	$179.90
Home Depot Credit Services	Shop supplies for Parks Department	$85.29
Home Depot Credit Services	Drywall supplies for 820 Kroe Lane	$195.08
Home Depot Credit Services	Anchoring cement - Signs	$35.95
Home Depot Credit Services	Lumber and hardware for training prop; batteries f	$231.95
Home Depot Credit Services	Bench Vice and Installation Parts	$62.45
Home Depot Credit Services	return of glue	($7.48)
Home Depot Credit Services	Bench Vice and Installation Parts	$14.38
Home Depot Credit Services	Bench Vice and Installation Parts	$2.00
Humdinger Equipment LTD	Joystick for TANA LF473	$903.08
IBS Inc	Consumables - Service Center	$1,626.45
Ideal Manufacturing Inc	Goosneck Pole - Gate Repair	$146.80
Joe Johnson Equipment LLC	ST342 - 75 lbs wire + frt - credit	$565.70
Joe Johnson Equipment LLC	ST342 - curtains + freight	$571.48
John Deere Financial #1111308145	(5) Pair of Jeans for Mitch Holsinger	$269.95
John Deere Financial #1111308145	(2) Pair of Pants for Stan Schwabauer	$49.98
John Deere Financial #1111308145	Water tank for elk pasture	$18.99
John Deere Financial #1111308145	Steel toe bog boots-Tyler Gay	$189.95
John Deere Financial #1111308145	Chain loop and sharpening set for KGC.	$84.96
John Deere Financial #1111308145	Work Pants - Streets	$79.20
John Deere Financial #1111308145	Steel toe bog boots-Carter King	$189.95
John Deere Financial #1111308145	Hydrant Pump	$89.99
John Deere Financial #1111308145	WInter jacket and bibs - Carter King	$225.23

Joshua A Meyers	safe rides	$489.00
Kilpatrick Creations Inc	Uniform Embroidery WWTP	$22.50
Kois Brothers Equipment Co	WC713 - valve, cylinders, joystick, etc.	$8,251.20
Lease Servicing Center Inc	loader and motor grader lease payment #6	$5,811.21
Local Govt Liability Pool	Insurance claim for tree damage to home.	$120.00
Luke A Goddard	Medical Doctor Coverage for December 2023	$500.00
Luke A Goddard	Medical Doctor Coverage for January 2024	$500.00
M&K Rentals	Stump grinder rental for Community Forestry	$753.75
Main Frame	Self-Gripping Picture Hooks, Steel Loop-End Cables	$1,711.50
Memorial Hospital of Sheridan County	Laboratory for KCondos 12-19-2023	$36.00
Memorial Hospital of Sheridan County	Laboratory for CEisenman 11-29-2023	$36.00
Memorial Hospital of Sheridan County	10 boxes of Large Nitrile Gloves; 5 boxes of XLarg	$252.00
Merchant McIntyre & Associates LLC	Infrastructure Grant Services - Jan 2024	$8,000.00
Morton Salt Inc	Bulk Solar white chrystal coarse salt	$6,186.09
Moxey Schreiber Veterinary Hospital	Necropsy	$136.00
Mullinax Concrete Service & Irrigation	Pea Gravel - Snow/Ice	$603.68
Nancy Jane Trangmoe	Embroidery for Stan Schwabauer and Mitch Holsinger	$70.00
Napa Auto Parts	hood deflector	$89.26
Napa Auto Parts	flasher, tail light	$203.35
Napa Auto Parts	battery	$383.58
Napa Auto Parts	oil filter	$21.94
Napa Auto Parts	air dryer	$293.39
Napa Auto Parts	halogen sealed beams	$9.39
Napa Auto Parts	exactfitblade	$26.48
Narwhal Met LLC	Weather Forecasting - Snow/Ice	$650.00
National Testing Network Inc	Peace Officer Testing	$55.00
Norco Inc	Bomber Jacket for Mitch Holsinger	$30.52
Norco Inc	(2) Cases of Paper Towels and (2) Cases of TP	$452.72
Norco Inc	Oxygen - Snow/Ice	$46.00
Norco Inc	Gloves - Snow/Ice	$10.78
Norco Inc	Welding Jacket - Signs	$45.61
Norco Inc	TP & Hand Soap - Service Center	$137.47
Norco Inc	Janitorial supplies for Parks grounds Mx	$203.00
Norco Inc	Parks welding cylinder rental	$100.44
Norco Inc	(2) Cases of Hand Soap	$111.96
Norco Inc	(5) Medium Zip Up Sweatshirts - Backstock	$127.50
Norco Inc	Handsoap, Film Wrap, Antibacterial Wipes and Eye F	$161.70
Norco Inc	Gloves - Snow/Ice	$21.56
Norco Inc	Gloves - Snow/Ice	$226.38
Norco Inc	Welding Rod - Snow/Ice	$145.30
Norco Inc	Acetylene - Signs	$72.62
Norco Inc	Paper Towels - Service Center	$142.09
Norco Inc	Lens cleaning towelette	$14.94
Office Shop Inc	Monthly Copy Charges	$60.41
Office Shop Inc	3rd floor copier charges	$245.57
Office Shop Inc	1st floor copier charges	$219.29
Office Shop Inc	UM copier maintenance.	$38.00
Office Shop Inc	Streets - copies on lease copier ID #6849 12/2/23	$29.60
Office Shop Inc	Canon/ IRAC5535i-II contract	$16.33
Office Shop Leasing	Copier Lease Payments	$89.54
Office Shop Leasing	Copier Leases	$131.93
Office Shop Leasing	Copier Leases	$60.00
Office Shop Leasing	3rd floor copier leas payment 43 of 60	$102.71
Office Shop Leasing	Lease pmt 43 of 60, Agreement #393	$101.15
One-Call of Wyoming	One-Call Tickets (219) for Dec 23 CDC	$164.25
One-Time Employee Reimbursement Vendor	Reimbursement for fuel to Riverton, WY to instruct	$45.44
One-Time Employee Reimbursement Vendor	Running socks (10 Pairs) for KCondos 12-16-2023	$186.14
One-Time Employee Reimbursement Vendor	CDL Permit - Streets	$47.25

One-Time Employee Reimbursement Vendor	Wellness Participation Reimbursement: Jason Etchec	$200.00
One-Time Employee Reimbursement Vendor	Beverages for City Art Exhibition	$166.00
One-Time Employee Reimbursement Vendor	Peter Brooks Tuition Reimbursement for Physics I	$597.60
Otis Elevator Company	Elevator Maintenance - 50% down payment	$74,625.00
Pace Analytical Services LLC	WY5600052- Bac T sample analysis invoice	$457.00
Pace Analytical Services LLC	Monthly Oil & Grease Effluent Tests WWTP	$111.00
Peak Pest Solutions LLC	Monthly pest service	$131.25
Peak Pest Solutions LLC	Monthly pest service	$78.75
Pfitzer Pest Control LLC	Quarterly Pest Control - Streets	$144.90
Polydyne Inc	Clarifloc C-6266 450lb Drum x4 units WWTP	$3,150.00
Porter Muirhead Cornia & Howard	FY 2023 audit	$2,883.00
Porter Muirhead Cornia & Howard	FY23 audit	$6,000.00
Powder River Heating & Air Conditioning Inc	Service Call to Troubleshoot Scale House Heater	$130.00
Powder River Heating & Air Conditioning Inc	Repairs to boiler system for City Hall	$260.00
Powder River Power of Sheridan Inc	Gloves x 5pkgs	$115.00
Powder River Power of Sheridan Inc	WC718 - hyd hose, assy & fitting	$53.40
Powder River Power of Sheridan Inc	SNE902 - hyd hose, assy & fittings	$77.96
Powder River Power of Sheridan Inc	ST345 - electrical connector	$13.90
Powder River Power of Sheridan Inc	Break Clean - Service Center	$51.60
Powder River Power of Sheridan Inc	WC7002 - hyd hose, assy & fittings	$195.86
Powder River Power of Sheridan Inc	ST435- hy hose, assy, couplers and fittings	$254.63
PreCise MRM LLC	Subscription - Snow/Ice	$140.00
Quill LLC	2024 Calendar	$11.99
Quill LLC	Packing Tape	$10.58
Quill LLC	Printer Ink	$143.98
Quill LLC	Storage bags, towels, hand soap	$147.72
Range	Crimestoppers	$33.73
Rhonda M Gould	seamstress	$90.00
Rocky Mountain Scale Works	Landfill Scale - install new scale	$130,585.00
Rodney Alermatt	Drywall work for Parks shop	$450.00
Servall Uniform & Linen Supply	Coveralls & Rugs - Streets	$182.08
Servall Uniform & Linen Supply	Bi-Weekly Rug Cleaning -SWR 12/28/23	$40.56
Servall Uniform & Linen Supply	Bi-Weekly Rug Cleaning - Landfill 12/28/23	$260.28
Servall Uniform & Linen Supply	UM rug cleaning	$104.19
Servall Uniform & Linen Supply	Rug Cleaning	$195.64
Servall Uniform & Linen Supply	Rugs, mops, overalls - Streets	$180.38
Servall Uniform & Linen Supply	City Hall rugs Dec 28 2023	$164.64
Servall Uniform & Linen Supply	Clean Rugs for SFR 1-4-2024	$35.32
ServerSupplydotcom Inc	Quote: 4165441 Part No: ST16000NM001G SEAGATE ST16	$654.61
Sheridan Artists Guild Et al	Administration for SPAC	$1,200.00
Sheridan Commercial Co	Utility Knife / Dusk Masks - Snow/Ice	$42.76
Sheridan Commercial Co	Ziploc bags for ice to ship samples	$20.68
Sheridan Commercial Co	copy paper	$269.00
Sheridan Commercial Co	Snaps for radio holster repair JSyring 1-5-2024	$5.37
Sheridan Commercial Co	Washer - Signs	$4.13
Sheridan Commercial Co	Shop supplies for Parks grounds Mx	$147.37
Sheridan Commercial Co	Weed and Pest shop supplies	$195.57
Sheridan Commercial Co	Shop supplies for KGC	$76.08
Sheridan Commercial Co	Heat Gun - Snow/Ice	$59.88
Sheridan Commercial Co	Padlock & Misc - Snow/Ice	$28.85
Sheridan Commercial Co	Key Blank - Snow/Ice	$14.82
Sheridan Commercial Co	WWTP Supplies & Ink (Tape, Brush, Key, Cabinet, et	$222.10
Sheridan Commercial Co	Backflow Kit Shipping, Extension Cord	$57.60
Sheridan Commercial Co	Bathroom Floor Repair - Service Center	$16.89
Sheridan Commercial Co	Bathroom Floor Repair - Service Center	$70.36
Sheridan Commercial Co	Spray Paint - Signs	$14.98
Sheridan Commercial Co	Primer - Streets	$21.94
Sheridan Commercial Co	Tape, Clock, & Paint - Service Center	$63.75

Sheridan Commercial Co	Scott Bath Tissue	$8.57
Sheridan Commercial Co	Eng. supplies - scissors, strips & desk calendar	$41.87
Sheridan Commercial Co	Battery for Gate Controller	$13.02
Sheridan County Chamber of Commerce	Sheridan Map Advertising SPAC	$300.00
Sheridan County Public Health	immunizations	$280.00
Sheridan County Public Works	Planning Ad - Mortenson Minor Sub	$7.00
Sheridan Econ-O-Wash Laundry	WWTP Econ-o-wash Laundry Services	$31.50
Sheridan Econ-O-Wash Laundry	WWTP Econ-o-wash Laundry Services	$22.50
Sheridan Fire Equipment & Service Professional LLC	Fire Extinguisher Service	$51.25
Sheridan Media	Holiday Recycling Ads 12/19/23 & 12/26/23	$273.00
Sheridan Media	Christmas Clean Up Ads 12/19/23 & 12/26/23	$231.00
Sheridan Media	Christmas and New Year's Hour Ads 12/19/23 and 12/	$126.00
Sheridan Media	Radio Ads for Everbridge on NewsTalk 930 KROE	$432.00
Sheridan Media	Radio Ads for Everbridge on Z94 FM	$432.00
Sheridan Media	Radio Ads for Everbridge on 1410 KWYO	$432.00
Sheridan Media	Radio Ads for Everbridge on 93.7 Coyote Country	$432.00
Sheridan Media	Radio Ads for Everbridge on Q104.9 Today's Hit Mus	$432.00
Sheridan Media	Radio Ads for Everbridge on Magic 102.3	$432.00
Sheridan Media	SheridanMedia.com Ads for Everbridge	$425.00
Sheridan Media	Country Bounty 14" Display Ads for Everbridge	$876.00
Sheridan Memorial Clinics	Firefighter Annual Medical Exams-Labs	$1,920.00
Sheridan Motor Inc	PD126 - replaced heater supply hose	$289.35
Sheridan Newspapers Inc	Classified Ad for Streets Administrative Assistant	$226.50
Sheridan Newspapers Inc	Classified Ad for Sanitation & Recycling Equipment	$274.00
Sheridan Newspapers Inc	Classified Ad for Street Maintenance Technician	$293.00
Sheridan Transportation Taxi	safe rides	$2,101.00
Tank Management Services	Monthly Tank Inspection - Streets	$748.00
Ted's Towing LLC	Tow Charge	$135.00
Test Gauge Inc - CO	Test Kit Calibration - Utility Tech Backflow	$118.04
Thomas J Klepperich	Judge's December Hours	$3,225.00
Tire Rama	PD137 - new tires installed (4)	$679.00
Tire Rama	MP178 - new tires installed (4)	$880.36
Tire Rama	WC701 - swapped rear tires (4)	$145.00
Tire Rama	WC320 - swapped rear drives & rotate	$193.00
Tire Rama	GC - loose mower tire/repair	$26.00
Tire Rama	WC78 - M&D tires & rotation	$410.00
Tire Rama	WC - spare drive tires & repairs w/retread	$1,752.40
Tire Rama	Tire repair UM382	$37.00
Tire Rama	W&P - tire repair	$50.83
Tires for Reclamation Inc	Tire Recycling 12/29/23	$1,513.00
Top Office Products Inc	SFR Office Supplies	$446.94
Toro NSN	Toro software for KGC	$175.00
Total Comfort Heating & Air Conditioning	Redo venting for the express gear and hose dryer	$1,250.00
Tractor Supply Credit Plan	WC316 - underbody 24" T-handle, Steel	$324.67
Transaction Warehouse Inc	profile/quckpay/auto pay	$4,485.60
Trihydro Corporation	2023 R&O - CA thru 11/25/2023	$12,183.25
Trihydro Corporation	Environmental Monitoring and Reporting - November	$585.76
TWS Trucking Services LLC	Tire Hauling 12/29/23	$800.00
Tyler Technologies Inc	implementation	$1,304.00
Vertical Door Solutions Inc	Bracket Changed on Shop Commercial Door	$192.81
Visionary Communications	Wireless Internet	$220.68
VRM Inc	Labor to Remove Old Dump Box Liner and Install New	$11,307.00
VRM Inc	Labor to Troubleshoot Joystick on TANA LF473	$250.00
VRM Inc	Labor to Troubleshoot Leaks on Dozer LF434A	$3,747.75
WAM-WCCA Energy Lease Program	FY24 Window loan payments	$2,500.00
Wamco Lab Inc	Full Chronic Toxicity Test WWTP	$2,800.00
Wareings Sheridan Chevrolet	MP178 - hail damage repair	$9,187.30
Water Products & Solutions	Water Dispenser Rental - Service Center	$10.00

Water Products & Solutions	5 Gallon Water - Service Center	$26.25
Wausau Equipment Company LLC	Snow plow	$26,988.50
Winsupply of Sheridan Wy Co	Coil for Compost Yard	$125.08
Winsupply of Sheridan Wy Co	Ball valve	$83.04
WY Department of Transportation	Main St. Construction thru 01/02/2024	$3,896.61
Wyoming First Aid & Safety Supply LLC	First aid supplies for KGC and Parks grounds maint	$370.46
Wyoming First Aid & Safety Supply LLC	Cemetery first aid supplies	$91.42
Wyoming Machinery Company	LF434A - hydro filter + del chg	$76.84
Wyoming Machinery Company	LF434A - tube assys + del chg	$409.34
Wyoming Machinery Company	repair UM463	$248.01
Wyoming Machinery Company	repair UM463	$153.03
Wyoming Machinery Company	LF4003 - 250 hr PM parts	$19.39
Wyoming Machinery Company	LF486 - lamp GP-HD + del chg	$192.62
Wyoming Regional EMS LLC	FY24 Ambulance Service	$12,420.00
Zowada Recycling & Steel LLC	ST569 - 11ga HR sheet 4'x4'	$77.93
CenturyLink Communications LLC	partial Centurylink December bill	$1,360.87
CenturyLink Communications LLC	partial Centurylink bills December	$194.27
Farmers Co-op Oil Co	Fuel for Landfill 12/01/23	$1,752.24
Farmers Co-op Oil Co	Propane - Signs	$17.34
Farmers Co-op Oil Co	Fuel for Landfill 12/08/23	$2,887.23
Farmers Co-op Oil Co	Def Fluid - Snow/Waste Collection	$918.75
Farmers Co-op Oil Co	Fuel for Landfill 12/15/23	$2,324.44
Farmers Co-op Oil Co	Fuel for Landfill 12/22/23	$2,632.91
Farmers Co-op Oil Co	DEF for Landfill Equipment 12/27/23	$918.75
Farmers Co-op Oil Co	Fuel for Landfill 12/29/23	$1,923.61
Farmers Co-op Oil Co	12/1/2023 fuel delivery to Cemetery	$274.19
Farmers Co-op Oil Co	12/5/2023 fuel delivery to csc	$10,093.80
Farmers Co-op Oil Co	12/11/2023 fuel delivery to GC Shop	$362.79
Farmers Co-op Oil Co	12/12/2023 fuel delivery to csc	$9,081.45
Farmers Co-op Oil Co	Bulk Oil - WC, RC, WW	$1,778.70
Farmers Co-op Oil Co	12/19/2023 fuel delivery to csc	$7,930.80
Farmers Co-op Oil Co	Propane - Streets	$34.67
Farmers Co-op Oil Co	12/26/2023 fuel delivery to csc	$5,794.62
Farmers Co-op Oil Co	Grease for Landfill Equipment 12/27/23	$147.00
Farmers Co-op Oil Co	12/28/2023 fuel delivery to GC shop	$308.21
Montana Dakota Utilities Co	partial MDU bills for December	$21,503.44
Range	Range phone bills December	$2,794.12

CITY OF SHERIDAN, WYOMING
55 Grinnell Street, P.O. Box 848, Sheridan Wyoming 82801
Ph (307) 674-6483 Fax (307) 674-2195

Attorney

MEMORANDUM

RE: Consideration of the Extension of the Funding Agreement between the City and SEEDA Joint Powers Board - City Attorney Brendon Kerns

From: Brendon Kerns, City Attorney

To: City Council

CC:

Date:

Background:

The SEEDA Joint Powers Board was created by the City of Sheridan and the Northern Wyoming College District. Since its inception, SEEDA has focused on economic and education development. Specifically, SEEEDA is responsible for obtaining the financing to enable such projects as Vacutech, Weatherby and Kennon. The cost of managing SEEDA is shared between the City of Sheridan and Sheridan College. The last agreement was entered into in 2021 and is set to expire June 30, 2024. The new agreement is identical to the prior agreement with the exception that the City will be charging slightly more for SEEDA accounting. The new contract will expire on June 30th, 2028.

