

**MEETING:                   REGULAR MEETING OF THE UTILITY ADVISORY COMMITTEE**

**DATE & TIME:           Thursday, August 15, 2024 at 5:00 PM**

**LOCATION:                   Germantown Village Hall Board Room  
N112 W17001 Mequon Road**

**NOTICE:** Citizens not wishing to attend the meeting personally or virtually may submit any public comments by sending an email to [comments@germantownwi.gov](mailto:comments@germantownwi.gov) by 4 p.m. on the day of the meeting so that it can be provided to the members of the body for their consideration.

### **AGENDA**

- I.     **CALL TO ORDER:** *This meeting has been given public notice in accordance with Section 19.83 and 19.84, Wis. Stats, in such form that will apprise the general public and news media of subject matter that is intended for consideration and action.*
- II.    **ROLL CALL:**
- III.   **PUBLIC COMMENTS:** *(Please be advised per 19.84(2) that information and comment will be received from the public. It is the policy of this municipality that public input be limited to a three (3) minute period per person with a time extension granted at the discretion of the Chairperson. Be advised that there may be limited discussion of the information received but no action will be taken under public comments.)*
- IV.    **APPROVAL OF MINUTES:**
  - A.     Minutes: April 24, 2024
- V.     **OLD BUSINESS:**
- VI.    **NEW BUSINESS:**
  - A.     Ruekert & Mielke Sewer Facilities Plan Review and Discussion
  - B.     Recommendation of the Sanitary Sewer System Facilities Plan Update
  - C.     Director Updates
- VII.   **ADJOURNMENT:**

UPON REASONABLE NOTICE, efforts will be made to accommodate the needs of disabled individuals through appropriate aids and services. For additional information or to request this service, please contact the Village Clerk at (262)250-4745 at least 2 days prior to the meeting.

<b>MEETING:</b>	<b>REGULAR MEETING OF THE UTILITY ADVISORY COMMITTEE</b>
<b>DATE AND TIME:</b>	<b>Wednesday, April 24, 2024 5:30 PM</b>
<b>LOCATION:</b>	<b>Germantown Village Hall Board Room N112 W17001 Mequon Road</b>

## MINUTES

- I. **CALL TO ORDER:** *This meeting has been given public notice in accordance with Section 19.83 and 19.84, Wis. Stats, in such form that will apprise the general public and news media of subject matter that is intended for consideration and action.*

Trustee Robert Warren called the Utility Advisory Committee meeting to order at 5:30 PM.

II. **ROLL CALL:**

**Present:** Trustee Robert Warren, Committee Member Scott Hefle, Committee Member Dan Campbell, Committee Member Peter Nilles, Committee Member Steve Wesolowski

**Absent:**

**Excused:**

**Also Present:** Director of Public Works Matt Mortwedt, Village Administrator Steve Kreklow, Deputy Clerk Maddy Laufenberg, Water Superintendent Paul Haugen

III. **PUBLIC COMMENTS:**

No public comments were made.

IV. **APPROVAL OF MINUTES:**

**Motion:** Approve as presented

**Motioned By:** Member Hefle

**Seconded By:** Member Nilles

**Yes:** Trustee Warren, Member Hefle, Member Campbell, Member Nilles, Member Wesolowski

**No:** None

**Abstain:** None

**Motion Carried (Yes 5, No 0, Abstained 0)**

A. Minutes: January 30, 2024

**V. OLD BUSINESS:**

A. Ehlers Sewer Rate Study

Study presented by John Cameron from Ehlers.

**Motion:** Recommend Option 1 to Public Safety Committee, with biannual rate review included

**Motioned By:** Member Campbell

**Seconded By:** Member Nilles

**Yes:** Trustee Warren, Member Hefle, Member Campbell, Member Nilles, Member Wesolowski

**No:** None

**Abstain:** None

**Motion Passed by Voice Vote (Yes 5, No 0, Abstained 0)**

B. Discussion of Proposed Update to the Sanitary Sewer Service Area

Discussion led by Public Works Director Mortwedt and Village Administrator Kreklow. Recommendations and comments from the Committee will be passed along to SEWRPC in internal discussions.

C. Water Utility Step Two Rates

Discussion led by Public Works Director Mortwedt, Village Administrator Kreklow, and Water Superintendent Haugen. This item was informational only; no action was taken by the Committee.

**VI. ADJOURNMENT:**

Trustee Warren adjourned the meeting at 6:49 PM.

## **BUSINESS OF THE UTILITY ADVISORY COMMITTEE**

MEETING DATE: August 15, 2024

PLACEMENT: Presentation

ITEM TITLE: Ruekert & Mielke Sewer Facilities Plan Review and Discussion

SUBMITTED BY: Matthew Mortwedt, Public Works Director

SUMMARY EXPLANATION:

The Village of Germantown has contracted with Ruekert & Mielke, Inc. (R/M) to complete an analysis of the existing sanitary sewer system facilities and plan for future development needs within the sanitary system facilities. The most recent Sanitary Sewer Service Plan report for the Village of Germantown was published in 1983 by the Southeastern Wisconsin Regional Planning Commission (SEWRPC), with multiple subsequent amendments to the refined Sanitary Sewer Service Area (SSSA) defined in the original 1983 report. The original report was planned for the year 2000.

The Village of Richfield has initiated the process of extending the Village of Germantown's sanitary sewer service to serve a recently proposed development within the Village of Richfield. This potential development, subsequent changes to the related sanitary sewer service area, and age of the original SEWRPC Sanitary Sewer Service Area Plan have served as an impetus to update Germantown's sanitary sewer facilities plan. The updated facilities plan will consider growth within Germantown as well as near- and long-term growth in a portion of Richfield. With the analysis of future development within the broad planning area, an accurate assessment for future improvements can be made.

R/M staff will present the plan and facilitate discussion.

ATTACHMENT:

1. Village of Germantown Sanitary Sewer System Facilities Plan Update DRAFT

STAFF RECOMMENDATION:

None.

ACTION BY Committee:

None.

# DRAFT

## FACILITIES PLAN UPDATE



### Village of Germantown Sanitary Sewer System Facilities Plan Update

*April 17, 2024*

**PREPARED FOR:**

**Village of Germantown**  
N122 W17177 Fond Du Lac Avenue  
Germantown, WI 53022

**PREPARED BY:**

**Ruekert & Mielke, Inc.**  
W233 N2080 Ridgeview Parkway  
Suite 300  
Waukesha, WI 53188



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## SANITARY SEWER SYSTEM FACILITIES PLAN UPDATE

### INTRODUCTION AND NEED FOR UPDATED FACILITIES PLAN

The Village of Germantown has contracted with Ruekert & Mielke, Inc. (R/M) to complete an analysis of the existing sanitary sewer system facilities and plan for future development needs within the sanitary system facilities. The most recent Sanitary Sewer Service Plan report for the Village of Germantown was published in 1983 by the Southeastern Wisconsin Regional Planning Commission (SEWRPC), with multiple subsequent amendments to the refined Sanitary Sewer Service Area (SSSA) defined in the original 1983 report. The original report was planned for the year 2000.

The Village of Richfield has initiated the process of extending the Village of Germantown's sanitary sewer service to serve a recently proposed development within the Village of Richfield. This potential development, subsequent changes to the related sanitary sewer service area, and age of the original SEWRPC Sanitary Sewer Service Area Plan have served as an impetus to update Germantown's sanitary sewer facilities plan. The updated facilities plan will consider growth within Germantown as well as near- and long-term growth in a portion of Richfield. With the analysis of future development within the broad planning area, an accurate assessment for future improvements can be made.

The Villages of Germantown and Richfield have recently requested an immediate amendment to Germantown's (SSSA) to continue moving forward on the potential development in Richfield. A development entity has expressed sincere interest in developing a vacant area near the I-41/Holy Hill Road interchange for office and light industrial uses. Market conditions have necessitated the immediate amendment of the SSSA so that the developer can be assured sewer service will be approved by SEWRPC, Milwaukee Metropolitan Sewerage District (MMSD), and the Wisconsin Department of Natural Resources (WDNR) for the proposed development. This will allow them to proceed with their acquisition of the property and subsequent development plans in a timely manner. The Village of Germantown Sanitary Sewer System Facilities Plan Update is being completed as a trailing condition of said immediate SSSA amendment along with a full amendment to the Germantown SSSA consistent with the Village's 2050 Comprehensive Plan.

### INTERGOVERNMENTAL AGREEMENT

The Villages of Germantown and Richfield have entered into an Intergovernmental Agreement (IGA) to define the parameters for a cooperative approach in the extension of sanitary sewer into the Village of Richfield. Richfield desires to encourage commercial and light industrial development due to the subject area's proximity to I-41, a major transportation arterial. Germantown has determined that in serving a portion of Richfield to facilitate development, they can capitalize on the financial benefit of a larger customer base as well as having non-Germantown property owners bear a portion of their capital costs.

The IGA details how costs will be shared for design, construction, administration, approvals, and land acquisitions for extension of infrastructure into Richfield. Germantown's existing construction standards and practices must be utilized.

The incremental area within the Village of Richfield to be served is detailed within the IGA, however for the purpose of this Facilities Plan the entire section of land within Richfield will be used for the SSSA Planning Area. The quantity and strength of the domestic wastewater stream from Richfield is defined based on Germantown's and the MMSD's guidelines. The IGA allows a quantity of domestic wastewater not to exceed 0.4 MGD Average Daily Flow with 0.7 MGD allowable Daily Peak Flow. This allowable flow is relative to the immediate SSSA amendment and not inclusive of the entire incremental planning area. Flow will be metered at a strategic location to accurately track the volume of wastewater generated within the Richfield SSSA.

A general route for gravity sewer has been planned by the Village of Richfield to run through undeveloped areas of Germantown for connection to the Richfield portion of the SSSA. The remainder of the route

may flow by gravity or be delivered via force main at Richfield's discretion. The general route assumes a connection point to a recently installed interceptor sewer at the intersection of Goldendale and Freistadt Roads. Germantown will own, operate, and maintain the entire sanitary sewer system, including the sanitary sewer system within Richfield's boundaries. Germantown will also be responsible for any necessary improvements downstream of this connection point, which will be identified within this Facilities Plan. Permits and inspections for new connections to the sanitary sewer system within Richfield will be administered and approved by Germantown. Sewage treatment rates have been established within the IGA, as well as determinations as to who will pay the costs for future expansions and upgrades to the system for development within Richfield.

## BACKGROUND

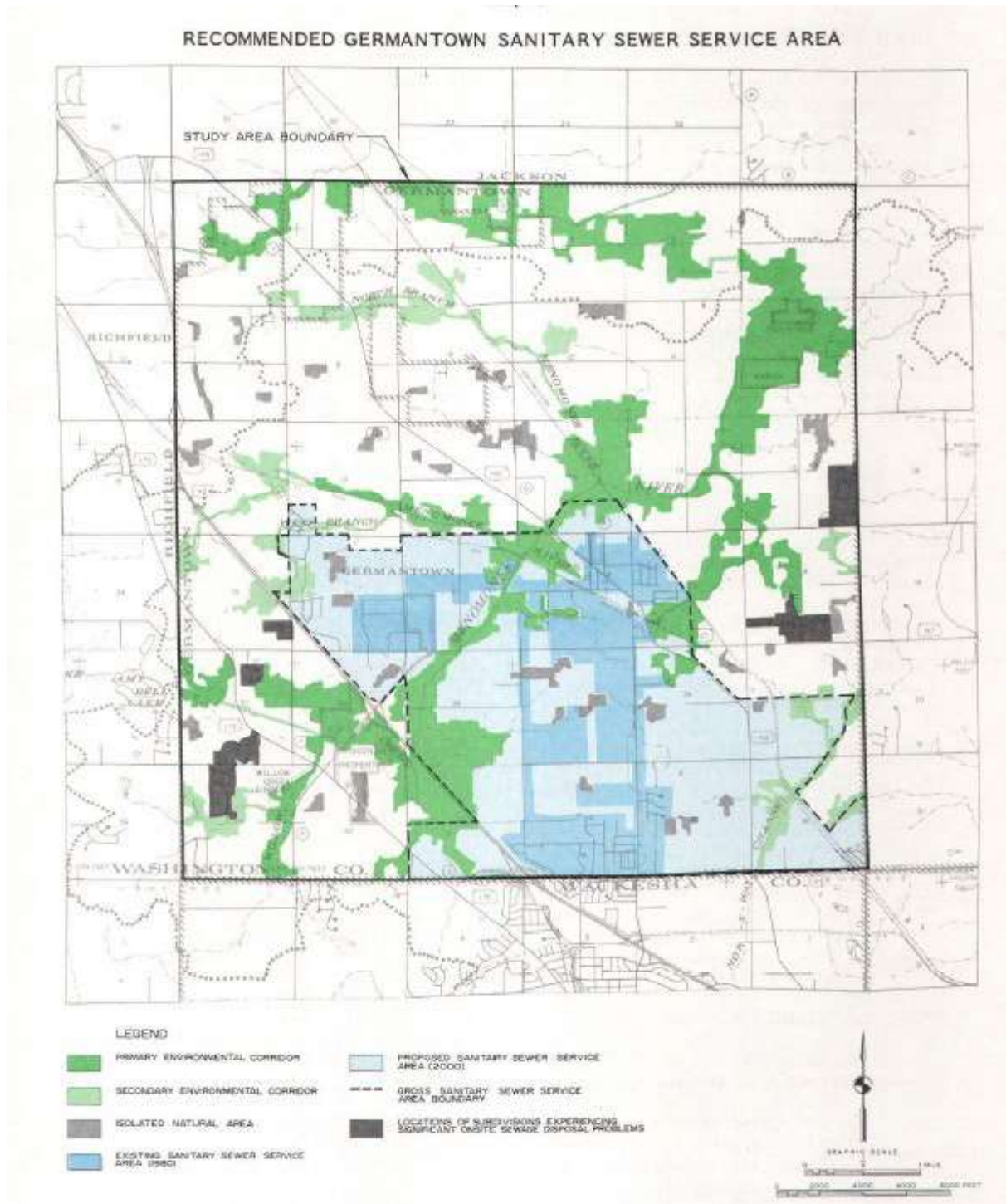
### History of the existing SSSA & Planning Area

The initial analysis and planning report for Village of Germantown's SSSA was authored by SEWRPC and published in July 1983. At the time, there was a recognized need for an area-wide water quality management plan, and in turn a need to accurately define future planned SSSA's for public sanitary sewer systems throughout Southeastern Wisconsin. The purpose of this report was to provide a framework for SSSA planning based on recommended land use through the year 2000.

At the time of the report, the area served by the Village's sanitary sewer system was approximately 1,984 acres. The Village operated its own wastewater treatment plant that was operating near its design capacity. With recommendations from SEWRPC and the MMSD, the Village concluded that a sewer connection should be made to the MMSD and that the Village's existing sewage treatment plant should be abandoned.

The delineation of the initial proposed SSSA considered not only current and future land use, but also failing septic systems, sewer tributary areas, existing and planned trunk sewers, and natural resource data. The resulting refined proposed SSSA totaled approximately 6,464 acres as shown in Figure 1 below:

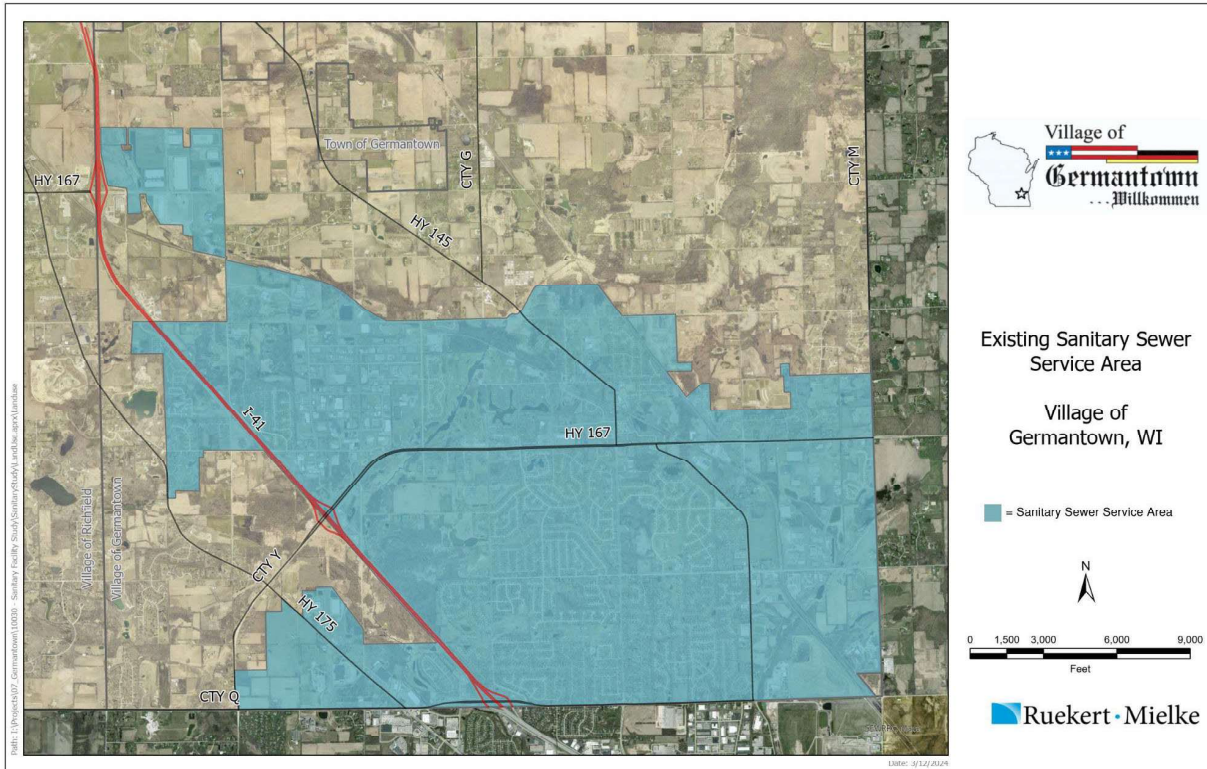
Figure 1 SEWRPC 1983 Planning Report - Sanitary Sewer Service Area



Source: SEWRPC 1983 Planning Report No. 70

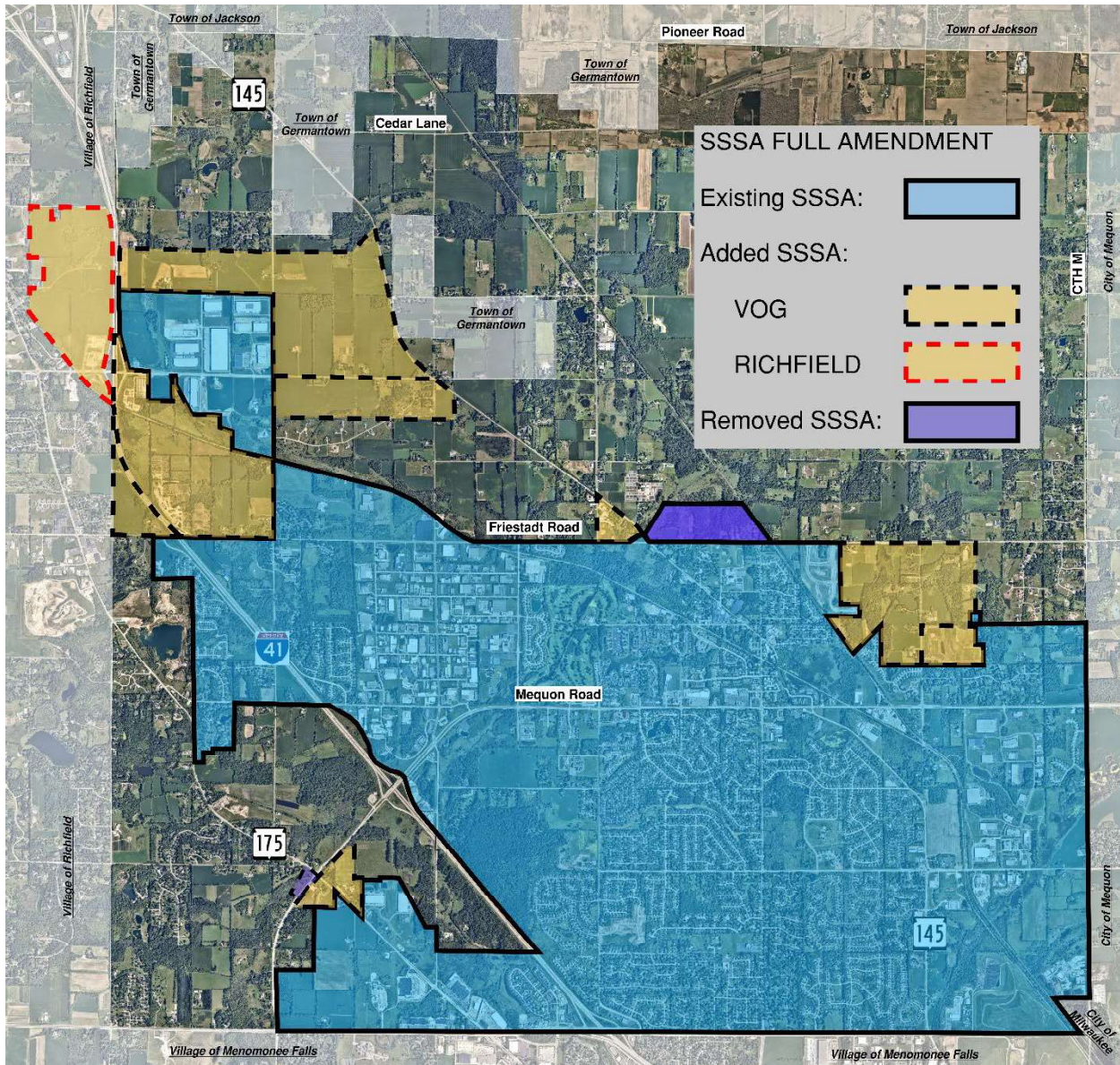
The proposed year 2000 SSSA was subsequently amended several times after the SEWRPC 1983 report was finalized. These amendments were approved in 1989, 1998, 2003, 2009, 2015, and most recently 2018 as the Village has expanded with development. The resulting Village of Germantown Sanitary Sewer Service Area is currently 9,432 acres and is delineated by SEWRPC as shown in Figure 2 below and included in Appendix A.

Figure 2 Existing Village of Germantown Sanitary Sewer Service Area



The pending immediate amendment, which is a portion of a larger full amendment, to the Germantown SSSA that is concurrent with this Facilities Plan will add a combined total of 814 acres to the SSSA, of which 526 acres are in the Village of Germantown and 288 acres are in the Village of Richfield. Beyond the immediate amendment, a full amendment has been defined for the 2050 planning term expansion to the existing SSSA and will be utilized as the future SSSA analysis area. The 2050 full amendment area is as shown in Figure 3 below and included in Appendix B:

Figure 3 2050 Full Sanitary Sewer Service Area Amendment

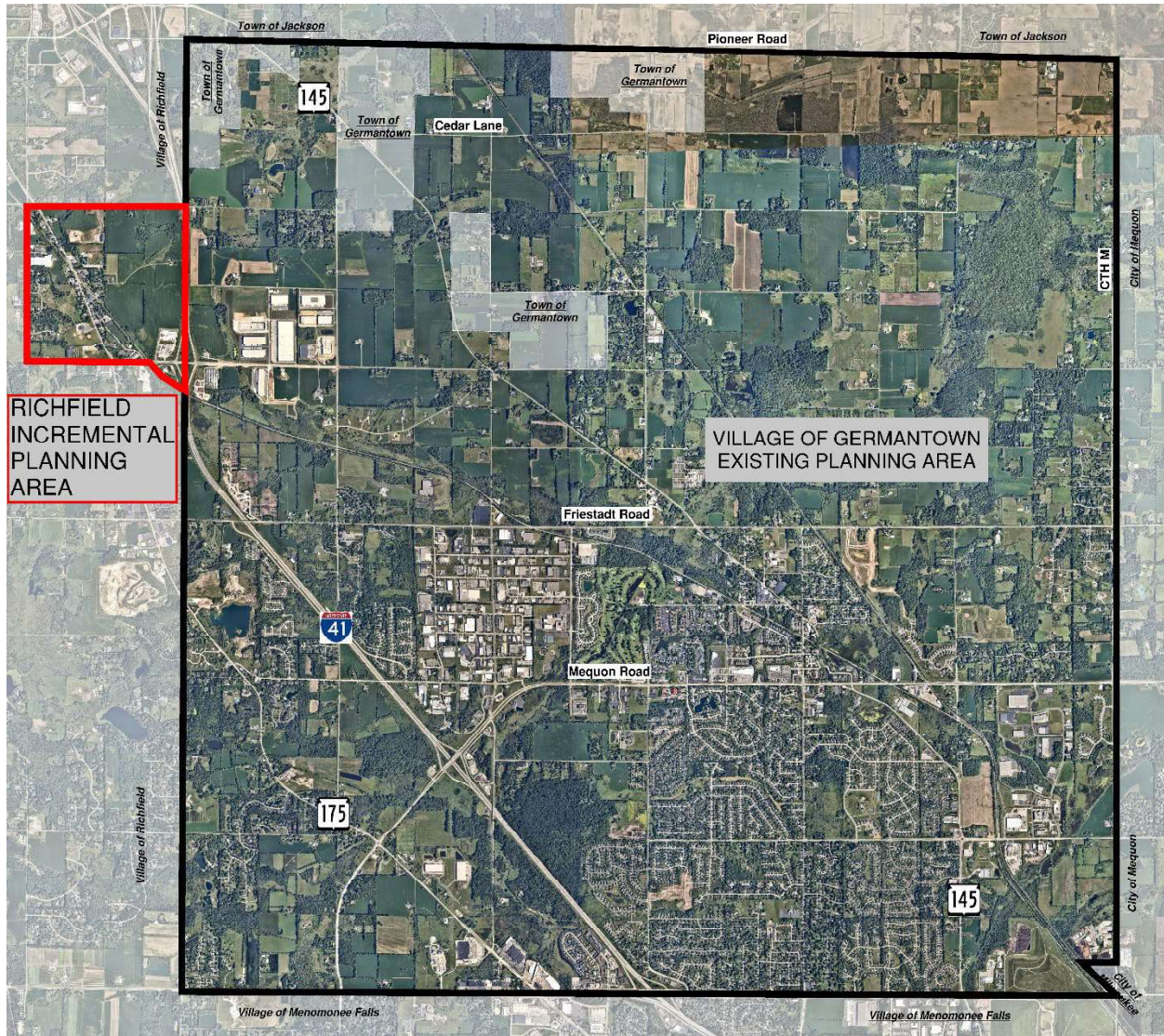


Source: Village of Germantown Planning

With the full amendment to the existing SSSA, the total area included in the Village of Germantown SSSA, herein referred to as the “expanded” SSSA could potentially be 10,964 acres.

For planning purposes, this Sanitary Sewer System Facilities Plan Update will also include the “Incremental Planning Area” within the Village of Richfield as a stand-alone incremental area tributary to the Village of Germantown’s expanded Future SSSA. This area of Richfield would potentially add another 665 acres in total to the fully amended Germantown SSSA described above. This area of Richfield is designated in Figure 4 below and included in Appendix C.

Figure 4 Village of Richfield Incremental Planning Area



Source: Village of Germantown Planning

Existing Sanitary Sewer System

In general, wastewater flow originates from the northwest region of the Village of Germantown near Holy Hill Road and I-41. The Richfield area to be added to the SSSA is located near this point, which makes adding sewer service in Richfield viable with the overall design of Germantown’s existing sanitary sewer system. Wastewater moves generally southeast through the network of trunk sewers, interceptors, and pump stations to a single connection point to the MMSD’s Metropolitan Intercepting Sewer (MIS) infrastructure at County Line Road and Wausaukee Road. At this connection point, the Village is allowed a peak hourly flow rate of 22.27 million gallons per day (MGD). Measured by a metering station at the connection point, the current average dry weather daily flow rate is 2.53 MGD with the peak hourly flow rate being approximately 12.67 MGD.

To determine peak flows, rain event data from the National Oceanic and Atmospheric Administration (NOAA) was used to verify if peak flow events corresponded to a rain event. Several rain events of note in 2022 and 2023 were observed at the Wastewater Utility Building weather station, with the most intense event being a 5.5-inch rainfall on September 12<sup>th</sup> of 2022. This event corresponded to the maximum

peak hourly flow observed during any rain events, and this maximum was used to calculate the peak hourly flow rate for the Wrenwood and the MMSD metering station.

The existing sewerage area within the Village of Germantown SSSA is served by approximately 99.2 miles of gravity sewer ranging in size from 8-inch to 48-inch diameter, and approximately 4.4 miles of force main sewer ranging in size from 6-inch to 20-inch diameter, as broken down by size category in Table 1. The system was constructed beginning in the mid-1960's with the largest portion of the system being constructed in the 1990's and 2000's. Pipe materials are largely Polyvinyl Chloride (PVC), Reinforced Concrete Pipe (RCP), and Ductile Iron, with a minimal quantity of Vitrified Clay, Nonreinforced Concrete Pipe, and ABS Truss pipe. The majority of the Village's 48" RCP interceptor has been rehabilitated with Cured-In-Place-Pipe. The Village has also completed a considerable amount of sewer replacement and extension projects to eliminate pump stations, provide service for new development, and upgrade capacity for undersized and outdated sewers.

*Table 1 Existing Village of Germantown Sanitary Sewer Pipe Sizes & Lengths*

Gravity Sewer		Force Main	
Diameter	Miles	Diameter	Miles
		6"	0.9
8"	59.3		
10"	6.5	10"	0.7
12"	9.2	12"	1.5
15"	5.1		
		16"	0.5
18"	4.8		
		20"	0.8
21"	2.0		
24"	2.1		
27"	2.1		
30"	3.6		
36"	0.9		
48"	3.5		
	<b>99.2</b>		<b>4.4</b>

Critical Sewer Flow Path

As the Village of Germantown's sanitary sewer system is analyzed, a critical path method can be used to identify the route conveying the bulk of the flow through the Village. This path is also the one most affected by future development, as the origin is in a largely undeveloped area of the Village, including the adjoining Village of Richfield area to be amended into the SSSA. Once this critical path through various trunk sewers, interceptors, and pump stations is determined, it can be used for analysis of future predicted flow conditions to identify any areas where future development may create a need for improvements.

At the northeast extents of the Village, the critical path begins just east of I-41 on Holy Hill Road with an 18-inch sanitary sewer that flows east and south continuing along Goldendale Road south to Freistadt Road. At Freistadt Road, the 18-inch sanitary sewer turns east to follow Freistadt Road. At the intersection of Freistadt Road and McCormick Drive, the sewer upsizes to 24-inch and continues to flow east following Freistadt Road. At the Wisconsin & Southern Railroad right-of-way (ROW), the sanitary

sewer deflects to the southeast and upsizes to 27-inch diameter. The 27-inch sewer continues southeast in alignment with the railroad ROW to a point approximately 1,000 feet east of River Road. At this point, the sewer turns to flow south and increases to 30-inch diameter.

The 30-inch sewer continues south through easement areas and along the east extents of the Blackstone Creek Subdivision. On the east side of the intersection of Blackstone Circle And Prestwick Court, the 30-inch sanitary sewer turns east and increases to 36-inch in diameter. The 36-inch sewer then flows east through the Blackstone Creek golf course and converges with a 30-inch sewer and 18-inch sewer that serve portions central to the Village before it terminates at the Main Street Pump Station at the intersection of Main Street and Division Road.

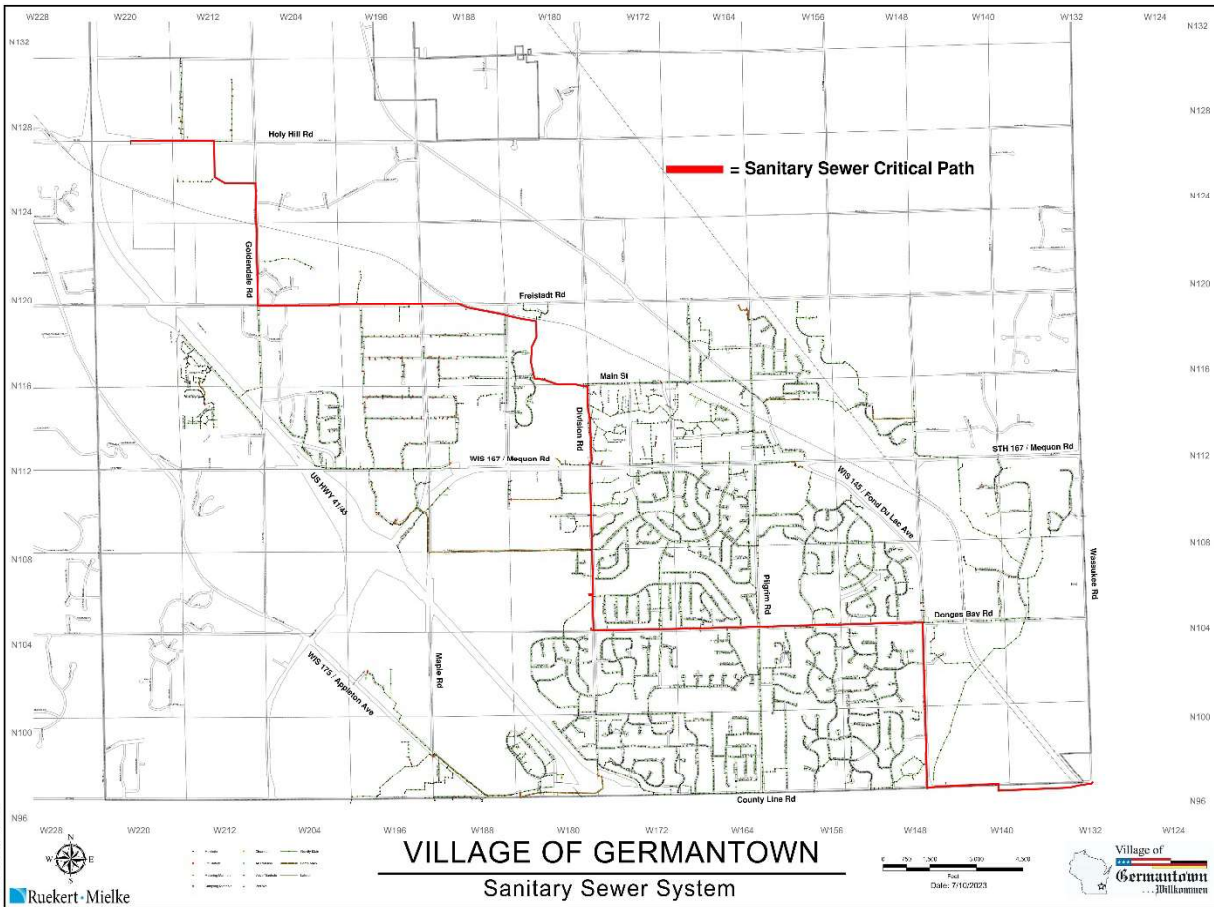
From the Main Street Lift Station, the wastewater is conveyed south through a 16-inch force main following Division Road until discharging into a manhole located approximately 100 feet north of State Highway 167, also known as Mequon Road where it returns to gravity flow through a 30-inch diameter sanitary sewer. This 30-inch sewer continues to flow south along Division Road until it reaches a convergence point at Old Farm Road where it meets a separate 36-inch sewer and combines with flow from the adjacent 36-inch sewer into the Old Farm Pump Station.

Wastewater flowing into the Old Farm Pump Station is discharged via a 20-inch diameter force main directed south along Division Road. At the intersection with Donges Bay Road, the force main turns east to follow Donges Bay Road until a point approximately 250 feet east of Ridgeview Lane where the force main discharges into a manhole that is located at the upstream end of a 48-inch diameter interceptor sewer.

The 48-inch interceptor sewer gravity flows east along Donges Bay Road to Fond Du Lac Avenue where it turns to the south and follows Fond Du Lac Avenue to County Line Road. At County Line Road, the 48-inch interceptor turns east. At the east side of the intersection of Fond Du Lac Avenue and County Line Road, a separate 30-inch sanitary sewer connects to the 48-inch interceptor and the conjoined flows continue in the easterly direction along County Line Road. The 48-inch interceptor follows the County Line Road (ROW) flowing east and meanders from the north side of County Line Road to the south side where it runs through a portion of the Old Orchard Landfill site. On the east extent of the Old Orchard Landfill Site, the interceptor flows through a metering station and then connects to a 54-inch diameter MIS sewer owned by the MMSD at the intersection of County Line Road and Wausaukee Road. This point is the singular connection point for all flow conveyed by the Village of Germantown's sanitary sewer system.