Attachments

agreement

SEEDA FUNDING AGREEMENT

This SEEDA Funding Agreement ("Agreement") is between the City of Sheridan, a Wyoming municipal corporation, ("City"), and Sheridan Economic and Educational Development Authority Joint Powers Board, ("SEEDA") and is entered into on the date undersigned.

Recitals

WHEREAS, SEEDA Joint Powers Board was established by the Sheridan Economic and Educational Development Authority Joint Powers Board Agreement, ("JPBA") pursuant to W.S. § 16-1-101 et. seq. by and between the City of Sheridan and Northern Wyoming Community College District ("Sheridan College"); and

WHEREAS, SEEDA was formed to: (a) Provide a mechanism to facilitate grants through the Joint Powers Board; (b) provide a mechanism for nonprofit entities, associations, foundations and others to make investments in projects; (c) provide a mechanism for participating agencies to jointly finance, develop, own, manage, lease, buy and sell real property assets to facilitate development of which will provide educational, business, cultural and social service opportunities; (d) provide long-term stability in the management of assets without disruption by shorter term political and personnel changes in the participating agencies forming the Joint Powers Board; and (e) provide for the financing and development of workforce training or job creation initiatives; and

WHEREAS, SEEDA has been successful at meeting its goals set forth in the JPBA through the recruitment and growth of multiple businesses which has resulted in hundreds of new jobs in Sheridan; and

WHEREAS, in order to maintain its current property, administer lease agreements with recruited businesses and continue to foster collaboration in construction and operation of facilities and programs furthering educational and economic development of Sheridan County, SEEDA requires annual funding from the City and Sheridan College; and

WHEREAS, the parties desire to provide fiscal security for SEEDA and budget predictability for the City; and

WHEREAS, pursuant to Article 9(c) of the JPBA, the financing of SEEDA shall be shared equally among the participating parties unless otherwise agreed to by the parties.

NOW THEREFORE, in consideration of mutual covenants set forth herein, the parties agree as follows:

Article I – Term

1.1 **Initial Term:** This Agreement shall begin July 1, 2023~~1~~ and expire June 30, 2028~~2~~.

1.2 **Term Extensions:** This Agreement shall automaticall be extended ~~for up to two additional one-year terms unless either party provides a notice ninety (90) days prior to June 30th of each respective year of its desire to negotiate terms. Should a notice to negotiate be delivered and~~if the parties are unable to reach an agreement prior to the date of expiration, this Agreement shall automatically continue for three-month terms until a new agreement is concluded or this Agreement is terminated by action of the parties.

Article II – Financing and Budgeting

2.1 **SEEDA Budget**: SEEDA shall be required to submit to the City a yearly budget. The City funding contribution shall be used and allocated by SEEDA per the annual budget. SEEDA shall not be prohibited from amending its budget, as needed, per Wyoming Statute.

2.2 **City Funding**: The City and SEEDA recognize that the total contribution owed to SEEDA per year is One Hundred and Fifty Thousand and xx/100 Dollars ($150,000.00). This amount shall be offset by the City providing accounting services which is worth Twenty-~~Four~~ Five Thousand and xx/100 Dollars per year ($254,000.00). Thus, City shall pay SEEDA One Hundred Twenty-Five~~Six~~ Thousand and xx/100 Dollars ($1256,000.00) which shall be paid quarterly.

2.3 **College Funding**: The City reserves the right to request the renegotiation of its funding obligation upon changes in Sheridan College's contribution.

2.4 **SEEDA Expansion:** Should SEEDA JPBA be amended to add an additional party, this agreement shall terminate.

Article III – SEEDA Administration and Services

3.1 **SEEDA Expenses:** The amount submitted to SEEDA per Article 2.2. shall be used to pay for SEEDA expenditures as described in the SEEDA budget.

3.2 **Administrator Presentation**: The SEEDA administrator shall provide the City of Sheridan Governing Body with a yearly update at a regularly scheduled meeting.

Article IV - City Services

4.1 **City Accounting**: City has and shall continue providing accounting services for SEEDA. The payment of SEEDA claims and expenses shall be per the SEEDA approved budget. Non-budgeted SEEDA claims and expenses shall be approved by the SEEDA Board or its authorized representative.

4.2 **Accounting Fee**: The City accounting services are deemed to be valued at twenty-~~four~~ five thousand and xx/100 Dollars ($254,000.00) per year which has been accounted.

4.3 **Engineering and Project Assistance**: Engineering and Project Assistance shall be provided by the City Public Works Department on a project-by-project basis. The cost of such

services is specifically excluded from this Agreement in order to provide flexibility and agility for the parties.

Article V – Miscellaneous

5.1 **Attorney Fees**: In the event any legal action is brought to enforce or interpret any term of this Agreement, the prevailing Party will be entitled to recover, in addition to any other damages or award, all reasonable legal costs and fees associated with the action.

5.2 **Modification of Agreement**: Any amendment or modification of this Agreement or additional obligation assumed by either Party in connection with this Agreement will only be binding if evidenced in writing, signed by each Party or an authorized representative of each Party.

5.3 **Time of the Essence:** Time is of the essence in this Agreement. No extension or variation of this Agreement will operate as a waiver of this provision.

5.4 **Entire Agreement**: It is agreed that there are no representations, warranty, collateral agreements or conditions affecting the Agreement except as expressly provided in this Agreement.

5.5 **Governing Law:** It is the intention of the Parties that this Agreement and all suits and special proceedings, be construed in accordance with the laws of Wyoming and brought in the fourth judicial district in Sheridan County.

IN WITNESS WHEREOF, the parties have duly executed this _____ this _____ day of _____, 2021.

City of Sheridan, State of Wyoming

By: _____
Title: _____
Date: _____
Attest: _____

SEEDA
By: _____
Title: _____
Date: _____

CITY OF SHERIDAN, WYOMING

55 Grinnell Street, P.O. Box 848, Sheridan Wyoming 82801
Ph (307) 674-6483 Fax (307) 674-2195

Public Works

MEMORANDUM

RE: Consideration of PL-23-49, Resolution 02-49, Teal Springs Subdivision PUD Phase I - Public Works Director Hanns Mercer

From: Hanns Mercer, Public Works Director

To: City Council

CC:

Date: 12/27/2023

Recommendation:

Staff recommends approval of PL-23-49, Resolution 02-24. The applicant, FP Little Goose LLC, is requesting approval of the Teal Spring Subdivision Planned Unit Development Phasing Plan.

Background:

The Teal Springs PUD and Master Plan was approved by the Governing Body on September 18, 2023 and the applicant, FP Little Goose, has requested that the City grant an amendment to the Teal Springs PUD to be constructed in two separate phases. The applicant has submitted updated plats, Teal Springs Subdivision Planned Unit Development – Phase 1 and Teal Springs Subdivision Planned Unit Development – Phase 2.

Discussion:

The Teal Springs Master Plan and Planned Unit Development (PUD) received a positive recommendation from the City of Sheridan Planning Commission and was approved by the Governing Body on September 18, 2023.

The applicant has requested that the City grant an amendment to the Teal Springs PUD to be constructed in two separate phases. City of Sheridan Ordinance allows the Director of Public Works to permit amendments as long as such are otherwise permitted by Wyoming Statute.

Attachments

Aerial

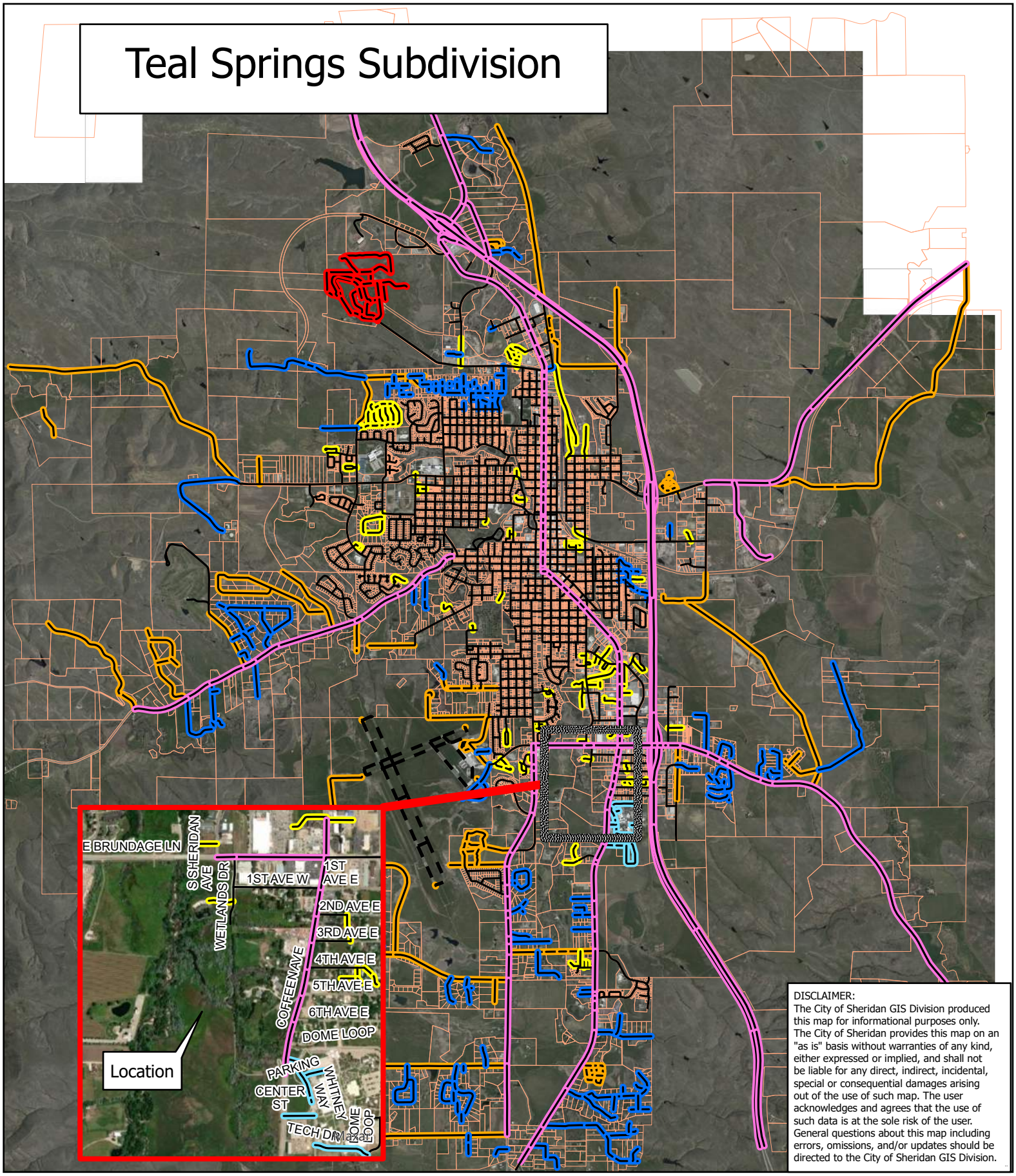
Developer Agreement

Plat - Phase I

Plat - Phase II

Resolution 02-24

Teal Springs Subdivision



DISCLAIMER:
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CITY OF Sheridan WYOMING

Legend

Roads
- County Road
- Forest Service Road
- Private Road
- PUBLIC ROAD
- City of Sheridan Road
- Sheridan College Road
- Sheridan County Airport
- State of Wyoming Road
- VA Road
- Parcels

City of Sheridan Imagery 2019
- Red: Band_1
- Green: Band_2
- Blue: Band_3

N

Miles 0 ¾ 1½

Date: 04/11/2023 11:18 AM User: sgoodman

Development Agreement for
Teal Spring Subdivision, Planned Unit Development

This agreement is made and entered into as of this _____day of _____, 2023, by and between the City of Sheridan, a municipal Corporation in the State of Wyoming, hereinafter known as the "City", and ***FP Little Goose, LLC,*** hereinafter known as the "Developer." The City and Developer for their mutual benefit and consideration agree to the terms and conditions as listed herein for the development of the Teal Spring Subdivision, Planned Unit Development:

Section 1. GENERAL CONDITIONS

A. The terms of this agreement shall be binding on all heirs, successors, and assigns of the Developer. In the event of a transfer of all or any portion of the property, the transferor shall be relieved of any and all obligations with respect to the transferred property upon acceptance of this signed development agreement and financial assurance by the City - which shall not be unreasonably withheld.

B. The development of the Teal Spring Subdivision, Planned Unit Development, is subject to the current requirements in Appendix B (Subdivisions) of the Sheridan City Code, as well as adopted City of Sheridan Standards for Street and Utility Construction.

C. Public improvements provided by the Developer for the Teal Spring Subdivision, Planned Unit Development shall consist of the following as per plans and specifications approved by the City Engineer:

Phase 1 (generally consisting of Lots 1-32, Lot 52, Tract 2, and Outlots A, B, and F)

- Street and sidewalk improvements
- Water System
- Sanitary Sewer System
- Storm Drainage System

Phase 2 (generally consisting of Lots 33-51 and Outlots C, D, and E)

- Street and sidewalk improvements
- Water System
- Sanitary Sewer System
- Storm Drainage System

D. Public improvements provided by the City for the Teal Spring Subdivision, Planned Unit Development shall consist of the following as designed and constructed by the City. These pathway improvements will be completed concurrent with Phase 1:

- Pathway improvements along Wetlands Drive (Wetlands Drive Sta. 406+29 to Sta. 416+14 and beyond according to Morrison-Maierle August 4, 2023 Construction Drawings) in accordance with the July 8, 2023 Easement between Teal Ponds, LLC and City of Sheridan, along with March 10, 2022 Amendment to Pathway Easement.

E. The Developer shall provide financial assurances for public improvements pursuant to and in conformance with Sheridan City Code, Appendix B., Sections 701 and 702, including 10% contingency fee. Financial assurance for Phase 1 shall cover the following costs established by a construction contract dated September 22, 2023 between FP Little Goose, LLC and Wagner Ranch Services LLC:

Phase 1	
Street and Sidewalk Improvements -	$2,156,157.05
Water System -	$462,987.35
Sanitary Sewer System -	$429,810.35
Storm Drainage System -	$223,045.00
10% Contingency -	$327,199.98
Total -	$3,599,199.73

Financial assurance for Phase 2 will be provided at the time of plat recording. Estimated amounts are as follows, but shall be based upon an updated Engineer's Opinion of Probably Construction Cost for Public Improvements or an executed construction contract.

Phase 2	
Street and Sidewalk Improvements -	$1,023,351.97
Water System -	$422,450.85
Sanitary Sewer System -	$271,634.65
Storm Drainage System -	$279,573.00
10% Contingency -	$199,701.05
Total -	$2,196,711.52

The financial assurances shall have appropriate amounts released upon verification by the City Engineer of completion of each portion of infrastructure or phase of development.

F. Developer shall provide test results, inspection reports and suitable as-built drawings, certified by a registered professional engineer, verifying satisfactory completion for roadway improvements, and water, sewer, and storm drainage utilities for the Teal Spring Subdivision, Planned Unit Development. Water, sewer, and storm drainage utilities shall be approved and accepted by City prior to issuance of further building permits for the Teal Spring Subdivision, Planned Unit Development. Acceptance of sewer utilities will include video inspection by City personnel. Verification for services of franchise utilities must be provided upon signing of this agreement.

G. Placement of ancillary utilities and services in platted easements, including but not limited to: cable television, gas, electricity, and telephone service, will be coordinated with the installation of water and sewer service lines and sidewalks to avoid interference with, or damage to, any service or utility properly installed in a platted easement. The Developer shall be responsible for repairs to any City utilities for which lack of coordination led to damage.

H. Any pedestrian pathway or sidewalk disturbed by building construction or installation of utilities for the Teal Spring Subdivision, Planned Unit Development shall be restored by the Developer to at least its condition prior to the damage caused by the building construction or installation of utilities for the Teal Spring Subdivision, Planned Unit Development.

I. Building permits will be issued as per the requirements of the Building Department and Appendix B, Section 707 of Sheridan City Code.

J. Sidewalks will be installed by the Developer prior to the issuance of a Certificate of Occupancy.

Section 2. COMPLIANCE WITH TERMS AND CONDITIONS

The Developer agrees to comply with the terms of this Agreement, including all deadlines, contained in Section 1. Should the Developer fail to comply with any of the conditions in Section 1 of this Agreement, the City will send a letter to the Developer listing the conditions for which the Teal Spring Subdivision, Planned Unit Development, is not compliant. The City reserves the right to withhold any future development approvals for the Teal Spring Subdivision, Planned Unit Development, and pursue any other enforcement means available under Sheridan City Code and state statute, if the Developer does not propose appropriate remedies which are reasonably acceptable to the City to eliminate the non-compliance(s) within three (3) weeks of the date of the letter of non-compliance.

Section 3. EFFECTIVE DATE

This Agreement shall be effective upon the date listed in the first paragraph on page 1.

Section 4. TERMINATION

This Agreement may be amended, revised, or terminated only by the mutual consent of both parties.

Section 5. SEVERABILITY

If any provision or portion of this agreement is declared by any court of competent jurisdiction to be void, unconstitutional, or unenforceable, then all remaining provisions and portions of this agreement shall remain in full force and effect.

Section 6. GOVERNMENTAL IMMUNITY

Nothing in this Agreement shall in any way be deemed a waiver of any of the requirements or immunities provided by the Wyoming Governmental Claims Act.

IN WITNESS WHEREOF, the parties execute this agreement as of the date set forth above.

For the City of Sheridan:

_____
Richard Bridger
Mayor

For the Developer:

_____
FP Little Goose, LLC
By: Matt Frisbie, Member

_____
FP Little Goose, LLC
By: Shari Frisbie, Member

Attest:

_____
City Clerk

The above and foregoing Agreement was Subscribed, Sworn to, and Acknowledged before me by _____ this_____ day of _____, 2023.
My commission expires_____

_____
Notary Public

FINAL PLAT OF

TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE - 1

RE-SUBDIVISION OF TRACT A, TURKEY TREE MINOR SUBDIVISION,
AND LOT 5, GREEN WING MINOR SUBDIVISION,
CITY OF SHERIDAN, WYOMING

AREA OF 33 LOTS ±15.71 ACRES
AREA OF 3 OUTLOTS ±14.56 ACRES
AREA OF 1 TRACT ±1.96 ACRES
AREA OF ROADS ±4.08 ACRES
AREA OF "PHASE 2 TRACT" ±28.68 ACRES
TOTAL = ±64.99 ACRES

ZONING: PLANNED UNIT DEVELOPMENT
LOT 1, LOT 52 & TRACT 2: ZONED B1

CERTIFICATE OF DEDICATION

KNOWN ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED FP LITTLE GOOSE, LLC BEING THE OWNER(S), PROPRIETORS OR PARTIES OF INTEREST IN THE LAND SHOWN ON THIS PLAT, DO HEREBY STATE:

THAT THE FOREGOING PLAT DESIGNATED AS **TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE-1,** IS A RE-SUBDIVISION OF TRACT A, TURKEY TREE MINOR SUBDIVISION, AND LOT 5, GREEN WING MINOR SUBDIVISION, CITY OF SHERIDAN, SHERIDAN COUNTY, WYOMING.