The Village of Germantown's full sanitary system map including the Critical Path as described can be found in Figure 5 below and in Appendix D.

Figure 5 Village of Germantown Sanitary Sewer System Map



### Pumping Stations

Another critical aspect of future analysis and planning is the existing pump station facilities within the sanitary sewer system. The Village owns and operates 6 pump stations of various sizes and capacities within the collection system. Germantown conducted a study of 5 of the 6 pump stations owned by the Village in 2022. The data collected within that study is being presented in summary within the Sanitary Sewer System Facilities Plan Update. The study included Pump Stations 3, 6, 7, Main Street, and Old Farm. The Village’s newest pump station, Wrenwood, was not part of the study area. For this report, data for the Wrenwood Pump Station has been collected independently of the pump stations included in the study.

GIS data from the Village of Germantown was utilized in the study to approximate the sewer service areas attributed to each pump station. Pump Stations 3, 7, Wrenwood, and Main Street handle flows exclusively from their respective sewershed basin. Pump Station 6 handles flow from its sewershed basin as well as flow from Pump Station 3. Old Farm Pump Station handles flow from its sewershed basin as well as Pump Stations 3, 6, 7, and Main Street.

Flow data was collected from the Village’s Supervisory Control and Data Acquisition (SCADA) system for Pump Stations 3, 6, 7, Main Street, and Old Farm for analysis related to the Pump Station study. Data for the Wrenwood Pump Station and the MMSD connection point was collected independently of the data included in the previous referenced study. The data collected included average dry weather flow, peak hourly flow during selected heavy rainfall events, and pumping capacities of each pump station. An

hourly peaking factor and remaining peak capacity were established for each pump station. The tributary area for each pump station includes all land use types, including wetlands and ROW.

The peaking factors have been determined from the prior pump station study utilizing flow data from the Village’s SCADA system; however this study did not include the Wrenwood Pump Station or the MMSD metering station. To determine peak flows at those locations, rain event data from NOAA was used to verify if peak flow events corresponded to a rain event. Several rain events of note in 2022 and 2023 were observed at the Wastewater Utility Building weather station, with the most intense event being a 5.5” rainfall on September 12<sup>th</sup> of 2022. This event corresponded to the maximum peak hourly flow observed during any rain events, and this maximum was used to calculate the peak hourly flow rate for the Wrenwood and the MMSD metering station. Table 2 summarizes the data collected and calculated.

*Table 2 Pumping Station Capacity Summary*

<b>Pump Station</b>	<b>Existing Tributary Area (Ac)</b>	<b>Existing Dry Weather Flow (GPM)</b>	<b>Peak Flow from Analyzed Rain Events (GPM)</b>	<b>Peaking Factor</b>	<b>Existing Maximum Capacity (GPM)</b>	<b>Peak / Capacity</b>	<b>Remaining Peak Capacity (GPM)</b>
PS 3	292.3	13	83	6.38	310	27%	227
PS 6	146.0	60	203	3.75	950	24%	725
PS 7	486.0	143	504	3.52	1,300	39%	796
Wrenwood	157.4	47	267	5.68	410	65%	143
Main Street	2461.1	1,007	2,818	2.80	6,250	45%	3432
Old Farm	4567.3	1,464	4,858	3.32	7,400	65%	2542
Connection to MMSD	9432.0	1,832	8,801	4.80	15,465	57%	6664

The analyzed data shows that in the current condition, there is some room for growth and, in turn, increased flow at each pump station. Analysis of the wastewater flow within the fully amended SSSA and Richfield SSSA will be incrementally compared to the existing design capacities to assess what, if any, upgrades may be required in the future to accommodate planned development. The need for upgrades will be assessed based on a threshold of 80 percent of design flow on a peak hour basis.

**BASIS OF ANALYSIS FOR INCREMENTAL PLANNING AREA & UNSEWERED AREAS**

To analyze future theoretical flow conditions for the Village of Germantown’s sanitary sewer system, certain parameters must be established for the basis for the analysis. Establishing a design period consistent with the Village’s 2050 Comprehensive Plan provides a cohesive analysis with the Village’s future overall plan. Both existing and future land uses are utilized to predict how the Village will develop over time and provide a basis for where improvements may be needed. Flow calculations will utilize factors for land use types, and population density assumptions can be made using occupancy factors. Base parameters established for design of new sewer facilities aid in preliminary concepts for potential future sewer facilities.

**Design Period**

For this Facilities Plan, a 20-year design period has been chosen. This design period coincides closely with Village of Germantown’s 2050 Comprehensive Plan for future growth and development.

## Land Use

Land use is assigned assuming a fully developed condition using a combination of existing land use information and known future planning for the respective municipalities. Land use is assigned on a parcel-by parcel basis and individual land parcels are not broken into smaller land use fractions. The exception is those parcels which contain wetlands, which were separated into a single land use category and a wetland category to exclude wetland areas from flow generation calculations.

In existing developed areas, the actual quantity of transportation corridor has been calculated for the respective areas and included in the land use calculations. Areas that are mostly undeveloped in their current condition have been assumed to contain 30% public transportation corridors in the future fully developed condition. This gives a more accurate depiction of future flow conditions as public transportation corridors have also been excluded from calculations related to flow generation.

Village of Germantown - For determination of future land use of undeveloped areas, the Village's 2050 Comprehensive Plan is used as a guide to the fully developed land use condition for those areas currently undeveloped within the unsewered expanded SSSA. For residential areas, dwelling units per acre can be calculated based on future planned density. Population within these residential areas can be estimated using existing and future planned dwelling unit density and occupancy factor. Residential areas have been split into a "Single-Family" category and a "Multifamily" category to account for more densely populated areas containing apartments, senior housing, or condominiums.

Village of Richfield - The area of the Village of Richfield included in the expanded planning area has been analyzed for future land use characteristics as well. Richfield's 2033 Comprehensive Plan includes an adopted future land use plan specifically related to its incremental planning area. The future land use in the planning area is generalized into broad categories of land use types. For residential areas, a density of one dwelling unit per three acres has been determined by the Village of Richfield. Population within these residential areas can be estimated using the planned unit density and occupancy factor.

## Flow Factors

In determining the future requirements for capacity within the existing sanitary sewer system and any required new sanitary sewer extensions, the potential flow must be calculated to determine if adequate capacity exists or if there is a future need for upgraded infrastructure. Flow factors used in this Facilities Plan are based on the MMSD's methodology for flow calculation:

### Base Flow

- Occupancy Factor – 2.50 people per dwelling unit (single-family).
- Occupancy Factor – 1.80 people per dwelling unit (multifamily).
- Residential – 68 gallons per capita, per day.
- Commercial – 1500 gallons per acre, per day.
- Industrial – 1000 gallons per acre, per day.
- Institutional – 1000 gallons per acre, per day.

Once the base flow is calculated using the above parameters and future determined land uses, a peaking factor is then applied to calculate the theoretical peak hourly flow within the system.

## Sanitary Sewer Design Criteria

Additions to the existing sanitary sewer system will be necessary for development within the unsewered portions of the existing SSSA as well future additions to the SSSA. The design should consider anticipated flows for the existing & future land use in a fully developed condition. Preliminary design of trunk sewers related to the expansion of the SSSA into the Village of Richfield has been completed by the Village of Richfield and provided to the Village of Germantown for use in this report.

The following criteria for future sewer extensions are assumed for analysis purposes:

- Minimum slope per Wisconsin Administrative Code.
- Minimum velocity: 2 feet per second when flowing full.
- Mannings “N” Value: Concrete Pipe – 0.013, PVC Pipe – 0.011.

### COST ESTIMATING METHODOLOGY

#### Sanitary Sewer Force Main, Trunk & Interceptors

Unit costs for gravity sanitary sewers are based on bids and information from recent projects. In estimating costs for future projects, consideration is also given to consider depth of excavation, size of pipe, pipe material, groundwater conditions, bedrock, and soil type. Preliminary cost estimates related to the expansion of the SSSA into the Village of Richfield have been completed by the Village of Richfield and provided to the Village of Germantown for use in this Facilities Plan.

#### Pump Station Upgrades & Construction

Costs associated with upgrades to existing pump stations and/or construction of new Pump Stations are based on historical R/M project information tabulated into graphical format. The estimated costs for pumping stations consider the same general parameters that affect gravity sewer construction as mentioned above.

### LAND USE ANALYSIS OF UNSEWERED AREA IN EXISTING AND EXPANDED SSSA

In analyzing the existing and full amendment the Village of Germantown SSSA, there are areas currently not served by sanitary sewers that may be sewerred in the future according to the Village’s 2050 Comprehensive Plan. The analysis will incrementally analyze these areas in a fully developed condition prior to adding in the incremental planning area from the Village of Richfield. Future land use is assigned to the undeveloped portions using the 2050 Plan as well as existing land uses as a guide to determine what future land use will most likely be as shown in Figure 6 and Appendix E.

Figure 6 Village of Germantown Future Land Use Map

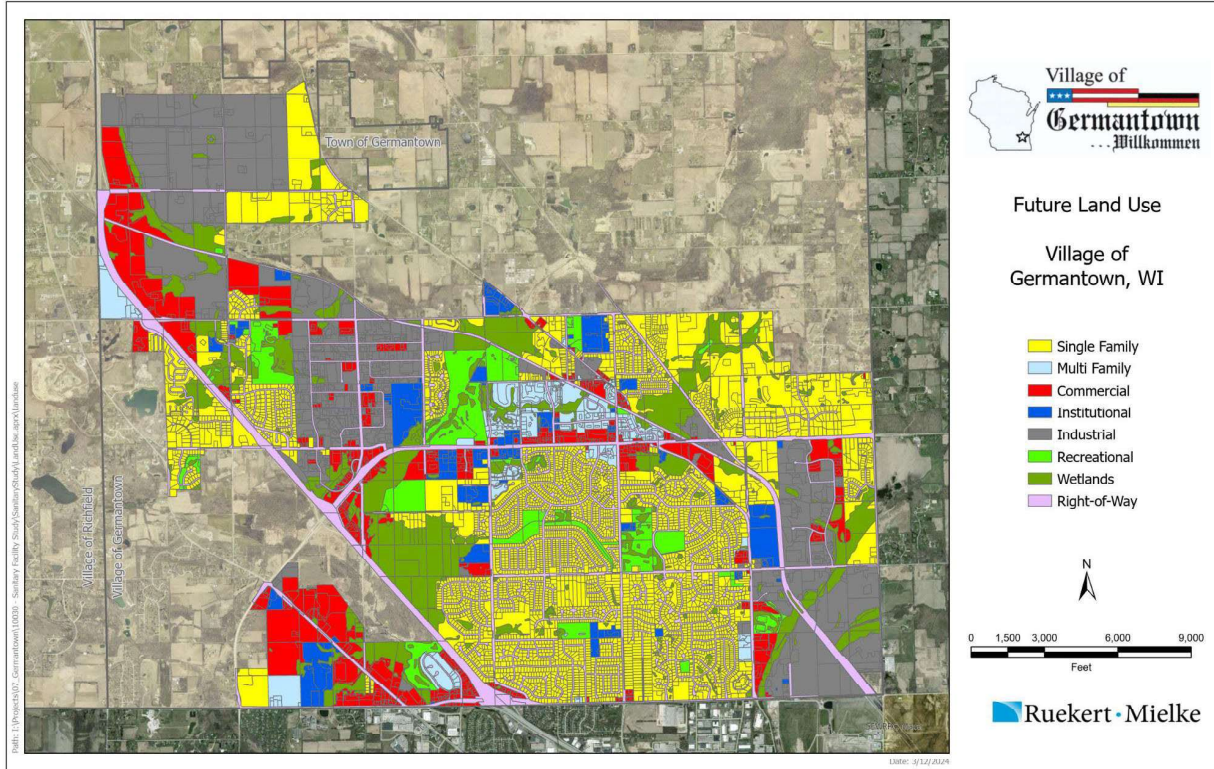


Table 3 breaks down the categories of assumed future land use conditions in the fully developed existing and expanded Germantown SSSA.

Table 3 Village of Germantown Future Land Use by Category

Germantown SSSA Fully-Developed Future Land Use (Acres) (Not including Richfield)							
Commercial	Industrial	Institutional	Multifamily	Recreational	Transportation	Single-Family	Wetlands
1,000.8	1,803.2	430.7	353.9	504.4	2,185.9	3,307.1	1,377.5
<b>Total Expanded SSSA</b>				<b>10,963.5</b>			
<b>Net Flow Generation Area*</b>				<b>6,895.8</b>			

\*Excludes Recreational, Transportation, and Wetlands land use categories

### Estimating Population

For single-family residential land use, an average density factor of 3.0 dwelling units/acre is appropriate based on the existing and desired density ranges described in the Village of Germantown's 2050 Comprehensive Plan. Most of the future development of residential areas falls into this category.

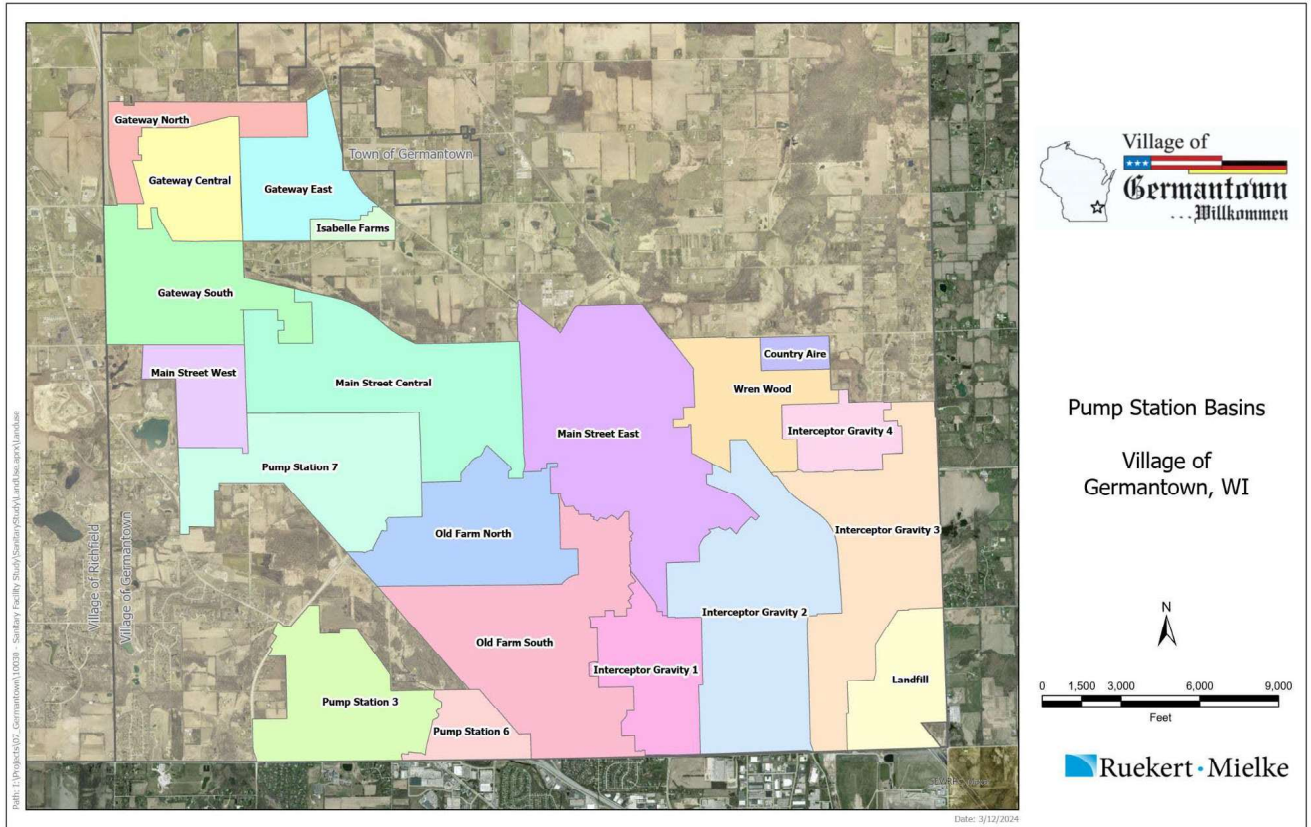
For multifamily residential land use, an average density factor of 8.0 dwelling units/acre is appropriate based on density ranges described in the Village of Germantown's 2050 Comprehensive Plan. Large-scale addition of multifamily residential development is not consistent with the Village's future plan, however, there is a potential for pockets of medium density residential mixed-use development within the Holy Hill Gateway Corridor. Because the Holy Hill Gateway Corridor has the potential for higher density residential development, the future multifamily land use in this basin alone was assigned a density of 16 dwelling units/acre.

Using the land use area, occupancy factor of 2.50 (single-family) or 1.80 (multifamily) people/dwelling unit and residential density factors described above, the total population of the fully developed existing and expanded Germantown SSSA is approximately 30,482. This is consistent with SEWRPC's Vision 2050 recommended population of 29,080 and high-growth population of 34,500. This population projection does not include the Richfield Incremental Planning Area (IPA).

### Identifying Analysis Basins

To provide a more comprehensive analysis of the future tributary areas and flow conditions for the entire system, the expanded Germantown SSSA is divided into analysis basins based on physical characteristics of each respective basin. Direction of flow, existing pump station locations, sewer system configuration, existing and future SSSA borders, and future "conceptual" pump station basins all were considered when delineating each basin. Figure 7 depicts the basin delineations and naming convention used for analysis within this Facilities Plan. The Sanitary Sewer Analysis Basin Map is also included in Appendix F.

Figure 7 Sanitary Sewer Analysis Basin Map



The basins can then be broken down into a more detailed description of future fully-developed land use using the same categories as the broad future land use breakdown. Table 4 details the future land use break-down of each individual basin.

*Table 4 Future Land Use by Analysis Basin*

<b>Germantown SSSA Future Land Use (Acres) (Not including Richfield)</b>									
<b>Basin Name</b>	<b>Commercial</b>	<b>Industrial</b>	<b>Institutional</b>	<b>Multifamily</b>	<b>Recreational</b>	<b>Right-of-Way</b>	<b>Single-Family</b>	<b>Wetlands</b>	<b>Basin Total</b>
Country Aire					1.2	13.4	31.2	30.5	76.2
Gateway Central	9.0	245.5				109.1		15.6	379.2
Gateway East		113.0				114.7	154.7	13.3	395.7
Gateway North	36.7	132.4				72.5	0.1	5.4	247.2
Gateway South	187.6	129.1		40.4	1.6	155.0	4.7	101.2	619.6
Interceptor Gravity 1	4.6		18.9		21.1	67.8	316.9	4.7	434.0
Interceptor Gravity 2	43.5	46.8	77.8	16.8	75.6	200.7	596.7	51.4	1109.3
Interceptor Gravity 3	75.3	257.7	2.9		17.3	226.4	192.5	128.9	900.9
Interceptor Gravity 4					0.1	68.8	160.5	8.3	237.8
Isabelle Farms						19.5	45.4	2.9	67.7
Landfill		279.9				37.5		44.1	361.5
Main Street Central	49.5	341.6	85.2	3.6	154.4	104.9	102.4	147.0	988.5
Main Street East	97.8	28.9	91.6	205.6	75.0	188.8	357.6	156.2	1201.7
Main Street West	48.7	0.0	5.9	0.5	2.6	64.9	96.4	61.4	280.4
Old Farm North	75.7		67.3	22.6	100.8	76.9	162.2	153.0	658.5
Old Farm South	21.2	3.4	17.0	1.6	12.9	206.6	603.7	193.0	1059.3
Pump Station 3	221.5	9.9	57.4	29.4	0.1	152.9	36.1	86.5	593.8
Pump Station 6	52.3	4.5	0.3	33.3	29.1	50.5	0.2	16.0	186.2
Pump Station 7	77.7	209.7	6.4		10.3	158.6	222.0	48.4	733.1
Wrenwood		0.7	0.0	0.0	2.2	96.3	223.9	109.7	432.9
<b>Total</b>	<b>1000.8</b>	<b>1803.2</b>	<b>430.7</b>	<b>353.9</b>	<b>504.4</b>	<b>2185.9</b>	<b>3307.1</b>	<b>1377.5</b>	<b>10963.5</b>

**Pump Station Tributary Area**

With the expansion of the Village of Germantown, the aggregate tributary for each pump station is inclusive of not only the immediate area tributary directly to the pump station, but also those areas upstream in other pump station basins that are tributary to more than one pump station. The acreages calculated include all land use types within the basin, including wetlands and ROW. The increase in tributary area includes areas within the existing SSSA that are currently unsewered as well as areas that will be amended into the expanded SSSA. The connection point to the MMSD contains all lands assumed to be included in the fully amended, fully developed SSSA. Summary of the changes to each pump station’s tributary area is calculated in Table 5.

*Table 5 Future Change in Pump Station Tributary Areas*

Existing Pump Station	Existing Aggregate Tributary Area (Ac)	Future Expanded SSSA Aggregate Tributary Area (Ac)	Future Richfield IPA Tributary Area (Ac)	Total Future Increase in Aggregate Tributary (Ac)	Percent Increase in Tributary Area
LS 3	292.3	593.8		301.5	103.1%
LS 6	438.3	780.0		341.7	78.0%
LS 7	486.0	733.1		247.1	50.8%
Wrenwood	157.4	432.9		275.5	175.0%
Main Street	2,461.1	4,180.0	665.4	2,384.3	96.9%
Old Farm	4,567.3	7,410.8	665.4	3,508.9	76.8%
Connection to MMSD	9,432.0	10,963.5	665.4	2,196.6	23.3%

A detailed analysis of the changes within each pump station's aggregate basins follows:

**Pump Station #3** - The area tributary to Pump Station #3 would increase approximately 301.5 acres to a total of 593.8 acres in a fully developed expanded SSSA. This area has substantial potential for development and expansion, with most of potential development already being within the existing SSSA, but not currently sewered. The incremental future land use in the tributary area is planned as a mixture of commercial, single-family residential, and multifamily residential development. This increase in area would subsequently be added to Pump Station #6.

**Pump Station #6** - The area tributary to Pump Station #6 would increase 341.7 acres to a total of 780 acres in a fully developed expanded SSSA. Most of this increase comes from the expansion of the area tributary to Pump Station #3. The tributary area for Pump Station #6 is largely fully developed and unlikely to undergo any significant future growth. The increase in tributary area to Pump Station #6 is primarily the area added to the Pump Station #3 tributary area that flows in aggregate through Pump Station #6. This increase in area would subsequently be added to the Old Farm Lift Station.

**Pump Station #7** - The area tributary to Pump Station #7 would increase 247.1 acres to a total of 733.1 acres in the fully developed expanded SSSA. The incremental increase in area tributary to Pump Station #7 is mostly developed and falls within the existing SSSA. The area contains unsewered areas of single-family residential homes and mobile homes that would become part of the tributary area to Pump Station #7 with a future sewer extension. This increase in area would subsequently be added to the Old Farm Pump Station.

**Main Street Pump Station** - The area tributary to the Main Street Pump Station would increase 2,384.3 acres to a total of 4,180 acres in the fully developed expanded SSSA and Richfield incremental planning area. This pumping station could see a substantial increase in flow from the future development of the Richfield planning area as well as large areas of Commercial and Residential development within the "Gateway" district in the northwestern portions of the expanded SSSA for the Village. This increase in area would subsequently be added to the Old Farm Pump Station.

**Old Farm Pump Station** - The area tributary to the Old Farm Pump Station would increase 3,508.9 acres to a total of 7,410.8 acres in the fully developed expanded SSSA and Richfield incremental planning area. While this pumping station's immediate tributary has a relatively small area with any potential development of single-family residential homes, most of the future flow to the Old Farm Pump Station will come in aggregate from Pump Stations 3, 6, 7, and Main Street.

Wrenwood Pump Station - The area tributary to the Wrenwood Pump Station would increase 275.5 acres to a total of 432.9 acres in the fully developed expanded SSSA. The incremental future land use in the tributary area is planned as predominately single-family residential development. The Wrenwood Pump Station ultimately contributes to gravity flow to the Village's interceptor, and currently does not accept flow from any basins other than its own.

## FLOW ANALYSIS OF UNSEWERED AREA IN EXISTING AND EXPANDED SSSA

### Flow Calculation Methodology

Flows calculated for the expanded Germantown SSSA are a blend of existing developed land uses as well as the additional development potential and associated future land use within the expanded SSSA. The entire expanded SSSA is assumed in a full-developed condition for the theoretical future flow conditions.

Theoretical flows are calculated for each analysis basin separately using the applicable occupancy and flow factors for each existing and future land use type and population within each basin. A spreadsheet method is utilized to calculate an average daily base flow, which is the total of flows within each land use category multiplied by their respective flow factor per acre or calculated population multiplied by gallons per capita. The average daily base flow is then multiplied by an applicable peaking factor to account for inflow and infiltration and calculate the peak hourly flow. Capacity analyses of sewers and pumping stations are made utilizing this peak hourly flow.

At the direction of Village Staff, a single point user was added into the calculated flow for the Gateway South Basin. This manufacturing operation consumes approximately 28 million gallons of water per year, so the associated sanitary wastewater flows equating to 53 GPM have been incorporated into the total calculated average base flow for the Gateway South Basin. At the time of this Facilities Plan, the Village does not have any other substantial single point users to be incorporated into the flow calculations.

Peaking factors for basins with mostly existing development have been determined using known flow data measured at each pump station and the MMSD metering station. The factors are calculated based on the largest increase in measured flow noted during multiple heavy rain events. Where no existing flow data is available, factors for basins which are mainly undeveloped were assigned a value of 2.50 based on the Wisconsin Administrative Code (range of 2.0-2.5) for municipalities with a population of 10,000 to 100,000.

Some exceptions to these determinations are the peaking factors for the Pump Station 3 Basin and the Wrenwood Basin. These basins currently have a very low dry weather flow, and therefore even a small amount of inflow and infiltration can cause an unusually high peaking factor. The Pump Station 3 basin in this case has a peaking factor of 6.38 determined by the R/M Lift Station Study. The Wrenwood Pump Station has a calculated peaking factor of 5.68 from recent flow metering data from the Village's SCADA system. Because both basins have the potential to develop to a size more than double the existing condition, some attenuation in the peaking factor can be expected. To provide a realistic estimate of future flow, a peaking factor of 3.50 was chosen for these basins.

Using the parameters as described to calculate generated theoretical future flows, Table 6 summarizes average flow, peaking factors, and theoretical peak-hour flow rate for each respective basin.

*Table 6 Summary of Future Sanitary Sewer Flows by Analysis Basin*

<b>Basin Name</b>	<b>Total Basin Area (Ac)</b>	<b>Net Flow Generation Area (Ac)</b>	<b>Applied Peaking Factor</b>	<b>Theoretical Peak-Hour Flow Rate Fully Developed (GPM)</b>	<b>Theoretical Peak-Hour Flow Rate - SSSA Fully Developed (CFS)</b>
Country Aire	76.2	31.1	2.50	28	0.06
Gateway Central	379.2	254.5	2.50	449	1.00
Gateway East	395.7	267.7	2.50	333	0.74
Gateway North	247.2	169.3	2.50	326	0.73
Gateway South	619.6	361.8	2.50	907	2.02
Interceptor Gravity 1	434.0	340.4	4.80	625	1.39
Interceptor Gravity 2	1,109.3	781.6	4.80	1,702	3.79
Interceptor Gravity 3	901.0	528.4	4.80	1,572	3.50
Interceptor Gravity 4	237.8	160.5	4.80	273	0.61
Isabelle Farms	67.7	45.4	2.50	40	0.09
Landfill	361.5	279.9	4.80	933	2.08
Main Street Central	988.5	582.2	2.80	1,083	2.41
Main Street East	1,201.7	781.5	2.80	1,266	2.82
Main Street West	280.4	151.5	2.80	250	0.56
Old Farm North	658.5	327.8	3.32	659	1.47
Old Farm South	1,059.3	646.9	3.32	834	1.86
Pump Station 3	593.8	354.3	3.50	1,086	2.42
Pump Station 6	186.2	90.6	3.75	302	0.67
Pump Station 7	733.1	515.8	3.52	1,090	2.43
Wrenwood	432.9	224.7	3.50	280	0.62
<b>Total</b>	<b>10,963.5</b>	<b>6895.8</b>		<b>14,036</b>	<b>31.27</b>

The theoretical peak-hour flow rate for the fully-developed future expanded Village of Germantown SSSA is 31.27 cubic feet per second (CFS). This equates to 20.21 MGD, which is below the MMSD's allowable peak hour flow rate of 22.27 MGD at the Village of Germantown's connection point to the MIS.

**VILLAGE OF RICHFIELD INCREMENTAL PLANNING AREA**

The area within the Village of Richfield that will be served by the Village of Germantown sanitary sewer system, the Richfield IPA, requires a more detailed analysis of the characteristics of the planning area. This area of Richfield has not been part of any other sanitary sewer planning area, whereas the entire Village of Germantown is within an existing planning area that has been previously analyzed by SEWRPC in the 1983 Planning Report.

The Richfield IPA is best described as all of Section 12 of Township 9 North, Range 19 East within the Village of Richfield, also including one individual parcel of land at the Northeast corner of Section 13 Township 9 North Range 19 East, also known as Tax Parcel #035000C. The individual parcel has been included within the IPA due to it being a probable location for sanitary sewer to enter the Village of Richfield. The pending amendment to the Germantown SSSA does not include the entire IPA at this point in time, however the entire IPA is being included in calculations and analysis in this Facilities Plan for simplicity of future expansion within the IPA in Richfield.

### Topography

The area of Richfield encompassed by the IPA has a variety of terrain and changing topographical features. In general, the land is rolling and hilly with slopes ranging from 2% to 20%. From Washington County's Geographical Information System (GIS) topographical data based on the NAVD 88 Datum, the lowest point within the IPA is at the very Northeast corner with an elevation of +/- 862.0. The highest elevation found within the IPA is +/- 1,018.0 located in the Southwest portion of the IPA near the eastern extent of Evergreen Court. The topography slopes from higher elevations in the west and south towards lower elevations in the east and north. There are multiple intermittent low and high glacial features of kettles and hills that may provide challenges when providing sewer service to the entire IPA. The topographical map included in Appendix G gives an overall view of the IPA in 5' contours.

### Soil Types

Soil types within the Richfield IPA are predominately within the Ozaukee, Hochheim, Lamartine, Mayville, Theresa, Ashkum, and Brookston series. These soils series generally classify as Silt Loam, Loam, and Silty Clay Loam which range widely from well-drained to poorly drained. With exception to drainageways and lowlands, most of the IPA is defined as well-drained or moderately well-drained. Seasonal perched water tables are consistently noted in the soils throughout the IPA. Soils of this nature are typically not conducive to in-ground (conventional) Private Onsite Wastewater Treatment Systems (POWTS), and typically would require construction of a Mound type POWTS or Holding Tank if adequate area is not available for a Mound type POWTS. Extension of sewer service in areas with such soil conditions provides greater opportunity for larger scale development. A complete map of the soil types in the Richfield IPA is included in Appendix H.

### Wetlands & Flooding Areas

Wetlands and floodways also play an important role in planning for sewer service in any area. The map included in Appendix I shows WDNR delineated wetlands within the Richfield IPA, as well floodways where a flood elevation has been determined by the WDNR. The IPA has few waterways and surface water. The rolling, hilly topography is fairly protected from flooding. At the far Northeast corner of the IPA, there is a drainageway that lies on the west side of Hwy 41. This drainageway is the only area noted as a floodway within the entire IPA. There are multiple scattered, relatively small areas of wetlands delineated in lowland areas and drainageways. These areas must be further investigated and considered during development and planning for sanitary sewer service.

### Transportation Corridors

One of the characteristics that makes the Richfield IPA desirable for large-scale development is its proximity to transportation corridors. The IPA is bordered on the east by US HWY 41, and on the south by STH 167. The intersection of US HWY 41 and STH 167 at the southeast corner of the IPA is an interchange providing easy access to both highways to and from the IPA. Other transportation corridors of note include STH 175 which generally bisects the IPA on an angle from southeast to northwest, and a railroad ROW owned by the State of Wisconsin running nearly in parallel with STH 175.

### Preliminary Environmental Screening

A preliminary environmental screening was conducted for the Richfield IPA. During the preliminary environmental screening, the following environmentally sensitive resources and assumptions were assessed:

- Presence of wetland and waterway features,
- Presence of 303d impaired waterways,
- Presence of areas of special natural resource interest,
- Documented wetland and waterway disturbance permits,

- Presence of Federal Emergency Management Agency (FEMA) floodplains, floodways, and flood fringe,
- Presence of WDNR Bureau of Remediation and Reclamation (BRR) Sites,
- Presence of Solid and Hazardous Waste Information System (SHWIMS) Sites,
- Presence of Shoreland Zoning,
- Presence of Planned or Existing County Trails,
- Presence of National Register of Historic Places,
- Presence of United States Department of Agriculture Drainage Districts, and
- Potential presence of Threatened and Endangered Species.

For wetlands and waterways, the WDNR Surface Water Data Viewer (SWDV) was accessed. Throughout the planning area, there are multiple wetland and waterway complexes. Wisconsin Wetland Inventory (WWI) listed wetlands include Emergent/wet meadow, Flats/unvegetated wet soil, Forested, and open water. The WWI also lists five unnamed waterways, three first order, and two second order waterways and three waterbodies. No features within the study area were identified as 303d impaired or are designated as an area of special natural resource interest.

The presence of FEMA designated floodplains, floodways and flood fringe were assessed for the study area. A study was conducted for the waterway in the northeast corner of the study area. The FEMA panels included in the study area are 55131C0264E effective 2/25/2022 and 55131C0268E effective 2/25/2022. Within panel 55131C0268E there are areas designated as Zone A and Zone AE.

The presence of shoreland zones were assessed for the study area. No known shoreland zones are provided by the Washington County GIS viewer. The Village of Germantown Code of Ordinance No. 24.04, defines the shoreland-wetland zoning district as all wetlands in the Village which are equal to or greater than 5 acres within 1,000 feet of the ordinary high-water mark (OHWM) of navigable lakes, ponds or flowages and within 300 feet of the OHWM of navigable rivers or streams, or the landward side of the floodplain, whichever distance is greater.

Using the National Register of Historic Places GIS viewer, the study area was assessed. There are no registered sites within the study area.

Using the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) Drainage Districts Interactive Map tool, the study area was assessed for presence of drainage districts. There are no drainage districts within the study area.

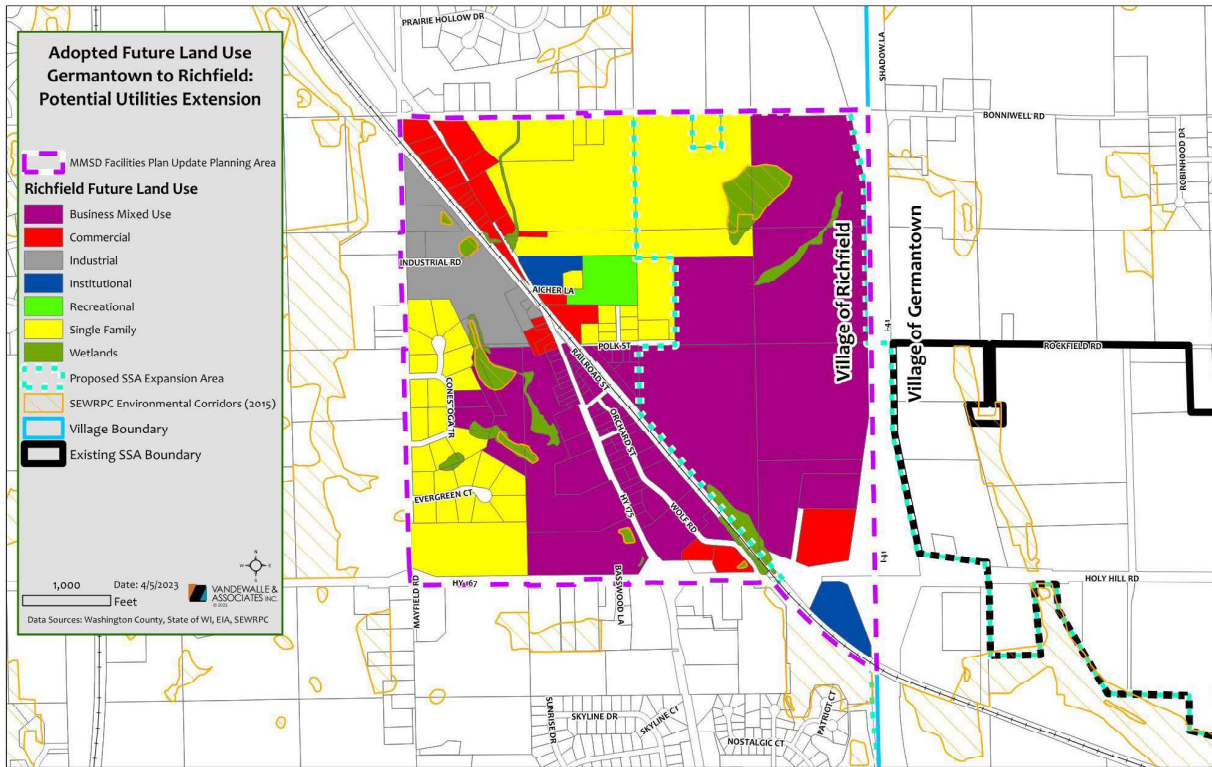
Using the Wisconsin Department Natural Resources Natural Heritage Inventory (NHI) Portal, the study area was assessed. Based on the assessment state endangered fish may be present within the study area. A preliminary Information for Planning and Consultation (IPaC) assessment was performed to identify potential habitat that may support federally threatened or endangered species. The IPaC results included the federally endangered northern long-eared bat, the proposed endangered tricolored bat, and the candidate endangered monarch butterfly. Further investigations will be needed to assess likelihood of presence, and potential impacts.