SAID RE-SUBDIVISION CONTAINS **±64.99 ACRES** OF LAND, MORE OR LESS.

TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE-1, AS IT IS DESCRIBED AND AS IT APPEARS ON THIS PLAT, IS MADE WITH THE FREE CONSENT AND IN ACCORDANCE WITH THE DESIRES OF THE UNDERSIGNED OWNER(S) AND PROPRIETORS; AND THAT THIS IS A CORRECT PLAT OF THE AREA AS IT IS DIVIDED INTO TRACT, LOTS, OUTLOTS, STREETS AND EASEMENTS.

THE UNDERSIGNED OWNER(S) OF THE LAND SHOWN AND DESCRIBED ON THIS PLAT DO HEREBY DEDICATE TO THE CITY OF SHERIDAN AND ITS LICENSEES FOR PUBLIC USE FOR THE INDICATED PURPOSES, ALL STREETS, EASEMENTS AND OTHER PUBLIC LANDS, AS INDICATED, AND NOT ALREADY OTHERWISE DEDICATED FOR PUBLIC USE.

UTILITY EASEMENTS, AS DESIGNATED ON THE PLAT, ARE HEREBY GRANTED TO THE CITY OF SHERIDAN AND IT'S LICENSEES FOR PUBLIC USE FOR THE PURPOSE OF INSTALLING, REPAIRING, REINSTALLING, REPLACING AND MAINTAINING SANITARY SEWERS, STORM SEWERS, WATERLINES, GAS LINES, ELECTRIC LINES, TELEPHONE LINES, CABLE TV LINE, AND OTHER FORMS AND TYPES OF PUBLIC UTILITIES NOW OR HEREAFTER GENERALLY UTILIZED BY THE PUBLIC.

OUTLOTS ARE DRAINAGE EASEMENTS, OTHER EASEMENTS (AS SHOWN & DEFINED), AND OPEN SPACES WHICH ARE OWNED & MAINTAINED BY THE HOMEOWNER'S ASSOCIATION.

OUTLOT F: IS A DRAINAGE EASEMENT, IRRIGATION EASEMENT, OTHER EASEMENTS (AS SHOWN & DEFINED), AND A OPEN SPACE WHICH IS OWNED & MAINTAINED BY THE HOMEOWNER'S ASSOCIATION.

IN TESTIMONY WHEREOF:

ALL RIGHTS UNDER AND BY VIRTUE OF THE HOMESTEAD EXEMPTION LAWS OF THE STATE OF WYOMING ARE HEREBY WAIVED AND RELEASED.

THE UNDERSIGNED HAVE CAUSED THESE PRESENTS TO BE SIGNED THIS _____ DAY OF _____, _____.

FP LITTLE GOOSE, LLC

BY: _____
MATT FRISBIE, MEMBER

FP LITTLE GOOSE, LLC

BY: _____
SHARI FRISBIE, MEMBER

STATE OF _____ :ss
COUNTY OF _____

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BY MATT & SHARI FRISBIE BEFORE ME THIS _____ DAY OF _____, _____.

WITNESS MY HAND AND OFFICIAL SEAL. MY COMMISSION EXPIRES _____

_____
NOTARY PUBLIC

SIGNED BY AFFIDAVIT

BY: FIRST NORTHERN BANK OF WYOMING
("LIEN HOLDER"), SEE AFFIDAVIT FILED
AT THE SHERIDAN COUNTY COURTHOUSE.
DOCUMENT NUMBER: _____

DECLARATION EXTINGUISHING PREVIOUS EASEMENTS

1) ALL EARLIER EASEMENTS OR PORTIONS THEREOF ENCOMPASSED BY THE BOUNDARY OF THIS PLAT ARE HEREBY EXTINGUISHED UNLESS NOTED OTHERWISE.

2) EXISTING UTILITIES PLACED IN PREVIOUS RECORDED EASEMENTS WITHIN THE BOUNDARY OF THIS PLAT HAVE SENIOR RIGHTS AND ARE NOW PROTECTED BY EASEMENTS OR ROADS AS SHOWN ON THIS PLAT.

3) A (30' RESERVED FOR FUTURE STREET DEVELOPMENT) PER MARSHALL SUBDIVISION, ENCOMPASSED BY THE BOUNDARY OF THIS PLAT IS HEREBY VACATED.

4) REALIGNMENT OF A 15.0' PATHWAY EASEMENT AS SHOWN ON SHEET 3 OF 3, ALONG WETLANDS DRIVE AND LOT 8.

CITY OF SHERIDAN CERTIFICATES OF APPROVAL

REVIEWED BY THE CITY OF SHERIDAN PLANNING COMMISSION THIS _____ DAY OF _____, _____.

_____ ATTEST: VICE-CHAIRMAN

_____ CHAIRMAN

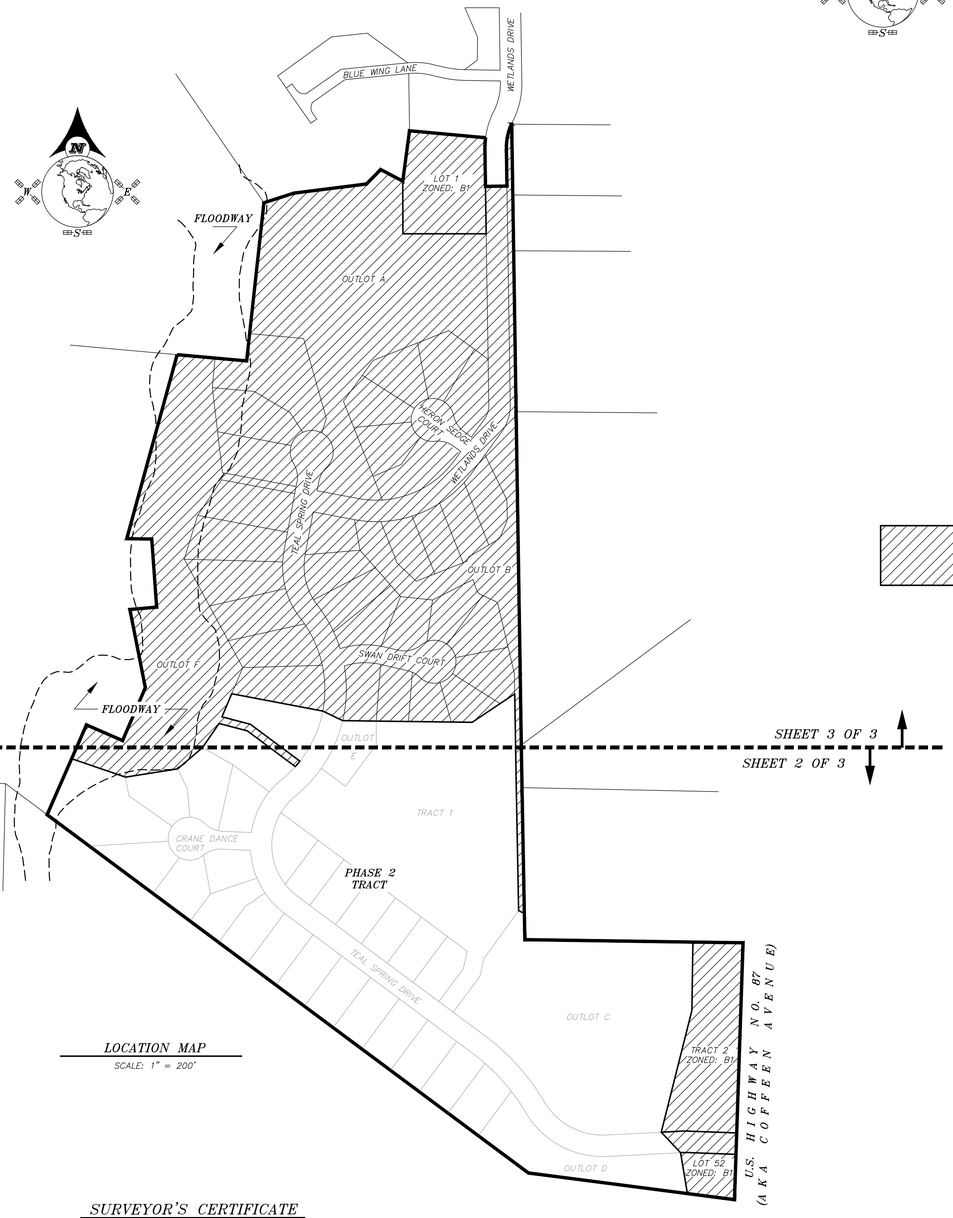
THIS PLAT HAS BEEN PREPARED IN ACCORDANCE WITH THE REQUIREMENTS AND PROCEDURES OUTLINED IN THE SUBDIVISION REGULATIONS OF THE CITY OF SHERIDAN, AND CERTIFIED THIS _____ DAY OF _____, _____, BY THE DIRECTOR OF PUBLIC WORKS OF SHERIDAN, WYOMING.

_____
DIRECTOR OF PUBLIC WORKS

APPROVED BY THE CITY COUNCIL OF THE CITY OF SHERIDAN, WYOMING, THIS ___ DAY OF _____, _____.

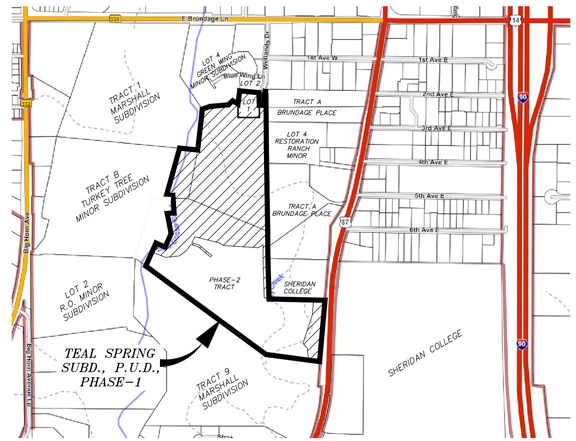
_____ ATTEST: CITY CLERK

_____ MAYOR



LOCATION MAP

SCALE: 1" = 200'



LOCATION MAP

NO TRUE SCALE

PHASE-1: CONSTRUCTION AREA

NOTES:

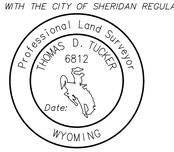
1) STRUCTURES BUILT WITHIN THE 100 TO 500-YEAR FLOODPLAIN WILL BE REQUIRED TO ACQUIRE A CERTIFIED ELEVATION CERTIFICATE AND TO BUILD A MINIMUM OF ONE FOOT ABOVE THE BASE FLOOD ELEVATION (BFE).

2) LOT OWNERS IN THIS SUBDIVISION ARE PROHIBITED FROM FLOODWAY ENCROACHMENTS THAT INCREASE OR DECREASE BASE FLOOD ELEVATIONS OR ALTER FLOODWAY BOUNDARIES.

SURVEYOR'S CERTIFICATE

STATE OF WYOMING :ss
COUNTY OF SHERIDAN

I, THOMAS D. TUCKER, DO HEREBY STATE THAT I AM A REGISTERED LAND SURVEYOR, LICENSED UNDER THE LAWS OF THE STATE OF WYOMING, THAT THIS PLAT IS A TRUE, CORRECT AND COMPLETE PLAT OF **TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE-1,** AS LAID OUT, PLATTED, DEDICATED AND SHOWN HEREON, THAT THIS PLAT WAS MADE FROM AN ACCURATE SURVEY OF SAID PROPERTY CONDUCTED BY ME OR UNDER MY DIRECT SUPERVISION AND CORRECTLY SHOWS THE LOCATION AND DIMENSIONS OF ALL TRACTS AND EASEMENTS OF SAID SUBDIVISION IN COMPLIANCE WITH THE CITY OF SHERIDAN REGULATIONS GOVERNING THE SUBDIVISION OF LAND.



"PLAT IS VALID ONLY IF PRINT HAS
ORIGINAL SIGNATURE OF SURVEYOR SIGNED AND DATED"

CERTIFICATE OF RECORDER

STATE OF WYOMING :ss
COUNTY OF SHERIDAN

THIS PLAT WAS FILED FOR RECORD IN THE OFFICE OF THE CLERK AND RECORDER AT _____ O'CLOCK __.M.,

THIS _____, DAY OF _____, 20 _____, AND IS RECORDED IN PLAT BOOK _____, PAGE _____

_____ COUNTY CLERK

STAMP RECEIVING NUMBER _____

FINAL PLAT OF

TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE - 1

RE-SUBDIVISION OF TRACT A, TURKEY TREE MINOR SUBDIVISION,
AND LOT 5, GREEN WING MINOR SUBDIVISION,
CITY OF SHERIDAN, WYOMING

CLIENT: FP LITTLE GOOSE, LLC
ATTN: MATT & SHARI FRISBIE
N8654 1090TH STREET
RIVER FALLS, WI 54022

PRESTFELDT SURVEYING
2340 WETLANDS DR., SUITE 100
SHERIDAN, WY 82801
307-672-7415

Morrison Maierle
engineers · surveyors · planners · scientists

JN: 2022-023 SJ: 18
DN: 2022-023-TEAL-SPRING-P1
PF: T2022-023
DRAWN BY: JSP & TDT
CHECKED BY: TDT & CT
DECEMBER 07, 2023

TRACT B
TURKEY TREE
MINOR SUBDIVISION

TRACT A
BRUNDAGE PLACE

TRACT 9
MARSHALL SUBDIVISION

OUTLOT F
±5.55 ACRES

FLOODWAY

OUTLOT E

OUTLOT C

OUTLOT D

TRACT 1

PHASE 2 TRACT
±28.68 ACRES

C R A N E D A N C E C O U R T

T E A L S P R I N G D R I V E

LOT 33
LOT 34
LOT 35
LOT 36
LOT 37
LOT 38
LOT 39
LOT 40
LOT 41
LOT 42
LOT 43
LOT 44
LOT 45
LOT 46
LOT 47
LOT 48
LOT 49
LOT 50
LOT 51
LOT 53
LOT 54
LOT 55
LOT 56
LOT 57
LOT 58
LOT 59

110.00'
S86°53'33"E
274.00'
103.24'
161.00'
N12°19'07"E
N71°07'30"W
159.23'
S80°58'34"W
147.61'
S49°19'39"W
91.54'
S34°53'24"W
81.07'
S75°16'51"E
81.47'
20.0' UTILITY
EASEMENT
N53°19'16"W
S53°19'16"E
120.54'
167.26'
C53
5.0' IRRIGATION
EASEMENT
N01°39'19"E
120.76'
S16°39'02"E
5.0' IRRIGATION
EASEMENT
25.0'
50' UTILITY EASEMENT
(BOOK 265, PAGE 229)
246.25'
180.20'
S10°57'47"E
28.66'
5.0' IRRIGATION
EASEMENT
N53°19'16"W
1676.88'
5.0' IRRIGATION
EASEMENT
5.0' IRRIGATION
EASEMENT
124.50'

30' RESERVED FOR FUTURE STREET
DEVELOPMENT (VACATED BY THIS PLAT)

S00°54'52"E
119.24'
S00°54'30"E
119.22'
15.0' PATHWAY
EASEMENT
1.00'
OUTLOT B
341.60'
S01°05'07"E
425.06'
351.87'
(BOOK 121, PAGE 253)

1.0' GAP
15.0' PATHWAY EASEMENT
S36°40'37"E
18.02'
73.19'
30' RESERVED FOR FUTURE
STREET DEVELOPMENT
(VACATED BY THIS PLAT)

DETAIL: 1
NO TRUE SCALE

SEE DETAIL: 1

S89°10'49"E
469.70'
609.90'
140.20'
30'
30' RESERVED FOR FUTURE STREET DEVELOPMENT
(VACATED BY THIS PLAT)

N00°41'17"E
161.00'
15.0' UTILITY
EASEMENT
551.17'
N44°57'35"E
718.52'
(R)115'
U.S. HIGHWAY NO. 87
(AKA COFFEE AVENUE)
S01°54'50"W
551.87'
TRACT 2
±1.96 ACRES
ZONED: B1

51.00'
N87°03'13"E
C33
S87°53'11"E
130.89'
±10,979 S.F.
±0.25 ACRES
78.25'
N43°18'59"W
60.00'
C34
N87°53'11"W
131.10'
N09°41'49"W
115.86'
LOT 52
±17,233 S.F.
ZONED: B1
126.71'
448.57'
N82°36'39"W
581.10'
132.53'

SCALE: 1"= 60'
BEARINGS ARE BASED ON THE
WYOMING COORDINATE SYSTEM NAD 1983, EAST CENTRAL ZONE
DISTANCES ARE SURFACE

GRAPHIC SCALE

−60 0 30 60 120 240

(U.S. SURVEY FEET)
1 inch = 60 FEET

DATUM:
NAD 83(1993), NAVD 88 (U.S. SURVEY FEET)
DATUM ADJUSTMENT FACTOR (DAF): 1.000235
DIVIDE SURFACE COORDINATES BY DAF TO CALCULATE
THE WYOMING COORDINATE SYSTEM NAD 1983,
EAST CENTRAL ZONE, COORDINATES

LEGEND:
- SET 2" ALUMINUM CAP PER PLS 6812
- FOUND 2" ALUMINUM CAP PER PLS 6812
- FOUND 3-1/4" ALUMINUM CAP PER PLS 6812
- FOUND 1-1/2" OR 2" ALUMINUM CAP PER PLS 2615
- FOUND 3-1/4" ALUMINUM CAP PER PLS 2615
- FOUND 2" ALUMINUM CAP PER PE&LS 3159
- CALCULATED: NOTHING FOUND/NOTHING SET
- WC WITNESS CORNER
- (R) RECORD
- BOUNDARY LINE
- PROPERTY/LOT LINE
- SECTION LINE
- HIGHWAY RIGHT-OF-WAY LINE
- FUTURE STREET DEVELOPMENT VACATED PER THIS PLAT
- EASEMENT LINE AS NOTED
- EASEMENT CENTERLINE
- DRAINAGE EASEMENT LINE
- 5.0' IRRIGATION EASEMENT LINE
- FLOODWAY (NO BUILD ZONE)

CURVE TABLE

CURVE	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C1	8°15'24"	230.00'	33.14'	S03°14'59"W	33.12'
C2	24°14'59"	170.00'	71.95'	N11°14'47"E	71.41'
C3	36°53'16"	130.00'	83.70'	S17°33'56"W	82.26'
C4	5°51'48"	330.00'	33.77'	S38°56'28"W	33.76'
C5	15°38'17"	330.00'	90.07'	S49°41'30"W	89.79'
C6	14°49'41"	330.00'	85.40'	S64°55'29"W	85.16'
C7	15°27'58"	330.00'	89.08'	S80°04'18"W	88.81'
C8	12°49'44"	330.00'	73.89'	N85°46'51"W	73.73'
C9	42°20'08"	177.00'	130.78'	S10°32'03"E	127.83'
C10	6°11'41"	177.00'	19.14'	S34°47'57"E	19.13'
C11	13°04'45"	383.00'	87.43'	S31°21'25"E	87.24'
C12	7°29'07"	383.00'	50.04'	S21°04'29"E	50.00'
C13	27°44'20"	240.00'	116.19'	N86°44'36"E	115.06'
C14	2°23'15"	240.00'	10.00'	S78°11'37"E	10.00'
C15	51°36'53"	75.00'	67.56'	N77°11'34"E	65.30'
C16	17°53'01"	60.00'	18.73'	N60°19'38"E	18.65'
C17	56°39'23"	60.00'	59.33'	S82°24'10"E	56.94'
C18	42°52'25"	60.00'	44.90'	S32°38'16"E	43.86'
C19	44°46'45"	60.00'	46.89'	S11°11'19"W	45.71'
C20	41°43'35"	60.00'	43.70'	S54°26'29"W	42.74'
C21	58°19'09"	60.00'	61.07'	N75°32'10"W	58.47'
C22	19°03'52"	75.00'	24.96'	N55°54'32"W	24.84'
C23	11°33'31"	75.00'	15.13'	N71°13'14"W	15.10'
C24	31°03'39"	190.00'	103.00'	S87°28'11"W	101.74'
C25	22°58'54"	383.00'	153.62'	S01°39'43"W	152.60'
C26	22°01'03"	383.00'	147.18'	S24°09'42"W	146.27'
C27	15°54'58"	383.00'	106.39'	S43°07'42"W	106.05'
C28	19°55'09"	177.00'	61.53'	S41°07'37"W	61.23'
C29	69°13'11"	177.00'	213.84'	S03°26'33"E	201.07'
C30	15°16'08"	177.00'	47.17'	S45°41'12"E	47.03'
C31	22°40'55"	630.00'	249.40'	S41°58'49"E	247.77'
C32	62°18'25"	190.00'	206.62'	S61°47'34"E	196.59'
C33	5°03'36"	330.00'	29.14'	N89°35'01"E	29.13'
C34	5°03'36"	270.00'	23.84'	S89°35'01"W	23.84'
C35	62°18'25"	250.00'	271.87'	N61°47'34"W	258.67'
C36	7°15'29"	570.00'	72.20'	N34°16'06"W	72.16'
C37	10°48'27"	570.00'	107.52'	N43°18'04"W	107.36'
C38	4°36'59"	570.00'	45.92'	N51°00'47"W	45.91'
C39	19°05'59"	237.00'	79.00'	N43°46'17"W	78.64'
C40	11°29'31"	237.00'	47.54'	N28°28'32"W	47.46'
C41	19°16'36"	237.00'	79.74'	N13°05'28"W	79.36'
C42	42°12'20"	75.00'	55.25'	S71°29'59"W	54.01'
C43	67°52'16"	60.00'	71.07'	S84°19'57"W	66.99'
C44	54°52'17"	60.00'	57.46'	N34°17'47"W	55.29'
C45	42°11'24"	60.00'	44.18'	N14°14'04"E	43.19'
C46	55°16'07"	60.00'	57.88'	N62°57'49"E	55.66'
C47	44°12'35"	60.00'	46.30'	S67°17'50"E	45.16'
C48	32°54'56"	75.00'	43.09'	S61°39'00"E	42.50'
C49	9°17'24"	75.00'	12.16'	S82°45'09"E	12.15'
C50	30°26'23"	237.00'	125.91'	N23°52'38"E	124.44'
C51	11°59'22"	237.00'	49.59'	N45°05'31"E	49.50'
C52	9°11'46"	323.00'	51.84'	N46°29'18"E	51.79'

CURVE TABLE

CURVE	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C53	3°33'17"	323.00'	20.04'	N40°06'47"E	20.04'
C54	27°33'18"	323.00'	155.34'	N24°33'29"E	153.85'
C55	22°51'12"	323.00'	128.83'	N00°38'46"W	127.98'
C56	22°28'56"	323.00'	126.74'	N23°18'50"W	125.93'
C57	3°20'30"	323.00'	18.84'	N36°13'33"W	18.84'
C58	22°47'32"	237.00'	94.28'	N26°30'01"W	93.66'
C59	18°08'10"	237.00'	75.02'	N06°02'10"W	74.71'
C60	7°36'06"	237.00'	31.44'	N06°49'58"E	31.42'
C61	42°12'20"	75.00'	55.25'	N10°28'09"W	54.01'
C62	48°47'47"	60.00'	51.10'	N07°10'25"W	49.57'
C63	48°20'49"	60.00'	50.63'	N41°23'53"E	49.14'
C64	52°39'14"	60.00'	55.14'	S88°06'05"E	53.22'
C65	107°50'20"	60.00'	112.93'	S07°51'18"E	96.98'
C66	35°25'51"	75.00'	46.38'	S28°20'57"W	45.64'
C67	14°18'49"	270.00'	67.45'	S86°31'24"E	67.28'
C68	50°18'38"	270.00'	237.08'	N61°09'53"E	229.54'
C69	42°12'20"	75.00'	55.25'	N75°05'36"W	54.01'
C70	41°28'44"	60.00'	43.44'	N75°27'24"W	42.49'
C71	49°14'55"	60.00'	51.57'	N30°05'34"W	50.00'
C72	37°53'06"	60.00'	39.67'	N13°28'26"E	38.95'
C73	46°30'09"	60.00'	48.70'	N55°40'04"E	47.37'
C74	41°34'59"	60.00'	43.55'	S80°17'22"E	42.60'
C75	47°42'45"	60.00'	49.96'	S35°38'30"E	48.53'
C76	42°12'20"	75.00'	55.25'	S32°53'17"E	54.01'
C77	36°53'16"	70.00'	45.07'	N17°33'56"E	44.29'
C78	25°00'55"	42.50'	18.56'	S13°23'36"E	18.41'
C79	23°47'42"	42.50'	17.65'	S11°00'42"W	17.52'
C80	36°16'06"	17.50'	11.08'	S41°02'36"W	10.89'
C81	55°51'50"	17.50'	17.06'	S31°14'44"W	16.39'
C82	20°39'58"	17.50'	6.31'	S08°54'37"E	6.28'
C83	45°35'12"	17.50'	13.92'	S42°02'12"E	13.56'
C84	51°23'10"	17.50'	15.69'	S39°08'13"E	15.17'
C85	2°54'21"	383.00'	19.42'	S36°37'23"W	19.42'
C86	13°00'38"	383.00'	86.97'	S44°34'53"W	86.78'
C87	55°15'50"	177.00'	170.72'	S03°32'08"W	164.18'
C88	13°57'21"	177.00'	43.11'	S31°04'27"E	43.01'

LINE TABLE

LINE	BEARING	LENGTH
L1	S89°35'18"E	1.00'
L2	S76°59'59"E	39.16'
L3	N87°23'51"W	80.63'
L4	S87°23'51"E	80.63'
L5	N10°38'01"E	20.00'
L6	N10°38'01"E	12.42'
L7	S10°38'01"W	25.85'
L8	N36°00'33"E	30.73'
L9	N53°59'27"W	25.00'
L10	S53°59'27"E	25.00'
L11	N36°00'33"E	60.19'
L12	S00°53'09"E	38.72'
L13	S22°54'34"W	40.57'
L14	S59°10'39"W	29.20'
L15	S59°10'39"W	60.92'
L16	S68°29'21"W	11.83'
L17	S19°14'36"E	47.28'
L18	S19°14'36"E	32.64'
L19	S64°49'48"E	8.55'
L20	S64°49'48"E	36.54'
L21	N89°07'18"E	16.00'
L22	S53°19'16"E	15.00'
L23	N71°17'33"E	15.07'
L24	S06°13'52"W	20.06'
L25	N75°16'51"W	31.95'
L26	S14°59'02"W	20.00'
L27	S75°16'51"E	29.15'

FINAL PLAT OF
TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE - 1

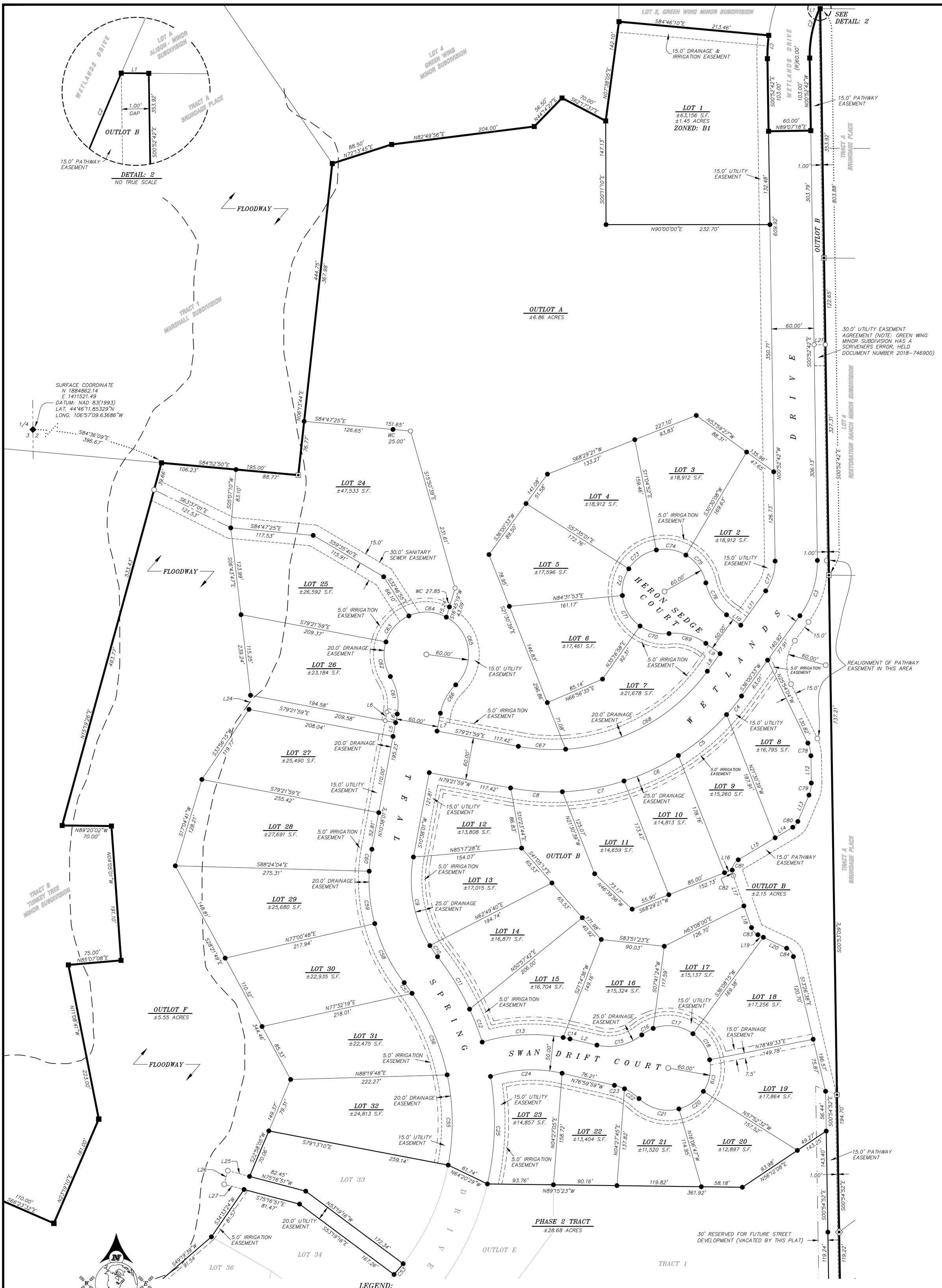
RE-SUBDIVISION OF TRACT A, TURKEY TREE MINOR SUBDIVISION,
AND LOT 5, GREEN WING MINOR SUBDIVISION,
CITY OF SHERIDAN, WYOMING

CLIENT: FP LITTLE GOOSE, LLC
ATTN: MATT & SHARI FRISBIE
N8654 1090TH STREET
RIVER FALLS, WI 54022

PRESTFELDT SURVEYING
2340 WETLANDS DR., SUITE 100
SHERIDAN, WY 82801
307-672-7415

Morrison Maierle
engineers • surveyors • planners • scientists

JN: 2022-023 SJ:18
DN: 2022-023-TEAL-SPRING-P1
PF: T2022-023
DRAWN BY: JSP & TDT
CHECKED BY: TDT & CT
DECEMBER 07, 2023



LEGEND:

- SET 2" ALUMINUM CAP PER PLS 6812
- FOUND 2" ALUMINUM CAP PER PLS 6812
- FOUND 3-1/4" ALUMINUM CAP PER PLS 6812
- FOUND 1-1/2" OR 2" ALUMINUM CAP PER PLS 2615
- FOUND 3-1/4" ALUMINUM CAP PER PLS 2615
- FOUND 2" ALUMINUM CAP PER PE&LS 3159
- CALCULATED: NOTHING FOUND/NOTHING SET
- WC WITNESS CORNER
- (R) RECORD
- BOUNDARY LINE
- PROPERTY/LOT LINE
- SECTION LINE
- HIGHWAY RIGHT-OF-WAY LINE
- FUTURE STREET DEVELOPMENT VACATED PER THIS PLAT
- EASEMENT LINE AS NOTED
- EASEMENT CENTERLINE
- DRAINAGE EASEMENT LINE
- 5.0' IRRIGATION EASEMENT LINE
- FLOODWAY (NO BUILD ZONE)

N

W E

S

SCALE: 1"= 60'

BEARINGS ARE BASED ON THE WYOMING COORDINATE SYSTEM NAD 1983, EAST CENTRAL ZONE
DISTANCES ARE SURFACE

GRAPHIC SCALE

-60 0 30 60 120 240

(U.S. SURVEY FEET)
1 inch = 60 FEET

DATUM:

NAD 83(1993), NAVD 88 (U.S. SURVEY FEET)
DATUM ADJUSTMENT FACTOR (DAF): 1.000235
DIVIDE SURFACE COORDINATES BY DAF TO CALCULATE
THE WYOMING COORDINATE SYSTEM NAD 1983,
EAST CENTRAL ZONE, COORDINATES

FINAL PLAT OF

TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE - 1

RE-SUBDIVISION OF TRACT A, TURKEY TREE MINOR SUBDIVISION,
AND LOT 5, GREEN WING MINOR SUBDIVISION,
CITY OF SHERIDAN, WYOMING

CLIENT: FP LITTLE GOOSE, LLC
ATTN: MATT & SHARI FRISBIE
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DN: 2022-023-TEAL-SPRING-P1
PF: T2022-023
DRAWN BY: JSP & TDT
CHECKED BY: TDT & CT
DECEMBER 07, 2023

FINAL PLAT OF

TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE - 2

RE-SUBDIVISION OF PHASE 2 TACT, TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE-1, TO THE CITY OF SHERIDAN, WYOMING

AREA OF 26 LOTS ±11.02 ACRES
AREA OF 3 OUTLOTS ±7.97 ACRES
AREA OF 1 TRACT ±6.64 ACRES
AREA OF ROADS ±3.05 ACRES
TOTAL = ±28.68 ACRES

ZONING: PLANNED UNIT DEVELOPMENT

CERTIFICATE OF DEDICATION

KNOW ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED FP LITTLE GOOSE, LLC BEING THE OWNER(S), PROPRIETORS OR PARTIES OF INTEREST IN THE LAND SHOWN ON THIS PLAT, DO HEREBY STATE:

THAT THE FOREGOING PLAT DESIGNATED AS **TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE-2,** A RE-SUBDIVISION OF PHASE 2 TRACT, TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE - 1, CITY OF SHERIDAN, SHERIDAN COUNTY, WYOMING.

SAID RE-SUBDIVISION CONTAINS **±28.68 ACRES** OF LAND, MORE OR LESS.

TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE-2, AS IT IS DESCRIBED AND AS IT APPEARS ON THIS PLAT, IS MADE WITH THE FREE CONSENT AND IN ACCORDANCE WITH THE DESIRES OF THE UNDERSIGNED OWNER(S) AND PROPRIETORS; AND THAT THIS IS A CORRECT PLAT OF THE AREA AS IT IS DIVIDED INTO TRACTS, LOTS, OUTLOTS, STREETS AND EASEMENTS.

THE UNDERSIGNED OWNER(S) OF THE LAND SHOWN AND DESCRIBED ON THIS PLAT DO HEREBY DEDICATE TO THE CITY OF SHERIDAN AND ITS LICENSEES FOR PUBLIC USE FOR THE INDICATED PURPOSES, ALL STREETS, EASEMENTS AND OTHER PUBLIC LANDS, AS INDICATED, AND NOT ALREADY OTHERWISE DEDICATED FOR PUBLIC USE.

UTILITY EASEMENTS, AS DESIGNATED ON THE PLAT, ARE HEREBY GRANTED TO THE CITY OF SHERIDAN AND IT'S LICENSEES FOR PUBLIC USE FOR THE PURPOSE OF INSTALLING, REPAIRING, REINSTALLING, REPLACING AND MAINTAINING SANITARY SEWERS, STORM SEWERS, WATERLINES, GAS LINES, ELECTRIC LINES, TELEPHONE LINES, CABLE TV LINE, AND OTHER FORMS AND TYPES OF PUBLIC UTILITIES NOW OR HEREAFTER GENERALLY UTILIZED BY THE PUBLIC.

OUTLOTS ARE DRAINAGE EASEMENTS, OTHER EASEMENTS (AS SHOWN & DEFINED), AND OPEN SPACES WHICH ARE OWNED & MAINTAINED BY THE HOMEOWNER'S ASSOCIATION.

IN TESTIMONY WHEREOF:

ALL RIGHTS UNDER AND BY VIRTUE OF THE HOMESTEAD EXEMPTION LAWS OF THE STATE OF WYOMING ARE HEREBY WAIVED AND RELEASED.

THE UNDERSIGNED HAVE CAUSED THESE PRESENTS TO BE SIGNED THIS _____ DAY OF _____, _____.

FP LITTLE GOOSE, LLC
BY: _____
MATT FRISBIE, MEMBER

FP LITTLE GOOSE, LLC
BY: _____
SHARI FRISBIE, MEMBER

STATE OF _____ :ss
COUNTY OF _____

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BY MATT & SHARI FRISBIE BEFORE ME THIS _____ DAY OF _____, _____.

WITNESS MY HAND AND OFFICIAL SEAL. MY COMMISSION EXPIRES _____

_____
NOTARY PUBLIC

SIGNED BY AFFIDAVIT

BY: FIRST NORTHERN BANK OF WYOMING
("LIEN HOLDER"), SEE AFFIDAVIT FILED
AT THE SHERIDAN COUNTY COURTHOUSE.
DOCUMENT NUMBER: _____

DECLARATION EXTINGUISHING PREVIOUS EASEMENTS

1) ALL EARLIER EASEMENTS OR PORTIONS THEREOF ENCOMPASSED BY THE BOUNDARY OF THIS PLAT ARE HEREBY EXTINGUISHED UNLESS NOTED OTHERWISE.

2) EXISTING UTILITIES PLACED IN PREVIOUS RECORDED EASEMENTS WITHIN THE BOUNDARY OF THIS PLAT HAVE SENIOR RIGHTS AND ARE NOW PROTECTED BY EASEMENTS OR ROADS AS SHOWN ON THIS PLAT.

CITY OF SHERIDAN CERTIFICATES OF APPROVAL

REVIEWED BY THE CITY OF SHERIDAN PLANNING COMMISSION THIS _____ DAY OF _____, _____.