The complete Preliminary Environmental Screening report including referenced tables and listings can be found in Appendix J.

### [Land Use Analysis](#)

Similar to the future land use analysis for the Village of Germantown SSSA, the Village of Richfield IPA was also analyzed for future land use in a fully developed condition. In the case of the Richfield IPA, a future land use plan was available from SEWRPC, based on Richfield's 2033 Comprehensive Plan. The future land use for the Richfield IPA is shown in Figure 8 and included in Appendix K.

Figure 8 Richfield Incremental Planning Area Future Land Use Map



Source: Vandewalle & Associates, Inc. via SEWRPC

Table 7 breaks down the categories of assumed future land use conditions in the fully developed Richfield Incremental Planning Area.

Table 7 Richfield Incremental Planning Area Future Land Use by Category

Richfield IPA Fully-Developed Future Land Use (Acres)							
Commercial	Industrial	Institutional	Multifamily	Recreational	Transportation	Single-Family	Wetlands
255.5	26.1	9.1	N/A	8.8	199.6	138.1	28.2
<b>Total Expanded SSSA</b>				<b>665.4</b>			
<b>Net Flow Generation Area*</b>				<b>428.8</b>			

\*Excludes Recreational, Transportation, and Wetlands land use categories

\*Transportation area assumed at 30% of total land area

Population and Flow Calculation

For single-family residential land use, an average density factor of 1.0 dwelling unit / 3.0 acres is appropriate based on the desired density indicated by the Village of Richfield. Using the same occupancy factor of 2.50 as used in the Germantown calculations, we arrive at a population of 114. Likewise, the same flow factors are used for each non-residential land category as described for the flow calculations related to the Germantown Expanded SSSA.

For analysis purposes, the Richfield IPA is treated as its own basin to be incrementally added to the basins previously described for the Village of Germantown. As a stand-alone basin, the calculated flow from the Village of Richfield IPA is shown in Table 8 below:

*Table 8 Richfield Incremental Planning Basin Flow Summary*

Basin Name	Total Basin Area (Ac)	Net Flow Generation Area (Ac)	Applied Peaking Factor	Theoretical Peak-Hour Flow Rate Fully Developed (GPM)	Theoretical Peak-Hour Flow Rate - SSSA Fully Developed (CFS)
Richfield IPA	665.4	428.8	2.50	740	1.65

The theoretical peak-hour flow rate calculated in this report for the fully-developed future expanded Village of Germantown SSSA is 31.27 cubic feet per second (CFS). Adding the calculated peak-hour flow rate for the Richfield IPA, the total peak-hour flow rate at the Village of Germantown’s connection point to the MMSD’s MIS is 32.92 CFS, or 21.28 MGD. This flow rate is just below the MMSD’s allowable peak-hour flow of 22.27 MGD for the Village of Germantown. If development within the Village of Germantown and Richfield IPA is to progress in the manner set forth in this Facilities Plan, further coordination with the MMSD will be critical to preventing a hold on further development due to meeting or exceeding allowable flow allocations from the MMSD.

[Conceptual Sewerage System Serving Richfield IPA](#)

The Village of Richfield has undertaken planning and design of new sewerage facilities required to service the Richfield IPA. As a requirement of the IGA between Richfield and Germantown, the Village of Richfield must fund said planning and design. The design work led by the Village of Richfield is incorporated into this section of the Facilities Plan for efficiency.

Preliminary construction plans provided by Richfield show a feasible design for sanitary sewer extension to serve the Richfield IPA as well as the immediate Germantown SSSA amendment area. The 12-inch gravity sanitary sewer extension connects to the existing Germantown sanitary sewer system at the intersection of Goldendale Road and Freistadt Road, just upstream of Pour Point #2 analyzed within this report. The proposed gravity sewer runs generally west along Freistadt Road and then north and west through existing undeveloped lands until the gravity portion of the extension terminates at the Wisconsin & Southern Railroad ROW. This point will be the discharge point for a 6-inch force main which continues northwest following the Wisconsin & Southern Railroad ROW. The force main crosses underneath U.S. Highway 41 into the Richfield IPA and turns north to follow Richfield Parkway. The 6-inch force main will terminate at the location of a future pumping station within the Village of Richfield which will convey all sanitary sewer flows generated within the Richfield IPA. Figure 9 depicts the preliminary layout of the sanitary sewer extension. The full preliminary plans are included in Appendix L.

Figure 9 Preliminary Route of Sewer and Water Extensions to Serve the Richfield SSSA



Source: Cedar Corporation Preliminary Plans dated September 26<sup>th</sup>, 2023

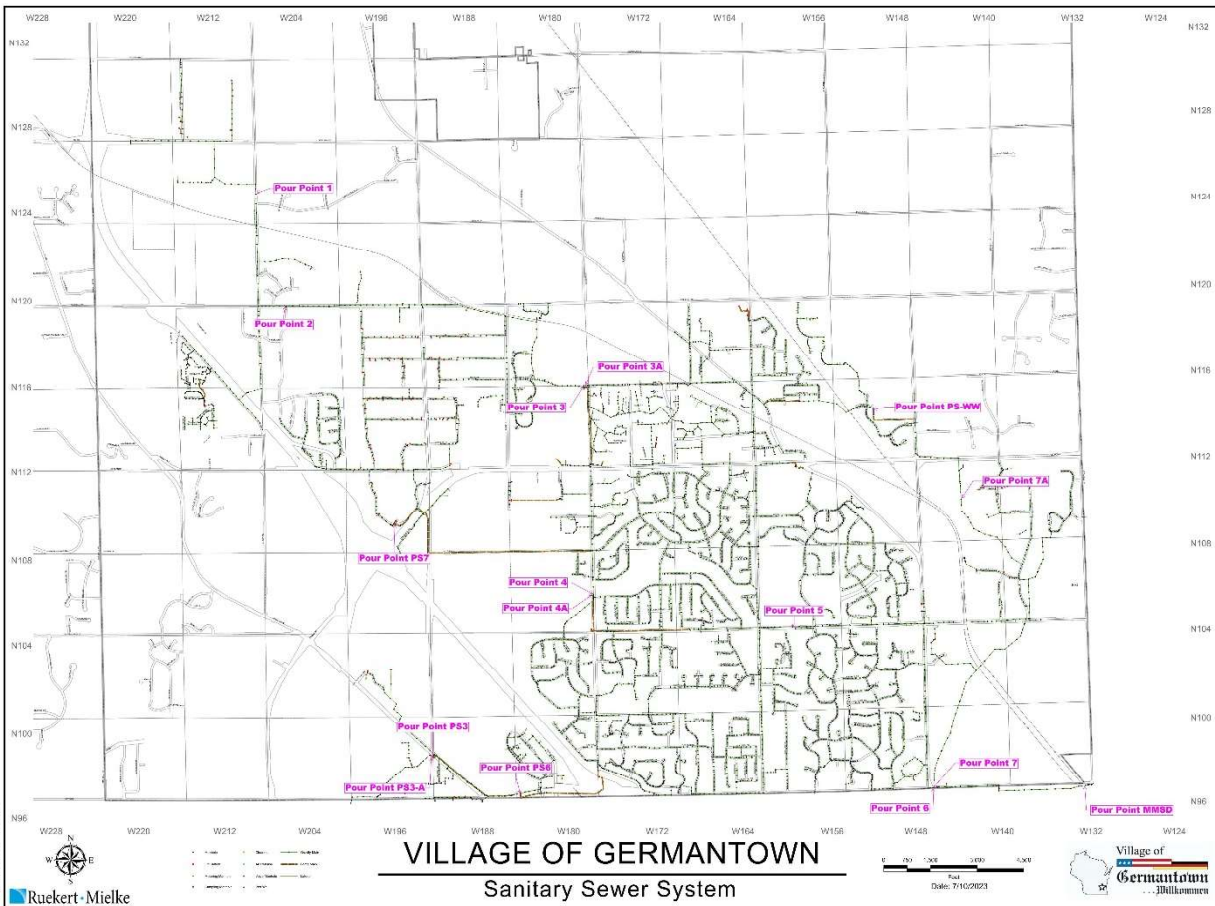
The Richfield IPA will be primarily served by gravity sewers that will flow to a common pumping station, ultimately pumping wastewater via connection to the 6-inch force main installed as part of the Richfield-Germantown Connection project as shown in the included Preliminary Plans. Per the IGA between Germantown and Richfield, the cost of installation of the Germantown Connection sewer and water infrastructure will be paid by the Village of Richfield. The Opinion of Probable Project Cost dated September 27<sup>th</sup>, 2023 is approximately \$5,186,000 in today's dollars for the sanitary sewer portion of the extension to Richfield. The project cost estimate document has been included in Appendix M.

The Richfield-Germantown Connection sanitary sewer extension project will not only allow the Village of Richfield to connect to sanitary sewer service, but also an area of the Village of Germantown that is currently undeveloped. The proposed sewer and water extension infrastructure will have a substantial positive impact on development of the Holy Hill Gateway Corridor for both Villages by facilitating development that would otherwise not be possible without sanitary sewer service available.

OVERALL FLOW AND CAPACITY ANALYSIS

With the expanded SSSA broken into the defined basins, tributary areas to each pump station as well as specific points within the sanitary sewer system can be analyzed with respect to current and future theoretical flows. Existing flow data was collected through the Village’s SCADA system at each pumping station as well as the metering station just upstream of the connection point to the MMSD. These points were used as analysis or “pour” points for theoretical future flow calculations, as well as other strategic points within the Village’s gravity sanitary sewer system. The pour points were chosen based on configuration of sewers, location of pumping stations, and contributory basin delineations. Typically, these points consist of an existing manhole or an existing pumping station. At pumping stations that receive flow from more than one nearby contributory sewer, multiple pour points are utilized to accurately calculate capacity in each contributory sewer. Figure 10 shows a map of the Village’s sanitary sewer system with the pour points identified for use in analysis and comparison throughout the system. The map has also been included in Appendix N.

Figure 10 Sanitary Sewer System Map with Flow Analysis Points



In prior steps, theoretical flows were calculated for each analysis basin independently. The individual theoretical flow from each basin can be added to calculate a combined theoretical flow for each “pour” point identified in Figure 10. The calculated theoretical future flow at each pour point can then be compared to sewer and lift station capacities to identify the need for upgrades or improvements to handle development growth within the planning period.

Gravity Sewers

Analysis of the existing capacity of the gravity sanitary sewer system is critical to determine future needs for upsizing of sewers, relief sewers, or other capacity improvements required to serve future planned development. With the Village of Germantown having a single connection discharge point to the MMSD, the analysis is equally important to determine the adequacy of the MMSD’s sanitary sewer infrastructure to handle future predicted peak flows originating from Germantown.

At each pour point, a sanitary sewer pipe capacity assessment is made using data derived from the Village of Germantown’s GIS as well as as-built information from available construction plans. The capacity is calculated at a point just upstream of the pour point. The following criteria have been assumed for existing sewer capacity calculations:

- “Full” capacity assumes pipe flow of 2/3 full.
- Mannings “N” Value: Concrete Pipe – 0.013, PVC Pipe – 0.011, CIPP Liner - 0.011.
- Length and diameter – From Village GIS.
- Invert Elevations – From GIS or available as-built plans, unknown inverts were assumed to have like slope of adjacent comparable sewers.
- Slope – From actual or assumed inverts.

Capacity is then calculated using the Manning Equation, and the average is taken for 2 or 3 pipe segments upstream of the pour point dependent upon the configuration of the sewers upstream of the pour point. Engineering judgement is used to eliminate anomalies in averaging and take a conservative approach. Any pipe segment having a considerably higher capacity in comparison to an adjacent segment was eliminated from the average. Table 9 below summarizes the existing sewer capacity available and analyzes future capacity using the theoretical flow for the fully developed expanded Germantown SSSA and Richfield IPA.

*Table 9 Gravity Sanitary Sewer Hydraulic Capacity Analysis*

Pour Point	Theoretical Peak-Hour Flow Rate - Germantown Expanded SSSA (cfs)	Estimated Capacity - Avg. of Applicable Spans (cfs) (2/3 full)	Theoretical Peak-Hour Flow Rate from Richfield Planning Area (cfs)	Theoretical Peak-Hour Flow Rate Including Richfield Planning Area (cfs)	Estimated Remaining Capacity (cfs)	% Remaining Capacity (to 2/3 full)
PS-3	0.80	4.45		0.80	3.65	82.0%
PS-3A	1.62	7.64		1.62	6.02	78.8%
PS-6	3.09	9.23		3.09	6.14	66.5%
PS-7	2.43	5.31		2.43	2.88	54.3%
PS-WW	0.62	2.52		0.62	1.90	75.3%
1	2.56	3.77		2.56	1.21	32.1%
2	5.14	8.33	1.65	6.79	1.54	18.5%
3	7.55	24.75	1.65	9.20	15.55	62.8%
3A	2.82	3.79		2.82	0.97	25.5%
4	14.26	27.62	1.65	15.91	11.70	42.4%
4A	4.95	44.61		4.95	39.66	88.9%
5	20.61	45.15	1.65	22.25	22.90	50.7%
6	24.40	65.49	1.65	26.05	39.44	60.2%
7	4.80	23.02		4.80	18.23	79.2%
7A	1.29	29.69		1.29	28.39	95.6%
MMSD	31.27	63.37	1.65	32.92	30.44	48.0%

Overall, Germantown’s sanitary sewer system appears to be adequate to serve the future fully developed and expanded Sanitary Sewer Service Area within the 20-year design period of this plan. Typically, maximum sanitary sewer capacity is based on a 2/3 full flow depth. In Table 9, the remaining capacity is shown as a percentage of two-thirds full flow. In the case of Germantown’s sanitary sewer system, none of the existing sanitary sewers are at or above the 2/3 full flow threshold during the theoretical peak-hour flow as calculated based on future land uses and peaking factors in Table 6. Of note, however, are pour points 1, 2, and 3A which are near enough to the threshold to warrant closer future study as development continues in the Village. Any substantial deviations from the land uses, densities, or SSSA used for flow and capacity calculations herein could impact sewers at these locations and render their capacity inadequate.

Pumping Stations

Like the sanitary sewer pipe capacity analysis, an analysis of the existing pumping stations is equally critical to determine the need for future capacity upgrades. Using the theoretical flows calculated for each Basin in Table 6, we can aggregate the flow from each basin that is tributary to a particular pumping station. Table 10 calculates the total flow to each lift station by summing the individual basin flows tributary to the respective lift station. This method allows a clear picture of which basins flow to any individual lift station, including wastewater that is conveyed by more than one pumping station.

*Table 10 Pumping Station Aggregate Peak Hour Theoretical Future Flow (GPM)*

Analysis Basin Name	Pumping Station (Flow in GPM)					
	PS-3	PS-6	PS-7	PS-WW	Main St	Old Farm
Gateway Central					449	449
Gateway East					333	333
Gateway North					326	326
Gateway South					907	907
Isabelle Farms					40	40
Main Street Central					1,083	1,083
Main Street East					1,266	1,266
Main Street West					250	250
Old Farm North						659
Old Farm South						834
Pump Station 3	1,086	1,086				1,086
Pump Station 6		302				302
Pump Station 7			1,090			1,090
Wrenwood				280		
Total Aggregate	1,086	1,388	1,090	280	4,654	8,624

The analysis basins that do not contribute flow to any existing pumping station have been omitted from Table 10. Flow from the Richfield IPA is also omitted in this calculation and will be added incrementally to the further capacity analysis. The summation for “Total Aggregate” is the theoretical peak-hour flow at each pumping station. This peak-hour flow is used in Table 12 as the basis for pumping station capacity analysis. Table 11 adds the Richfield IPA theoretical flow incrementally and then compares future theoretical flow to the existing pumping station capacities.

*Table 11 Sanitary Sewer Pumping Station Capacity Analysis*

Existing Pump Station	Theoretical Peak-Hour Flow Rate into Pump Station - Germantown Expanded SSSA (GPM)	Existing Maximum Capacity of Pump Station (GPM)	Theoretical Peak-Hour Flow Rate from Richfield Planning Area (GPM)	Theoretical Peak-Hour Flow Rate Including Richfield Planning Area (GPM)	Estimated Remaining Capacity (GPM)	% Capacity Utilized
PS-3	1,086	310		1,086	-776	350.3%
PS-6	1,388	950		1,388	-438	146.1%
PS-7	1,090	1,300		1,090	210	83.8%
Wrenwood	280	410		280	130	68.2%
Main Street	4,654	6,250	740	5,394	856	86.3%
Old Farm	8,624	7,400	740	9,364	-1,964	126.5%

At the 20-year design period, assuming a fully developed condition in the existing and expanded SSSA including the Richfield IPA, the Village’s pumping stations will very likely need major upgrades to provide adequate capacity for the predicted development. The typical threshold for action is at 80% of existing capacity utilized for a pump station. At the 80% threshold, a plan should be put in motion for upgrades to existing pump stations, new pump stations, or relief sewers to increase pump station capacities or reduce the amount of flow into the pump station.

In the Village of Germantown, the theoretical peak-hour flow for the future fully developed condition predicts all but one of the existing pump stations to exceed the 80% threshold. PS-3, PS-6, and Old Farm pump stations far exceed 100% of their existing capacity, indicating that the Village needs a plan in place for major upgrades or additions to the pumping station infrastructure to accommodate future development. These upgrades and additions are detailed in the alternatives analysis portion of this report.

[ALTERNATIVES ANALYSIS](#)

After analyzing the sanitary system flow and capacity in both gravity sanitary sewers and pump stations, a high-level analysis can be conducted for various options to improve capacity in areas of need to accommodate future development within the expanded SSSA and Richfield IPA.

[Existing Gravity Sanitary Sewer System](#)

Overall, the Village of Germantown’s existing gravity sanitary system has adequate capacity to support future development as theorized in this Facilities Plan. Significant variations from the assumed future land use, population, and SSSA used for calculations in this study may require more in-depth analysis to determine impacts to the capacity needs of the sanitary sewer system. In addition, any new single point users consuming significant capacity will need to be accounted for in addition to the results shown in this Facilities Plan. Because the existing gravity sanitary sewers can adequately support future growth in the Village of Germantown, no analysis of alternatives for relay or relief sewers has been completed within this study.

[Existing Pump Stations](#)

As mentioned in the flow and capacity analysis section of this report, there appears to be a substantial future weak point in the Village’s existing pump stations with respect to future capacity needs. Having a plan in place to reconstruct or upgrade these pump stations is critical to keeping the overall sanitary sewer system on pace with the anticipated future development in the Village and in Richfield. Alternatives presented in this Facilities Plan have been analyzed for feasibility and favorability factors at a high level.

As the Village continues to pursue these alternatives, more in-depth design and study will be needed to thoroughly detail and choose the most favorable alternatives.

Future capacity need for each pump station is sized based on setting the 80% threshold at the theoretical peak hour flow. This provides a 20% buffer of utilized capacity versus maximum capacity.

Pump Stations #3 & #6 – Alternative A (PS 3) – Upgrade of PS #3 from an existing capacity of 310 GPM to a future capacity need of 1,086 GPM would require two new 1,086 GPM pumps, new station discharge piping, new valves, a new standby generator and new controls with pump motor variable frequency drives (VFDs), and replacement of the existing 6” force main with approximately 3,200 LF of new 10” force main. It is assumed that a new building would be required for the generator, controls, and valves. It is assumed the existing wet well could accommodate the proposed upgrades with the incorporation of pump motor VFDs.

Alternative A (PS 6) – Upgrade of PS #6 from an existing capacity of 950 GPM to a future capacity need of 1,388 GPM would need to be done in tandem with upgrades to PS #3, as PS #6 is immediately downstream of the discharge point for PS #3. The existing 10” force main for PS #6 can accommodate a maximum capacity of 1,500 GPM. Upgrades to PS #6 would require two new 1,388 GPM submersible pumps, new station discharge piping, new valves, a new standby generator, and new controls with pump motor variable frequency drives. The station is a dry well/wet well station with the dry well consisting of a buried steel chamber housing the suction and discharge piping, valves, fittings, pumps, electrical components, and controls. The chamber is crowded and there is not space for larger piping, valves, and pumps. It is assumed that the station would be converted to a submersible style. It is assumed the existing wet well could accommodate the proposed upgrades with the incorporation of pump motor VFDs. A new building would be required for the generator, controls, and valves.

PS #6 is located on a relatively small parcel of land near the Menomonee River, so expansion of the station with the upgrades described may not be a viable alternative.

Alternative B (PS 3/6) – A more favorable alternative to the Village may be consolidation of PS #3 and #6 into one single pumping station. The proximity to one another creates an ideal opportunity to consolidate the two stations into one. In this alternative, land acquisition would likely be necessary to construct a new pumping station to replace existing PS #6. The Village has discussed utilizing the vacant commercial property just to the west of PS #6 for this purpose. A new pumping station of approximately 1,500 GPM capacity with submersible pumps, backup generator and control building, and valve building would be constructed in the vicinity of the existing PS #6. The existing 10” force main could be extended to the new pump station location and reused.

Elimination of PS #3 would then be possible by installation of approximately 3,400 LF of 18” sanitary sewer from the new pump station location along the path of existing 8” sanitary sewer west on County Line Road and then northwest along Appleton Avenue to connect to an existing 18” sanitary sewer that flows into PS #3. The new sewer installation would range in depth from 15-feet to 25-feet.

While the complexity and expense of this alternative may be greater than other alternatives for PS #3 and PS #6, there is considerable value in eliminating ongoing maintenance and operating costs with consolidation of the two pumping stations to one new reliable station.

Pump Station #7 – Alternative A (PS 7) – At the future theoretical peak-hour flow of 1,090 GPM, PS #7 will still be under its maximum capacity of 1,300 GPM. The predicted future utilized capacity is just over the 80% threshold at 83.8%. As development of the tributary basin for PS #7 happens, detailed data should be collected and monitored to see if peak-hour flow rates begin to approach the 80% threshold. As land uses, developments, and consumers may change from the predicted conditions, the peak-hour flow may or may not ever reach a threshold critical for upgrades. If PS #7 needed to be upgraded, it is feasible to expand the capacity to 1,750 GPM using the existing 12” force main and upgrading the three existing submersible pumps to 875 GPM each. A detailed analysis would have to be done to determine if the

existing 125kW standby generator would have to be replaced. For the purpose of this study, it is assumed the generator would not have to be replaced.

A secondary alternative for PS #7 has not been analyzed as this alternative is very likely to be the preferred alternative in this scenario.

Main Street Pumping Station – The Main Street Pumping Station is a major part of the sanitary sewer infrastructure in the Village. This pumping station is expected to convey approximately 40% of the Village's peak-hour flow in the future fully developed land use condition. At the future theoretical peak-hour flow of 5,394 GPM, the Main Street PS will still be under its existing maximum capacity of 6,250 GPM. It should be noted that the existing maximum capacity of 6,250 GPM creates a velocity greater than 6 feet per second in the existing 16-inch force main. Velocities greater than 6 feet per second can cause undesirable pressure transients in the force main and ultimately lead to catastrophic failure. A detailed pressure transient analysis is recommended for any peak flow at the Main Street PS more than 4,100 GPM.

The predicted future utilized capacity is over the 80% threshold, however, at 86.3%. This utilized capacity is based on the maximum capacity of 6,250 GPM. If the velocity limitation is used as the governing factor, the Main Street PS is 31.5% over the 4,100 GPM capacity determined in the prior R/M Lift Station Study report. This is cause for concern as a large portion of the tributary area to the Main Street PS is yet to be developed, so any deviations to the predicted land use, developments, and consumers could easily have an adverse impact on available capacity.

Alternative A(MS) – To increase the available capacity at the Main Street PS, velocities in the existing 16-inch force main would need to exceed the recommended 6 feet per second threshold. Installation of a new larger force main or a parallel force main would be needed to reduce total dynamic head (TDH) and maintain acceptable velocities in the force main.

To increase the capacity to meet future demand, approximately 2,650 LF of new parallel 14-inch force main could be installed along the path of the existing 16-inch force main. The reduction in TDH would provide adequate capacity for peak-flow events. The parallel force main would also provide redundancy in the event of maintenance or repairs on one of the two parallel lines. If this alternative were chosen, it would also be recommended to assess the structural condition of the existing 16-inch force main due to its age of approximately 37 years.

In conjunction with the installation of the new parallel force main, the existing force main could be rehabilitated with Cured-In-Place Pipe to extend its lifespan without the cost of full replacement. This alternative would likely be feasible without major upgrades to the wet well, pumps, generator, and controls unless otherwise desired by the Village. There would be miscellaneous upgrades to the station required to update the HVAC, plumbing, and to replace the bridge crane.

Alternative B(MS) – For comparative purposes, the Village could potentially replace the Main Street PS with a new PS with a capacity of approximately 5,400 GPM. While this would bear greater cost and complexity, it is a viable alternative given the availability of open space in the vicinity of the existing Main Street PS. A new pumping station would still require a new, larger force main, or similar parallel arrangement as described in Alternative A.

Old Farm Pumping Station – The Old Farm Pumping Station is the largest pumping station within the Village's sanitary sewer system. This pumping station is expected to convey approximately 67% of the Village's peak-hour flow in the future fully developed land use condition. The future theoretical peak-hour flow of 9,364 GPM will exceed Old Farm's maximum capacity of 7,400 GPM by 26.5%. It should be noted that the existing maximum capacity of 7,400 GPM creates a velocity greater than 6 feet per second in the existing 20-inch force main. Velocities greater than 6 feet per second can cause undesirable pressure transients in the force main and ultimately lead to catastrophic failure. A detailed pressure transient analysis is recommended for any peak flow at the Old Farm PS more than 6,300 GPM.

Alternative A (OF) – To increase the available capacity at the Old Farm PS, velocities in the existing 20-inch force main would need to exceed the recommended 6 feet per second threshold. Installation of a new larger force main or a parallel force main would be needed to reduce total dynamic head (TDH) and maintain acceptable velocities in both force mains while increasing the capacity to meet demand.

Approximately 4,400 LF of new parallel 16-inch force main could be installed along the path of the existing 20-inch force main. The parallel force main would also provide redundancy in the event of maintenance or repairs on one of the two parallel lines. If this alternative were chosen, it would also be recommended to assess the structural condition of the existing 20-inch force main due to its age of approximately 37 years. In conjunction with the installation of the new parallel force main, the existing force main could be rehabilitated with Cured-In-Place Pipe to extend its lifespan without the cost of full replacement.

In addition to a parallel force main, this alternative may require upgrades to the pumping station itself including three larger pumps and motors, larger suction piping, and a larger generator. Other miscellaneous upgrades to the station would be required to upgrade the HVAC, plumbing, and to replace the bridge crane. A detailed investigation would be needed to determine the feasibility of installing these upgrades within the existing building configuration. It is assumed that the existing wet well could be reused with the use of pump motor VFDs. This would have to be confirmed with a detailed analysis.

Alternative B (OF) – For comparative purposes, the Village could potentially replace the Old Farm PS with a new PS with a capacity of approximately 9,400 GPM. This alternative would be the most expensive option by far, but it is a viable alternative given the availability of open space in the vicinity of the existing Old Farm PS. A new pumping station would still require a new, larger force main, or similar parallel arrangement as described in Alternative A.

### Sanitary Sewer System Extensions & Expansion

For unsewered areas within the existing SSSA and areas to be added in the full SSSA amendment, sanitary sewer extensions will be required to offer sanitary sewer service to development within those areas. A preliminary general route and design has been analyzed for each of these areas based on each Analysis Basin used for flow calculation in earlier steps. The analysis determines where any new pumping stations may need to be constructed as well as the general route and feasibility of construction for sewers anticipated to be 12 inches in diameter or greater. Unsewered areas in the existing and expanded SSSA anticipated to be served by sewers less than 12 inches in diameter have not been analyzed for construction feasibility or costs for new sewers within this report. Unsewered or expanded basins anticipated to require a new pumping station to be served in the future have been analyzed at a high level for general placement and size of the pumping station.

Appendices O and P show layouts, locations, and general design of sewer extensions and pump stations in various basins as detailed below:

Country Aire Basin – A new pumping station would likely be needed to expand sanitary sewer service to this undeveloped basin. Topography limits the extension of gravity sewers into this basin, so a pumping station could be installed near the local low point within the basin on Country Aire Drive approximately 1,000 feet south of Freistadt Road. The pumping station would need a maximum capacity of approximately 30 GPM and would discharge through 2,100 LF of 4-inch force main to the south on Country Aire Drive. These proposed improvements are shown in Appendix O. With low predicted flow in this basin, the Village could also explore the option of publicly or privately owned individual grinder pumps and low-pressure sewers for properties developed within the basin.

Wrenwood Basin – This basin is partially developed and served by the Wrenwood PS. The portion of this basin that is currently undeveloped can be served by the existing Wrenwood PS with extended sanitary trunk sewers. Extension of approximately 2,300 LF of 12-inch diameter sanitary sewer, varying in depth from 12 to 29 feet, from the existing Wrenwood PS to the north could serve the future development within this basin. These proposed improvements are shown in Appendix O.

Interceptor Gravity 4 Basin – This basin is mostly developed with the majority being low-density residential homes currently served by septic systems. Extension of approximately 4,000 LF of 12-inch diameter sanitary sewer, varying in depth from 15 to 40 feet, could serve the entire basin and allow for future SSSA expansion to areas north of the basin. A 24-inch interceptor installed in 2019 offers a connection point on Mequon Road which would ultimately flow by gravity to the Village’s 48-inch interceptor sewer. These proposed improvements are shown in Appendix O.

Gateway North Basin – A new pumping station would likely be needed to expand sanitary sewer service into this undeveloped basin. Topography limits the extension of gravity sewers in this area, so a pumping station could be constructed at the far northwest corner of the basin. The pumping station would need a maximum capacity of approximately 350 GPM and would discharge through 1,600 LF of 6-inch force main to the south and east on Rockfield Road. From the discharge point of the 6-inch force main, 1,400 LF of 12-inch gravity sewer would need to be constructed in Rockfield Road to a connection point to the east at Gateway crossing. In addition, approximately 6,500 LF of 12-inch trunk sanitary sewer, varying in depth from 10 to 27 feet, would be installed from the new pumping station to the east along the northern border of the basin to serve the development within. These proposed improvements are shown in Appendix P.

Gateway East Basin – This undeveloped basin can utilize existing sanitary sewers in Goldendale Road to serve future development primarily by gravity. Serving this basin would include construction of approximately 1,300 LF of 15-inch and 8,700 LF of 12” trunk sanitary sewer, varying in depth from 16’ to 30’ starting at the connection point in Goldendale Road and routing two branches to the north and east. It may be possible to reduce the sewer depth in certain areas depending upon the configuration of future developments. These proposed improvements are shown in Appendix P.

Isabelle Farms Basin – This basin has some low-density residential development currently served by septic systems, as well as some undeveloped areas. A new pumping station would likely be needed to expand sanitary sewer service to this basin. Topography limits the extension of gravity sewers into this basin, so a pumping station could be installed near the local low point within the basin on Maple Road approximately 1,200 feet south of Holy Hill Road. The pumping station would need a maximum capacity of approximately 40 GPM and would discharge through 3,000 LF of 4-inch force main to gravity sewers constructed within the Gateway East Basin. These proposed improvements are shown in Appendix O. With low predicted flow in this basin, the Village could also explore the option of publicly or privately owned individual grinder pumps and low-pressure sewers for properties developed within the basin.

### Cost Analysis for Alternatives

After determining viable needed upgrades and extensions to serve future demands, estimated costs associated with the alternatives for improvements to existing Village sanitary sewer infrastructure are summarized in Table 12. Estimated costs for extensions and new infrastructure to support future development are summarized in Table 13. These costs are presented in today’s dollars using the cost estimating methodology described previously within this report. These estimates include a 30% engineering and contingency to account for modest price increases, engineering design, and engineering construction administration. The estimates do not account for land acquisition costs, environmental remediation, or ancillary utility relocations.

*Table 12 Cost Estimate for Potential Improvements to Existing Infrastructure*

Alternative	Improvement	Unit	Quantity	Unit Price	Cost
<b>Pump Stations #3 and #6</b>					
A (PS 3)	Replacement station with new 1,086 gpm pumps, piping, new generator, valves, electrical and controls.	EA	1	\$900,000	\$900,000
	New 10" Force Main	LF	3,200	\$265	\$848,000
A (PS 6)	Replacement station with new 1,388 gpm pumps, piping, generator, valves, electrical and controls all inside new building.	EA	1	\$1,820,000	\$1,820,000
<b>Alternative A Total</b>					<b>\$3,568,000</b>
B (PS 3/6)	Full Reconstruction of PS #6	LS	1	\$1,950,000	\$1,950,000
	18" Sanitary Sewer to Eliminate PS #3	LF	3,400	\$900	\$3,060,000
<b>Alternative B Total</b>					<b>\$5,010,000</b>
<b>Pump Station #7</b>					
A (PS 7)	875 GPM Submersible Pump Upgrade	EA	3	\$45,000	\$135,000
<b>Alternative A Total</b>					<b>\$135,000</b>
<b>Main Street Pump Station</b>					
A (MS)	Addition of Parallel 14" Force Main	LF	2,650	\$410	\$1,086,500
	CIPP Rehabilitation of 16" Force Main	LF	2,650	\$200	\$530,000
	Miscellaneous Upgrades to MS PS	LS	1	\$500,000	\$500,000
<b>Alternative A Total</b>					<b>\$2,116,500</b>
B (MS)	Full Reconstruction of MS PS	LS	1	\$6,100,000	\$6,100,000
	Addition of Parallel 14" Force Main	LF	2,650	\$420	\$1,113,000
	CIPP Rehabilitation of 16" Force Main	LF	2,650	\$200	\$530,000
<b>Alternative B Total</b>					<b>\$7,743,000</b>
<b>Old Farm Pump Station</b>					
A (MS)	Addition of Parallel 16" Force Main	LF	4,400	\$440	\$1,936,000
	CIPP Rehabilitation of 20" Force Main	LF	4,400	\$250	\$1,100,000
	Pump and Motor Upgrade	EA	3	\$110,000	\$330,000
	Generator Upgrade	LS	1	\$450,000	\$450,000
	Suction Piping Upgrade	LS	1	\$150,000	\$150,000
	Miscellaneous Upgrades to OF PS	LS	1	\$500,000	\$500,000
<b>Alternative A Total</b>					<b>\$4,466,000</b>
B (MS)	Full Reconstruction of OF PS	LS	1	\$8,060,000	\$8,060,000
	Addition of Parallel 16" Force Main	LF	4,400	\$440	\$1,936,000
	CIPP Rehabilitation of 20" Force Main	LF	4,400	\$250	\$1,100,000
<b>Alternative B Total</b>					<b>\$11,096,000</b>

*Table 13 Cost Estimate for Potential New Infrastructure for Future Development*

	Improvement	Unit	Quantity	Unit Price	Cost
<b>Country Aire Basin</b>					
	200 GPM Pumping Station	LS	1	\$750,000	\$750,000
	4" Force Main	LF	2,100	\$120	\$252,000
<b>Country Aire Basin Total</b>					<b>\$1,002,000</b>
<b>Wrenwood Basin</b>					
	12" Sanitary Sewer, 12'-29' depth	LF	2,300	\$650	\$1,495,000
<b>Wrenwood Basin Total</b>					<b>\$1,495,000</b>
<b>Interceptor Gravity 4 Basin</b>					
	12" Sanitary Sewer, 12'-40' depth	LF	4,000	\$800	\$3,200,000
<b>Interceptor Gravity 4 Basin Total</b>					<b>\$3,200,000</b>
<b>Gateway North Basin</b>					
	350 GPM Pumping Station	LS	1	\$925,000	\$925,000
	6" Force Main	LF	1,600	\$150	\$240,000
	12" Sanitary Sewer - Rockfield Road	LF	1,400	\$400	\$560,000
	12" Sanitary Sewer - 10'-27' depth	LF	6,500	\$650	\$4,225,000
<b>Gateway North Basin Total</b>					<b>\$5,950,000</b>
<b>Gateway East Basin</b>					
	15" Sanitary Sewer - 20' depth	LF	1,300	\$700	\$910,000
	12" Sanitary Sewer - 16'-30' depth	LF	8,700	\$650	\$5,655,000
<b>Gateway North Basin Total</b>					<b>\$6,565,000</b>
<b>Isabelle Farms Basin</b>					
	200 GPM Pumping Station	LS	1	\$750,000	\$750,000
	4" Force Main	LF	3,000	\$120	\$360,000
<b>Isabelle Farms Basin Total</b>					<b>\$1,110,000</b>

**SUMMARY OF ALTERNATIVES AND IMPLEMENTATION**

Through the data collection and analysis in this Facilities Plan, the Village of Germantown's future sanitary sewer infrastructure needs have been identified in detail, as well as feasible alternatives to meet these needs. With the addition of the Richfield IPA to Germantown's existing SSSA and subsequent development in those areas, the needs associated with the Germantown/Richfield connection are most critical in the near term.