_____ ATTEST: VICE-CHAIRMAN

_____ CHAIRMAN

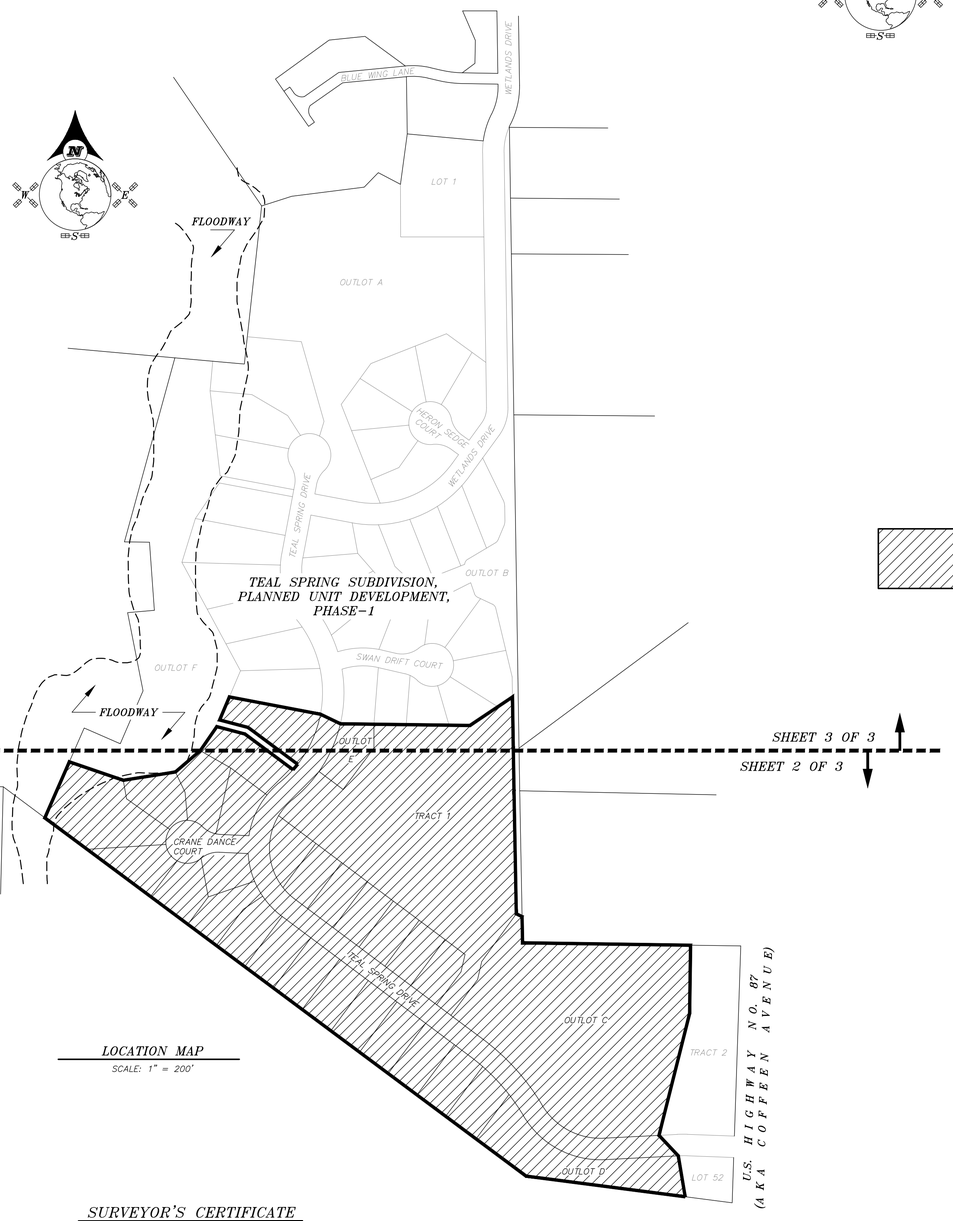
THIS PLAT HAS BEEN PREPARED IN ACCORDANCE WITH THE REQUIREMENTS AND PROCEDURES OUTLINED IN THE SUBDIVISION REGULATIONS OF THE CITY OF SHERIDAN, AND CERTIFIED THIS _____ DAY OF _____, _____, BY THE DIRECTOR OF PUBLIC WORKS OF SHERIDAN, WYOMING.

_____
DIRECTOR OF PUBLIC WORKS

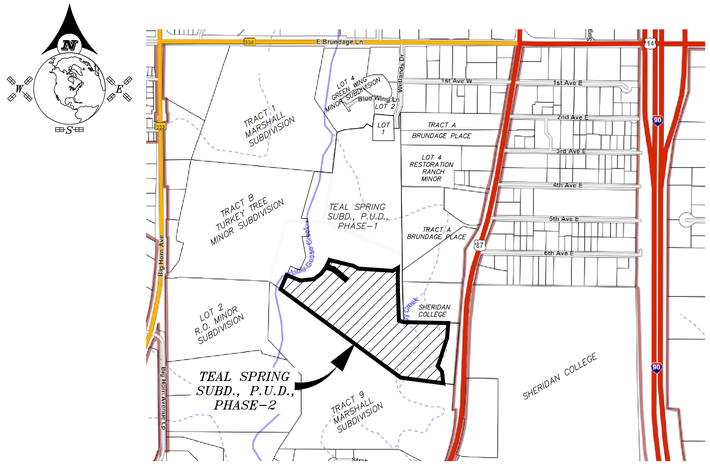
APPROVED BY THE CITY COUNCIL OF THE CITY OF SHERIDAN, WYOMING, THIS ___ DAY OF _____, _____.

_____ ATTEST: CITY CLERK

_____ MAYOR



LOCATION MAP
SCALE: 1" = 200'



LOCATION MAP
NO TRUE SCALE

PHASE-2: CONSTRUCTION AREA

NOTES:

1) STRUCTURES BUILT WITHIN THE 100 TO 500-YEAR FLOODPLAIN WILL BE REQUIRED TO ACQUIRE A CERTIFIED ELEVATION CERTIFICATE AND TO BUILD A MINIMUM OF ONE FOOT ABOVE THE BASE FLOOD ELEVATION (BFE).

2) LOT OWNERS IN THIS SUBDIVISION ARE PROHIBITED FROM FLOODWAY ENCROACHMENTS THAT INCREASE OR DECREASE BASE FLOOD ELEVATIONS OR ALTER FLOODWAY BOUNDARIES.

SURVEYOR'S CERTIFICATE

STATE OF WYOMING :ss
COUNTY OF SHERIDAN

I, THOMAS D. TUCKER, DO HEREBY STATE THAT I AM A REGISTERED LAND SURVEYOR, LICENSED UNDER THE LAWS OF THE STATE OF WYOMING, THAT THIS PLAT IS A TRUE, CORRECT AND COMPLETE PLAT OF **TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE-2,** AS LAID OUT, PLATTED, DEDICATED AND SHOWN HEREON, THAT THIS PLAT WAS MADE FROM AN ACCURATE SURVEY OF SAID PROPERTY CONDUCTED BY ME OR UNDER MY DIRECT SUPERVISION AND CORRECTLY SHOWS THE LOCATION AND DIMENSIONS OF ALL TRACTS AND EASEMENTS OF SAID SUBDIVISION IN COMPLIANCE WITH THE CITY OF SHERIDAN REGULATIONS GOVERNING THE SUBDIVISION OF LAND.

"PLAT IS VALID ONLY IF PRINT HAS ORIGINAL SIGNATURE OF SURVEYOR SIGNED AND DATED."

CERTIFICATE OF RECORDER

STATE OF WYOMING :ss
COUNTY OF SHERIDAN

THIS PLAT WAS FILED FOR RECORD IN THE OFFICE OF THE CLERK AND RECORDER AT _____ O'CLOCK ___.M.,
THIS _____, DAY OF _____, 20 _____, AND IS RECORDED IN PLAT BOOK _____, PAGE _____

_____ STAMP RECEIVING NUMBER _____
COUNTY CLERK

FINAL PLAT OF

TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE - 2

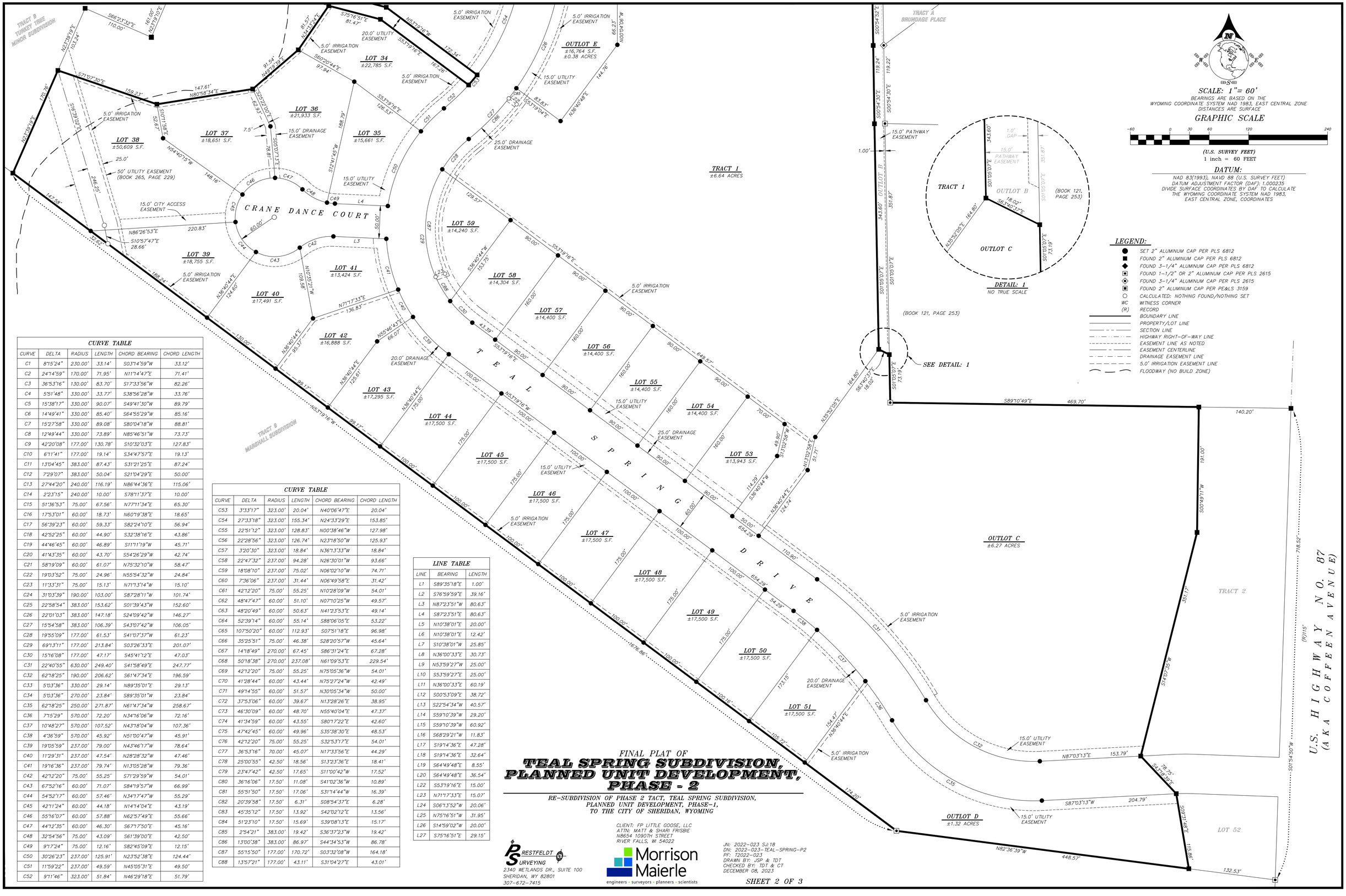
RE-SUBDIVISION OF PHASE 2 TACT, TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE-1, TO THE CITY OF SHERIDAN, WYOMING

CLIENT: FP LITTLE GOOSE, LLC
ATTN: MATT & SHARI FRISBIE
N8654 1090TH STREET
RIVER FALLS, WI 54022

PRESTFELDT SURVEYING
2340 WETLANDS DR., SUITE 100
SHERIDAN, WY 82801
307-672-7415

Morrison Maierle
engineers · surveyors · planners · scientists

JN: 2022-023 SJ:18
DN: 2022-023-TEAL-SPRING-P2
PF: T2022-023
DRAWN BY: JSP & TDT
CHECKED BY: TDT & CT
DECEMBER 08, 2023



CURVE TABLE

CURVE	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C1	8°15'24"	230.00'	33.14'	S03°14'59"W	33.12'
C2	24°14'59"	170.00'	71.95'	N11°14'47"E	71.41'
C3	36°53'16"	130.00'	83.70'	S17°33'56"W	82.26'
C4	5°51'48"	330.00'	33.77'	S38°56'28"W	33.76'
C5	15°38'17"	330.00'	90.07'	S49°41'30"W	89.79'
C6	14°49'41"	330.00'	85.40'	S64°55'29"W	85.16'
C7	15°27'58"	330.00'	89.08'	S80°04'18"W	88.81'
C8	12°49'44"	330.00'	73.89'	N85°46'51"W	73.73'
C9	42°20'08"	177.00'	130.78'	S10°32'03"E	127.83'
C10	6°11'41"	177.00'	19.14'	S34°47'57"E	19.13'
C11	13°04'45"	383.00'	87.43'	S31°21'25"E	87.24'
C12	7°29'07"	383.00'	50.04'	S21°04'29"E	50.00'
C13	27°44'20"	240.00'	116.19'	N86°44'36"E	115.06'
C14	2°3'15"	240.00'	10.00'	S78°11'37"E	10.00'
C15	51°36'53"	75.00'	67.56'	N77°11'34"E	65.30'
C16	17°53'01"	60.00'	18.73'	N60°19'38"E	18.65'
C17	56°39'23"	60.00'	59.33'	S82°24'10"E	56.94'
C18	42°52'25"	60.00'	44.90'	S32°38'16"E	43.86'
C19	44°46'45"	60.00'	46.89'	S11°11'19"W	45.71'
C20	41°43'35"	60.00'	43.70'	S54°26'29"W	42.74'
C21	58°19'09"	60.00'	61.07'	N75°32'10"W	58.47'
C22	19°03'52"	75.00'	24.96'	N55°54'32"W	24.84'
C23	11°33'31"	75.00'	15.13'	N71°13'14"W	15.10'
C24	31°03'39"	190.00'	103.00'	S87°28'11"W	101.74'
C25	22°58'54"	383.00'	153.62'	S01°39'43"W	152.60'
C26	22°01'03"	383.00'	147.18'	S24°09'42"W	146.27'
C27	15°54'58"	383.00'	106.39'	S43°07'42"W	106.05'
C28	19°55'09"	177.00'	61.53'	S41°07'37"W	61.23'
C29	69°13'11"	177.00'	213.84'	S03°26'33"E	201.07'
C30	15°16'08"	177.00'	47.17'	S45°41'12"E	47.03'
C31	22°40'55"	630.00'	249.40'	S41°58'49"E	247.77'
C32	62°18'25"	190.00'	206.62'	S61°47'34"E	196.59'
C33	5°03'36"	330.00'	29.14'	N89°35'01"E	29.13'
C34	5°03'36"	270.00'	23.84'	S89°35'01"W	23.84'
C35	62°18'25"	250.00'	271.87'	N61°47'34"W	258.67'
C36	7°15'29"	570.00'	72.20'	N34°16'06"W	72.16'
C37	10°48'27"	570.00'	107.52'	N43°18'04"W	107.36'
C38	4°36'59"	570.00'	45.92'	N51°00'47"W	45.91'
C39	19°05'59"	237.00'	79.00'	N43°46'17"W	78.64'
C40	11°29'31"	237.00'	47.54'	N28°28'32"W	47.46'
C41	19°16'36"	237.00'	79.74'	N13°05'28"W	79.36'
C42	42°12'20"	75.00'	55.25'	S71°29'59"W	54.01'
C43	67°52'16"	60.00'	71.07'	S84°19'57"W	66.99'
C44	54°52'17"	60.00'	57.46'	N34°17'47"W	55.29'
C45	42°11'24"	60.00'	44.18'	N14°14'04"E	43.19'
C46	55°16'07"	60.00'	57.88'	N62°57'49"E	55.66'
C47	44°12'35"	60.00'	46.30'	S67°17'50"E	45.16'
C48	32°54'56"	75.00'	43.09'	S61°39'00"E	42.50'
C49	9°17'24"	75.00'	12.16'	S82°45'09"E	12.15'
C50	30°26'23"	237.00'	125.91'	N23°52'38"E	124.44'
C51	11°59'22"	237.00'	49.59'	N45°05'31"E	49.50'
C52	9°11'46"	323.00'	51.84'	N46°29'18"E	51.79'

CURVE TABLE

CURVE	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C53	3°33'17"	323.00'	20.04'	N40°06'47"E	20.04'
C54	27°33'18"	323.00'	155.34'	N24°33'29"E	153.85'
C55	22°51'12"	323.00'	128.83'	N00°38'46"W	127.98'
C56	22°28'56"	323.00'	126.74'	N23°18'50"W	125.93'
C57	3°20'30"	323.00'	18.84'	N36°13'33"W	18.84'
C58	22°47'32"	237.00'	94.28'	N26°30'01"W	93.66'
C59	18°08'10"	237.00'	75.02'	N06°02'10"W	74.71'
C60	7°36'06"	237.00'	31.44'	N06°49'58"E	31.42'
C61	42°12'20"	75.00'	55.25'	N10°28'09"W	54.01'
C62	48°47'47"	60.00'	51.10'	N07°10'25"W	49.57'
C63	48°20'49"	60.00'	50.63'	N41°23'53"E	49.14'
C64	52°39'14"	60.00'	55.14'	S88°06'05"E	53.22'
C65	107°50'20"	60.00'	112.93'	S07°51'18"E	96.98'
C66	35°25'51"	75.00'	46.38'	S28°20'57"W	45.64'
C67	14°18'49"	270.00'	67.45'	S86°31'24"E	67.28'
C68	50°18'38"	270.00'	237.08'	N61°09'53"E	229.54'
C69	42°12'20"	75.00'	55.25'	N75°05'36"W	54.01'
C70	41°28'44"	60.00'	43.44'	N75°27'24"W	42.49'
C71	49°14'55"	60.00'	51.57'	N30°05'34"W	50.00'
C72	37°53'06"	60.00'	39.67'	N13°28'26"E	38.95'
C73	46°30'09"	60.00'	48.70'	N55°40'04"E	47.37'
C74	41°34'59"	60.00'	43.55'	S80°17'22"E	42.60'
C75	47°42'45"	60.00'	49.96'	S35°38'30"E	48.53'
C76	42°12'20"	75.00'	55.25'	S32°53'17"E	54.01'
C77	36°53'16"	70.00'	45.07'	N17°33'56"E	44.29'
C78	25°00'55"	42.50'	18.56'	S13°23'36"E	18.41'
C79	23°47'42"	42.50'	17.65'	S11°00'42"W	17.52'
C80	36°16'06"	17.50'	11.08'	S41°02'36"W	10.89'
C81	55°51'50"	17.50'	17.06'	S31°14'44"W	16.39'
C82	20°39'58"	17.50'	6.31'	S08°54'37"E	6.28'
C83	45°35'12"	17.50'	13.92'	S42°02'12"E	13.56'
C84	51°23'10"	17.50'	15.69'	S39°08'13"E	15.17'
C85	2°54'21"	383.00'	19.42'	S36°37'23"W	19.42'
C86	13°00'38"	383.00'	86.97'	S44°34'53"W	86.78'
C87	55°15'50"	177.00'	170.72'	S03°32'08"W	164.18'
C88	13°57'21"	177.00'	43.11'	S31°04'27"E	43.01'

LINE TABLE

LINE	BEARING	LENGTH
L1	S89°35'18"E	1.00'
L2	S76°59'59"E	39.16'
L3	N87°23'51"W	80.63'
L4	S87°23'51"E	80.63'
L5	N10°38'01"E	20.00'
L6	N10°38'01"E	12.42'
L7	S10°38'01"W	25.85'
L8	N36°00'33"E	30.73'
L9	N53°59'27"W	25.00'
L10	S53°59'27"E	25.00'
L11	N36°00'33"E	60.19'
L12	S00°53'09"E	38.72'
L13	S22°54'34"W	40.57'
L14	S59°10'39"W	29.20'
L15	S59°10'39"W	60.92'
L16	S68°29'21"W	11.83'
L17	S19°14'36"E	47.28'
L18	S19°14'36"E	32.64'
L19	S64°49'48"E	8.55'
L20	S64°49'48"E	36.54'
L22	S53°19'16"E	15.00'
L23	N71°17'33"E	15.07'
L24	S06°13'52"W	20.06'
L25	N75°16'51"W	31.95'
L26	S14°59'02"W	20.00'
L27	S75°16'51"E	29.15'

SCALE: 1"= 60'

BEARINGS ARE BASED ON THE WYOMING COORDINATE SYSTEM NAD 1983, EAST CENTRAL ZONE
DISTANCES ARE SURFACE

GRAPHIC SCALE

−60 0 30 60 120 240

(U.S. SURVEY FEET)
1 inch = 60 FEET

DATUM:

NAD 83(1993), NAVD 88 (U.S. SURVEY FEET)
DATUM ADJUSTMENT FACTOR (DAF): 1.0002135
DIVIDE SURFACE COORDINATES BY DAF TO CALCULATE
THE WYOMING COORDINATE SYSTEM NAD 1983,
EAST CENTRAL ZONE, COORDINATES

LEGEND:

- SET 2" ALUMINUM CAP PER PLS 6812
- FOUND 2" ALUMINUM CAP PER PLS 6812
- FOUND 3-1/4" ALUMINUM CAP PER PLS 6812
- FOUND 1-1/2" OR 2" ALUMINUM CAP PER PLS 2615
- FOUND 3-1/4" ALUMINUM CAP PER PLS 2615
- FOUND 2" ALUMINUM CAP PER PE&LS 3159
- CALCULATED: NOTHING FOUND/NOTHING SET
- WC WITNESS CORNER
- (R) RECORD
- BOUNDARY LINE
- PROPERTY/LOT LINE
- SECTION LINE
- HIGHWAY RIGHT-OF-WAY LINE
- EASEMENT LINE AS NOTED
- EASEMENT CENTERLINE
- DRAINAGE EASEMENT LINE
- 5.0' IRRIGATION EASEMENT LINE
- FLOODWAY (NO BUILD ZONE)

FINAL PLAT OF
TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE - 2

RE-SUBDIVISION OF PHASE 2 TACT, TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE-1, TO THE CITY OF SHERIDAN, WYOMING

CLIENT: FP LITTLE GOOSE, LLC
ATTN: MATT & SHARI FRISBIE
N8654 1090TH STREET
RIVER FALLS, WI 54022

PRESTFELDT SURVEYING
2340 WETLANDS DR., SUITE 100
SHERIDAN, WY 82801
307-672-7415

Morrison Maierle
engineers · surveyors · planners · scientists

JN: 2022-023 SJ:18
DN: 2022-023-TEAL-SPRING-P2
PF: T2022-023
DRAWN BY: JSP & TDT
CHECKED BY: TDT & CT
DECEMBER 08, 2023

SCALE: 1"= 60'

BEARINGS ARE BASED ON THE
WYOMING COORDINATE SYSTEM NAD 1983, EAST CENTRAL ZONE
DISTANCES ARE SURFACE

GRAPHIC SCALE

−60 0 30 60 120 240

(U.S. SURVEY FEET)
1 inch = 60 FEET

DATUM:

NAD 83(1993), NAVD 88 (U.S. SURVEY FEET)
DATUM ADJUSTMENT FACTOR (DAF): 1.000235
DIVIDE SURFACE COORDINATES BY DAF TO CALCULATE
THE WYOMING COORDINATE SYSTEM NAD 1983,
EAST CENTRAL ZONE, COORDINATES

LEGEND:

- SET 2" ALUMINUM CAP PER PLS 6812
- FOUND 2" ALUMINUM CAP PER PLS 6812
- FOUND 3−1/4" ALUMINUM CAP PER PLS 6812
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FINAL PLAT OF
TEAL SPRING SUBDIVISION, PLANNED UNIT DEVELOPMENT, PHASE - 2

RE−SUBDIVISION OF PHASE 2 TACT, TEAL SPRING SUBDIVISION,
PLANNED UNIT DEVELOPMENT, PHASE−1,
TO THE CITY OF SHERIDAN, WYOMING

CLIENT: FP LITTLE GOOSE, LLC
ATTN: MATT & SHARI FRISBIE
N8654 1090TH STREET
RIVER FALLS, WI 54022

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JN: 2022−023 SJ:18
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PF: T2022−023
DRAWN BY: JSP & TDT
CHECKED BY: TDT & CT
DECEMBER 08, 2023

CITY OF SHERIDAN
RESOLUTION 02-24

A RESOLUTION APPROVING AN AMENDMENT TO THE TEAL SPRING SUBDIVISION FOR THE PROPERTY LOCATED AT 3060 COFFEEN AVE, SHERIDAN, WYOMING, HEREINAFTER "THE PROPERTY".

WHEREAS, the Teal Spring PUD and Master Plan was approved by the Governing Body on September 18, 2023; and

WHEREAS, the applicant, FP Little Goose, hereinafter "Applicant" has requested that the City grant an amendment to the Teal Spring PUD to be constructed in two separate phases; and

WHEREAS, the Applicant has submitted updated plats Teal Spring Subdivision Planned Unit Development – Phase 1 and Teal Spring Subdivision Planned Unit Development – Phase 2; and

WHEREAS, City of Sheridan Ordinance Appendix B Article 806.8(B) allows the Director of Public Works to permit amendments as long as such are otherwise permitted by Wyoming Statute; and

WHEREAS, City of Sheridan Ordinance Appendix B Article 806.8(C) allows for the City Governing Body to approve Major Amendments to the PUD Master Plan.

BE IT RESOLVED BY THE GOVERNING BODY OF THE CITY OF SHERIDAN:

1. City of Governing Body findings:
   a. The proposed amendment does not violate the spirit and intent of the Teal Spring Master Plan PUD.
   b. The proposed amendment will not adversely affect the rights of other property owners in a material matter.

2. The Teal Spring Master Plan PUD is hereby amended to be constructed in two separate phases as shown in Teal Spring Subdivision Planned Unit Development – Phase 1 and Teal Spring Subdivision Planned Unit Development – Phase 2.

3. The method of phasing shall be done in accordance with City Code Appendix B Article 806.2(A) and approved by the Director of Public Works.

PASSED, APPROVED AND ADOPTED this 15th day of January, 2024.

City of Sheridan

_____
Richard Bridger, Mayor

ATTEST:

_____
Cecilia Good, City Clerk

CITY OF SHERIDAN, WYOMING
55 Grinnell Street, P.O. Box 848, Sheridan Wyoming 82801
Ph (307) 674-6483 Fax (307) 674-2195

Fire Rescue

MEMORANDUM

RE: Consideration of Award for Fire Service MasterPlan Study in the Amount of not to exceed $50,403.00 to Emergency Service Consulting Int'l- Fire Chief Gary Harnish

From: Gary Harnish, Fire Chief

To: City Council

CC:

Date:

Recommendation:

Hire Emergency Services Consulting International (ESCI) to prepare a Long-Range Master Plan for Sheridan Fire-Rescue at a cost not to exceed $50,403. This study was not included in the FY24 budget, so I am requesting contingency funding. The study will take 6 months to complete.

Background:

During a review of master plans in the CIty of Sheridan it was noted that one does not exist for Sheridan Fire-Rescue. In my time with the City I am aware of two studies involving Sheridan Fire-Rescue; a 1997 Efficiency Assessment for Consolidating City/County/Federal Fire & Emergency Services and a 2018 Review and Assessment of Sheridan County Fire Services. The consolidation occurred in 1999 and then dissolved in 2011. The 2018 study looked at participating departments and made basic recommendations for training, HR procedures, and departmental governance and leadership.

In November I reached out to (4) four vendors for quotes. Three responded and one declined. The responses were as follows:

Emergency Services Consulting International, Long-Range Masterplan $50,403

Heim & Associates, Comprehensive Master Plan $27,615

McGrath Consulting Group, Standard of Cover - for Future Delivery of FIre/EMS Services $34,150 + Travel

As we reviewed the proposals, McGrath was eliminated as it was a different level study than a Master Plan. When comparing ESCI and Heim, we found ESCI to be more experienced (in operation since 1976) and more in depth. Campbell County Fire in Gillette has previous and current experience with ESCI and are very pleased with the process and product of (4) four separate studies.

Our intention is to secure a guiding document that will help provide for the safety of the citizens and firefighters of the City of Sheridan over the next 15 years by answering the following questions:

Where are we now?

Where do we need to be in the future?

How do we get there?

This document will provide these answers along with benchmarks, anticipated costs, and funding suggestions.

Attachments

PROJECT PROPOSAL

Prepared by:

EMERGENCY SERVICES CONSULTING INTERNATIONAL

4795 Meadow Wood Lane Suite 110 Chantilly, Virginia 20151

1-800-757-3724

info@esci.us

www.esci.us

CITY OF Sheridan
WYOMING

LONG-RANGE MASTER PLAN

SHERIDAN FIRE-RESCUE

Sheridan, Wyoming

COVER LETTER

Chief Harnish,

Emergency Services Consulting International (ESCI) is pleased to submit our proposal for a Long-Range Master Plan project for Sheridan Fire-Rescue. ESCI is well positioned to assist you with this critical project. ESCI has worked with many communities across the country; our project team has significant experience in the development and delivery of Cultural Studies, Expansion Studies, Community Risk Assessments, Standards of Cover, Strategic Plans, Agency Evaluations, Master Plans, Staffing and Organizational Studies, Fire Station Assessments, and similar planning studies and reports.

Established in 1976, ESCI specializes in high-quality, professional consulting services to public safety and emergency management organizations throughout the United States and Canada. Considered the nation's leader in public safety consulting, the ESCI team brings first-hand experience and subject matter experts in emergency planning, mitigation, response, and recovery, with active involvement in highly visible and responsible leadership positions. ESCI operates on the principles of honesty, integrity, and service. You can count on us to understand your issues, challenges, and responsibilities and to provide proven, community-driven solutions and best practices designed to meet your specific needs on time and within budget.

We thank you for the opportunity to present this proposal, and we look forward to working with you on this critical project. Should you have any questions, please do not hesitate to contact me at joe.powers@esci.us.

Sincerely,

Joe Powers, Managing Director
Emergency Services Consulting International
Esci.us | 503.570.7778 | Joe.Powers@esci.us

Since 2008, ESCI has been the consulting firm of the International Association of Fire Chiefs.

ESCI OVERVIEW

Since 1976, ESCI's strength has been its commitment to customer satisfaction, innovation, and quality services. We are a vision-driven organization that is growing and changing to meet the dynamic challenges and opportunities for public safety services worldwide. ESCI approaches its mission in a manner that results in scalable, sustainable, and defensible solutions for all types and sizes of public safety organizations.

Our formula is simple. We utilize the best and brightest consultants, professionals, strategic partners, and subject matter experts. These amazing men and women provide validated and proven analysis of current and future conditions, compare findings against industry best practices and community standards and provide innovative, sustainable, and customized solutions for the future.

We take the time to develop meaningful relationships with our clients and partners, provide recognition of the essential and vital work of public safety agencies, and demonstrate unwavering respect for the men and women providing public safety services worldwide.

ESCI is thinking differently about public safety consulting to help change the world, one community at a time. I encourage you to read through this prospectus and learn all we offer. We'd love to work with you and your community.

> *We accomplish this by providing the highest value of consulting services and educational programs.*

> *The mission of ESCI is to provide expertise and guidance that enhances community safety.*

THE ESCI ADVANTAGE

ESCI's advantage begins with our technical expertise and capability, extends to our experienced and highly qualified staff, and concludes with a product that will enable your organization to meet the challenges of emergency services into the future.

ESCI's team has first-hand experience in the process of analyzing emergency service providers and recommending an array of opportunities that are economically, culturally, and operationally feasible. Each team member is a specialist in fire, rescue, law enforcement, EMS, or related fields. The team will work collaboratively to create the best possible strategies and options for your organization.

The ESCI Advantage includes:

- A clear understanding and appreciation of the complexity of the local and regional environment.
- Over 40 years of public safety consulting experience; the successful completion of hundreds of consulting engagements.
- The ability to deliver a high-quality product on time, and with organizational support and endorsement.
- Knowledge of contemporary issues associated with the delivery of emergency services.
- Experience with a variety of jurisdictions including municipalities, counties, and state governments.
- A highly skilled and knowledgeable team of professionals with skill-sets necessary to meet your

ESCI AT A GLANCE

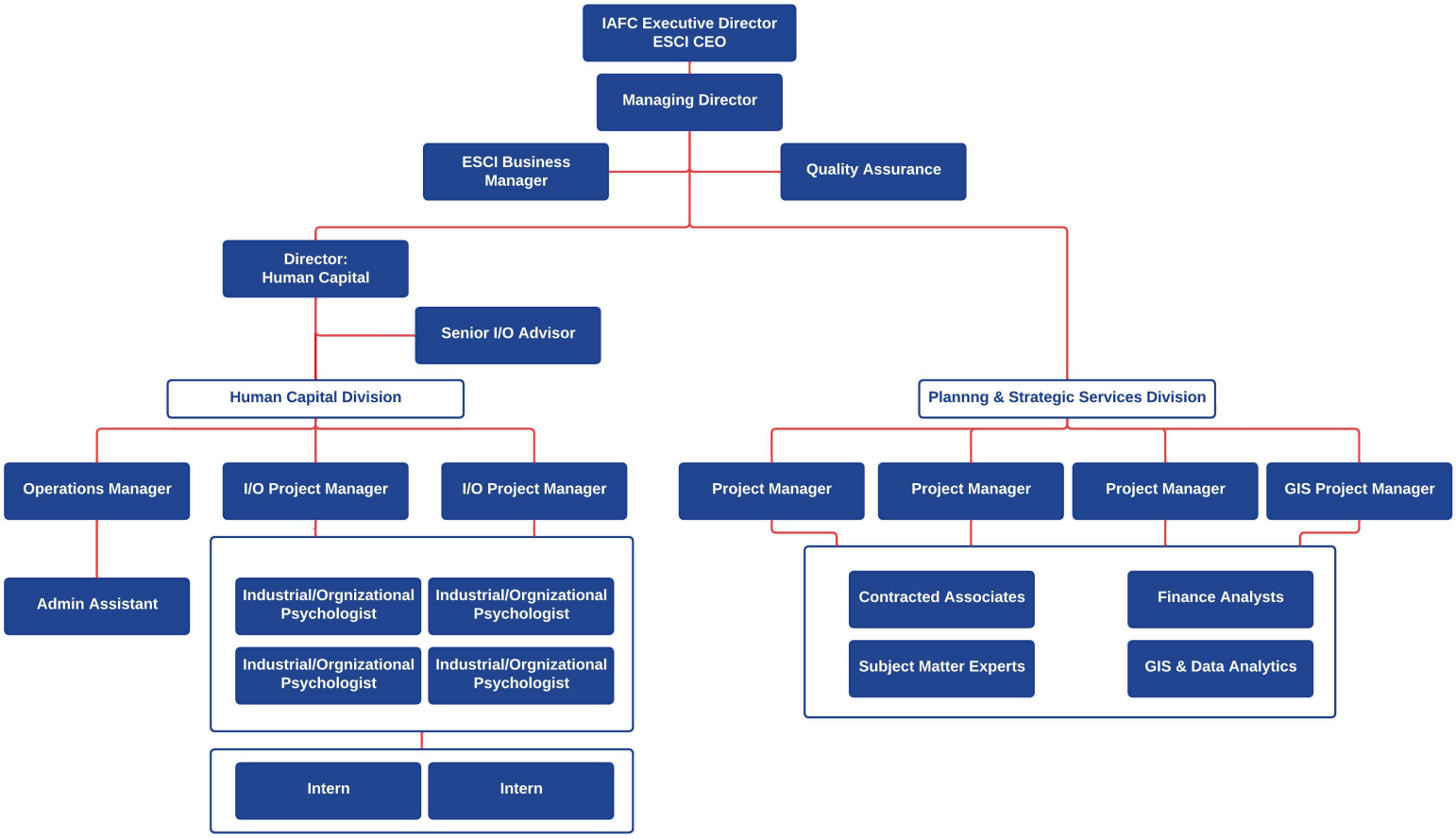
As the consulting firm of the International Association of Fire Chiefs, Emergency Services Consulting International has reliably met the needs of emergency services agencies for over nearly fifty years. With our international presence, ESCI has the ability to draw upon a international network of resources to assist with fire, EMS, law enforcement and homeland security agencies to plan and adapt to future needs.

COMMUNITY SAFETY

- PLANNING SERVICES
- RISK ASSESSMENT & RESOURCE DEPLOYMENT
- PUBLIC SAFETY AGENCY MANAGMENT & ASSESSMENT
- RECRUITMENT, TESTING & PROMOTION

RELATIONSHIPS. RECOGNITION. RESPECT

ESCI ORGANIZATIONAL CHART



Proposal Submission Date
December 1, 2023

LONG-RANGE MASTER PLAN

SHERIDAN FIRE-RESCUE, WYOMING

PROJECT UNDERSTANDING

ESCI proposes a Long-Range Master Plan for the Sheridan Fire-Rescue Department (SFR). This service is a high-level, big-picture process that plans for 10 to 15 years. This longer timeframe is critical for communities experiencing significant growth and trying to match service levels with the changing demographics. A master plan will answer the following three questions:

- Where is the SFR now?
- Where will it need to be in the future?
- How will it get there?

The process begins with a detailed evaluation of current conditions in the Sheridan Fire-Rescue Department, then forecasts future population and service demands within the city, and then develops strategies that can be utilized to meet future needs. The following Scope of Work addresses the city's growth and SFR decision-making priorities, including operational analysis, management, and decision-making approaches, current and forecast future service demands, and a focus on future service delivery analysis and modeling. Findings are provided in a manner that is benchmarked against industry best practices, applicable standards, and requirements, along with the extensive experience of ESCI consultants.