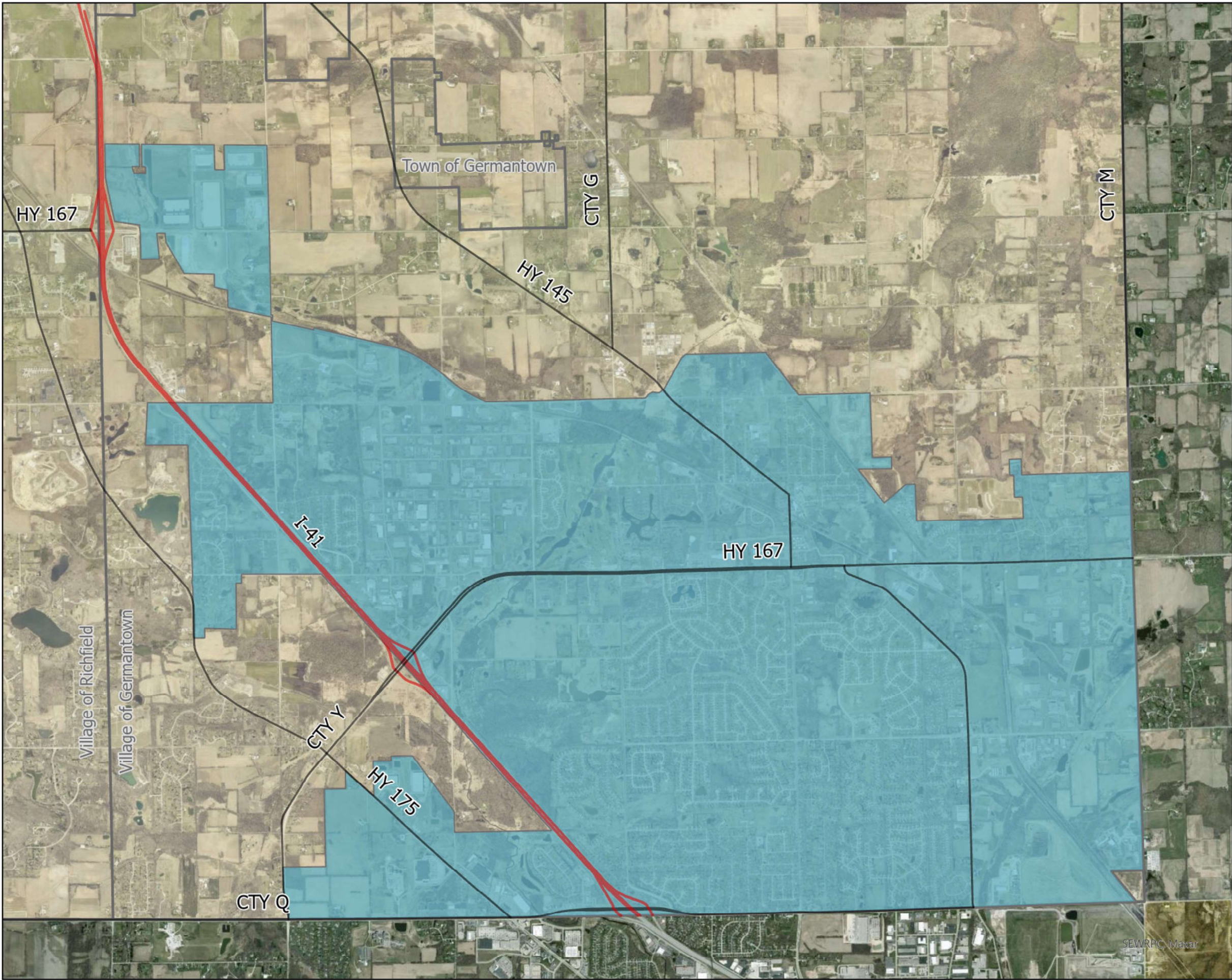
The most critical of these needs appear to be within the Village's two main pump stations, Main Street and Old Farm. With the bulk of near-term development likely within basins tributary to these two pump stations, measures should be taken as soon as possible to investigate the alternatives in detail so that plans for construction of upgrades and new facilities can take place well in advance of capacity issues. As development continues coincident with planning, design, and construction for capacity upgrades, the Main Street and Old Farm pump stations can be ready for increased capacity before reaching a critical point.

Pump stations #3, #6, and #7 are less critical for immediate analysis and planning, as their tributary basins are less likely to see considerable development in the near-term basis. In these basins, the Village can monitor the future potential for development and institute measures for detailed investigation of capacity upgrades as development proceeds.

The needs for new infrastructure in unsewered areas can be further assessed as proposals for development within those basins are brought to the Village. The new infrastructure in the unsewered basins identified in the alternatives analysis is not critical to development in the Village at this time.

The costs associated with construction of new sanitary sewers to connect Richfield are to be paid by Richfield per the IGA between the two municipalities. Costs associated with upgrades or capacity expansion of Germantown's existing sanitary sewer infrastructure will be the responsibility of Germantown. For improvements to existing infrastructure, the Village may be able to take advantage of low-interest Clean Water Fund loans or Bonds typical to municipal infrastructure projects. For new infrastructure, the Village may be able to defray all or a portion of the cost for sewer service extensions to the development entity proposing and construction the new developments in those areas.

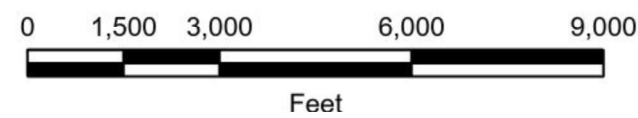
Appendix A – Village of Germantown Existing Sanitary Sewer Service Area Map



Existing Sanitary Sewer Service Area

Village of Germantown, WI

 = Sanitary Sewer Service Area



Appendix B – 2050 Full Sanitary Sewer Service Area Amendment Map



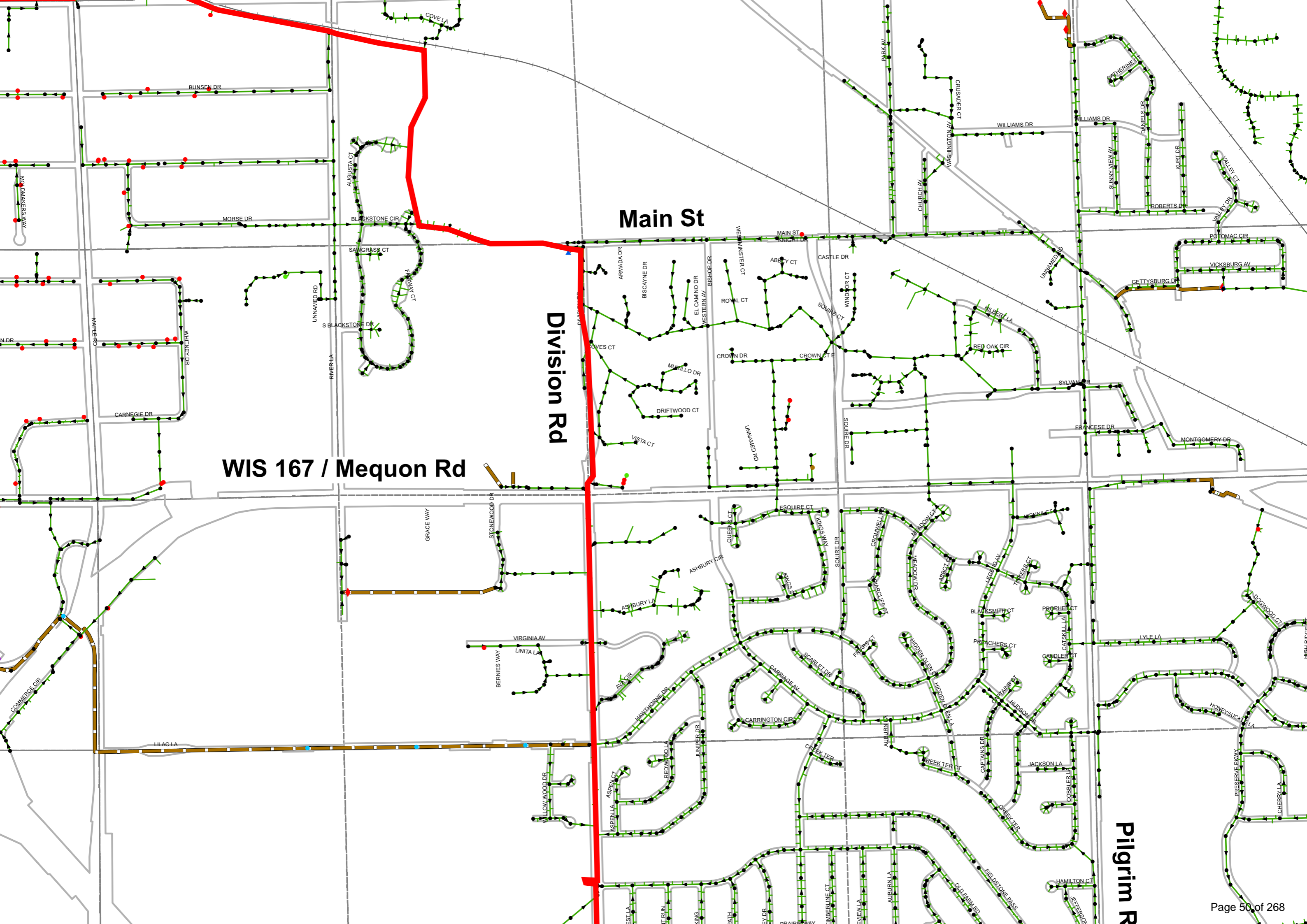
**Friestadt Road**

Appendix C – Village of Richfield Incremental Planning Area Map

An aerial photograph of a suburban area. A road, labeled 'Friestadt Road', runs horizontally across the middle of the image. To the left of the road is a residential neighborhood with many houses and parking lots. To the right is a golf course with green fairways, sand traps, and a large pond. The background shows more green fields and some industrial or commercial buildings. The text 'Friestadt Road' is overlaid in a white box with black text.

# Friestadt Road

Appendix D – Village of Germantown Sanitary Sewer System Map



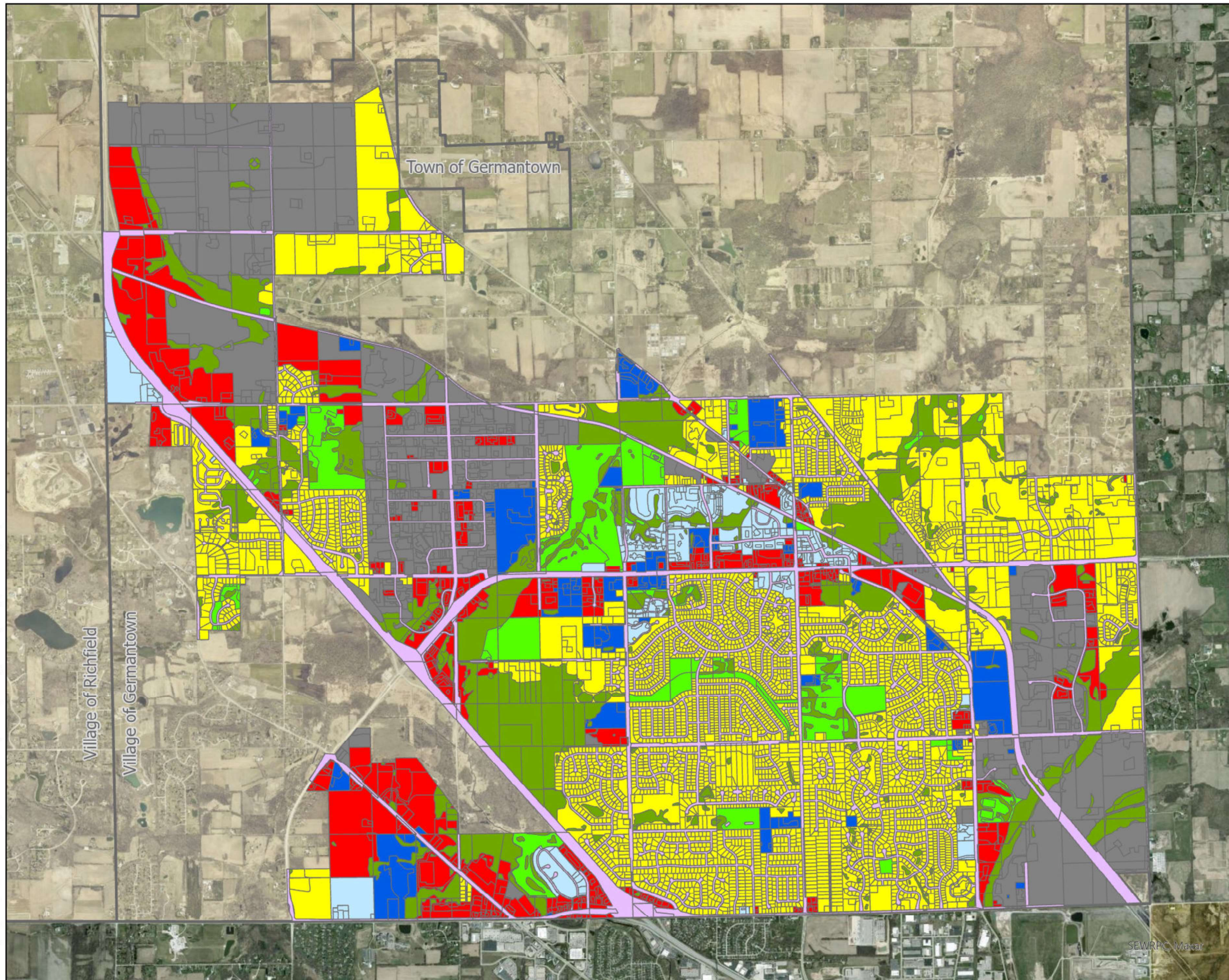
**WIS 167 / Mequon Rd**

**Division Rd**

**Main St**

**Pilgrim R**

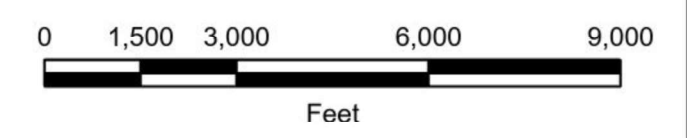
Appendix E – Village of Germantown Future Land Use Map



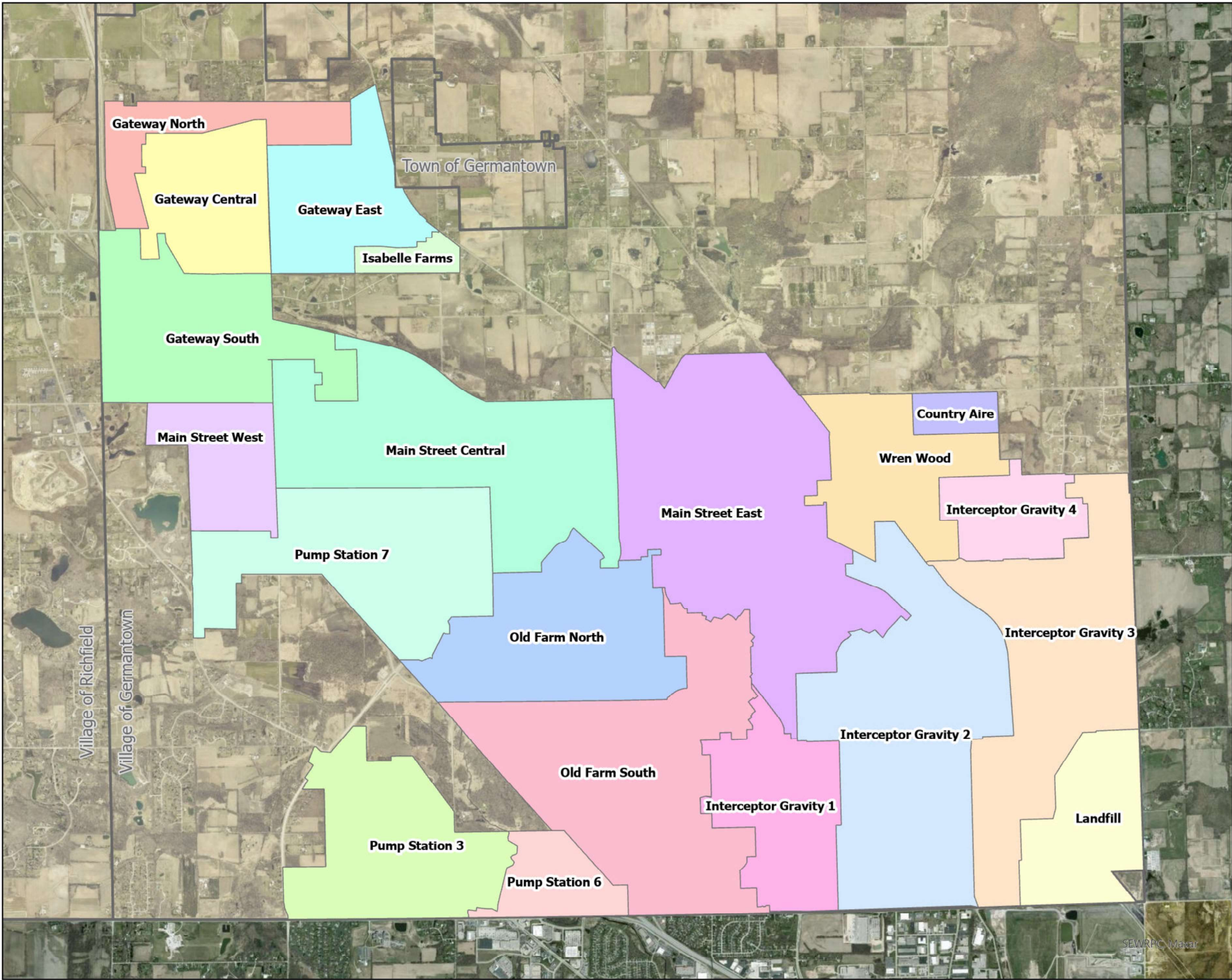
### Future Land Use

### Village of Germantown, WI

- Single Family
- Multi Family
- Commercial
- Institutional
- Industrial
- Recreational
- Wetlands
- Right-of-Way



Appendix F – Sanitary Sewer Analysis Basin Map



### Pump Station Basins

Village of  
Germantown, WI



Appendix G – Richfield Incremental Planning Area Topographical Map



Appendix H – Richfield Incremental Planning Area Soils Type Map



McB

HmC2

DdB

AICHER LA

OdD2

WOODSIDE LA

POLK ST

HY 115

RAILROAD ST

ThB2

RaA

DEPOT ST

HmB2

HmD2

LmA

ORCHARD ST

SvD2

ELM ST

ThD2

RICHFIELD SERVICE DR

McB

Ph

HmC2

ThC2

McB

WOLF RD

Appendix I – Richfield Incremental Planning Area FEMA Floodplain and Wetlands Map



AICHER LA

WOODSIDE LA

POLK ST

RAILROAD ST

HY 175

DEPOT ST

ORCHARD ST

ELM ST

RICHFIELD SERVICE DR

WOLF RD

Appendix J – Richfield Incremental Planning Area Environmental Review

The overall site is comprised of a large planning area to the east of the Town of Germantown, Washington County, Wisconsin.

General project location lat/long: 43.25828, -88.19166 (center), bounded by 43.26548, -88.20209; 43.26533, -88.18172; 43.25082, -88.20214; 43.25061, -88.18193.

Section / Township / Range: S12 T09N R19E

During the preliminary environmental screening, the following environmentally sensitive resources and assumptions were assessed:

- Presence of wetland and waterway features,
- Presence of 303d impaired waterways,
- Presence of areas of special natural resource interest,
- Documented wetland and waterway disturbance permits,
- Presence of FEMA floodplains, floodways and flood fringe,
- Presence of WDNR Bureau of Remediation and Reclamation (BRR) Sites,
- Presence of Solid and Hazardous Waste Information System (SHWIMS) Sites,
- Presence of Shoreland Zoning,
- Presence of Planned or Existing County Trails,
- Presence of National Register of Historic Places,
- Presence of United States Department of Agriculture Drainage Districts, and
- Potential presence of Threatened and Endangered Species.

A summary of findings is described below.

### Wetlands and Waterways

The WDNR Surface Water Data Viewer (SWDV) was accessed. Throughout the planning area, there are multiple wetland and waterway complexes. Wisconsin Wetland Inventory (WWI) listed wetlands include: Emergent/wet meadow, Flats/unvegetated wet soil, Forested, and open water. The WWI also lists five unnamed waterways, three first order, and two second order waterways and three waterbodies. No features within the study area were identified as 303d impaired or are designated as an area of special natural resource interest.

The SWDV maintains a list of permitted activities and informal decisions held by the WDNR. Please refer to Table 1 below for a summary of WDNR actions.

**Table 1. WDNR Actions**

Permit ID	Docket Number	Applicant	Permit Date	Activity	Permit Decision
6076221	GP-SE-2019-67-01338	Koehnke	5/29/2019	Wetland Fill - Residential/Commercial/Industrial	A - Approved
5013080	IP-SE-2007-67-0439	Riverwoods Parkway Group, LLC	12/12/2007	Wetland WQC (Federal)	A - Approved
5013081	GP-SE-2007-67-0440MW	Riverwoods Parkway Group, LLC	12/12/2007	Pond-stormwater	A - Approved
5013082	GP-SE-2007-67-0441MW	Riverwoods Parkway Group, LLC	12/12/2007	Pond-stormwater	A - Approved

Permit ID	Docket Number	Applicant	Permit Date	Activity	Permit Decision
5013083	GP-SE-2007-67-0442MW	Riverwoods Parkway Group, LLC	12/12/2007	Pond-stormwater	A - Approved
5013084	GP-SE-2007-67-0443MW	Riverwoods Parkway Group, LLC	12/12/2007	Culvert w/o engineering	A - Approved
5013085	GP-SE-2007-67-0444MW	Riverwoods Parkway Group, LLC	12/12/2007	Culvert w/o engineering	A - Approved
N/A	INF-SE-2006-67-1046	Baudhuin Incorporated	10/26/2006	Shoreland Zoning	N/A
N/A	INF-SE-2007-67-0354	J.D. Knowles	5/29/2007	Ordinary High Water Mark Determination	N/A
N/A	INF-SE-2005-67-1088	Bauduin Inc	9/27/2005	Jurisdictional Determination	N/A
N/A	INF-SE-2005-67-0987	Northern Lakes Development	9/12/2005	Wetland Delineation	N/A

Please note, this is not representative of all possible wetlands and waterways within the project area. Refer to Figures 1, 2, and 3.

#### FEMA Floodplains, Floodways and Flood fringe

The presence of FEMA designated floodplains, floodways and flood fringe were assessed for the study area. A study was conducted for the waterway in the northeast corner of the study area. The FEMA panels included in the study area are 55131C0264E effective 2/25/2022 and 55131C0268E effective 2/25/2022. Within panel 55131C0268E there are areas designated as Zone A and Zone AE.

Refer to Figure 4.

#### Bureau of Remediation and Reclamation and Solid and Hazardous Waste Information System

The Bureau of Remediation and Reclamation, and the Solid and Hazardous Waste Information System were assessed for the study area. There are multiple open and closed sites with continuing obligations present throughout the study area. Care needs to be taken when considering impacting listed sites.

**Table 2. Known BRRTs Sites**

DNR BRRTS #	Site Status	Site Name	Facility ID #	Start Date / End Date	Has Continuing Obligations (Yes/No)	X Coordinate (m, WTM91)	Y Coordinate (m, WTM91)
0367563012	Open	WI DOT Kosterman Parcel	267200120	12/16/2014 / N/A	N/A	666007	311840
0267578745	Open	Laubenheimers Garage**	267032480	2/3/2017 / N/A	N/A	666605	310833
0367107634	Closed	Wolf Brothers Fuel Inc	267056130	7/9/1996 / 6/5/2000	Y	666381	311217.7
0367168387	Closed	White, Robert Property	267162500	7/23/1997 / 11/20/2003	Y	665929	311161

DNR BRRTS #	Site Status	Site Name	Facility ID #	Start Date / End Date	Has Continuing Obligations (Yes/No)	X Coordinate (m, WTM91)	Y Coordinate (m, WTM91)
0367201172	Closed	Richfield Truck Stop	267026760	9/21/1998 / 3/20/2000	N	667398.7	310323.7
0367004277	Closed	Laubenheimers Garage**	267032480	6/13/1994 / 12/12/2017	Y	666586.3	310844.7
0367001520	Closed	Gotez Garage	267032700	4/22/1991 / 6/8/2018	Y	666878.6	310283.4
0367246102	Closed	Craden MFG Inc	267064930	3/10/2000 / 6/19/2009	N	666423.3	311115.7
0367583781	Closed	Richfield Truck Stop	267026760	5/20/2019 / 6/17/2019	N	667423.9	310343.3
0367585483	Closed	Exxon Richfield Truckstop Proposed KT 1013	267026760	12/16/2019 / 12/16/2019	N	667410.1	310366.7
0367000546	Closed	Richfield Truck Stop	267026760	12/29/1989 / 11/9/2012	Y	667412.5	310370.5
0367005194	Closed	Richfield Service	267150400	3/25/1995 / 10/21/2009	Y	667387	310212
** LAUBENHEIMERS GARAGE has been identified as impacting another property.							

Additionally, the study area was examined using the WDNR Solid and Hazardous Waste Information System (SHWIMS). This system provides access to information on sites, and facilities operating at sites, that are regulated by the Wisconsin DNR Waste and Materials Management (WMM) program. The following sites were identified within the study area:

**Table 3. SHWIMS Sites**

Status	Facility Name	Address	FID	Region
Operating	Craden MFG Inc	1961 STH 175	267064930	Southeast
Closed	Johnson Equipment	1704 STH 175	267032700	Southeast
Closed	Richfield Truck Stop	2900 STH 167	267026760	Southeast

Refer to Figure 5 and the SHWIMS Database Export.

### Shoreland Zoning

The presence of shoreland zones were assessed for the study area. No known shoreland zones are provided by the Washington County GIS viewer. The Village of Germantown Code of Ordinance No. 24.04, defines the shoreland-wetland zoning district as all wetlands in the Village which are equal to or greater than 5 acres within 1,000 feet of the ordinary high water mark (OHWM) of navigable lakes,

ponds or flowages and within 300 feet of the OHWM of navigable rivers or streams, or the landward side of the floodplain, whichever distance is greater.<sup>1</sup>

### Planned or Existing County Trails

Using the Washington County Adopted Bikeway and Trail Network Plan, Adopted June 2019<sup>2</sup>, the study area has two wide shoulder paths and one side path existing. No new paths are proposed for the study area.

### National Historic Register

Using the National Register of Historic Places GIS viewer, the study area was assessed. There are no registered sites within the study area.<sup>3</sup>

### United States Department of Agriculture Drainage Districts

Using the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) Drainage Districts Interactive Map tool, the study area was assessed for presence of drainage districts. There are no drainage districts within the study area.<sup>4</sup>

### Threatened and Endangered Species

Using the Wisconsin Department Natural Resources Natural Heritage Inventory (NHI) Portal, the study area was assessed. Based on the assessment state endangered fish may be present within the study area. A preliminary Information for Planning and Consultation (IPaC) assessment was performed to identify potential habitat that may support federally threatened or endangered species. The IPaC results included the federally endangered northern long-eared bat, the proposed endangered tricolored bat, and the candidate endangered monarch butterfly. Further investigations will be needed to assess likelihood of presence, and potential impacts.

Refer to the attachments for the NHI Portal assessment and the IPaC assessment.

---

<sup>1</sup> Reference: [https://library.municode.com/wi/germantown/codes/code\\_of\\_ordinances?nodeId=CH24SHTLZOCOCROR5-88\\_24.04SHTLZODI](https://library.municode.com/wi/germantown/codes/code_of_ordinances?nodeId=CH24SHTLZOCOCROR5-88_24.04SHTLZODI)

<sup>2</sup> Reference:

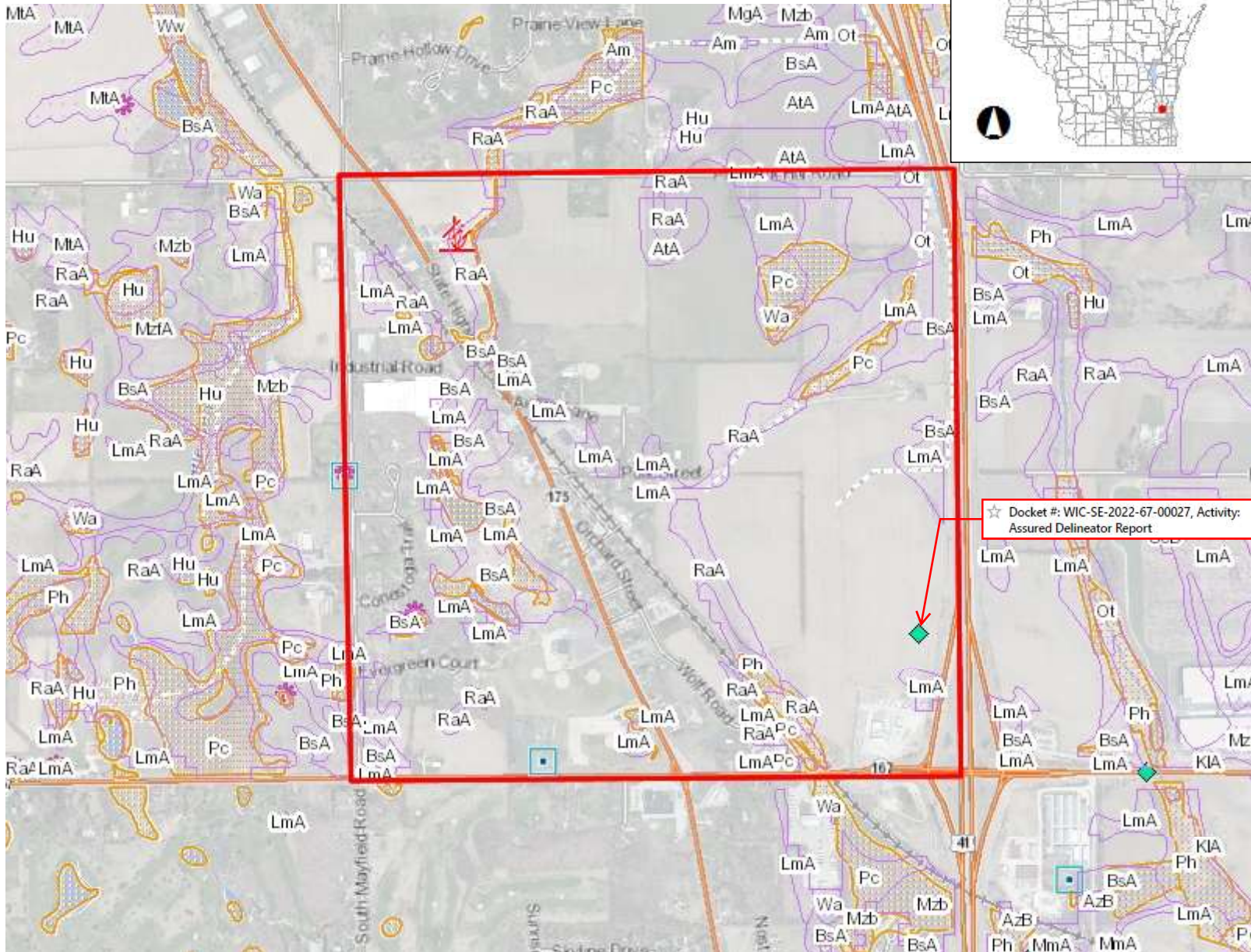
<https://www.washcowisconsin.gov/common/pages/DownloadFileByUrl.aspx?key=5xm1up4mTLLDgP3Y8GLTDcqwZlPhTR1nv9N17WjzjgHThLXmHzcSHnlll0qUmAHPXI4Ei2uaZtd1NZ3h2NIAzBGZYRMZ%2bk%2f90KZhIjusQa9K%2b0n3y13lBvBhuCbwVTr80aVZdiatZOUkhs6QP13w8v1IS%2bOmOjBkn%2fsmpliUj%2fL3jYs1VYHftEjKJo87tFBBQfLI5eeK%2ffUh81M0t%2bl2Q8F48Ks%3d>

<sup>3</sup> Reference: <https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466>

<sup>4</sup> Reference: <https://datcpgis.wi.gov/maps/?viewer=dd>



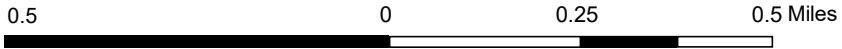
Figure 1: Wetlands and Waterways



Legend

- Wetland Indicators
- Wetland Class Areas
- Wetland Class Points
- Dammed pond
- Excavated pond
- Filled/draind wetland
- Wetland too small to delineate
- Filled excavated pond
- Filled Points
- Wetland Class Areas
- Filled Areas
- Wetland Class Areas
- Wetland Class Points
- Dammed pond
- Excavated pond
- Filled/draind wetland
- Wetland too small to delineate
- Filled excavated pond
- Filled Points
- Wetland Class Areas
- Filled Areas
- Wetland Identifications and Confirmations
- NRCS Wetspots
- Municipality
- State Boundaries
- County Boundaries
- Major Roads**
- Interstate Highway
- State Highway
- US Highway
- County and Local Roads**
- County HWY
- Local Road
- Railroads