SCOPE OF WORK

Phase I: Project Initiation & Site Visit

Task 1-A: Project Initiation & Development of Work Plan

ESCI will develop a project work plan based on the scope of work and converse with the SFR project team to gain a comprehensive understanding of the background, goals, and expectations for the project. This work plan will be developed, identifying:

- Primary tasks to be performed
- Person(s) responsible for each task
- Timetable for each task to be completed
- Method of evaluating results
- Resources to be utilized
- Possible obstacles or problem areas associated with the accomplishment of each task

This process will also help to establish working relationships, make logistical arrangements, determine appropriate lines of communication, and finalize contractual arrangements.

Task 1-B: Acquisition & Review of Background Information

ESCI will request pertinent information and data from the SFR's assigned project manager. This data will be used extensively in the analysis and development of the master plan document. The documents and information relevant to this project will include, but not be limited to, the following:

- Past or current Fire-Rescue Department studies or research
- Local census and demographics data
- Zoning maps and zoning code
- Insurance Services Office (ISO) Public Protection Classification Summary Report
- Financial data, including debt information, long-range financial plans, and projections
- Administrative policies and procedures
- Standard Operating Guidelines (SOGs) and service delivery practices
- Current service delivery objectives and targets
- Facilities and apparatus inventories
- Local collective bargaining agreement(s), if applicable
- Automatic and mutual aid agreements

- Records management data, including National Fire Incident Reporting System (NFIRS) incident data
- Computer-Aided Dispatch (CAD) incident records
- Local Geographic Information Systems (GIS) data, where available

Task 1-C: Initial Data & GIS Analytics

The ESCI analytics team will conduct the initial service delivery and GIS studies, utilizing data from previous tasks. This initial analysis phase will equip the ESCI project team with a fundamental understanding of system performance, enabling them to formulate preliminary assumptions for discussion during the upcoming site visit.

Task 1-D: Site Visit & Stakeholder Input

The ESCI project team will conduct interviews with and gather information from key personnel, including:

- Elected and appointed officials of the city
- Fire-Rescue Department managers and other key staff
- City of Sheridan Finance Director
- City planning and comprehensive plan staff
- City of Sheridan Human Resources Director
- External Fire and EMS agencies within the region
- Employee groups
- Medical facilities representatives
- Others as they may contribute to this project

The project team, working with the SFR project manager, will interview key stakeholders who can contribute to this study. At a minimum, members of the project team will interview appropriate community officials, Fire-Rescue Department officials, labor organization representatives, and others that the project team deems necessary.

Phase II: Evaluation of Current Conditions

The initial phases of the study focus on a baseline assessment of the current conditions and current service performance. ESCI will conduct an organizational analysis of the SFR based on the elements included in the following tasks. The purpose of this evaluation is to assess the SFR's operations in comparison to industry standards and best practices, as well as to create a benchmark against which the options for future service delivery can be measured.

Task 2-A: Organizational Overview

An overview of the SFR will be developed, discussing:

- Service area population and demographics
- History, formation, and general description of the SFR
- Description of the current service delivery infrastructure
- Governance and lines of authority
- Foundational policy documents
- Organizational design
- Operating budget, funding, fees, taxation, and financial resources

Task 2-B: Financial Analysis

ESCI will analyze actual revenues and expenditures for all budgets/funds supporting SFR operations for a five-year period, including the current adopted budget(s) and proposed budget(s), if applicable. The review will include any CIP funds/debt service related to the department to provide a complete picture of the annual and long-term costs associated with providing fire, rescue, and EMS services. A status quo projection will be provided as context for the added expense and associated revenue needs, of any improvements that may be needed following the adoption of recommendations.

Task 2-C: Management Components

The SFR's basic management processes will be reviewed, including:

- Mission, vision, strategic planning, goals, and objectives
- Internal assessment of critical issues
- Internal assessment of future challenges
- Internal and external communications processes
- Document control and security
- Reporting and recordkeeping

Task 2-D: Capital Assets and Capital Improvement Program (CIP)

ESCI will review the status of current major capital assets (facilities and apparatus) and analyze needs relative to the existing condition of capital assets and their viability for continued use in future service delivery, including:

Facilities: Tour and make observations in areas related to station efficiency and functionality. Items to be contained in the report include:

- Design
- Construction
- Safety
- Environmental Issues
- Code Compliance
- Staff Facilities
- Efficiency
- Future Viability

Apparatus/Vehicles: Review and make recommendations regarding the inventory of apparatus and equipment. Items to be reviewed include:

- Age, condition, and serviceability
- Distribution and deployment
- Maintenance
- Regulatory compliance
- Future needs

Task 2-E: Staffing

ESCI will review the SFR's staffing levels. Tasks to be completed include:

- Review and evaluate administration and support staffing levels
- Review and evaluate operational staffing levels
- Review staff allocation to various functions and divisions
- Review staff scheduling methodology
- Analyze current deployment methods and staffing performance for incidents
- Review utilization of career staffed companies
- Review responsibilities and activity levels of personnel

Task 2-F: Service Delivery and Performance

ESCI will review and make observations in areas specifically involved in, or affecting, service levels and performance. Areas to be reviewed shall include, but not necessarily be limited to:

- Service Demand Study
  - Analysis and geographic display of current service demand by incident type and temporal variation
- Resource Distribution Analysis
  - Overview of the current facility and apparatus deployment strategy, analyzed through Geographical Information Systems software, with identification of service gaps and redundancies
- Resource Concentration Study
  - Analysis of response time to achieve full effective response force
  - Analysis of company and staff distribution as related to effective response force assembly
- Response Reliability Assessment
  - Analysis of current workload, including unit hour utilization of individual companies (to the extent data is complete)
  - Review of actual or estimated failure rates of individual companies (to the extent data is complete)
  - Analysis of call concurrency and impact on effective response force assembly
- Response Performance Summary
  - Analysis of actual system reflex time performance, analyzed by individual companies (to the extent data is available)
- Incident control and management
- Mutual and automatic aid systems

Task 2-G: Planning for Fire Protection and Emergency Medical Services

The planning processes within the SFR will be reviewed. Key components will include:

- Review and evaluate the adequacy of the current planning process
- Review of tactical planning within the SFR
- Examination of operational planning within the SFR

- Analysis of strategic planning practices
- Review of long-range master planning efforts
- Make recommendations relative to future planning process needs

Phase III: Future System Demand Projections and Community Risk

The project moves forward with an assessment of the future community conditions, service demand, and fire protection risks that the district can be expected to serve. ESCI will conduct work with the city's planning staff as well as SFR staff and related documents to develop an analysis of community growth projections and interpret their impact on emergency service planning and delivery.

ESCI will also develop a high-level evaluation of community risk in light of existing land use and zoning factors, including the identification of specific hazard types.

Task 3-A: Population Growth Projections

An interpretation of available census and community development data will be provided, indicating:

- Population history
- Census-based population growth projections
- Community planning-based population growth projections

Task 3-B: Service Demand Projections

Population growth projections, along with historical and forecast incident rates, will be utilized to develop projections for future service demand.

Task 3-C: Overview of Community Risk Factors and Demographics

Land use and zoning classifications will be used, along with specific target hazard information, to analyze and classify community fire protection risk by geography. This process will be completed with GIS software and will consider:

- Population and population density
- Demographics
- Community land use regulations
- Other special considerations

Phase IV: Future Delivery System Modeling/Recommended Enhancements

The project concludes with strategies intended to place the SFR in a position to successfully serve its future demand and risk. ESCI will develop and analyze various operational models for providing emergency services with the specific intent of identifying those options that can deliver the desired levels of service identified in the previous task at the most efficient cost. Recommendations will be provided identifying the best long-range strategy for service delivery and the impact of initiating such a strategy. In addition, short and mid-term strategies will be recommended for service delivery improvement or increased efficiency.

Task 4-A: Analysis of Response Performance Targets

The establishment of fire and EMS response time standards and targets is a primary responsibility of policymakers, based on community risk, citizen expectations, and the SFR's capabilities. ESCI will provide data analysis and comparison against industry standards to assist the SFR in developing its service delivery goals.

ESCI will identify the current level of emergency services provided by the SFR and compare its performance against industry standards and best practices, such as the benchmarks described by the Insurance Services Office (ISO), consensus standards from the National Fire Protection Association (NFPA), recommended practices from the Center for Public Safety Excellence (CPSE), and other pertinent resources.

A review and discussion of existing response performance goals (if in place) or a discussion of existing response performance (if goals are not in place) will be provided, matching the nature and type of risks identified in the previous report sections. The performance goals shall be discussed as they relate to:

- Response Time Performance: Each element of the response system, from receipt of call to first unit arrival
- Resource Distribution: Initial attack (first due) resources for risk-specific intervention
- Resource Concentration: Effective response force assembly (apparatus and personnel) of the initial resources necessary to stop the escalation of the emergency for each risk type

Task 4-B: Short and Mid-Term Strategies

Recommendations for improving service delivery and system efficiency prior to any full implementation of the long-term strategy will be provided in areas such as:

- Agency management and organization
- Staffing and personnel deployment
- Service delivery methods

- Training programs
- Prevention programs
- Enhanced cooperative service agreements with other communities or agencies
- System funding and cost recovery
- Others as appropriate and necessary

Task 4-C: Recommended Long-Term Strategy

ESCI will develop a recommended long-term option for resource deployment that will improve the SFR's level of service towards the identified performance objectives and targets. This may include, but is not necessarily limited to, specific recommendations regarding:

- Any relocations of existing facilities
- General locations of future necessary fire stations
- Selection and deployment of apparatus by type
- Deployment of operations personnel
- Future administrative and support personnel
- Deployment of special units or resources
- Additional infrastructure or facilities for administration and support programs

ESCI will evaluate and present in graphical and descriptive format for each of the deployment option(s):

- Degree of benefit to be gained through its implementation
- Extent to which it achieves established performance targets
- Potential negative consequences

Task 4-D: Cost Projections

ESCI will provide general projections of the cost of recommended long-term strategies, specifically related to:

- Facility changes or additions
- Staff changes or additions
- Primary apparatus changes or additions

Cost projections will be provided for both capital expenditures and on-going operational costs. Operational costs will be provided as one-year projections of additional or reduced expenditures resulting from full implementation of the strategy. Additional findings and recommendations will be made, where appropriate, regarding:

- Options for long-term funding strategies
- Options for cost avoidance
- Options for cost recovery

Phase V: Development, Review, and Delivery of Report

Task 5-A: Development and Review of Draft Report

ESCI will develop and produce an electronic version of the draft written report for review by the SFR. Client feedback is a critical part of this project, and adequate opportunity will be provided for review and discussion of the draft report prior to finalization. The report will include:

- Detailed narrative analysis of each report component structured in easy-to-read sections and accompanied by explanatory support to encourage understanding by both staff and civilian readers
- Clearly designated recommendations highlighted for easy reference and cataloged as necessary in a report appendix
- Supportive charts, graphs, and diagrams, where appropriate
- Supportive maps, utilizing GIS analysis as necessary

Task 5-B: Delivery and Presentation of Final Report

ESCI will complete any necessary revisions of the draft and produce five publication-quality bound, final versions of the written report along with an electronic in PDF file format. A formal presentation of the project report will be made by ESCI project team member(s) to staff, elected officials, and/or the general public as necessary and will include the following:

- A summary of the nature of the report, the methods of analysis, the primary findings, and critical recommendations
- Supportive audio-visual presentation
- Review and explanation of primary supportive charts, graphs, diagrams, and maps, where appropriate
- Opportunity for questions and answers, as needed
- All presentation materials, files, graphics, and written material will be provided to the client at the conclusion of the presentation(s)

Master Plan Project Completion Timelines

ESCI offers the following project timeline, which is subject to change based on the mutual agreement of the SFR and ESCI. The timeline will not begin until ESCI has been provided with all information and data necessary for the successful completion of the project.

Project Phase	Month 0–1	Month 2	Month 3	Month 4	Month 5	Month 6
Phase I: Project Initiation						
Phase II: Evaluation of Current Conditions						
Phase III: Future System Demand Projections & Community Risk						
Phase IV: Future Delivery System Modeling/Recommended Enhancements						
Phase V: Development, Review, & Delivery of Long-Range Master Plan						

Long-Range Master Plan Proposed Project Fee

Emergency Services Consulting International is pleased to present the following formal cost proposal for the project outlined in the Scope of Work. The fee ESCI is proposing to perform this study is inclusive of expenses as follows:

Project Phase	Consulting Fees	Expenses	Total
Phase I: Project Initiation and Site Visit	$12,841	$4,214	**$17,054**
Phase II: Evaluation of Current Conditions / Standards of Cover Development	$14,176	$0	**$14,176**
Phase III: Future System Demand Projections	$4,108	$0	**$4,108**
Phase IV: Future Delivery System Models / Recommended Enhancements	$7,366	$0	**$7,336**
Phase V: Development, Review, & Delivery of Project Report	$5,838	$1,861	**$7,699**
Total Cost (Not to exceed):			**$50,403**

Pricing is valid for six months from the proposal submission date.

Proposed Payment Schedule

- 10% payment due upon signing of the contract.
- Monthly invoicing thereafter as work progresses.

ESCI Hourly Rates

Senior Level Project Oversight, Senior Data Engineer/SME	$260/hr.
Project Manager, Senior Consultant	$230/hr.
Consultant	$200/hr.
Data Analyst	$150/hr.
Admin Support	$90/hr.

CITY OF SHERIDAN, WYOMING

55 Grinnell Street, P.O. Box 848, Sheridan Wyoming 82801
Ph (307) 674-6483 Fax (307) 674-2195

Public Works

MEMORANDUM

RE: Consideration of Resolution 01-24 Submission of Federal Mineral Royalty Capital Construction Account Grant (MRG) Application in the Amount of $1,000,000 for the Hub on Smith Parking Lot Improvements - Public Works Director Hanns Mercer

From: Hanns Mercer, Public Works Director

To: City Council

CC:

Date: 12/28/2023

Recommendation:

Staff recommends that the Mayor and City Council approve Resolution 01-24, which authorizes submission of a Federal Mineral Royalty Capital Construction Account Grant (MRG) Application for the Hub on Smith's parking lot in the amount of $1,000,000.
Staff requests that the Mayor and City Council authorize the Public Works Director, Hanns Mercer, as the authorized representative of the City of Sheridan, to act on behalf of the Governing Body in all matters relating to this grant application.

Background:

The Hub on Smith's parking lot is in need of improvements and the City of Sheridan recognizes that as owners of the building and share support for this project, enhancing staff, client, and volunteer safety.

The City of Sheridan will sponsor the grant for The Hub, which will be responsible for the application process and matching funds, of which they plan on receiving from private foundation donation(s), other additional ARPA or state funding, and fundraising and other grants.

Attachments

Resolution 01-24

Site Improvement Report

CITY OF SHERIDAN
RESOLUTION 01-24

A RESOLUTION AUTHORIZING SUBMISSION OF A FEDERAL MINERAL ROYALTY CAPITAL CONSTRUCTION ACCOUNT GRANT APPLICATION TO THE STATE LOAN AND INVESTMENT BOARD ON BEHALF OF THE GOVERNING BODY FOR THE CITY OF SHERIDAN, WYOMING FOR THE PURPOSE OF FINANCIAL ASSISTANCE FOR THE HUB ON SMITH'S PARKING LOT.

WHEREAS, the Governing Body of the City of Sheridan desires to participate in the Federal Mineral Royalty Capital Construction Account Grant program to assist in financing this project; and

WHEREAS, the Governing Body of the City of Sheridan recognizes the need for the project; and

WHEREAS, the Federal Mineral Royalty Capital Construction Account Grant program requires that certain criteria be met, as described in the State Loan and Investment Board's Rules and Regulations governing the program, and to the best of our knowledge this application meets those criteria; and

WHEREAS, the Governing Body of the City of Sheridan plans to match the requested Federal Mineral Royalty Capital Construction Account Grant from the following source(s) private foundation donation, other additional ARPA or state funding, and fundraising or other grants; and

WHEREAS, the City of Sheridan recognizes that as owners of the building at 211 Smith Street, share support for this project, enhancing staff, client, and volunteer safety.

NOW, THEREFORE, BE IT RESOLVED BY THE GOVERNING BODY OF THE CITY OF SHERIDAN:

that a grant application in the amount of One-Million and 00/100 Dollars ($1,000,000.00) be submitted to the State Load and Investment Board for consideration at the June 2024 meeting to assist in funding the Hub on Smith's Parking Lot.

BE IT FURTHER RESOLVED, that Hanns Mercer, Public Works Director, is hereby designated as the authorized representative of the City of Sheridan to act on behalf of the Governing Body on all matters relating to this grant application.

PASSED, APPROVED AND ADOPTED this 15th day of January, 2024.

City of Sheridan

_____
Richard Bridger, Mayor

ATTEST:

_____
Cecilia Good, City Clerk

The Hub on Smith

Upward Project Phase V: Site Improvements

211 Smith St,

Sheridan, WY 82801

October 27, 2023

-

Schematic Design

Narrative & Estimate

108 S. Thurmond Street | Sheridan, Wyoming 82802 | 307.461.1031 | qc10architects.com

Project Team:

Architect:

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Sheridan, WY 82801

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Executive Summary

The Hub on Smith Upward Project Phase V: Site Improvements contains plans to upgrade and refine the site of the Hub at 211 Smith Street while also addressing much needed improvements to site safety, functionality, and repairs. The enclosed Schematic Design narrative, estimate, and drawings have been completed to provide a concise overview of the project's scope for the Hub on Smith to understand, comment on, and approve the design and costs of the project.

The design included herein includes architectural, landscape, civil, mechanical (plumbing) and electrical components. It addresses the primary needs of the Hub on Smith with regards to the site:

- Safety
    - At grade access to all public entries
    - Low-slopes in parking lot to reduce slips and falls
    - Traffic calming to slow through traffic and visitors
    - Decreases pedestrian/vehicle hazards
- Repairs
    - Replaces the failing pavement
    - Improves drainage
    - Replaces the existing failing sewer connection
- Brooks Street Entry
    - Reorientates the main Hub entry to be from Brooks Street
    - Integrates the improvements made to the Brooks Street lot
- Whitney Commons connection
    - Creates a "green" park connection between the Hub and Whitney Commons
    - Integrates the Hub into the public amenities (YMCA, Library) around Whitney Commons
- Expansion of the Hub on Smith building
    - Relocates existing grease trap outside of future building footprint
    - Creates "greenspace" adjacent to existing building where future expansion can occur
    - Prepares site for expansion

The proposed schedule for this project is for it to be bid in January or February of 2024 with a Spring 2024 start of construction. Construction is anticipated to last 3-4 months depending on how or if it is phased.

The cost of this project is estimated to be $2,950,514 inclusive of construction and professional fees. We recommend the Hub budget an additional 10% for an Owner's Contingency at $295,051, making the total recommended budget for the project $3,245,565.

Project Description

The Hub on Smith occupies an approximately 2.56-acre site bordered by Whitney Commons to the north, Smith Street to the south, Brooks Street and neighboring businesses to the east, and Whitney Commons and residences to the west. The Hub would like to improve their site by reconfiguring the parking, eliminating a severe slope in the parking lot to improve safety and accessibility, eliminate a grade change at the north side of the building that necessitates exterior stairs, and improve connectivity to Whitney Commons and pedestrian routes through and adjacent to the site. The site improvements will consider a planned building addition on its east and north faces and lay the groundwork for that future improvement.