☆ Docket #: WIC-SE-2022-67-00027, Activity: Assured Delineator Report



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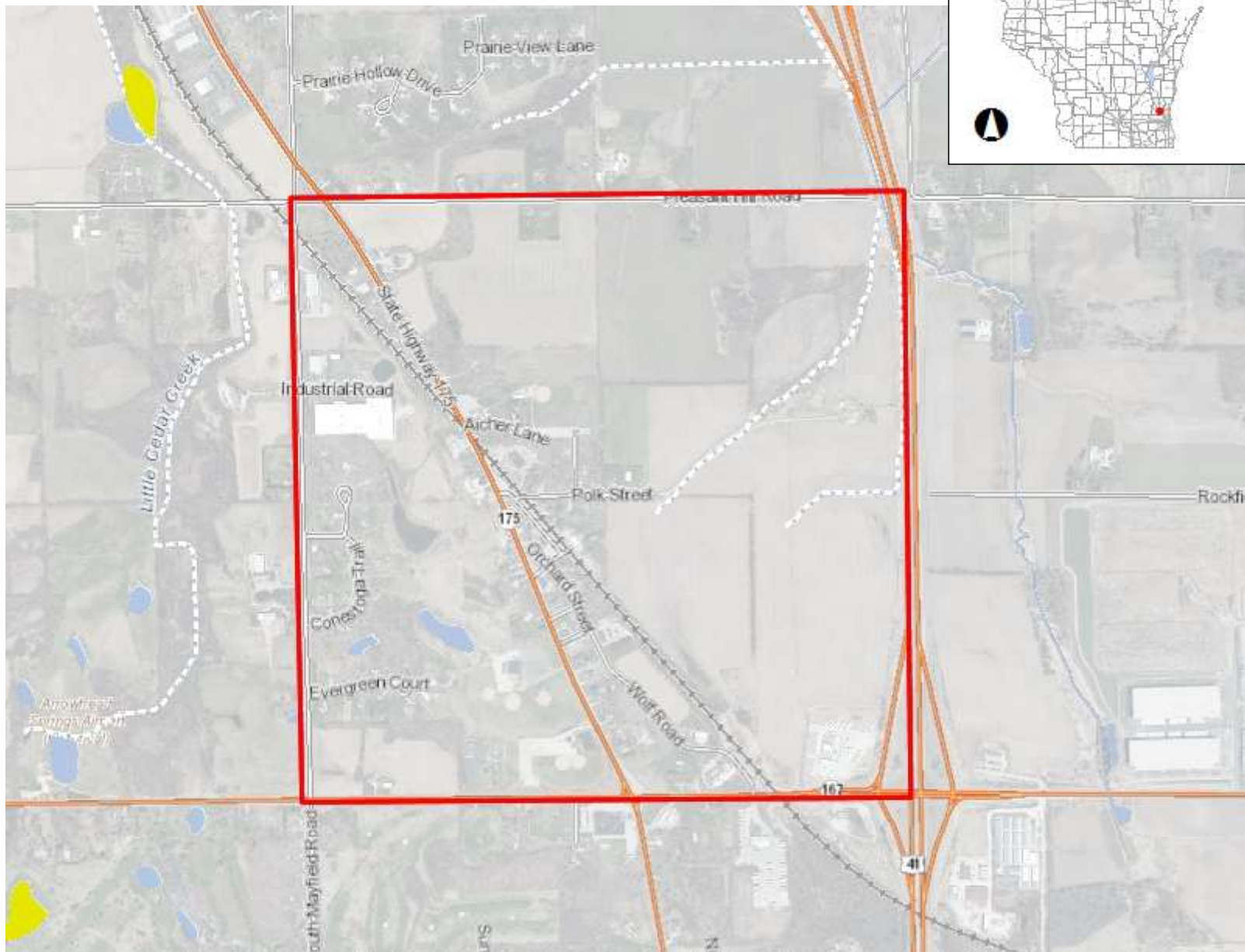
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Notes

Surface Water Data Viewer Layers:  
Wetlands, Hydric soils



Figure : Additional Surface Water Resources



**Legend**

- Impaired Rivers and Streams
- Impaired Lakes
- TMDL Category Lines**
  - Other or Multiple Factors
  - Contaminated Sediment Dominated
  - Atmospheric Deposition Dominated
  - Physical or Habitat Dominated
  - Nonpoint Source Dominated
  - Point and Nonpoint Source Blend
  - Point Source
  - Proposed for 303d listing
- TMDL Category Areas**
  - Other or Multiple Factors
  - Contaminated Sediment Dominated
  - Atmospheric Deposition Dominated
  - Physical or Habitat Dominated
  - Nonpoint Source Dominated
  - Point and Nonpoint Source Blend
  - Point Source
  - Proposed for 303d listing
- PNW-ASNRI Sensitive Areas of Lakes
- PNW-ASNRI Wild and Scenic Rivers
- PNW-ASNRI Outstanding and Exceptional Streams
- PNW-ASNRI Trout Streams
- PNW-ASNRI Wild Rice Streams
- PNW-ASNRI Outstanding and Exceptional Lakes
- PNW-ASNRI Special Area Management Plan Streams

**Notes**

Surface Water Data Water Layers:  
Impaired Waterways, PNW-ASNRI,  
Fisheries Management

0.5 0 0.25 0.5 Miles

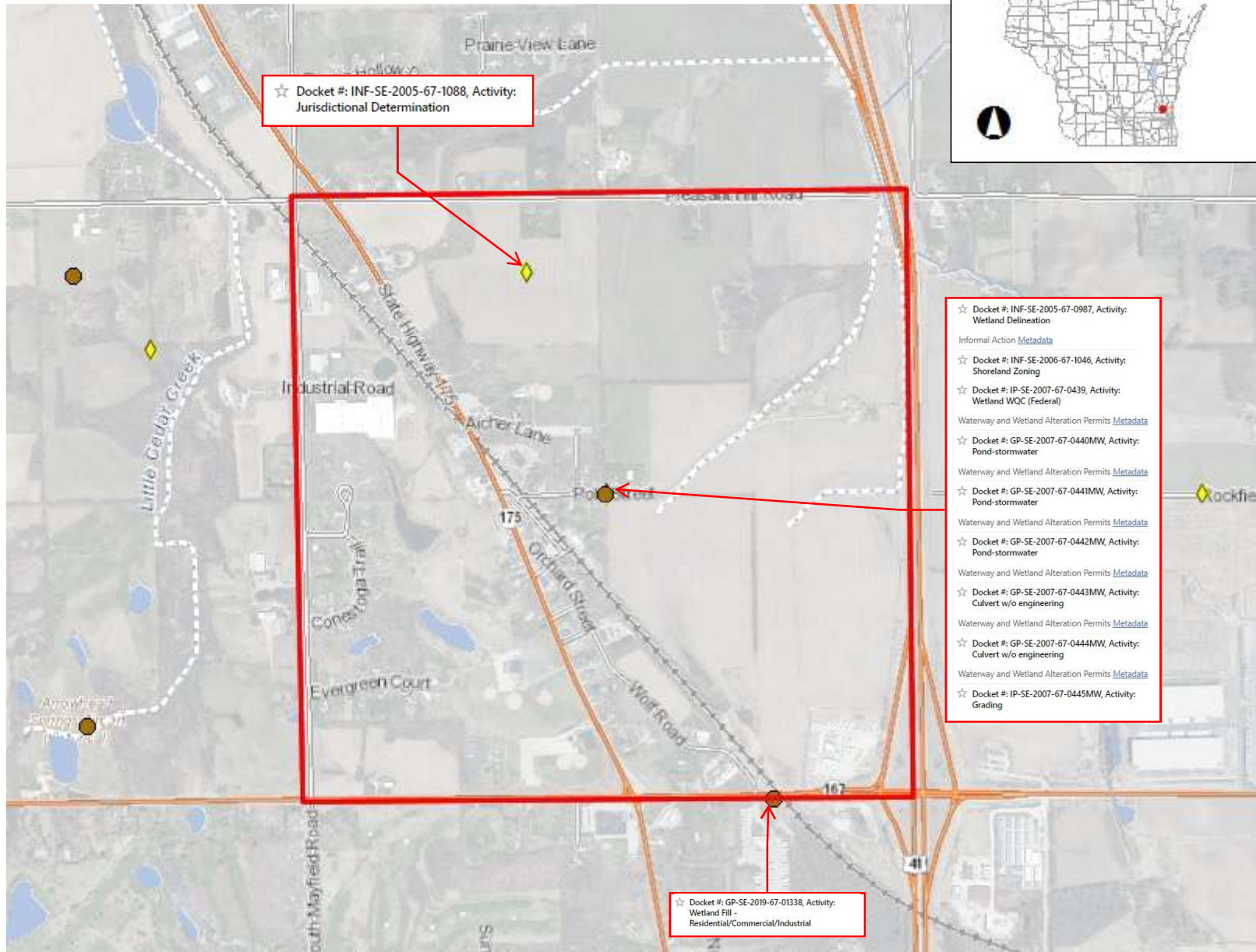
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# Figure 3: WDNR Permits and Determinations



- Legend**
- Waterway and Wetland Alterations
  - ◆ Formal/Informal Actions
  - ▲ Exemption Determinations
  - Ordinary High Water Mark Determinations
- Navigability Determinations**
- Yes
  - Yes with Agricultural Exemption
  - No
- ▲ Surface Water Outfalls
  - Municipality
  - State Boundaries
  - County Boundaries
- Major Roads**
- Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads**
- County HWY
  - Local Road
- Railroads
  - Tribal Lands
  - Rivers and Streams
  - Intermittent Streams
  - Lakes and Open water

0.5 0 0.25 0.5 Miles

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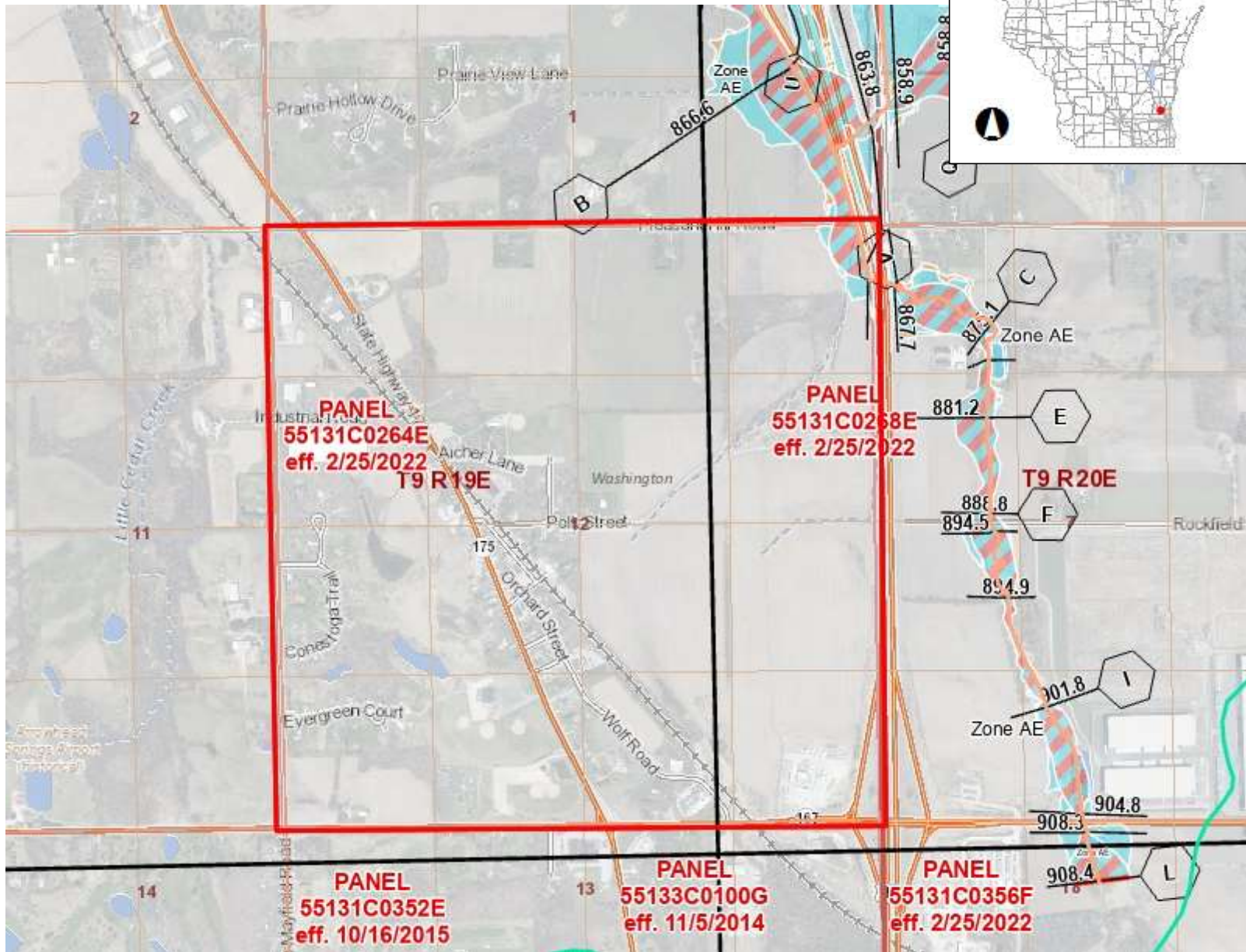
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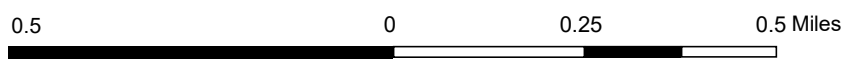
Notes



Figure 4: FEMA Floodplain Firmette



- Legend**
- 2D Water Surface Elevation Grid**
    - High : 937.629
    - Low : 853.184
  - Dams**
    - Dam
    - FERC and FERC Exempt Dam
    - Cranberry Dam
    - Removed Dam
    - Structure not on Waterway
    - <all other values>
  - Levees**
  - Geomarks**
  - Floodplain Analysis Lines**
    - Case by Case Analysis for Development in Floodplain
    - Dam Failure Analysis
    - Encroachment Analysis
    - Flood Insurance Study
    - Flood Storage Analysis
    - Floodplain Study (Locally Funded)
    - Hydrology/Hydraulics developed at a Dam
    - <all other values>
  - Floodplain Analysis Catchments**
  - Floodplain Analysis Points**
    - Case by Case Analysis for Development in Floodplain
    - Dam Failure Analysis
    - Encroachment Analysis
    - Flood Insurance Study
    - Flood Storage Analysis
    - Floodplain Study (Locally Funded)
    - Hydrology/Hydraulics developed at a Dam



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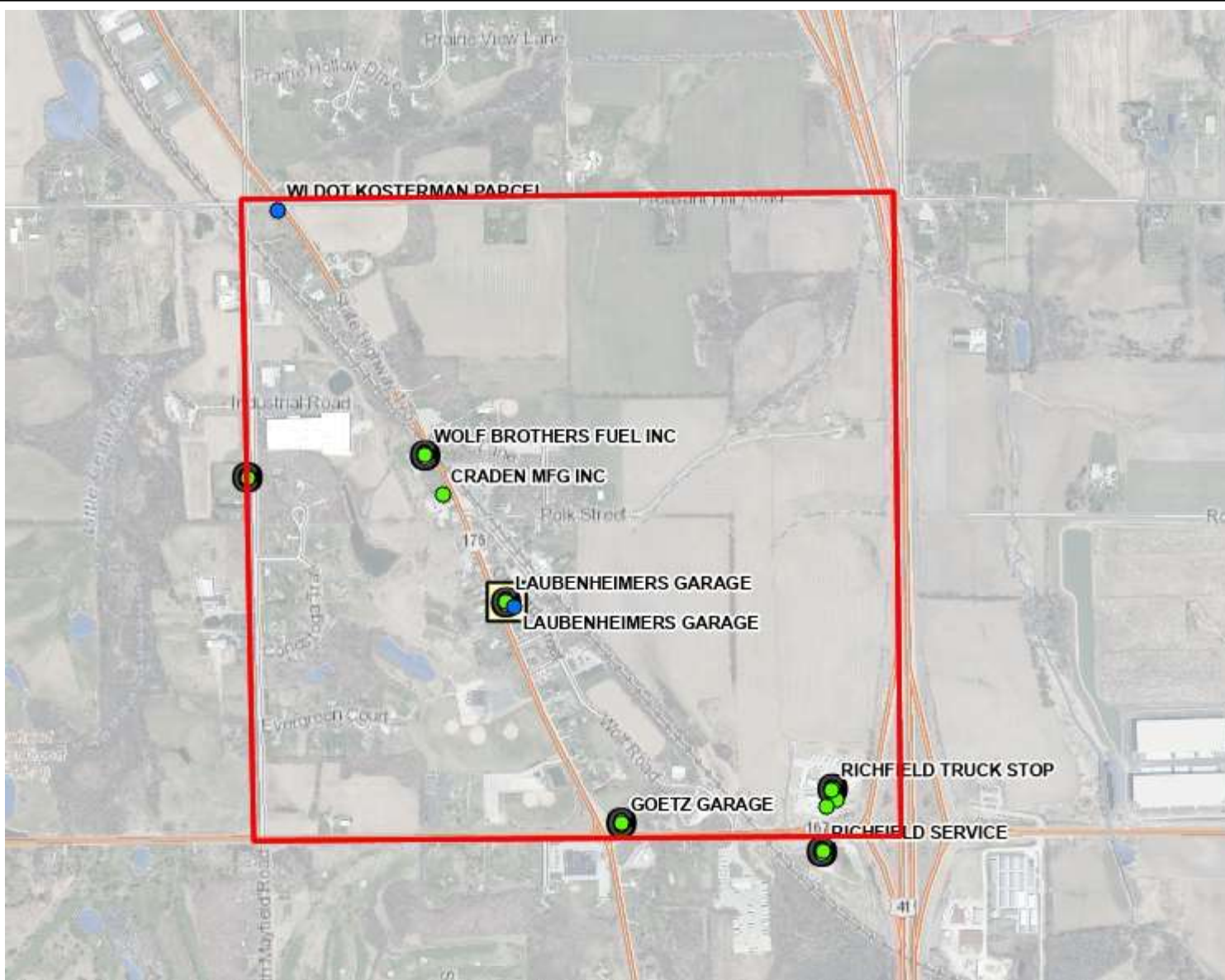
1: 15,840

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**Notes**

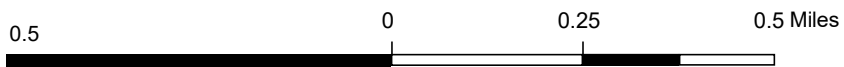


# Figure 5: BRRTs Export



### Legend

- Open Site
- Closed Site
- Continuing Obligations Apply
- Impacted Another Property(ies) or Right-
- Facility-wide Site



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1: 15,840

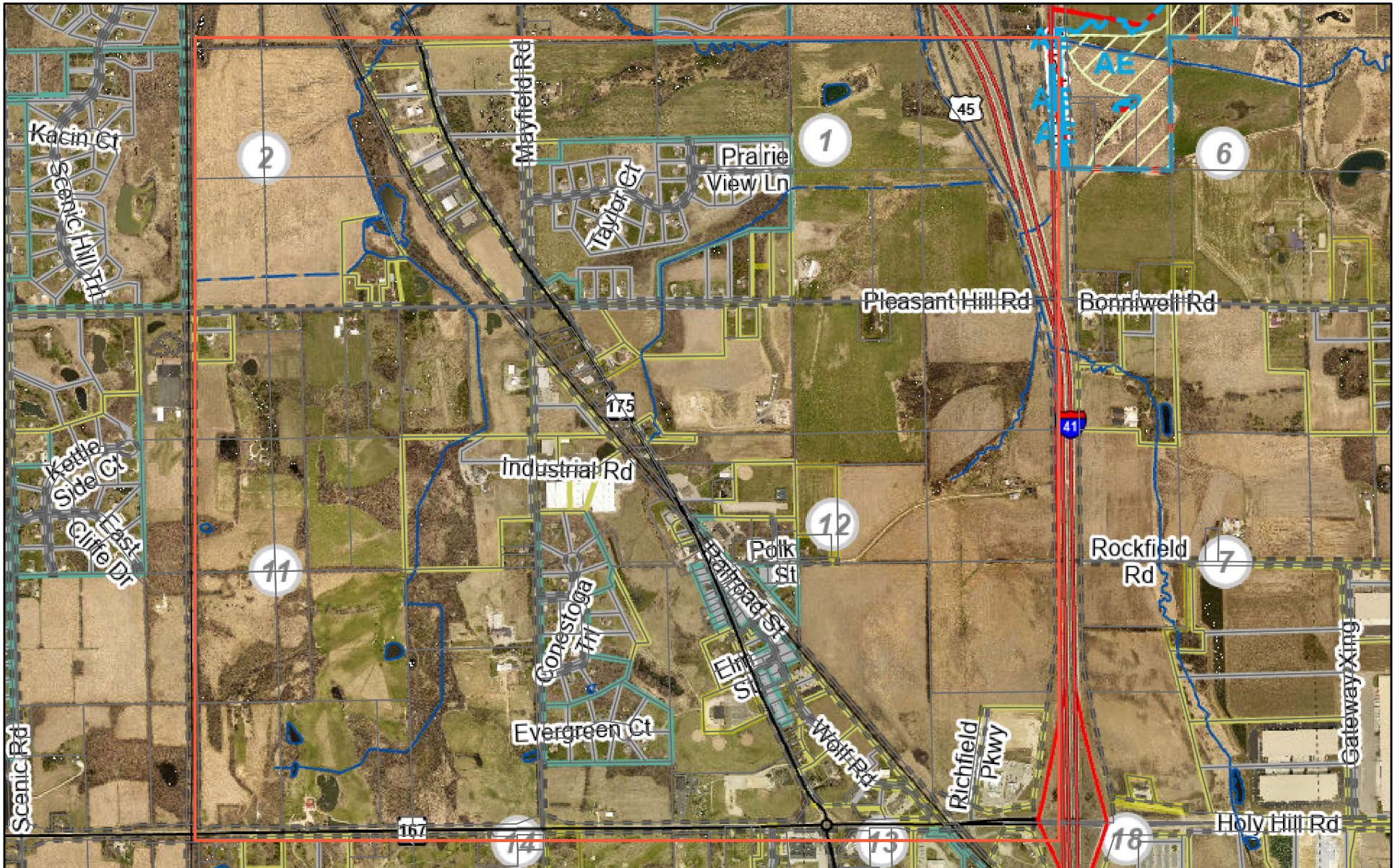


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*Note: Not all sites are mapped.*

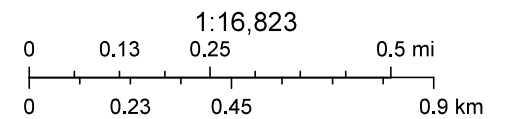
### Notes

# Shoreland Zoning



8/8/2023, 3:14:15 PM

- |                          |                                  |  |   |                     |
|--------------------------|----------------------------------|--|---|---------------------|
| Override 1               | Federal Highway                  | Intermittent Lake, Pond, Stream or Watercourse | Assessor Plat; Cemetery Plat; Subdivision | Local Road Labels   |
| Current Parcel           | Railroad Centerlines             | Perennial Lake, Pond, Stream or Watercourse    | Lot                                       | Local Road          |
| Road Centerline STH, CTH | Shoreland Zoning District        | Perennial Lake, Pond, Stream or Watercourse    | PLSS Boundary                             | Named Private Drive |
| State Highway            | Non-Navigable Stream in Ag. Area | Floodway Zoning District                       | PLSS Section                              |                     |
| Ramp                     | NNAGSTREAM                       | 100 Year Floodplane Zoning District            | Right-of-Way                              |                     |
| Road Centerline I, USH   | NOBUFFER; PLAKE; PSTREAM         | Plat   | Municipality                              |                     |
| Interstate               |                                  | Certified Survey Map                           |   |                     |



# ATTACHMENT

## WDNR SHWIMS on the Web

Navigation: [SOTW Home](#) >> [Advanced Search](#) >> [Search Results](#) >> [Location Detail](#)

### CRADEN MFG INC Facility Name

[HELP](#)

#### General Information

<b>Facility Name</b>		<b>County</b>	<b>WDNR Region</b>	
CRADEN MFG INC		WASHINGTON	SOUTHEAST REGION	
<b>Facility Status</b>	<b>FID</b>	<b>EPA ID</b>	<b>SIC Code</b>	<b>NAICS Code</b>
OPERATING	267064930	WID063499693	NONE	NONE
<b>Physical Address</b> <a href="#">Find on Google Maps</a> [Exit DNR]		<b>Municipality</b>	<b>State</b>	<b>Zip</b>
1961 STH 175		RICHFIELD	WI	53076
<b>Mailing Address</b>		<b>City</b>	<b>State</b>	<b>Zip</b>
1961 HWY 175		RICHFIELD	WI	53076
<b>Facility Owner Type</b>	<b>Public Land Survey System Desc.</b>		<b>Latitude and Longitude</b>	
PRIVATE	SE 1/4 of the NW 1/4 of Sec 12, T9N, R19E		NOT AVAILABLE	

#### Facility Owner(s)

SOL CRADEN 1961 HWY 175 RICHFIELD, WI 53076
---

#### Waste Management Activities at this Location

Activity Type <small>Click to view details</small>	Activity Status	License No.
<a href="#">HW GENERATOR - VERY SMALL</a>	ACTIVE	N/A

#### Other Activities at this Location

Activity Number and Name <small>Click to view details on AW/RR BOTW</small>	Type/Status
<a href="#">03-67-246102 CRADEN MFG INC</a>	LUST - CLOSED

## WDNR SHWIMS on the Web

Navigation: [SOTW Home](#) >> [Advanced Search](#) >> [Search Results](#) >> [Location Detail](#)

### JOHNSON EQUIPMENT Facility Name

[HELP](#)

#### General Information

<b>Facility Name</b>		<b>County</b>	<b>WDNR Region</b>	
JOHNSON EQUIPMENT		WASHINGTON	SOUTHEAST REGION	
<b>Facility Status</b>	<b>FID</b>	<b>EPA ID</b>	<b>SIC Code</b>	<b>NAICS Code</b>
CLOSED	267032700	WID988597605	7538	NONE
<b>Physical Address</b> <a href="#">Find on Google Maps</a> [Exit DNR]		<b>Municipality</b>	<b>State</b>	<b>Zip</b>
1704 STH 175		RICHFIELD	WI	53076
<b>Mailing Address</b>		<b>City</b>	<b>State</b>	<b>Zip</b>
1704 HWY 175		RICHFIELD	WI	53076
<b>Facility Owner Type</b>	<b>Public Land Survey System Desc.</b>		<b>Latitude and Longitude</b>	
PRIVATE	SW 1/4 of the SE 1/4 of Sec 12, T9N, R19E		NOT AVAILABLE	

#### Facility Owner(s)

STEVEN & TERRY FASSBENDERS 1704 HWY 175 RICHFIELD, WI 53076
---

#### Waste Management Activities at this Location

<b>Activity Type</b> <small>Click to view details</small>	<b>Activity Status</b>	<b>License No.</b>
<a href="#">HW GENERATOR - VERY SMALL</a>	INACTIVE	N/A
<a href="#">HW GENERATOR - SMALL</a>	INACTIVE	N/A

#### Other Activities at this Location

<b>Activity Number and Name</b> <small>Click to view details on AW/RR BOTW</small>	<b>Type/Status</b>
<a href="#">03-67-001520 GOETZ GARAGE</a>	LUST - CLOSED

## WDNR SHWIMS on the Web

Navigation: [SOTW Home](#) >> [Advanced Search](#) >> [Search Results](#) >> [Location Detail](#)

### RICHFIELD TRUCK STOP Facility Name

[HELP](#)

#### General Information

<b>Facility Name</b>		<b>County</b>	<b>WDNR Region</b>	
RICHFIELD TRUCK STOP		WASHINGTON	SOUTHEAST REGION	
<b>Facility Status</b>	<b>FID</b>	<b>EPA ID</b>	<b>SIC Code</b>	<b>NAICS Code</b>
CLOSED	267026760	WIR000017699	NONE	NONE
<b>Physical Address</b> <a href="#">Find on Google Maps</a> [Exit DNR]		<b>Municipality</b>	<b>State</b>	<b>Zip</b>
2900 STH 167		RICHFIELD	WI	53076
<b>Mailing Address</b>		<b>City</b>	<b>State</b>	<b>Zip</b>
NONE		NONE	NONE	NONE
<b>Facility Owner Type</b>	<b>Public Land Survey System Desc.</b>		<b>Latitude and Longitude</b>	
UNKNOWN	SE 1/4 of the SE 1/4 of Sec 12, T9N, R19E		NOT AVAILABLE	

#### Facility Owner(s)

J-ARROW INC 2900 HWY 167 W RICHFIELD, WI 53076
--

#### Waste Management Activities at this Location

Activity Type <small>Click to view details</small>	Activity Status	License No.
<a href="#">HW GENERATOR - SMALL</a>	INACTIVE	N/A

#### Other Activities at this Location

Activity Number and Name <small>Click to view details on AWR/R BOTW</small>	Type/Status
<a href="#">03-67-000546 RICHFIELD TRUCK STOP</a>	LUST - CLOSED
<a href="#">03-67-201172 RICHFIELD TRUCK STOP</a>	LUST - CLOSED
<a href="#">03-67-583781 RICHFIELD TRUCK STOP</a>	LUST - CLOSED
<a href="#">03-67-585483 EXXON RICHFIELD TRUCKSTOP PROPOSED KT 1013</a>	LUST - CLOSED
<a href="#">04-67-551867 RICHFIELD TRUCK STOP</a>	SPILL - CLOSED



## Endangered Resources Preliminary Assessment

Created on **8/8/2023**. This report is good for one year after the created date.

*DNR staff will be reviewing the ER Preliminary Assessments to verify the results provided by the Public Portal. ER Preliminary Assessments are only valid if the project habitat and waterway-related questions are answered accurately based on current site conditions. If an assessment is deemed invalid, a full ER review may be required even if the assessment indicated otherwise.*

### Results

A search was conducted of the NHI Portal within a 1-mile buffer (for terrestrial and wetland species) and a 2-mile buffer (for aquatic species) of the project area. Based on these search results, below are your next steps.

**An ER Review is needed to ensure compliance** with Wisconsin's Endangered Species Law (s. 29.604 Wis. Stats.) and the Federal Endangered Species Act (16 USC ss 1531-43). Therefore you should request an Endangered Resources Review <https://dnr.wi.gov/topic/ERReview/Review.html>

The ER Review will list the endangered resources that have been recorded within the vicinity of the project area and follow-up actions may be necessary.

One (or more) of the following situations apply:

- The species recorded are state or federal threatened or endangered animals.
- The species recorded are state threatened or endangered plants on public land.
- The species recorded are federal threatened or endangered plants on federal land or involve federal funds or a federal permit.
- The project site overlaps the Karner Blue Butterfly High Potential Range.
- The project overlaps the Rusty Patched Bumble Bee High Potential Zone.

*A copy of this document can be kept on file and submitted with any other necessary DNR permit applications to show that the need for an ER Review has been met. This notice only addresses endangered resources issues. This notice does not constitute DNR authorization of the proposed project and does not exempt the project from securing necessary permits and approvals from the DNR and/or other permitting authorities.*

### Project Information

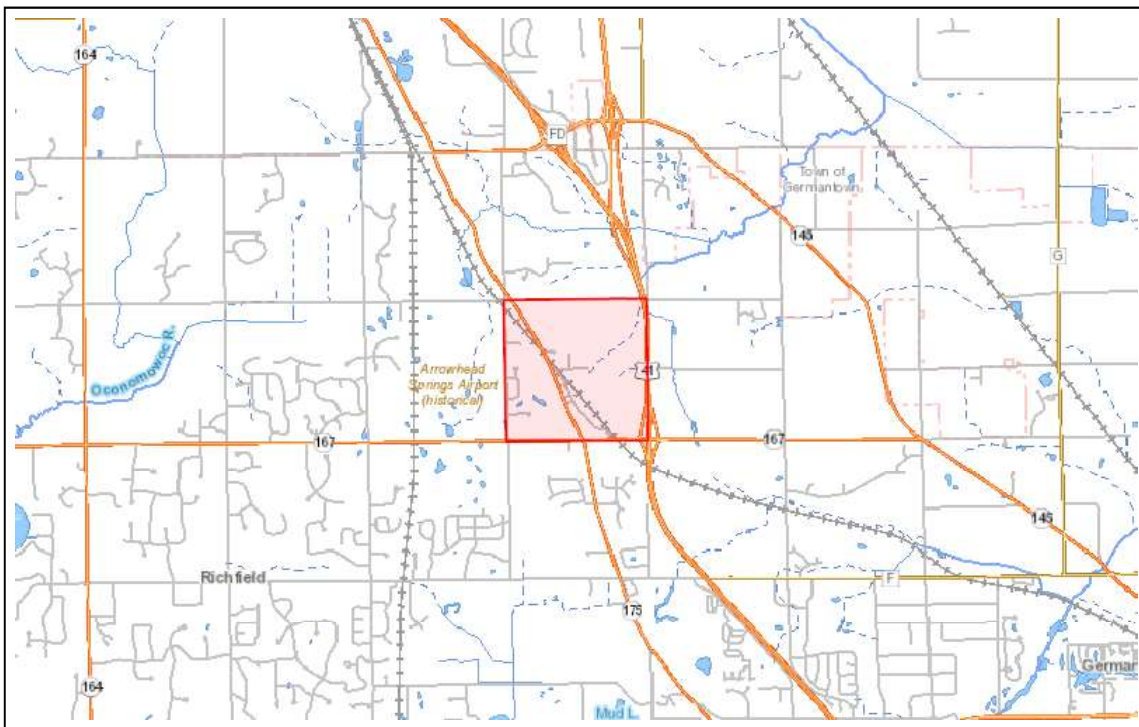
Landowner name	Village of Germantown
Project address	
Project description	Study area

### Project Questions

Does the project involve a public property?	Yes
Is there any federal involvement with the project?	Yes
Is the project a utility, agricultural, forestry or bulk sampling (associated with mining) project?	No
Is the project property in Managed Forest Law or Managed Forest Tax Law?	No
Project involves tree or shrub removal?	No
Is project near (within 300 ft) a waterbody or a shoreline?	Yes
Is project within a waterbody or along the shoreline?	Yes

Does the project area (including access routes, staging areas, laydown yards, select sites, source/fill sites, etc.) occur **entirely within** one or more of the following habitats?

Urban/residential	No
Manicured lawn	No
Artificial/paved surface	No
Agricultural land	No
Areas covered in crushed stone or gravel	No



The information shown on these maps has been obtained from various sources, and is of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. Users of these maps should confirm the ownership of land through other means in order to avoid trespassing. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: <http://dnr.wi.gov/legal/>.

<https://dnrx.wisconsin.gov/nhiportal/public>

101 S. Webster Street . PO Box 7921 . Madison, Wisconsin 53707-7921

# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

## Location

Washington County, Wisconsin



## Local office

Minnesota-Wisconsin Ecological Services Field Office

☎ (952) 858-0793

📅 (952) 646-2873

3815 American Blvd East

Bloomington, MN 55425-1659

NOT FOR CONSULTATION

# Endangered species

**This resource list is for informational purposes only and does not constitute an analysis of project level impacts.**

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries<sup>2</sup>).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

- 
1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

## Mammals

NAME	STATUS
<p>Northern Long-eared Bat <i>Myotis septentrionalis</i>            Wherever found            No critical habitat has been designated for this species.  <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a></p>	Endangered
<p>Tricolored Bat <i>Perimyotis subflavus</i>            Wherever found            No critical habitat has been designated for this species.  <a href="https://ecos.fws.gov/ecp/species/10515">https://ecos.fws.gov/ecp/species/10515</a></p>	Proposed Endangered

## Insects

NAME	STATUS
<p>Monarch Butterfly <i>Danaus plexippus</i>            Wherever found            No critical habitat has been designated for this species.  <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a></p>	Candidate

## Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

## Bald & Golden Eagles

There are no documented cases of eagles being present at this location. However, if you believe eagles may be using your site, please reach out to the local Fish and Wildlife Service office.

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds  
<https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide conservation measures for birds  
<https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

Bald and Golden Eagle information is not available at this time

**What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?**

The potential for eagle presence is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply). To see a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

**What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?**

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

**What if I have eagles on my list?**

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the [Eagle Act](#) should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

## Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

Migratory bird information is not available at this time

**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?**

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

### **What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

### **How do I know if a bird is breeding, wintering or migrating in my area?**

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

### **What are the levels of concern for migratory birds?**

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

## Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

## What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

## Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

# Facilities

## National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

## Fish hatcheries

There are no fish hatcheries at this location.

## Wetlands in the National Wetlands Inventory (NWI)

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

[PEM1F](#)

[PEM1C](#)

FRESHWATER FORESTED/SHRUB WETLAND

[PSS1Bg](#)

[PFO1C](#)

FRESHWATER POND

[PUBHx](#)[PUSC](#)[PUBGx](#)

RIVERINE

[R4SBC](#)[R5UBH](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

**NOTE:** This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

### Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

### Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

### Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should

seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION



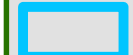

Appendix K – Richfield Incremental Planning Area Future Land Use Map

# Adopted Future Land Use Germantown to Richfield: Potential Utilities Extension

 MMSD Facilities Plan Update Planning Area

## Richfield Future Land Use

-  Business Mixed Use
-  Commercial
-  Industrial
-  Institutional
-  Recreational
-  Single Family
-  Wetlands

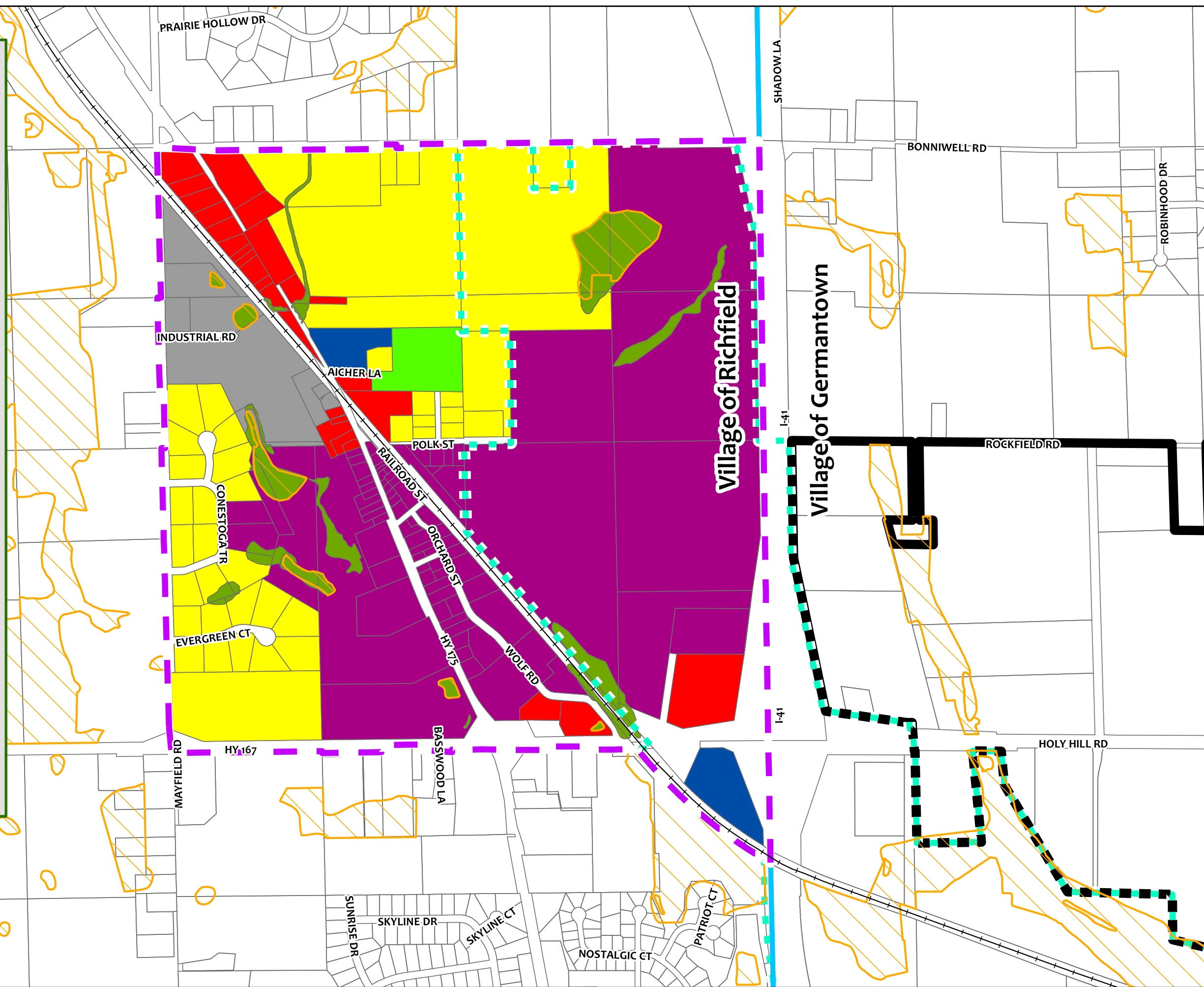
-  Proposed SSA Expansion Area
-  SEWRPC Environmental Corridors (2015)
-  Village Boundary
-  Existing SSA Boundary

1,000 Feet Date: 4/5/2023



 VANDEWALLE & ASSOCIATES INC.  
© 2022

Data Sources: Washington County, State of WI, EIA, SEWRPC



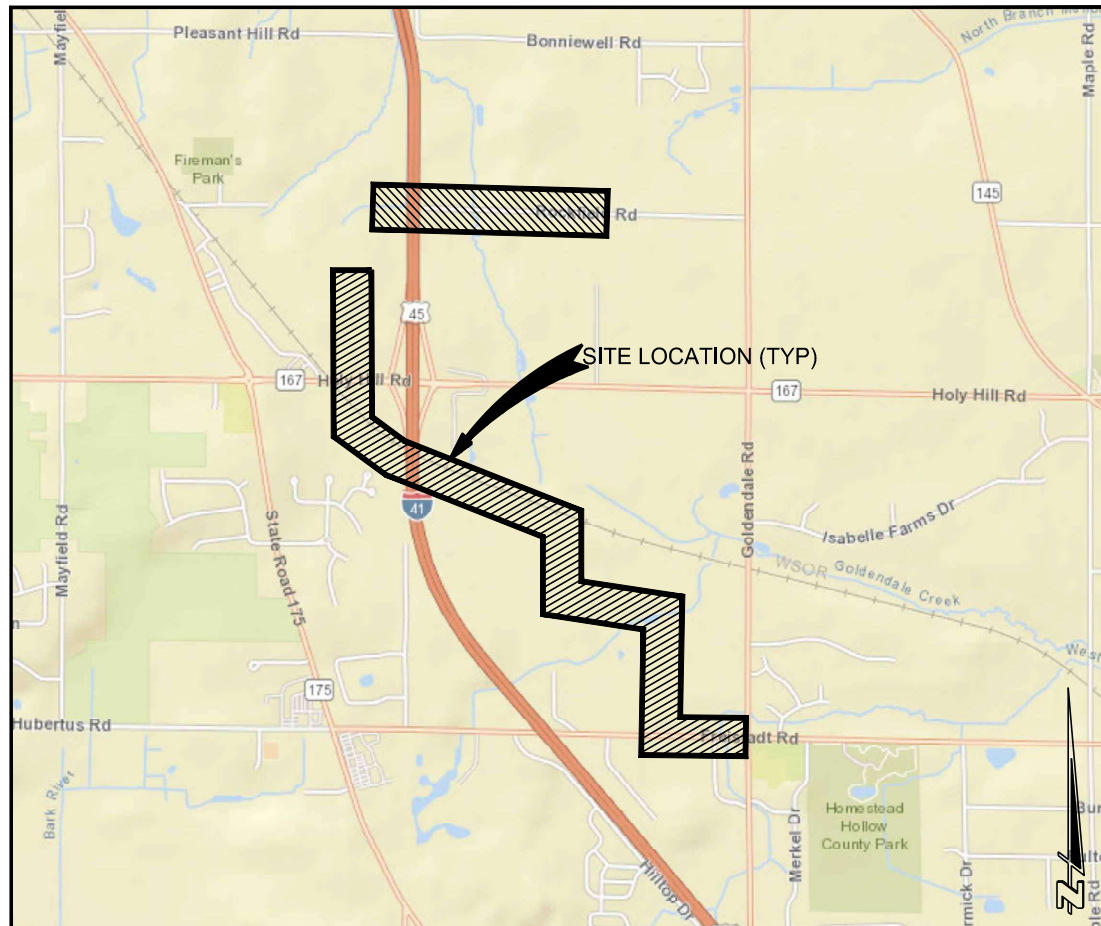
Appendix L – Preliminary Route of Sewer and Water Extensions to Serve the Richfield SSSA

# CONSTRUCTION DRAWINGS FOR GERMANTOWN CONNECTION VILLAGE OF RICHFIELD WASHINGTON COUNTY, WI September 26, 2023

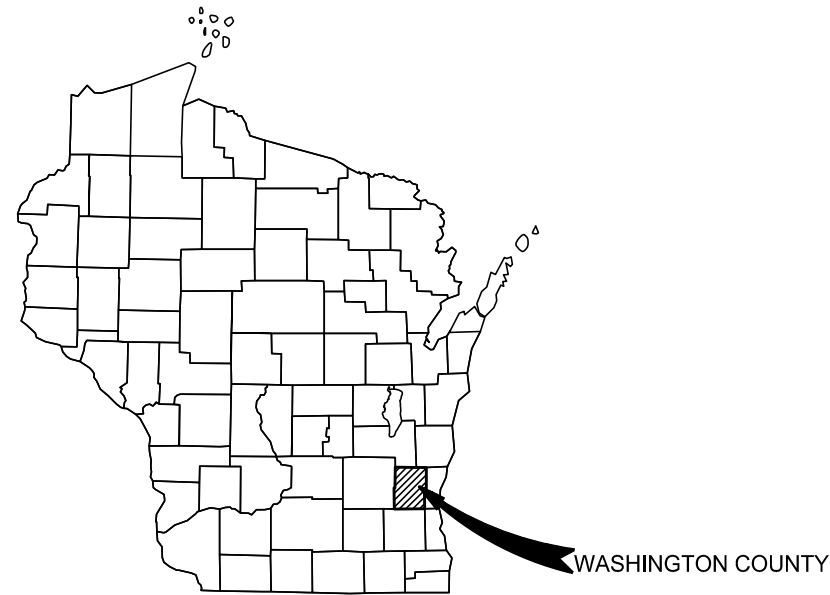
Prepared By



PROJECT I.D. 05771-0017



SITE LOCATION MAP



COUNTY LOCATION MAP

INDEX TO DRAWINGS	
SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	STANDARD SYMBOLS AND ABBREVIATIONS
3	OVERVIEW SHEET
4 - 6	FREISTADT ROAD PLAN AND PROFILE
7 - 18	FUTURE ROAD PLAN AND PROFILE
19 - 23	RAILROAD EASEMENT PLAN AND PROFILE
24 - 26	RICHFIELD PARKWAY PLAN AND PROFILE
27 - 32	ROCKFIELD ROAD PLAN AND PROFILE
33 - 35	STANDARD DETAILS

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ENGINEER SHALL BE HELD RESPONSIBLE FOR THE SCALE OR PRINT  
QUALITY OF DOWNLOADED PLANS. ONLY PRINTED PLANS FROM CEDAR  
CORPORATION SHALL BE CONSIDERED TO BE SCALEABLE PLANS.

I:\Clients-Cedars\05771\_Richfield\_Village\_of\_Richfield\_Connection\_Preliminary\_Design\04\_CADD\DWG\CoverDetails.dwg 09/27/23 12:33:50 PM

**MAPPING & TOPOGRAPHY SYMBOLOLOGY**

DESCRIPTION	SYMBOL	EXISTING	PROPOSED
SANITARY SEWER (PLAN) - LENGTH-DIA. MATERIAL @ GRADE	(SIZE & MAT'L.) SAN	→	→ LENGTH - SIZE MATL SAN
STORM SEWER (PLAN) - LENGTH-DIA. MATERIAL @ GRADE	(SIZE & MAT'L.) STM	→	→ LENGTH - SIZE MATL STM
WATER MAIN (PLAN)- LENGTH-DIA. MATERIAL-(FITTING-FITTING)	(SIZE & MAT'L.) WTR	→	→ LENGTH - SIZE MATL WTR
SANITARY SEWER (PROFILE) - LENGTH-DIA. MATERIAL @ GRADE	(SIZE & MAT'L.)	==	XXX'- XX" PVC SAN @ 0.00%
SANITARY FORCEMAIN (PROFILE) - DIA. MATERIAL	(SIZE & MAT'L.)	==	XXX'- XX" FORCEMAIN @ 0.00%
STORM SEWER (PROFILE) - LENGTH-DIA. MATERIAL @ GRADE	(SIZE & MAT'L.)	==	XXX'- XX" RCP STM @ 0.00%
WATER MAIN (PROFILE)- DIA. MATERIAL	(SIZE & MAT'L.)	==	X" PVC WM.
GAS MAIN	GAS	---	---
ELECTRIC - BURIED	UGE	---	---
ELECTRIC - OVERHEAD	OE	---	---
TELEPHONE - BURIED	TEL	---	---
TELEPHONE - BURIED (FIBER OPTIC)	FO	---	---
TELEPHONE - OVERHEAD	OH	---	---
CABLE TELEVISION - BURIED	TV	---	---
CABLE TELEVISION - OVERHEAD	OH	---	---
CENTERLINE		---	---
RIGHT-OF-WAY LINE		---	---
PROPERTY LINE		---	---
PAVEMENT (STREET, DRIVE, SIDEWALK, ETC.)		---	---
GRAVEL		---	---
CURB & GUTTER		---	---
RAILROAD			
GUARDRAIL		□	□
FENCE - AS LABELED		○	○

**CONTACTS**

xxxxx

**MAPPING & TOPOGRAPHY SYMBOLOLOGY**

DESCRIPTION	SYMBOL	EXISTING	PROPOSED
BENCHMARK		⊕	
CATCH BASIN/INLET		⊞	⊞
CONTROL POINT		▽	
CULVERT	(DIA. & TYPE)		(LENGTH-DIA. & TYPE)
CURB STOP		⊙	G OR W
ELECTRIC PEDESTAL		▽	
FIRE HYDRANT		⊕	⊕
IRON PIPE = IP IRON ROD = IR		⊙ OR ⊙ <sub>IR</sub>	⊙ IP OR ⊙ IR
LIGHT - ORNAMENTAL		⊕	⊕
LIGHT - STREET		⊙	⊙
MAILBOX		MB	
MANHOLE ELECTRIC		⊕	
MANHOLE GAS		⊕	
MANHOLE MISCELLANEOUS		⊕	⊕ MH
MANHOLE SANITARY		⊕	⊕ SAN MH
MANHOLE SIGNAL		⊕	⊕ SIG MH
MANHOLE STORM		⊕	⊕ STM MH
MANHOLE STORM INLET CATCH BASIN		⊕	⊕
MANHOLE WATER		⊕	
MANHOLE TELEPHONE		⊕	
METER - GAS		⊕	
METER - WATER		⊕	
PEDESTAL CABLE TV		▽	
PEDESTAL TELEPHONE		▽	
SIGN		⊕	
BUSH CONIFER		⊕	
BUSH DECIDUOUS		⊕	
TREE DECIDUOUS/INCH DIA		⊕ 12"	
TREE CONIFEROUS/INCH DIA		⊕ 10"	
TREE LINE		~	
VALVE: W=WATER, G=GAS		⊕ OR ⊕ <sub>W</sub>	⊕ <sub>W</sub> OR ⊕ <sub>G</sub>
UTILITY POLE		⊕	
SILT FENCE		SF	SF
MAJOR CONTOURS		890	890
MINOR CONTOURS			
SPOT ELEVATIONS		+891.2	+891.22
INLET PROTECTION			□

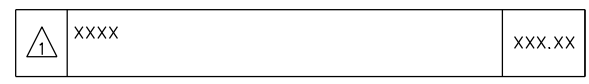
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1. THESE DRAWINGS ARE NEITHER A LEGALLY RECORDED MAP, NOR A SURVEY, AND IS NOT INTENDED TO BE USED AS ONE.
2. ALL PROPERTY LINES SHOWN ARE ESTABLISHED FROM COUNTY GIS FILES. PROPERTY LINES MAY NOT REFLECT ACTUAL LOT LINE LOCATIONS AND ARE FOR INFORMATIONAL PURPOSES ONLY.
3. UTILITY LOCATIONS SHOWN ON THE PLANS WERE PROVIDED BY THE UTILITY OWNER. FIELD LOCATIONS MAY VARY AND ADDITIONAL UTILITIES MAY EXIST. CONTRACTOR SHALL CONTACT DIGGERS HOTLINE A MINIMUM OF 3 WORKING DAYS PRIOR TO BEGINNING CONSTRUCTION.
4. ALL LENGTHS OF PROPOSED UTILITIES SHOWN ON THE PLANS ARE PER DESIGN, ACTUAL LENGTHS MAY VARY DURING CONSTRUCTION.

**LIST OF STANDARD ABBREVIATIONS**

ASPH	ASPHALT	NTS	NOT TO SCALE
B/B	BACK TO BACK	PC	POINT OF CURVATURE
BOC	BACK OF CURB	PCC	POINT OF COMPOUND CURVE
BLDG	BUILDING	PE	PEDESTAL
BM	BENCHMARK	PVMT	PAVEMENT
BSMT	BASEMENT	PI	POINT OF INTERSECTION
C	CUT	PL	PROPERTY LINE
C&G	CURB AND GUTTER	PP	POWER POLE
C/C	CENTER TO CENTER	PROP	PROPOSED
CABC	CRUSHED AGGREGATE BASE COURSE	PT	POINT OF TANGENCY
CB	CATCH BASIN	PVC	POLYVINYL CHLORIDE
CI	CAST IRON PIPE	PVI	POINT OF VERTICAL INTERSECTION
CL	CENTERLINE	PVT	POINT OF VERTICAL TANGENCY
CMP	CORRUGATED METAL PIPE	R	RANGE OR RADIUS
CO	CLEAN OUT	RCP	REINFORCED CONCRETE PIPE
CONC	CONCRETE	REBAR	REINFORCEMENT BAR
CP	CONTROL POINT	REOD	REQUIRED
CTH	COUNTY TRUNK HIGHWAY	RL	REFERENCE LINE
CTV	CABLE TV	ROW	RIGHT-OF-WAY
CS	CURB STOP	SAN	SANITARY
DIA	DIAMETER	WALK	SIDEWALK
DI	DUCTILE IRON PIPE	SF	SILT FENCE
EA	EACH	SL	SANITARY LATERAL
ELEC	ELECTRIC (E WHEN USED IN LINE STYLE)	SHLDR	SHOULDER
EP	EDGE OF PAVEMENT	STA	STATION
EXIST	EXISTING	STH	STATE TRUNK HIGHWAY
FH	FIRE HYDRANT	STM	STORM OR STORM SEWER
FL	FLOW LINE	TEL	TELEPHONE
FM	FORCE MAIN	TEMP	TEMPORARY
FO	FIBER OPTIC	TOC	TOP OF CURB
G	GAS	TYP	TYPICAL
GV	GAS VALVE	VC	VERTICAL CURVE
GW	GUY WIRE	WM	WATER MAIN
INV	INVERT	WS	WATER SERVICE
IP	IRON PIPE OR PIN	WV	WATER VALVE
L	LENGTH (OF CURVE)		
LC	LONG CHORD OF CURVE		
LP	LIGHT POLE		
MB	MAILBOX		
MG	METER-GAS		
MH	MANHOLE		

**BENCHMARKS**



NOTE: ALL BENCHMARK LOCATIONS ARE SHOWN ON PLAN

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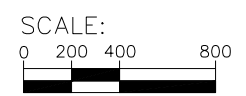
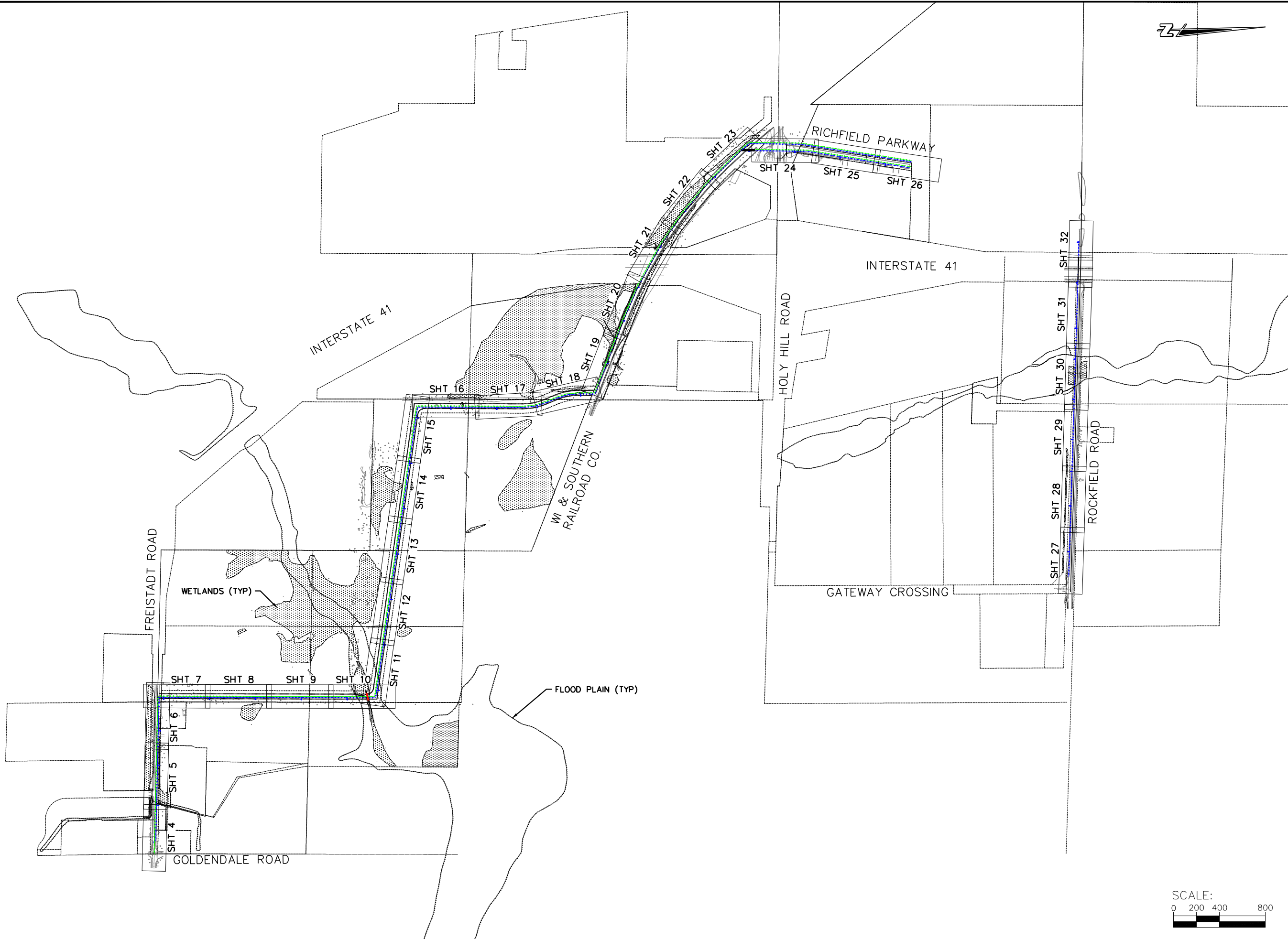
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STANDARD SYMBOLS AND ABBREVIATIONS

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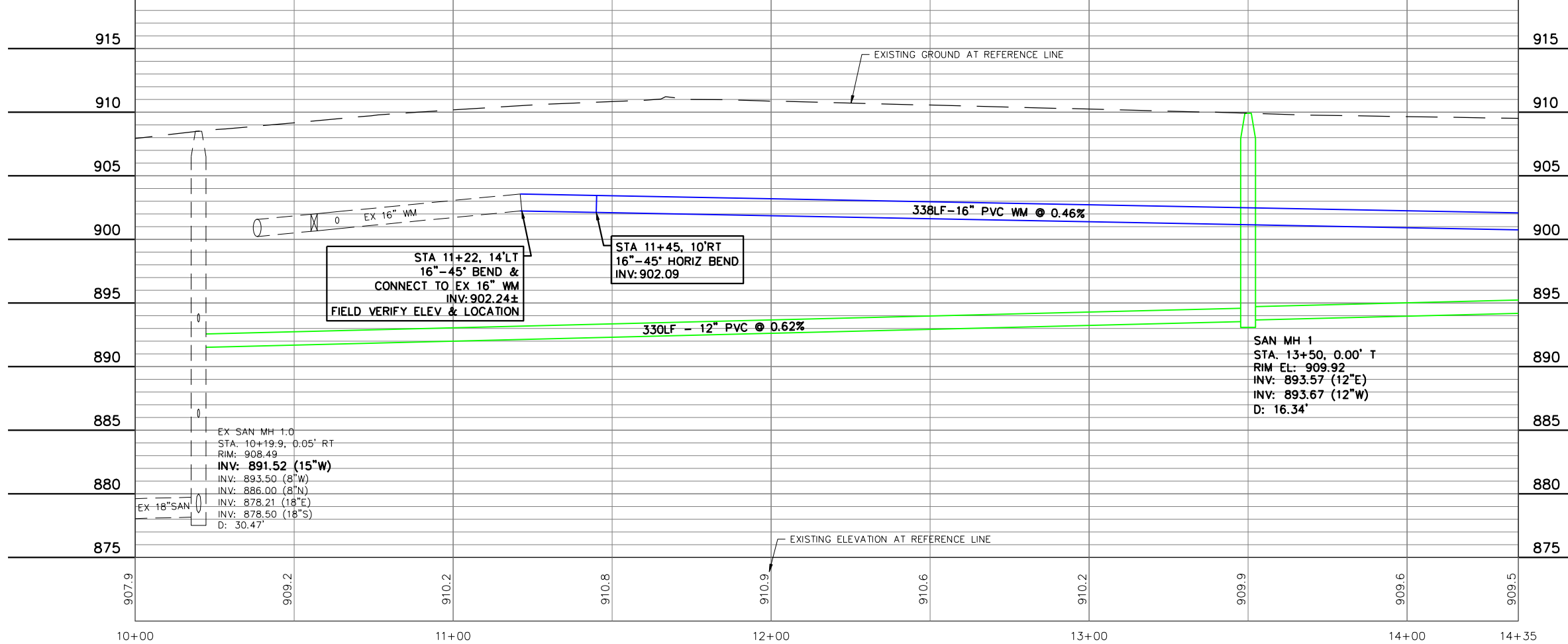
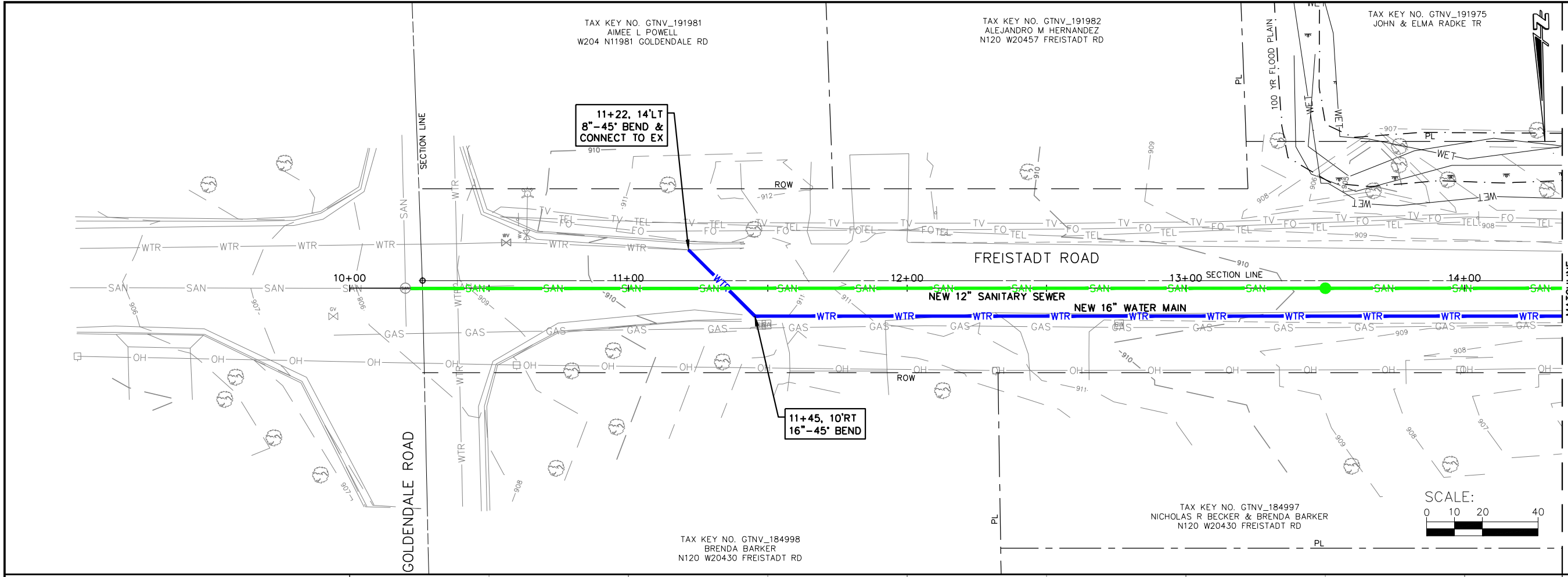
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OVERVIEW SHEET