This project includes, but is not limited to, significant modifications to grades at the existing lot (significant fill to raise the grade); electrical site work; site drainage and storm drains; paving; curbs; pedestrian pathways; landscaping; irrigation; ADA compliant parking, curb cuts, and paths; utility connections; paths to the existing and future Hub entries; fire department access around the building; and design that allows delivery trucks to enter and exit the site safely and efficiently.

Three concepts were developed in the summer of 2020. Positive features from these schemes were incorporated into the single schematic design described herein.

Architectural Narrative

The primary architectural related work (building and future building) in the proposed project includes the new, at grade entries to the building, planning an appropriate interface between the new site design and the future building, and coordinating work of the various disciplines working on the project.

The northern entries at the Hub will be raised to be at grade, eliminated the existing ramps, stairs and railings. A north facing patio off of the dining room will be created for summer use with a view across to Whitney Commons. Likewise, a southeast facing patio near the Grab N Go will be constructed where users can enjoy the morning sun. The patios are planned as stained concrete and will include raised planters to buffer the area from the parking lots.

The increase in grades adjacent to the existing building requires the roof drains and masonry weeps at the northeast corner of the existing building be raised to remain above grade. The masonry will be sealed at this location to prevent water infiltration and subsequent damage.

Landscaping is planned to match the character and type of planting completed by the Brooks Street Parking Lot and adjacent Whitney Commons. It will be low maintenance, need little water, and provide a consistent appearance throughout the area. It is included in the estimate although is not detailed in the plans at this time.

Civil, Mechanical, and Electrical Narrative

DESCRIPTION OF EXISTING SITE INFRASTRUCTURE

Parking Lots and Drives:

Access to the site is from Smith Street through six (6) different approaches (five from Smith Street, one from Brooks). Two of the existing approaches are one way, with the access closest to Brooks Street an entrance only while the next access to the west, closer to the Hub, is an exit only. A third approach near the entrance to the building accommodates a few handicap parking spaces near the front door. The fourth and fifth approaches are both located southwest of the building. A sixth approach was installed in 2021 from the new east Brooks Street parking lot and accommodates two-way entry/exit.

Existing parking for the facility is mostly provided east and north of the building, with a small amount of parking near the southwest corner that is slated to remain.

Water:

Water to the facility is provided by a 1-1/2" domestic service line, and a 4" fire service line. Both are served from a 12" PVC water main located in Smith Street. The main and service connections in the street were installed in 2009 as part of a City project. No significant changes to water service are anticipated unless it is determined that some portion of the lines outside of the building warrant replacement.

Sanitary Sewer:

Sanitary sewer service for the facility is provided by a 4" Schedule 40 PVC service. Sewer is served by a 24" PVC sewer main located in Smith Street that was installed in 2009. It also appears that there is a short section of 8" VCP (vitrified clay pipe) sewer main in the alley east of the Hub property that serves several businesses.

An existing grease interceptor for kitchen waste is located near the southeast corner of the building. This grease interceptor will need to be replaced and relocated outside of the new building addition footprint. The interceptor will direct flow to the south and connect to the 24" main, rather than re-enter the building as it currently functions.

Storm Drainage:

The storm drainage system for the facility has been surveyed and mapped as thoroughly as possible, though portions of the storm system remain unknown. The City of Sheridan used their camera system to inspect the storm lines on June 3, 2020. They were not able to inspect any section of existing storm drain line in total as they encountered various obstacles, including silt/mud in the bottom of the pipes, inability to access certain portions of pipe, and one location northwest of the Hub building where it appeared that the storm drain line had been damaged most likely by an underground utility boring. However, the general condition of the existing storm drain piping appears good. Portions of the north/south and east/west storm system appear to be ±24" HDPE pipe, though the age of the pipe is unknown. A 30" CMP culvert was replaced in-kind in 2021 as part of the east parking lot expansion project.

Natural Gas Service:

MDU relocated the gas service building entrance location in 2021 to the west side of the building. No changes to
the service are anticipated.

Electrical Service:
MDU relocated overhead utilities underground in 2021. No conflicts are anticipated with the proposed site upgrades.

Communications Services:

Currently no change or conflicts with the building communications service(s) are anticipated.

PROPOSED SITE INFRASTRUCTURE IMPROVEMENTS

The parking lot, access road, and sidewalk infrastructure would all be constructed with the anticipation of the future building addition. Underground site lighting infrastructure would be installed along with light pole and luminaires. Landscaping would be installed with a more temporary-style (i.e. gravel/rock) surface where the future building addition is planned. Monument signage for both the Hub on Smith as well as Whitney Commons is located adjacent to Brooks Street.

The parking lot site reconstruction will include:

- All other parking improvements north and east of the building, including the new maintenance access west of the building (Paul Drive) and the northwest corner of the property to accommodate Whitney Benefits.
- New dumpster enclosure pad area accessed from the west maintenance drive.
- Site regrading/fill to raise grade along the north and east side of the building to match building finish floor elevation; grade will be raised to eliminate the need for steps or ramps to access the building.
- Nearly all the existing site concrete pavements and walks will be removed and replaced, including new approaches on the adjacent streets and the existing concrete west maintenance drive up to the new maintenance cul-de-sac.
- Modifications to the storm drainage system to accommodate the revised parking lot layout and change in site grading; the existing storm drain system is anticipated to largely remain intact, with changes as needed for manhole and storm drain inlet installation.
- Provide new site lighting for the new parking lot that match Whitney Commons and the existing parking lot on the east side of the lot. The new site lighting will consist of (24) new poles, (3) flagpole lights, and (4) sign lights. Poles will be placed along the landscape areas, parking lot islands and alongside walks. All circuiting will be routed to the building's electrical system.
- Lights will be controlled with a photocell and timeclock.
- Major pedestrian routes will likely include raised crosswalks to promote safety and slow traffic.
- Certain sidewalk, crosswalk areas, and curb ramps adjacent to the public streets are anticipated to include special concrete finished (colored and/or stamped concrete)
- The center of the maintenance cul-de-sac will likely be colored and stamped concrete that is flush with the surrounding pavement.
- Site improvements are expected to include selective demolition and placement of new walks adjacent to Whitney Commons; revision to the existing retaining walls may be necessary.

Estimate

The estimated construction cost of the project is $2,776,288 based upon the attached estimate and breakdown of costs. The recommended project budget is broken down below.

Construction Cost	$	2,776,288
Professional Fees*	$	174,226
Sub total	$	2,950,514
10% Owner's Contingency	$	295,051
Total Project Budget	**$**	**3,245,565**

* Project fees are projected based upon fee proposal provided to the Hub on Smith on 9/13/2023. Final fees may vary based upon proposed phases to be billed on a Time & Materials basis.

Uniformat Summary

The Hub on Smith Sitework

K-MACK CONSULTING, LLC *Conceptual Estimate* *October 31, 2023*

Group Elements	Labor Amount	Material Amount	Sub Amount	Other Amount	Total Amount
D49MECH			**35,000**		**35,000**
F20BldgDemo			**10,000**		**10,000**
G10SitePrep			**463,448**		**463,448**
G20SiteImpvmt	**1,322**	**1,800**	**1,361,126**		**1,368,749**
G30MechUtilty			**122,290**		**122,290**
G40ElecUtilty			**70,000**		**70,000**
X10GenReq			**195,000**		**195,000**

Estimate Totals

Description	Amount	Totals	Hours	Rate
Labor	1,322		78.000 hrs	
Material	1,800			
Subcontract	2,256,864			
	2,264,486	**2,264,486**		
Contingency	339,673			15.000 %
Sales / Use Tax	108			6.000 %
General Liability	13,021			0.500 %
Plan Check Fee	5,000			
Utility Tap Fees	250			
CM/GC Bonds	21,546			
	379,598	**2,644,084**		
Profit	132,204			5.000 %
	132,204	**2,776,288**		
Total		***2,776,288***		

Group Elements	Individual Elements	Phase	Description	Takeoff Quantity	Labor Amount	Material Amount	Sub Amount	Other Amount	Total Amount	Notes
D49MECH										
	D4910MechComplete									
		220500.00	Mechanical Allowance - Interior Bldg	1.00 ls	-	-	35,000	-	35,000	
			D4910MechComplete				35,000		35,000	
			D49MECH				**35,000**		**35,000**	
F20BldgDemo										
	F2010BldgElementDemo									
		24119.00	Selective Demolition & Patching Allowance	1.00 ls	-	-	10,000	-	10,000	Includes any demolition & patching work required for mechanical & electrical work
			F2010BldgElementDemo				10,000		10,000	
			F20BldgDemo				**10,000**		**10,000**	
G10SitePrep										
	G1020SiteDemolition									
		24113.00	Demo Loading Dock	1.00 ls	-	-	15,000	-	15,000	
		24113.00	Demo Site Utilities	1.00 ls	-	-	30,000	-	30,000	
		24113.00	Remove Curbs	1,000.00 lf	-	-	10,000	-	10,000	
		24113.00	Remove 6" Concrete Pavement	77,724.00 sf	-	-	155,448	-	155,448	includes haul-off
		24113.00	Saw Concrete	6,000.00 lf	-	-	15,000	-	15,000	
			G1020SiteDemolition				225,448		225,448	
	G1030SiteEarthwork									
		310300.00	Mobilization	1.00 ls	-	-	40,000	-	40,000	
		310300.00	Site Cut/Fill	5,200.00 cy	-	-	78,000	-	78,000	
		312300.00	Engineered Fill Gravel	3,000.00 cy	-		120,000	-	120,000	
			G1030SiteEarthwork				238,000		238,000	
			G10SitePrep				**463,448**		**463,448**	
G20SiteImpvmt										
	G2010Roadways									
		310300.00	12" Subgrade Compaction (small equipment)	173.06 cy	-	-	1,384	-	1,384	Curb & Gutter
		310300.00	12" Subgrade Compaction (large equipment)	352.89 cy	-	-	2,117	-	2,117	Concrete Drive - 8" thick concrete over 4" base & 12" subgrade recompaction
		310516.00	Crusher Run Base (Pvmt.)	117.63 cy	-	-	11,469	-	11,469	Concrete Drive - 8" thick concrete over 4" base & 12" subgrade recompaction
		310516.00	Crusher Run Base (Curb and Gutter)	86.53 cy	-	-	10,686	-	10,686	Curb & Gutter
		321100.00	Geotextile Fabric	9,528.00 sf	-	-	3,335	-	3,335	Concrete Drive - 8" thick concrete over 4" base & 12" subgrade recompaction
		321100.00	Geotextile Fabric	4,672.50 sf	-	-	1,635	-	1,635	Curb & Gutter
		321300.00	Concrete Paving - Sub	235.26 cy	-	-	188,207	-	188,207	Concrete Drive - 8" thick concrete

Group Elements	Individual Elements	Phase	Description	Takeoff Quantity	Labor Amount	Material Amount	Sub Amount	Other Amount	Total Amount	Notes
	G2010Roadways									
										over 4" base & 12" subgrade recompaction
			G2010Roadways				218,834		218,834	
	G2020ParkingLots									
		55000.00	Slotted Drain	100.00 lf	-	-	8,000	-	8,000	
		310300.00	12" Subgrade Compaction (large equipment)	103.44 cy	-	-	621	-	621	Additiona Concrete @ Parking Lot - 8" thick concrete over 4" base & 12" subgrade recompaction
		310300.00	12" Subgrade Compaction (large equipment)	277.11 cy	-	-	1,663	-	1,663	Sidewalks - 4" thick concrete over 4" base & 12" subgrade recompaction
		310300.00	12" Subgrade Compaction (large equipment)	1,475.59 cy	-	-	8,854	-	8,854	Concrete Parking Lot - 6" thick concrete over 4" base & 12" subgrade recompaction
		310516.00	Crusher Run Base (Pvmt.)	34.48 cy	-	-	3,362	-	3,362	Additiona Concrete @ Parking Lot - 8" thick concrete over 4" base & 12" subgrade recompaction
		310516.00	Crusher Run Base (Pvmt.)	92.37 cy	-	-	9,006	-	9,006	Sidewalks - 4" thick concrete over 4" base & 12" subgrade recompaction
		310516.00	Crusher Run Base (Pvmt.)	491.86 cy	-	-	47,957	-	47,957	Concrete Parking Lot - 6" thick concrete over 4" base & 12" subgrade recompaction
		321100.00	Geotextile Fabric	2,793.00 sf	-	-	978	-	978	Additiona Concrete @ Parking Lot - 8" thick concrete over 4" base & 12" subgrade recompaction
		321100.00	Geotextile Fabric	39,841.00 sf	-	-	13,944	-	13,944	Concrete Parking Lot - 6" thick concrete over 4" base & 12" subgrade recompaction
		321300.00	Concrete Paving - Sub	68.96 cy	-	-	55,170	-	55,170	Additiona Concrete @ Parking Lot - 8" thick concrete over 4" base & 12" subgrade recompaction
		321300.00	Concrete Paving - Sub	92.37 cy	-	-	73,896	-	73,896	Sidewalks - 4" thick concrete over 4" base & 12" subgrade recompaction
		321300.00	Concrete Paving - Sub	737.80 cy	-	-	590,237	-	590,237	Concrete Parking Lot - 6" thick concrete over 4" base & 12" subgrade recompaction
		321600.00	Curb & Gutter - Subcontractor	1,869.00 lf	-	-	84,105	-	84,105	Curb & Gutter
		321723.00	Pavement marking - sub	1.00 ls	-	-	2,000	-	2,000	
			G2020ParkingLots				899,792		899,792	
	G2030PedestrianPvmt									
		310300.00	12" Subgrade Compaction (large equipment)	56.93 cy	-	-	342	-	342	Decorative Concrete (Stamped/Colored) - 6" thick concrete over 4" base & 12" subgrade recompaction
		310300.00	12" Subgrade Compaction (large equipment)	101.30 cy	-	-	608	-	608	Dining & South Plaza - 6" thick

Group Elements	Individual Elements	Phase	Description	Takeoff Quantity	Labor Amount	Material Amount	Sub Amount	Other Amount	Total Amount	Notes
	G2030PedestrianPvmt									
										concrete over 4" base & 12" subgrade recompaction
		310516.00	Crusher Run Base (Pvmt.)	18.98 cy	-	-	1,850	-	1,850	Decorative Concrete (Stamped/Colored) - 6" thick concrete over 4" base & 12" subgrade recompaction
		310516.00	Crusher Run Base (Pvmt.)	33.77 cy	-	-	3,292	-	3,292	Dining & South Plaza - 6" thick concrete over 4" base & 12" subgrade recompaction
		321100.00	Geotextile Fabric	1,537.00 sf	-	-	538	-	538	Decorative Concrete (Stamped/Colored) - 6" thick concrete over 4" base & 12" subgrade recompaction
		321100.00	Geotextile Fabric	2,735.00 sf	-	-	957	-	957	Dining & South Plaza - 6" thick concrete over 4" base & 12" subgrade recompaction
		321300.00	Decorative Concrete Paving - Sub	28.46 cy	-	-	45,541	-	45,541	Decorative Concrete (Stamped/Colored) - 6" thick concrete over 4" base & 12" subgrade recompaction
		321300.00	Concrete Paving - Sub	50.65 cy	-	-	81,037	-	81,037	Dining & South Plaza - 6" thick concrete over 4" base & 12" subgrade recompaction
		321300.00	ADA Access @ Walk	3.00 ea			-	-	4,500	Includes detectable warning plate
			G2030PedestrianPvmt				134,164		138,664	
	G2040SiteDevelopment									
		34500.00	Precast Coping	43.00 lf	-	-	2,580	-	2,580	
		42200.00	8" Split Face	258.00 sf	-	-	16,770	-	16,770	Dumpster Enclosure
		101453.00	Misc. Traffic Signs - Labor	12.00 ea	1,322	-	-	-	1,322	
		101453.00	Misc. Traffic Signs - Material	12.00 ea	-	1,800	-	-	1,800	Includes Post
		321300.00	Dumpster Enclosure Foundation	10.00 cy	-	-	8,000	-	8,000	
			G2040SiteDevelopment		1,322	1,800	27,350		30,472	
	G2050Landscaping									
		328400.00	Irrigation	12,560.00 sf	-	-	18,840	-	18,840	
		329100.00	Topsoil	250.00 cy	-	-	5,850	-	5,850	
		329200.00	Sod	3,768.00 sf	-	-	3,768	-	3,768	
		329300.00	Trees	25.00 ea	-	-	16,250	-	16,250	
		329300.00	Shrubs	110.00 ea	-	-	8,800	-	8,800	
		329300.00	Ground Cover Plants	165.00 ea	-	-	3,300	-	3,300	
		329300.00	Rock/Cobble Mulch	8,792.00 sf	-	-	24,178	-	24,178	
			G2050Landscaping				80,986		80,986	
			G20SiteImpvmt		**1,322**	**1,800**	**1,361,126**		**1,368,749**	
G30MechUtilty										
	G3010WaterSupply									
		331100.00	Water Line - 1"	194.00 lf	-	-	16,490	-	16,490	West side of site

Group Elements	Individual Elements	Phase	Description	Takeoff Quantity	Labor Amount	Material Amount	Sub Amount	Other Amount	Total Amount	Notes
	G3010WaterSupply									
			G3010WaterSupply				16,490		16,490	
	G3020SanitarySewer									
		331100.00	Sanitary Line - 4"	207.00 lf	-	-	20,700	-	20,700	West side of site
		331100.00	Sanitary Line - 4"	189.00 lf	-	-	18,900	-	18,900	Eastside of site
		331100.00	Grease Interceptor	1.00 ls	-	-	33,000	-	33,000	
			G3020SanitarySewer				72,600		72,600	
	G3030StormSewer									
		331100.00	Storm Drainage	365.00 lf	-	-	29,200	-	29,200	
		331100.00	Area Inlets	4.00 ea	-	-	4,000	-	4,000	
			G3030StormSewer				33,200		33,200	
			G30MechUtilty				**122,290**		**122,290**	
G40ElecUtilty										
	G4010ElecDistributn									
		261200.00	Site Electrical Allowance	1.00 ls	-	-	70,000	-	70,000	This would include any new distribution work & site lighting
			G4010ElecDistributn				70,000		70,000	
			G40ElecUtilty				**70,000**		**70,000**	
X10GenReq										
	X1010Field/SiteSetup									
		11100.00	General Requirements	4.00 mo	-	-	160,000		160,000	
			X1010Field/SiteSetup				160,000		160,000	
	X1015ManagementEngr									
		17200.00	Surveying	1.00 ls	-	-	35,000	-	35,000	
			X1015ManagementEngr				35,000		35,000	
			X10GenReq				**195,000**		**195,000**	

Estimate Totals

Description	Amount	Totals	Hours	Rate
Labor	1,322		78.000 hrs	
Material	1,800			
Subcontract	2,256,864			
	2,264,486	**2,264,486**		
Contingency	339,673			15.000 %
Sales / Use Tax	108			6.000 %
General Liability	13,021			0.500 %
Plan Check Fee	5,000			
Utility Tap Fees	250			
CM/GC Bonds	21,546			
	379,598	**2,644,084**		
Profit	132,204			5.000 %
	132,204	**2,776,288**		
Total		***2,776,288***		