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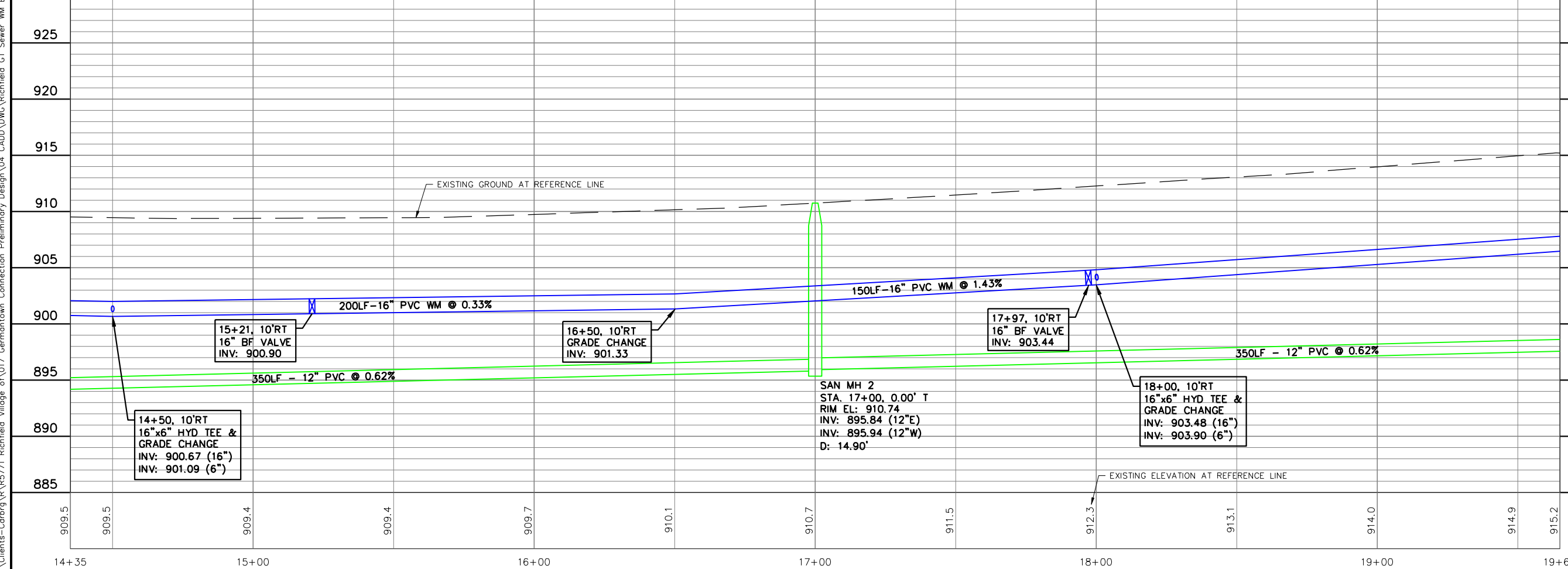
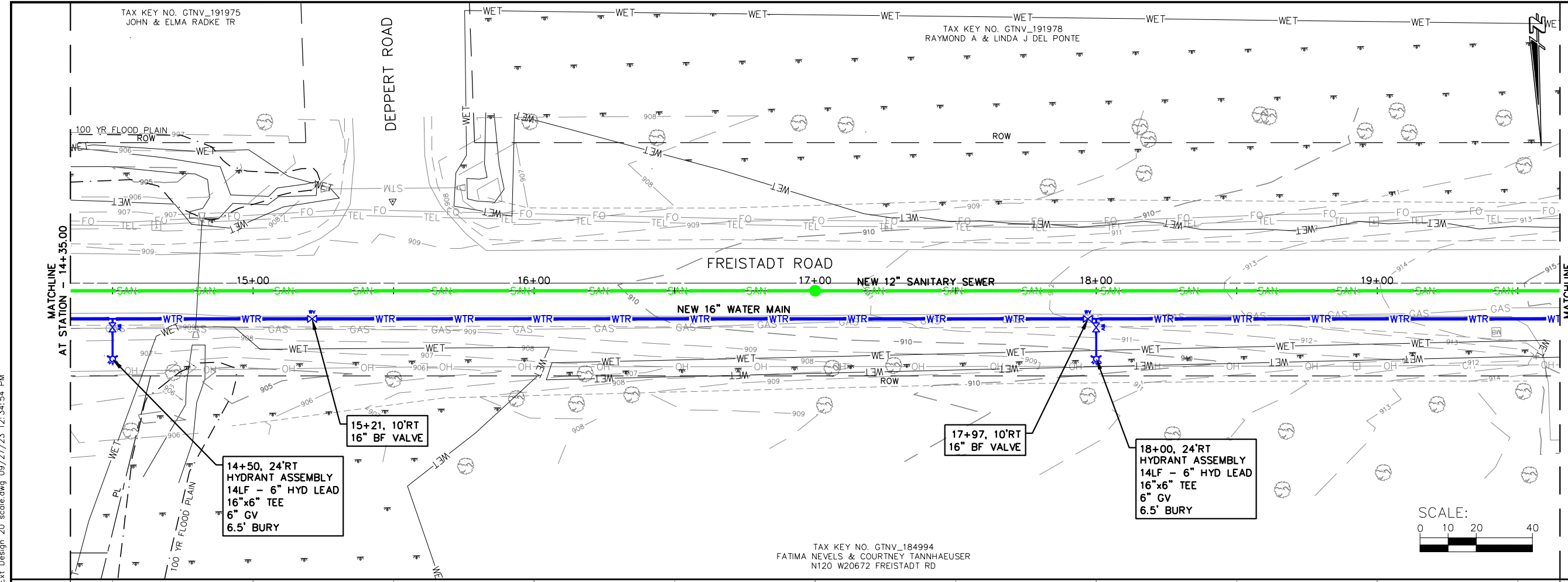
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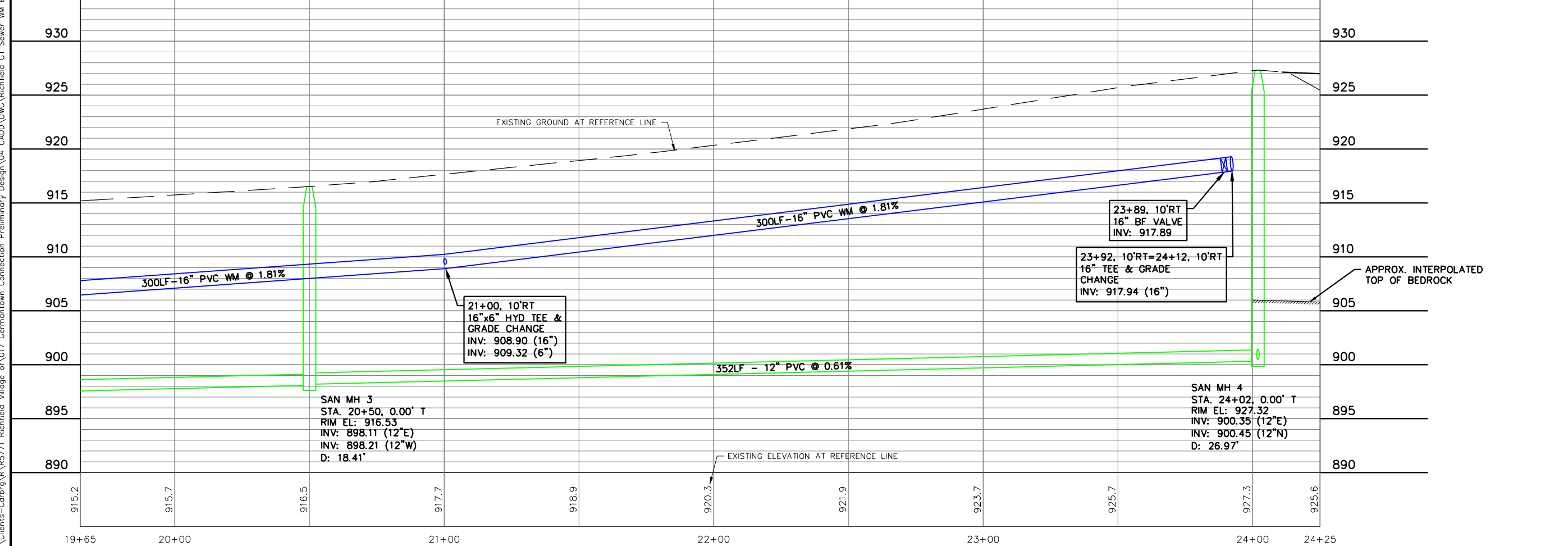
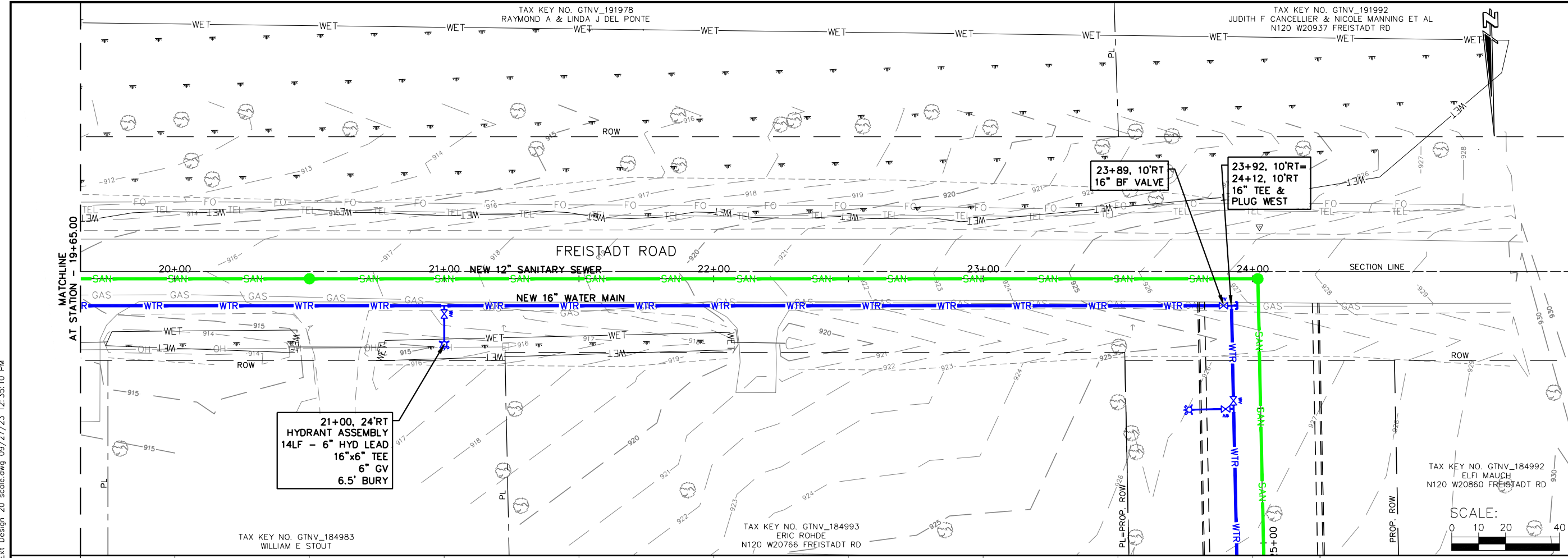
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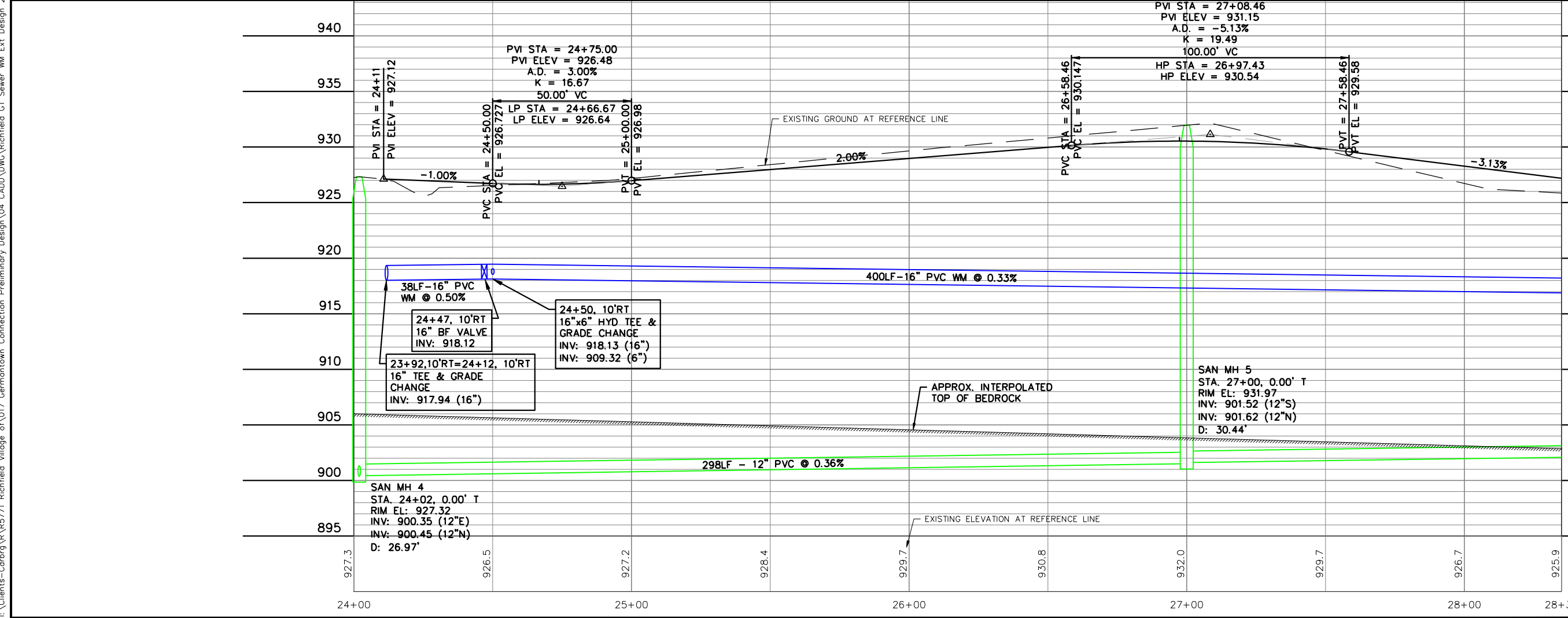
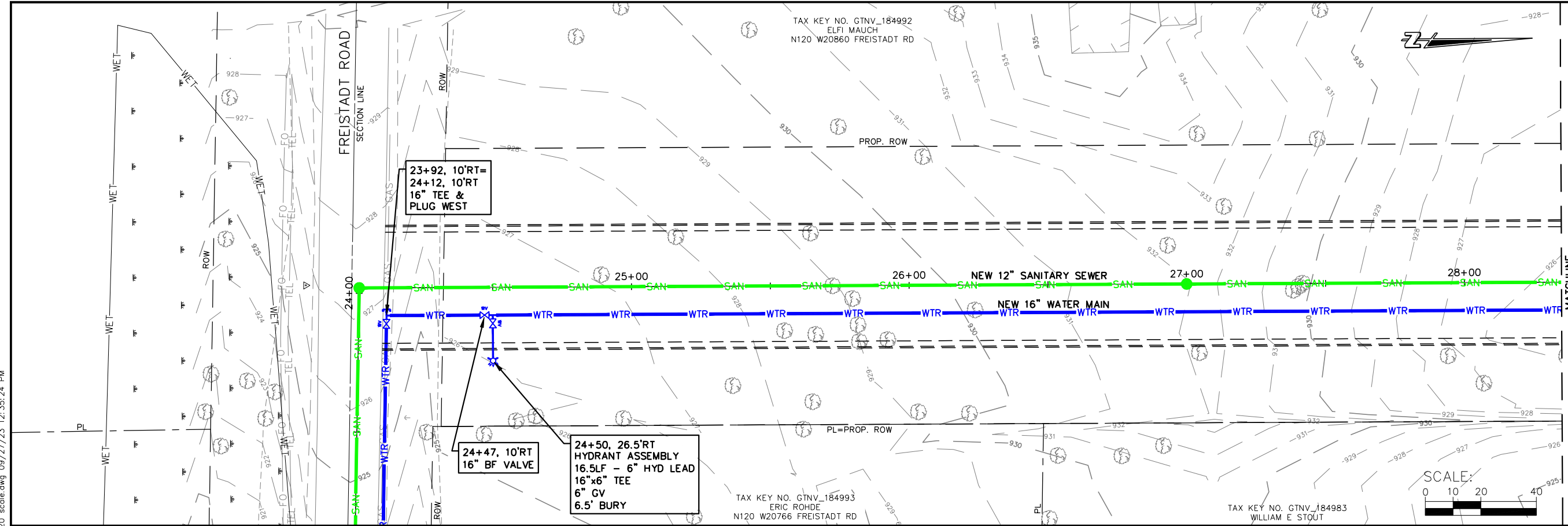
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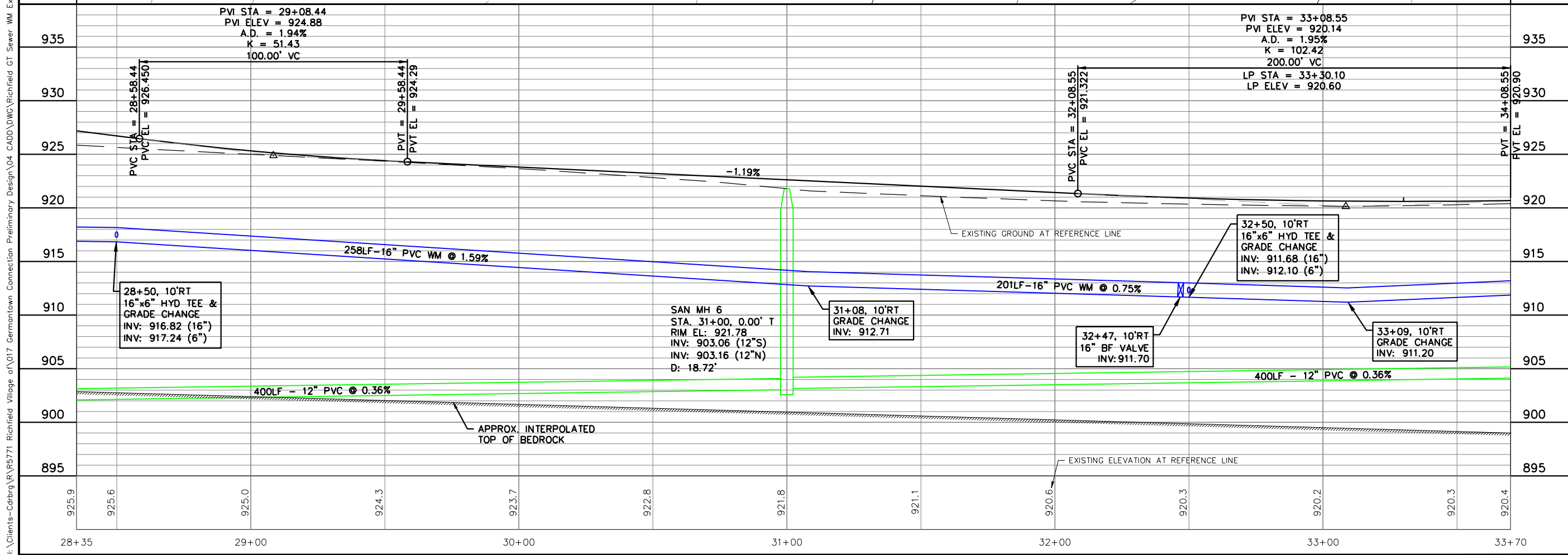
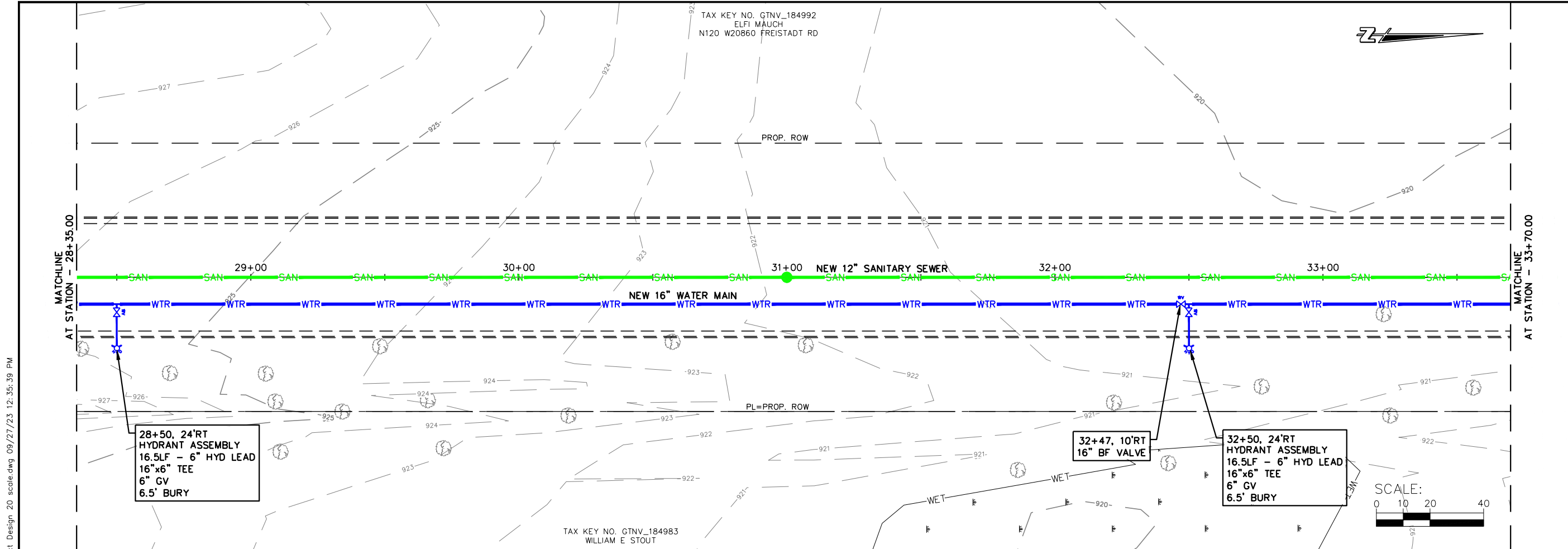
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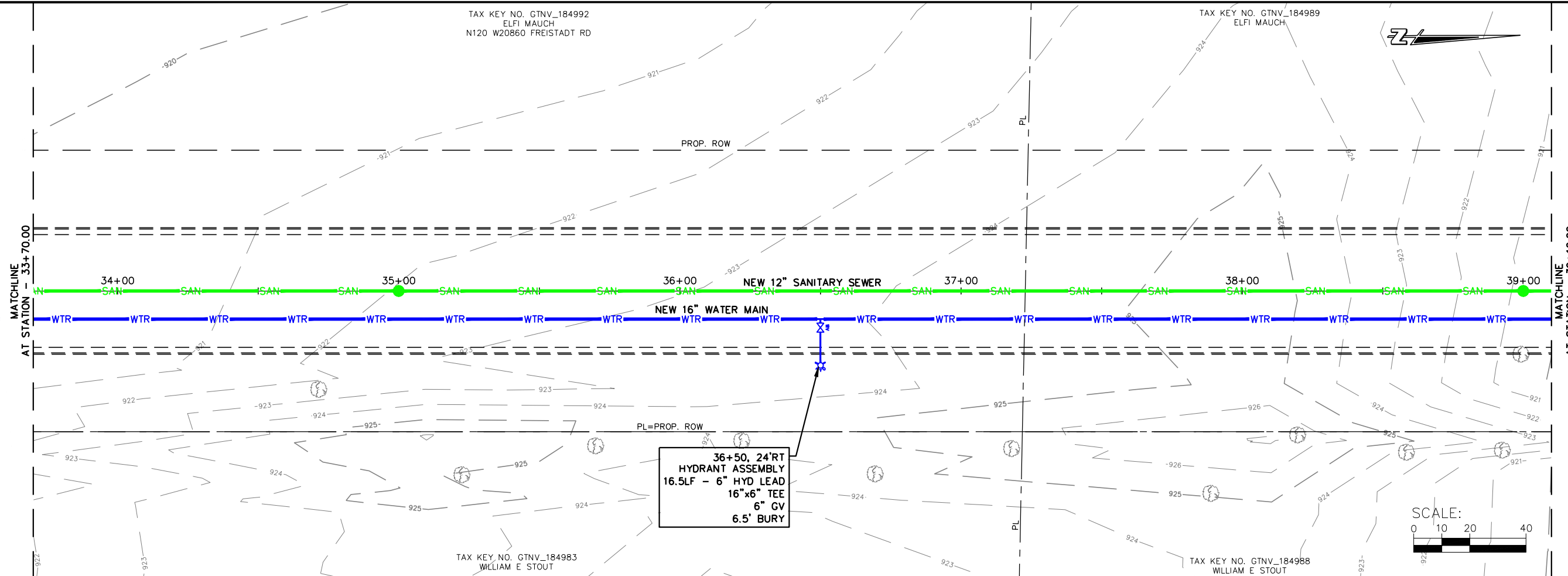
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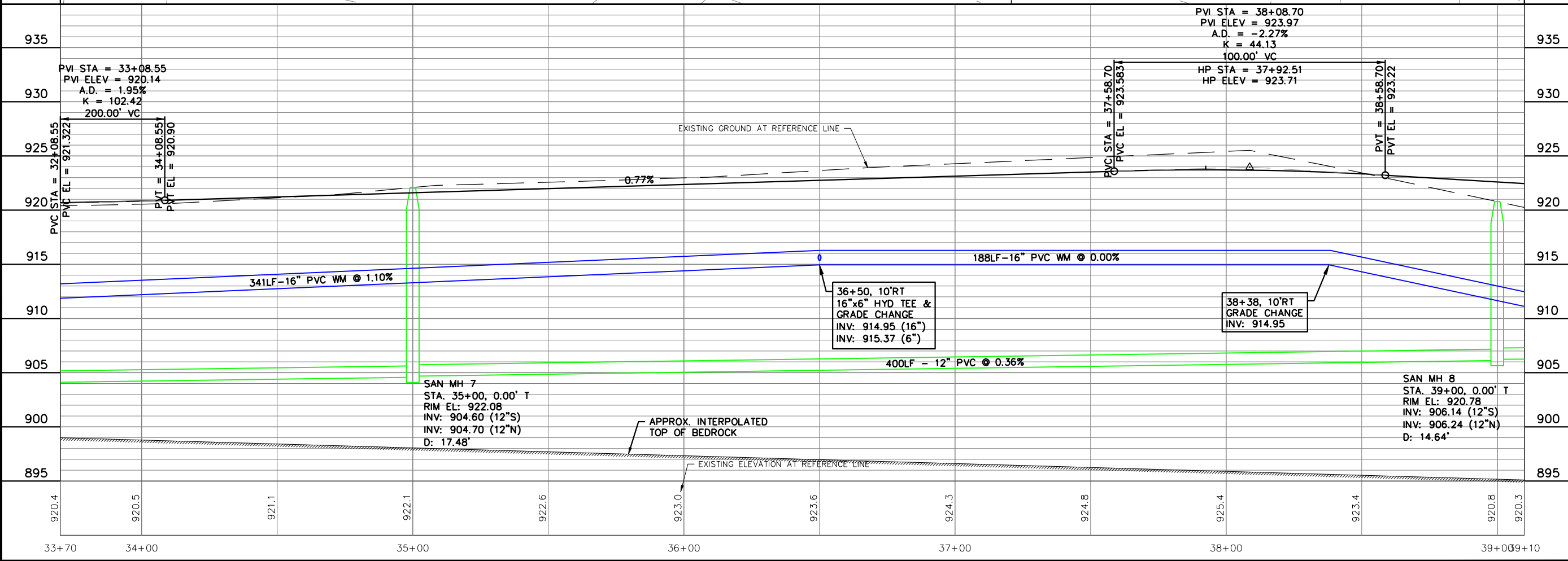
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36+50, 24'RT  
HYDRANT ASSEMBLY  
16.5LF - 6" HYD LEAD  
16"x6" TEE  
6" GV  
6.5' BURY



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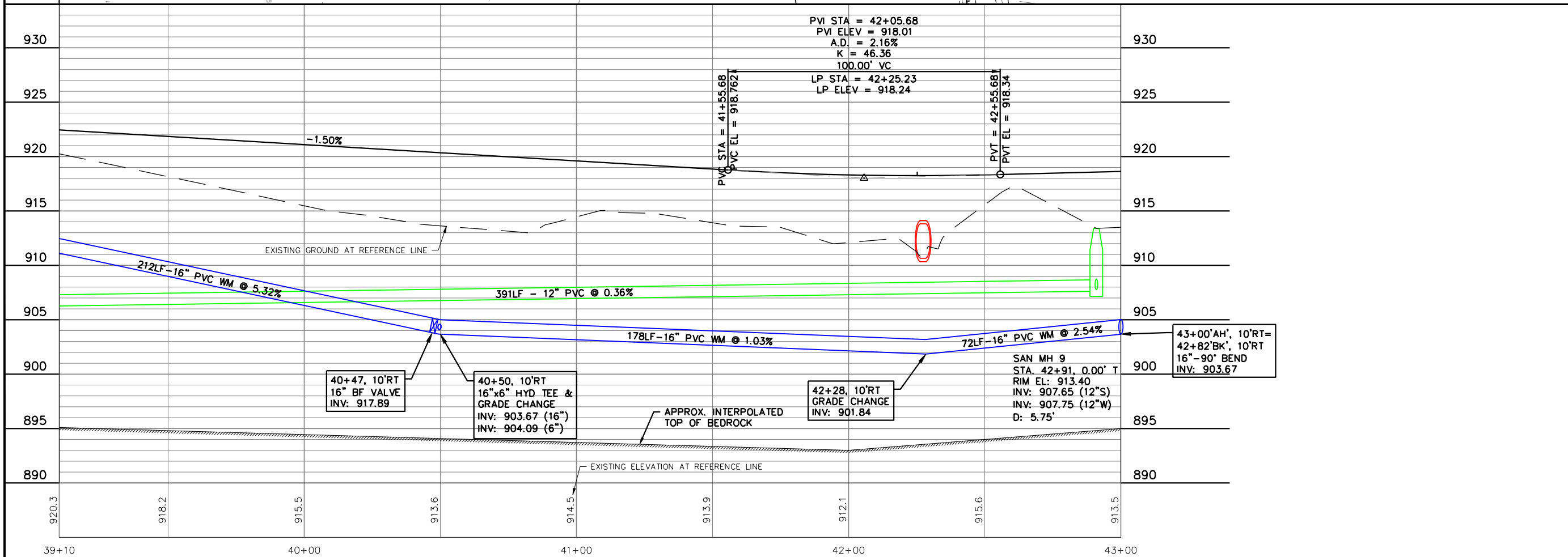
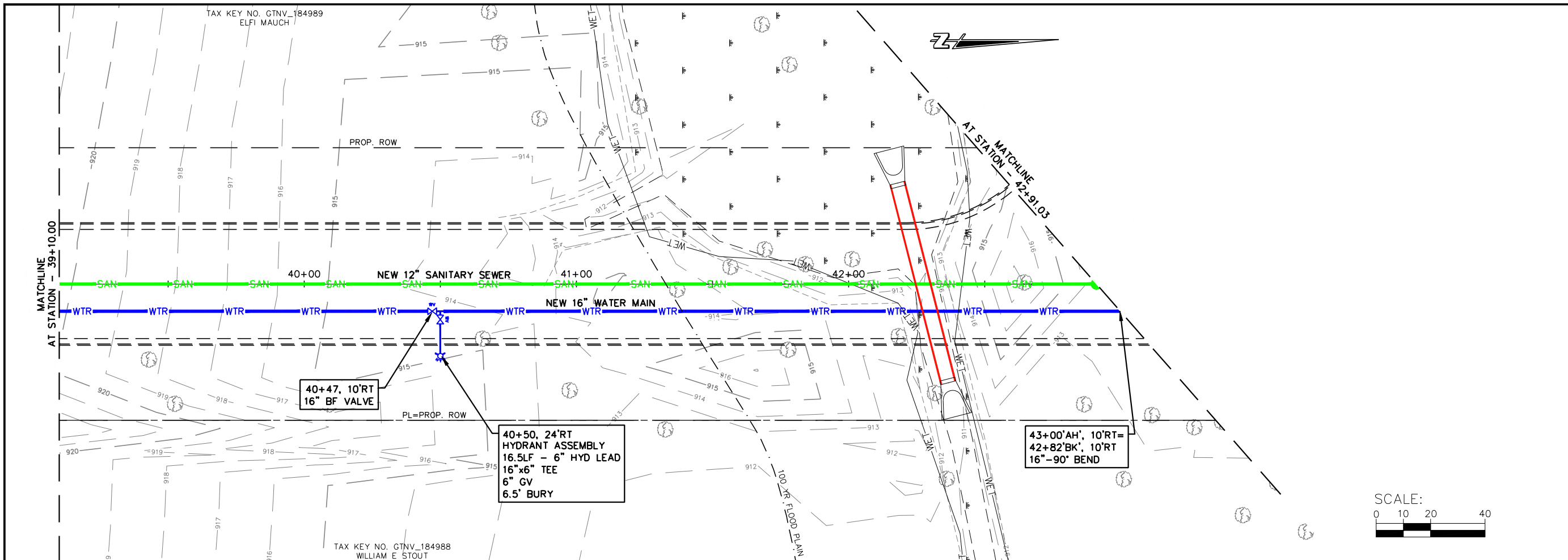
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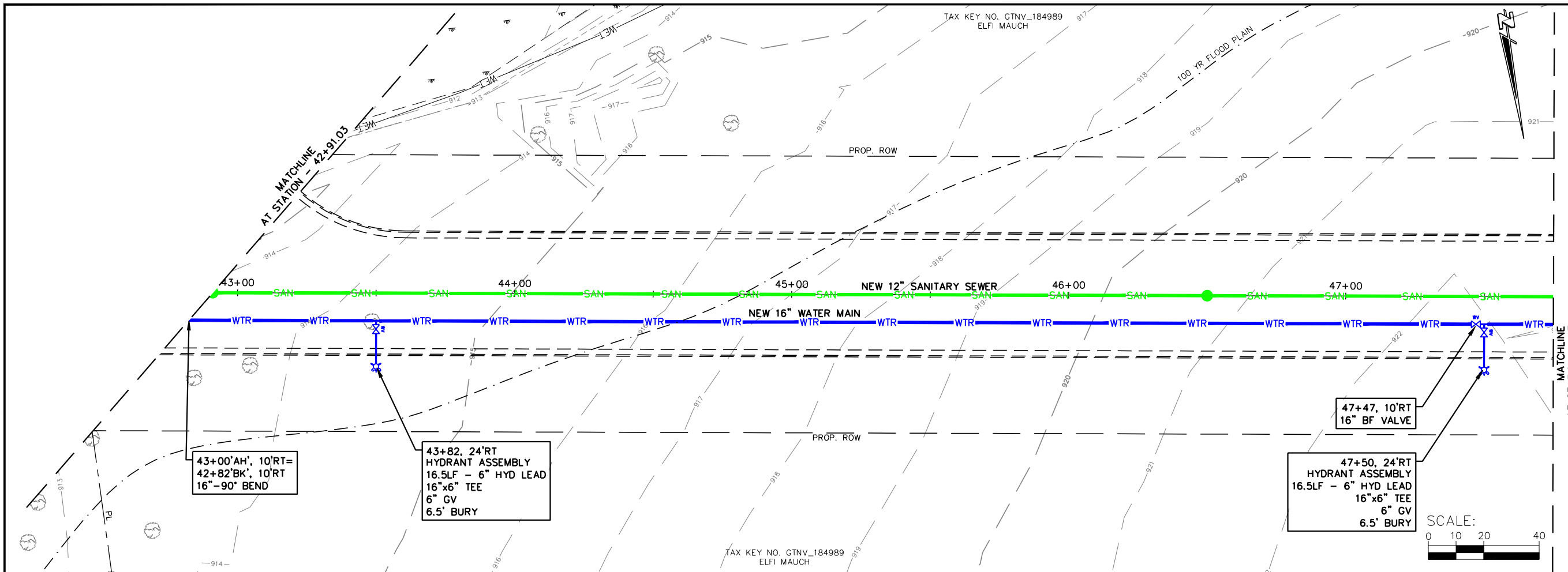
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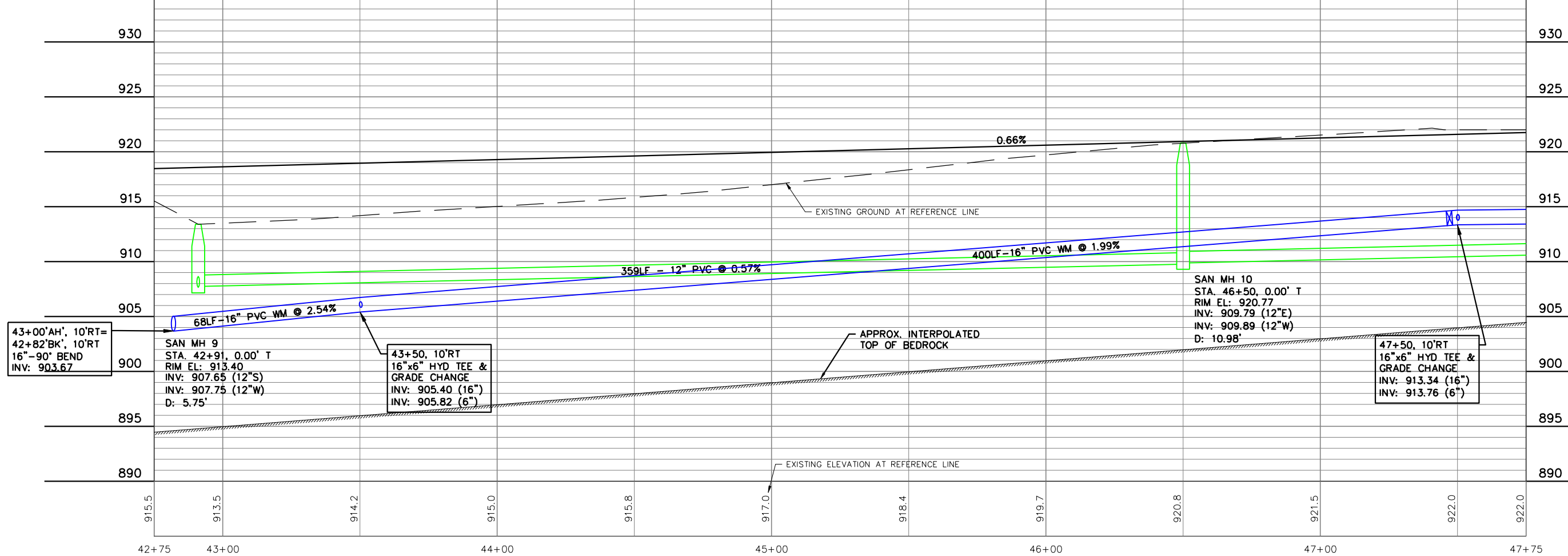
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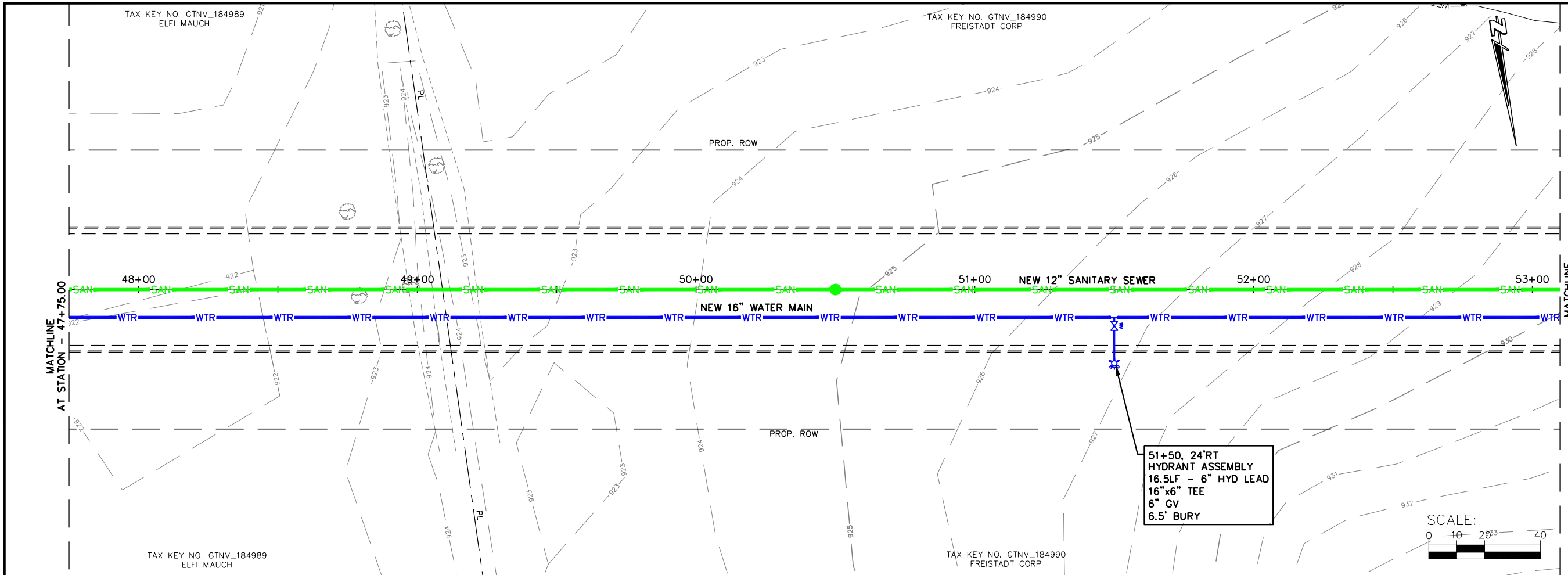
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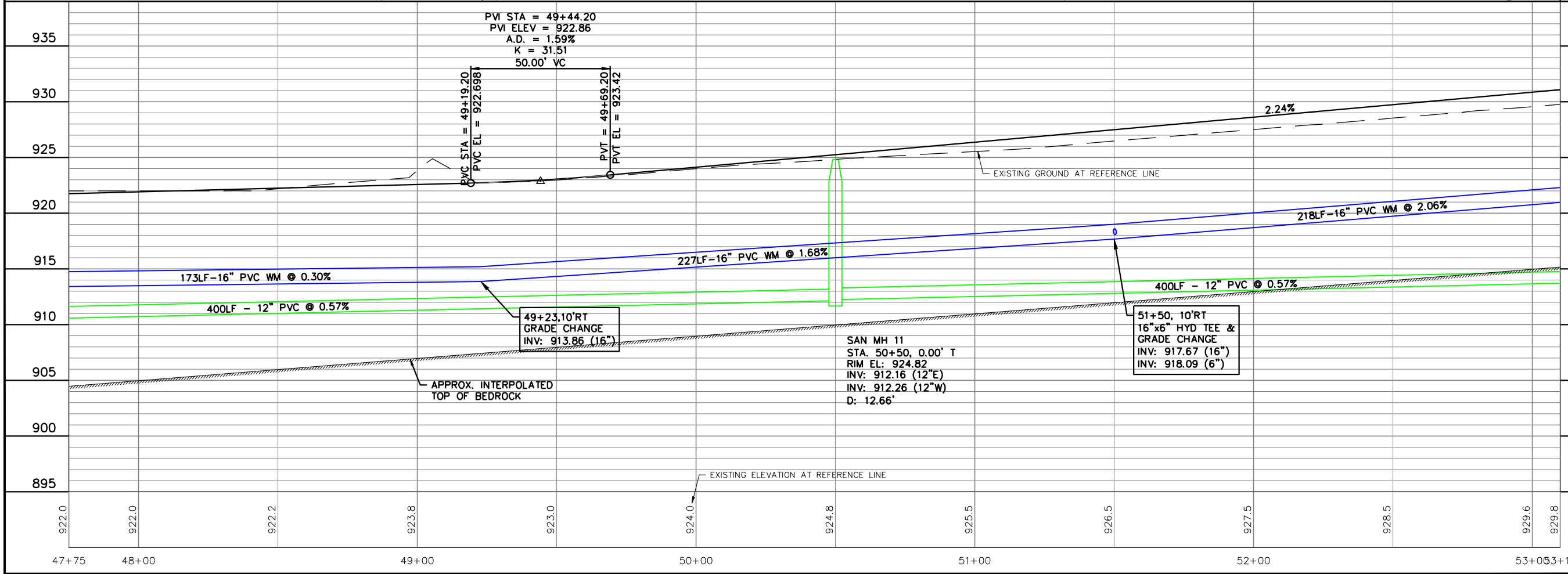
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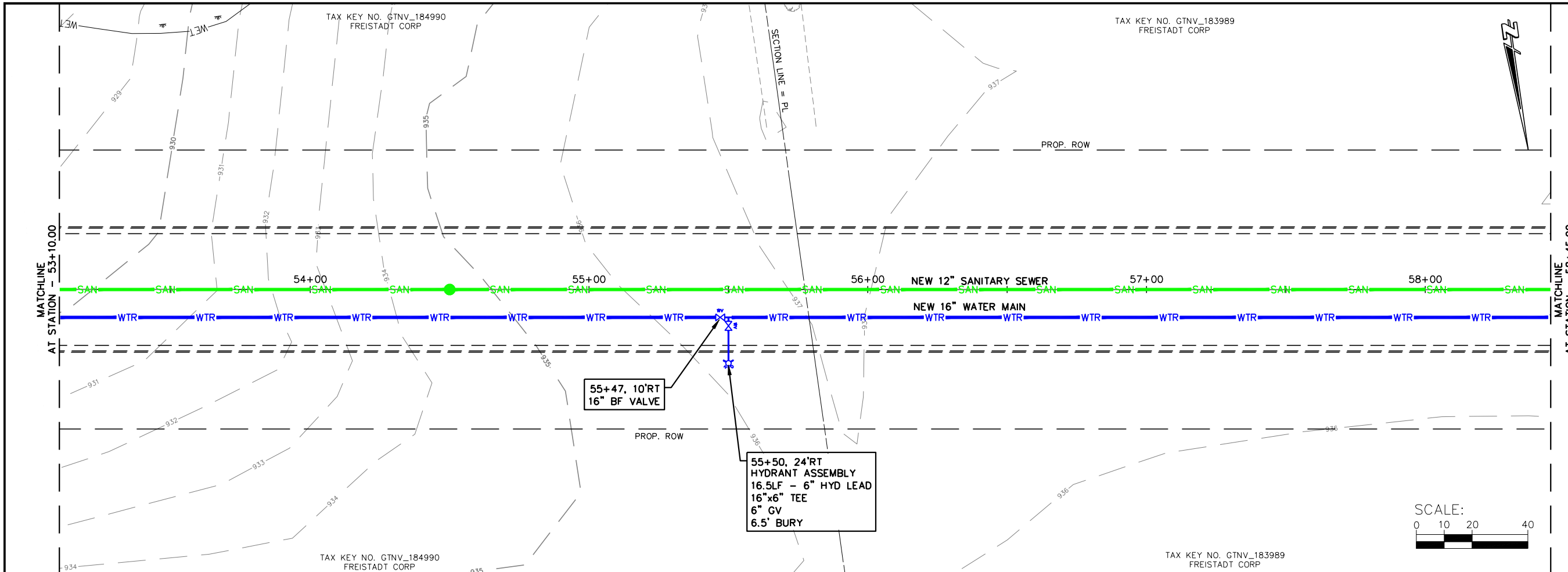
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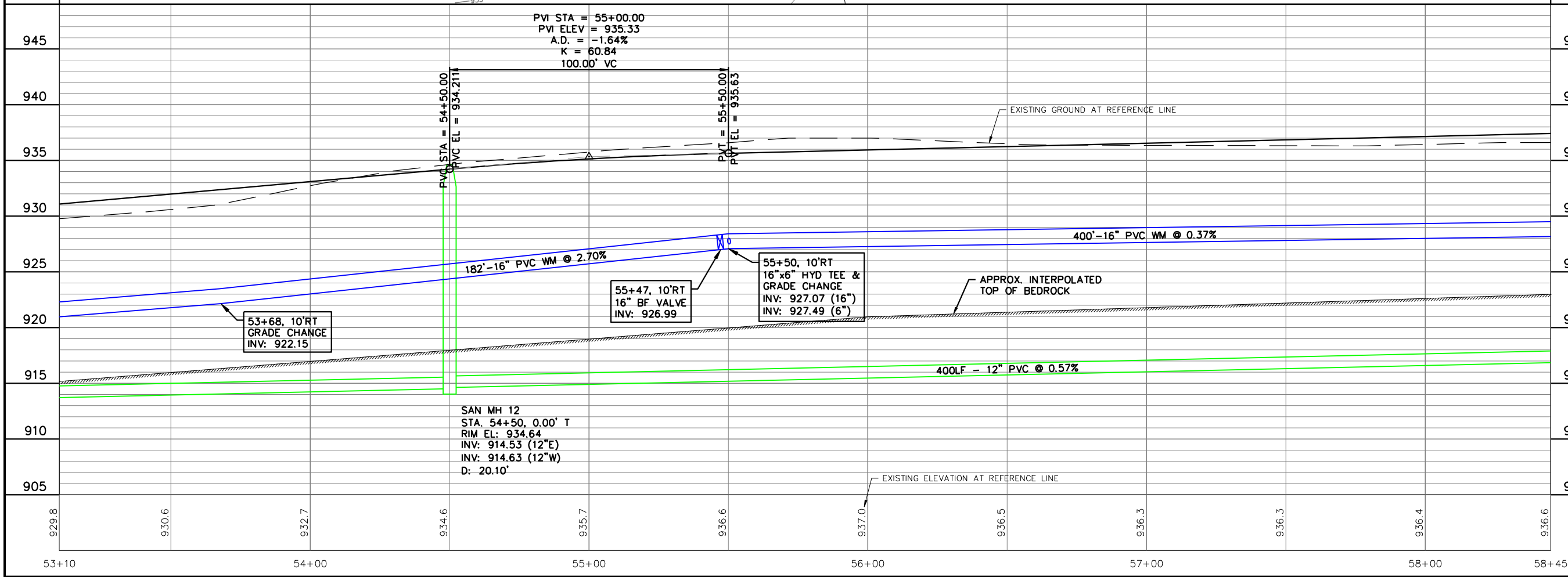
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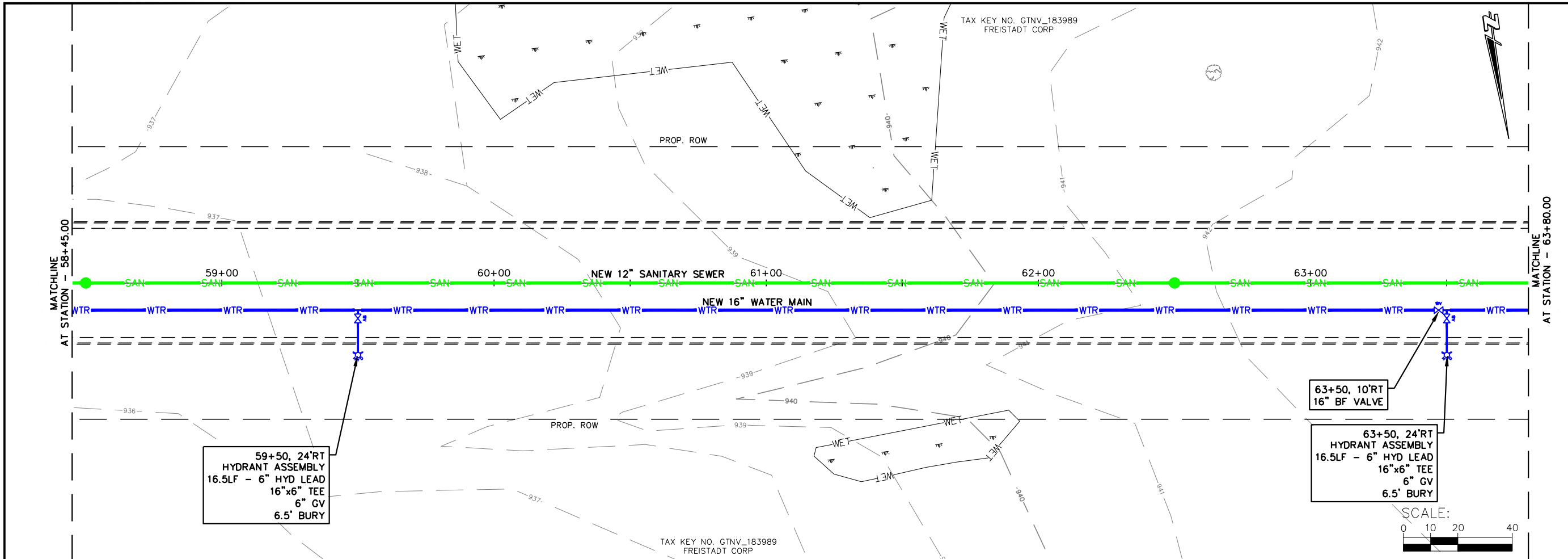
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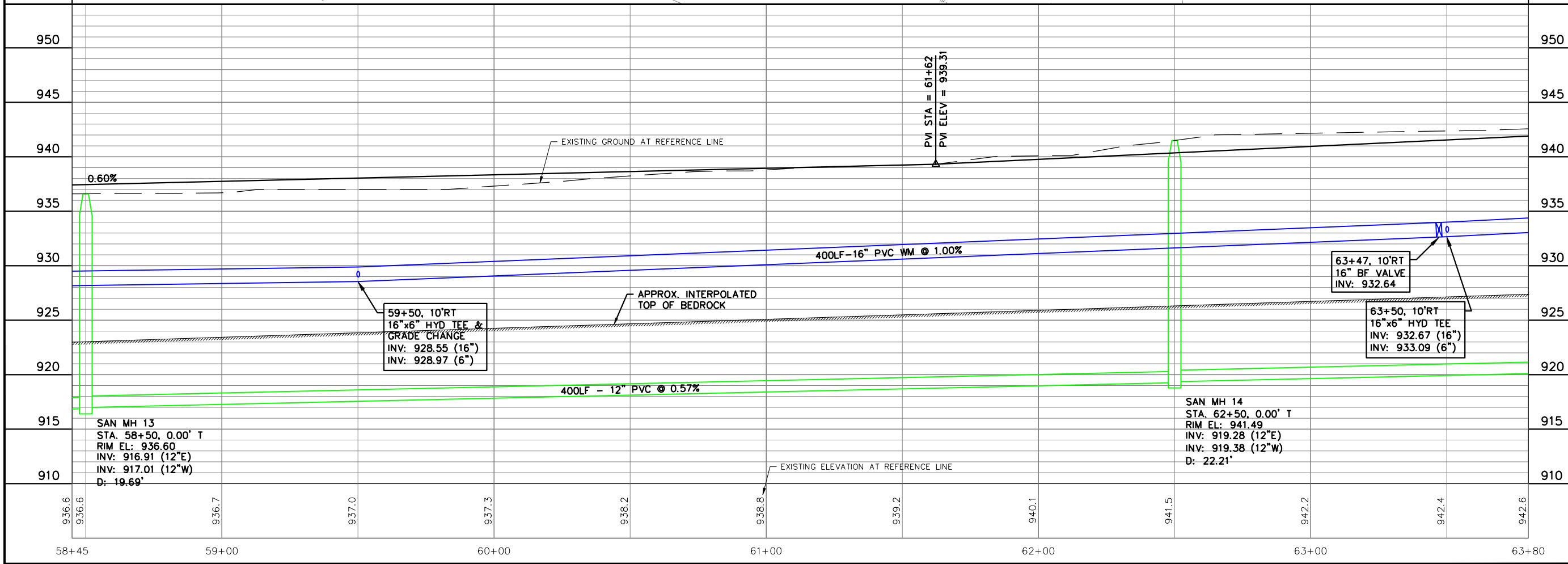
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59+50, 24"RT  
HYDRANT ASSEMBLY  
16.5LF - 6" HYD LEAD  
16"x6" TEE  
6" GV  
6.5' BURY

63+50, 10'RT  
16" BF VALVE

63+50, 24"RT  
HYDRANT ASSEMBLY  
16.5LF - 6" HYD LEAD  
16"x6" TEE  
6" GV  
6.5' BURY



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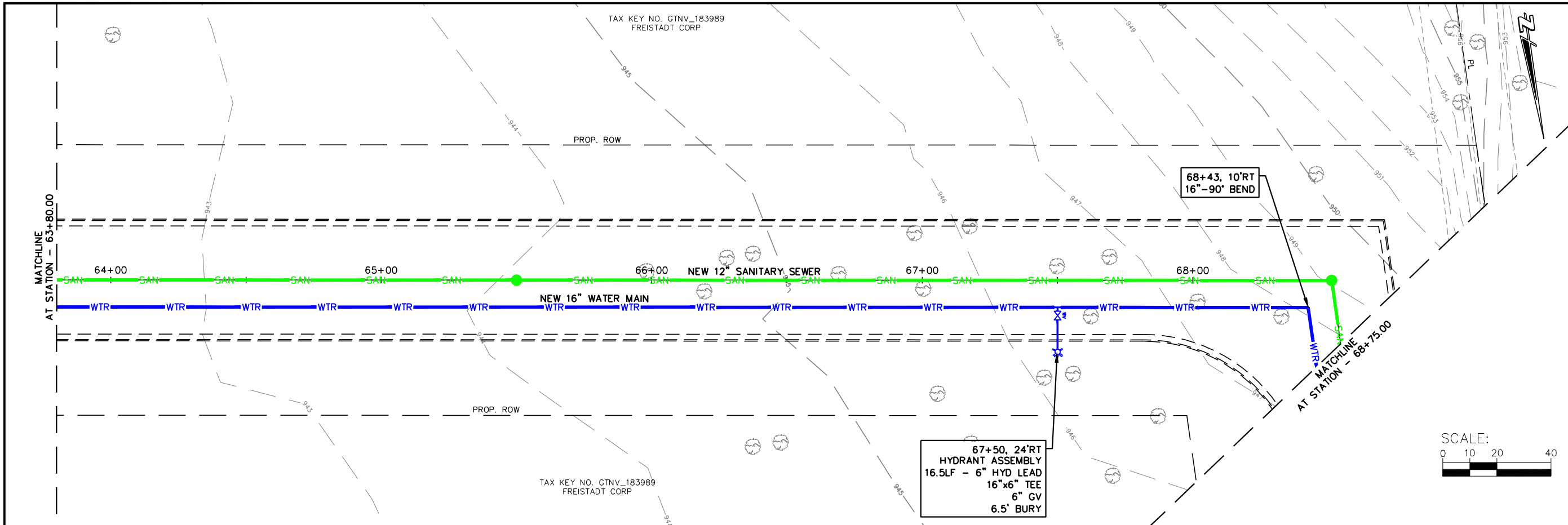
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FAX: 608-249-5824

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GERMANTOWN CONNECTION  
WASHINGTON COUNTY, WISCONSIN  
FUTURE ROAD PLAN AND PROFILE

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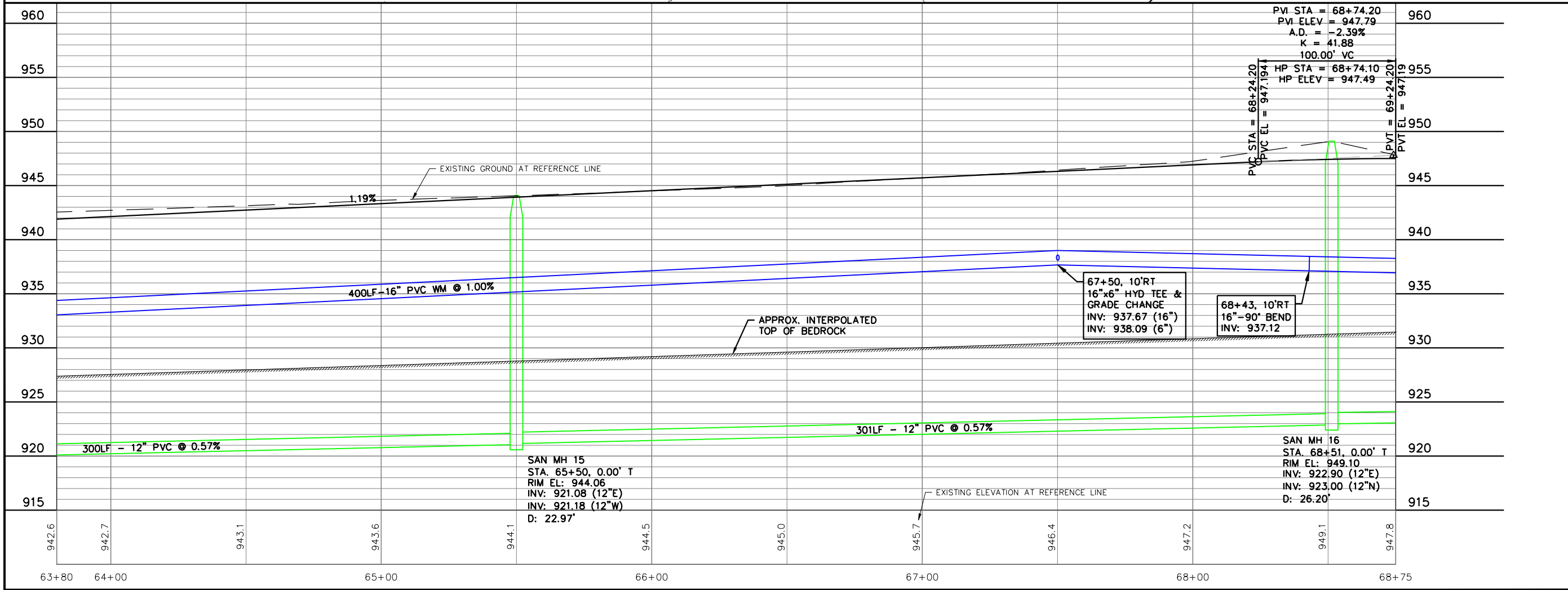
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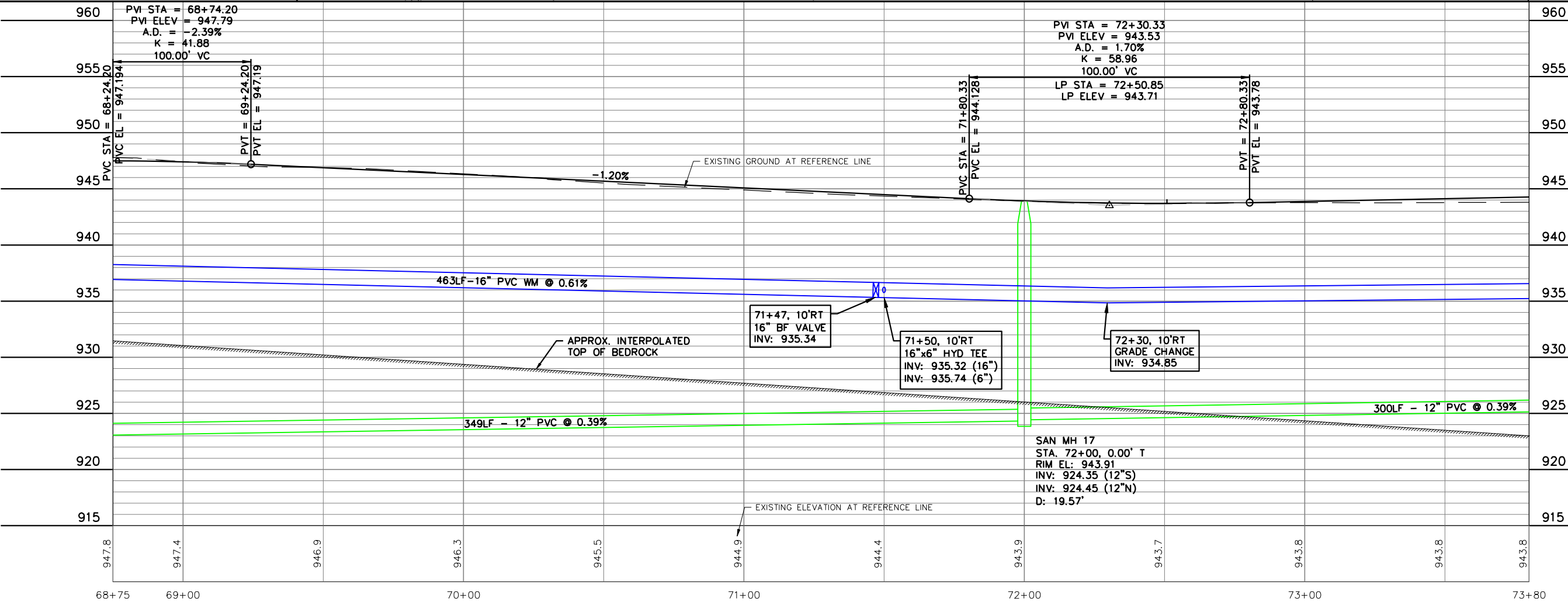
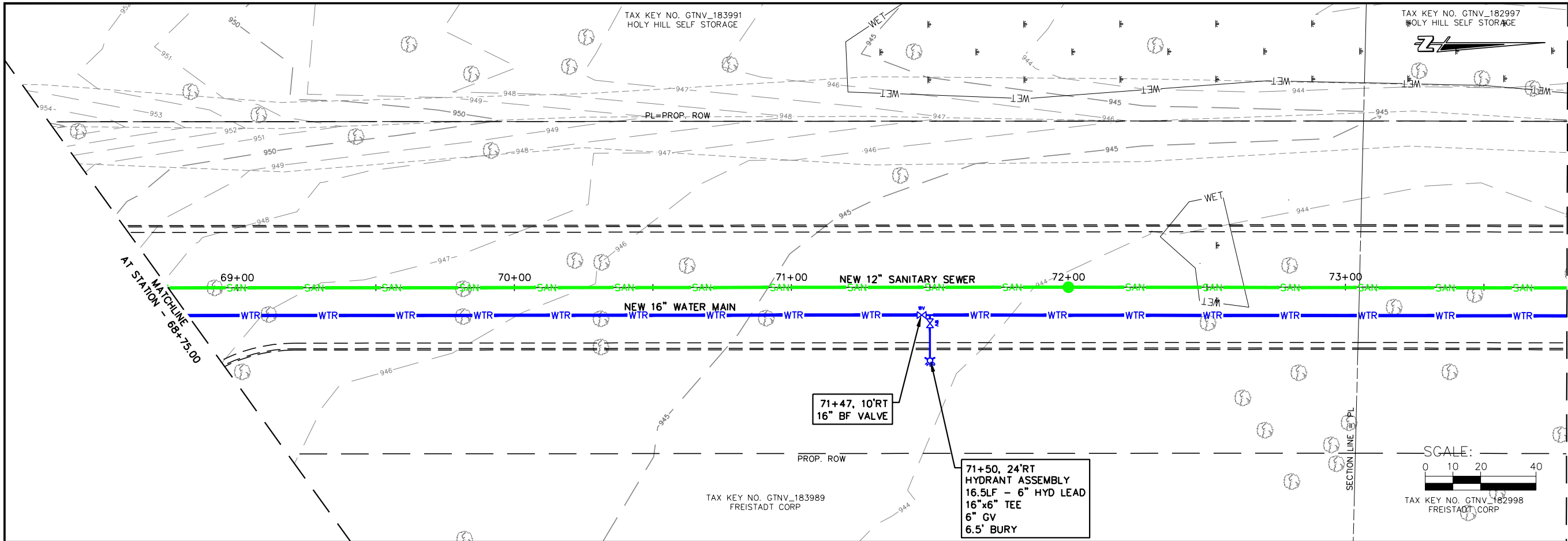
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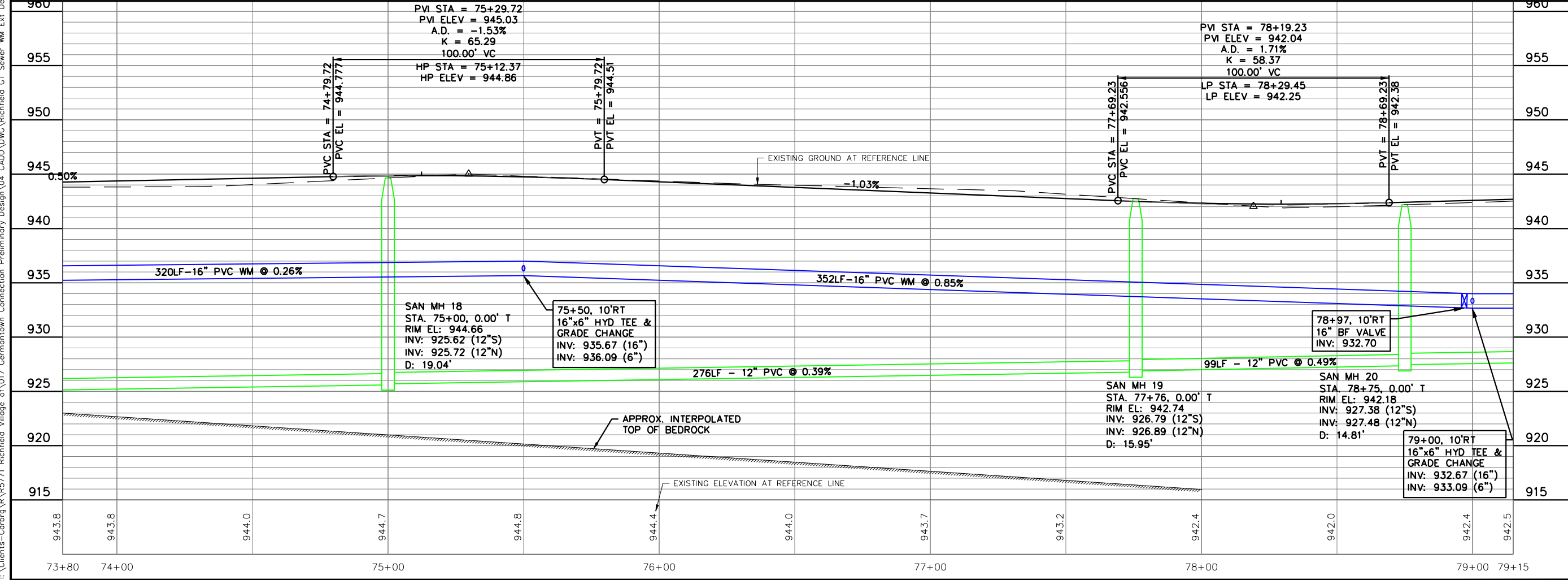
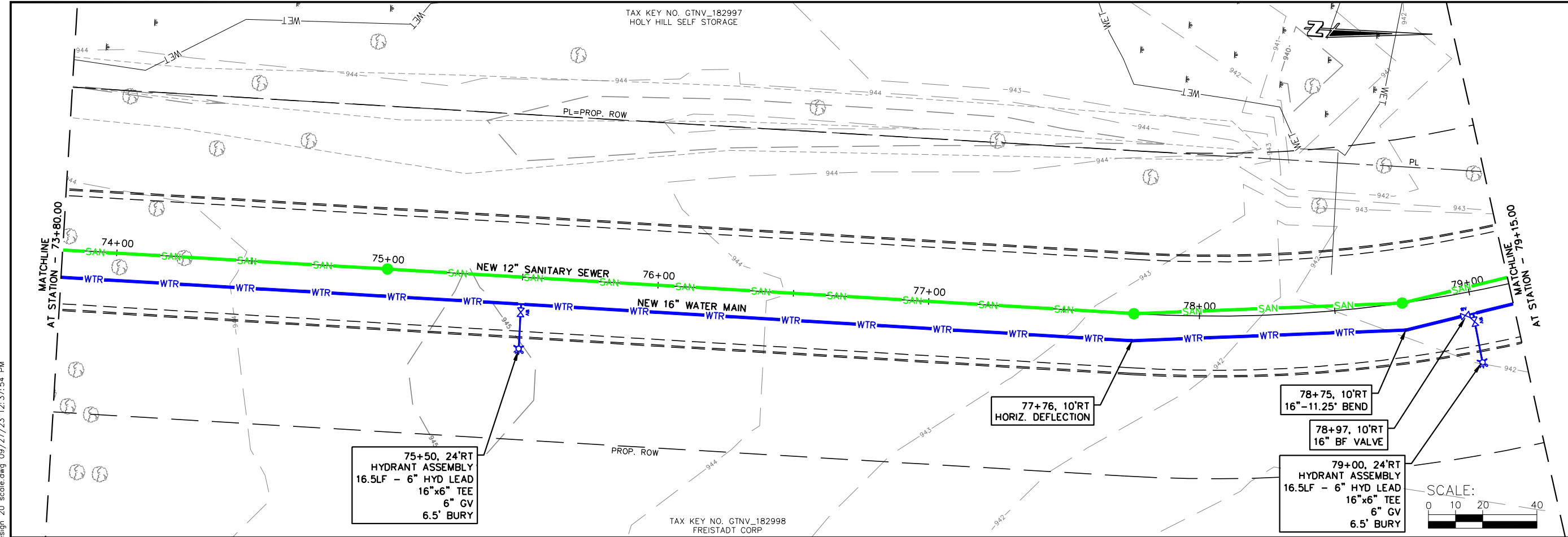
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FAX 608-249-8824  
FAX 920-491-9020  
FAX 715-235-2727

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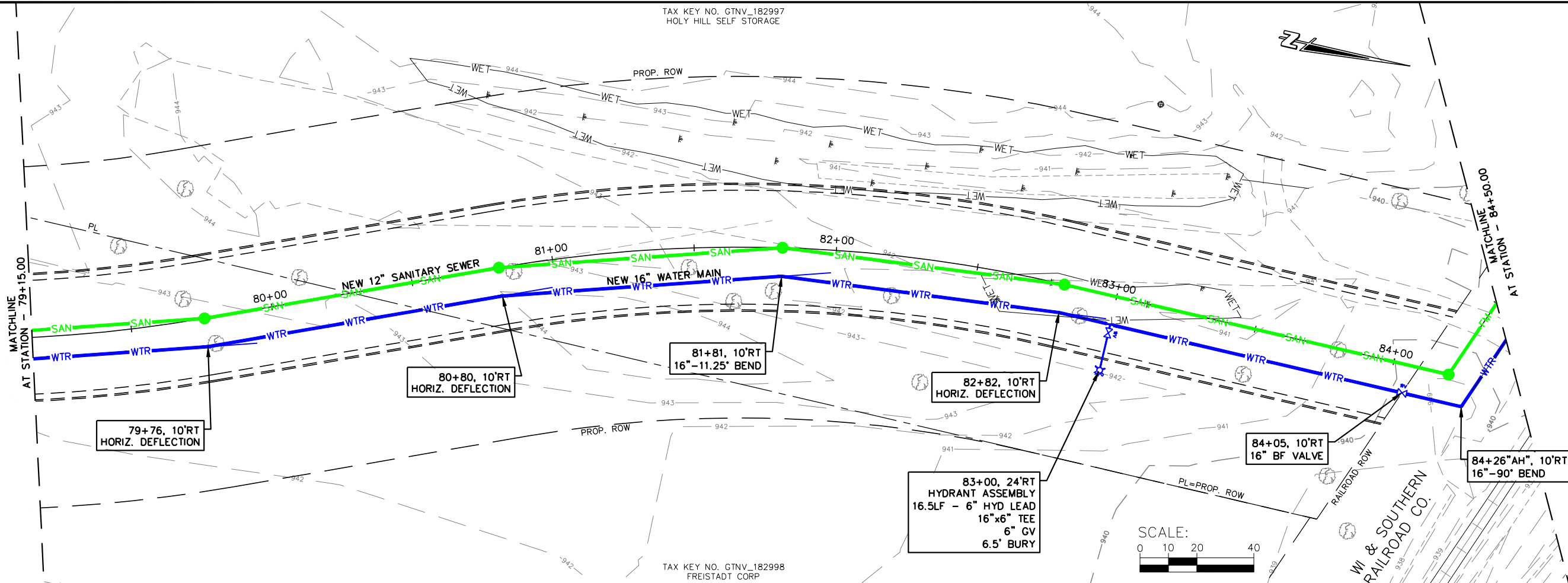
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Winneconne, WI 53198  
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TAX KEY NO. GTNV\_182997  
HOLY HILL SELF STORAGE

TAX KEY NO. GTNV\_182998  
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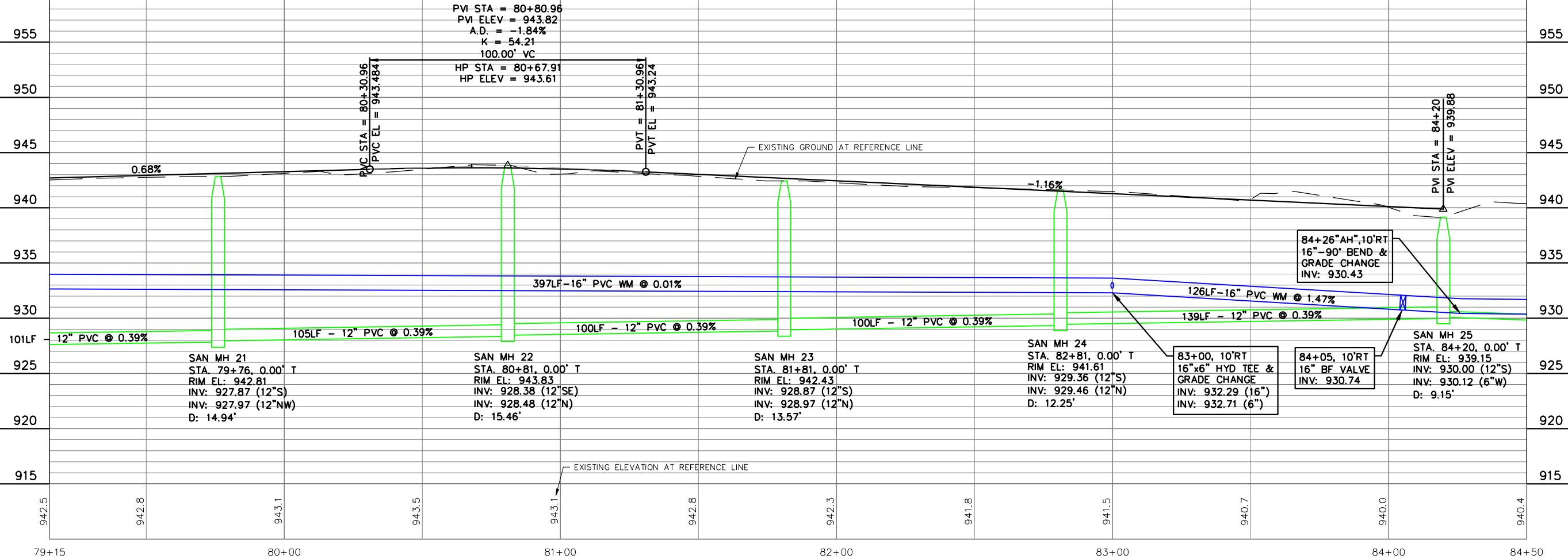
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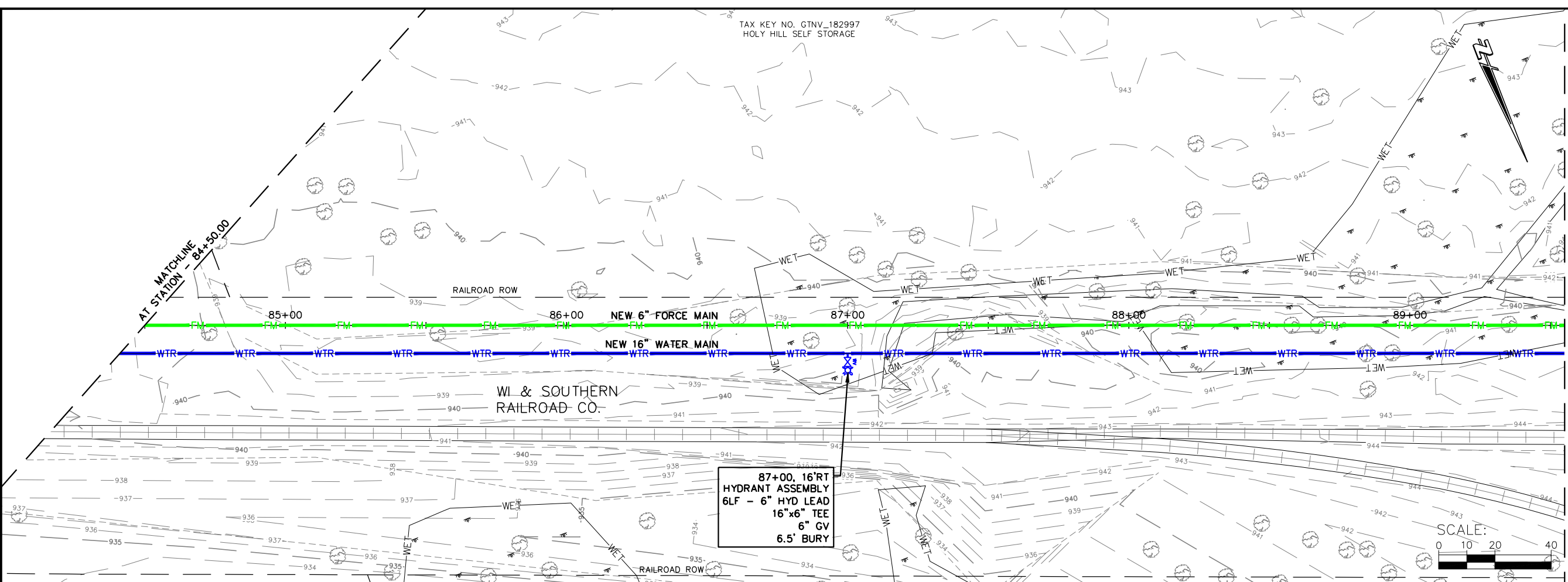
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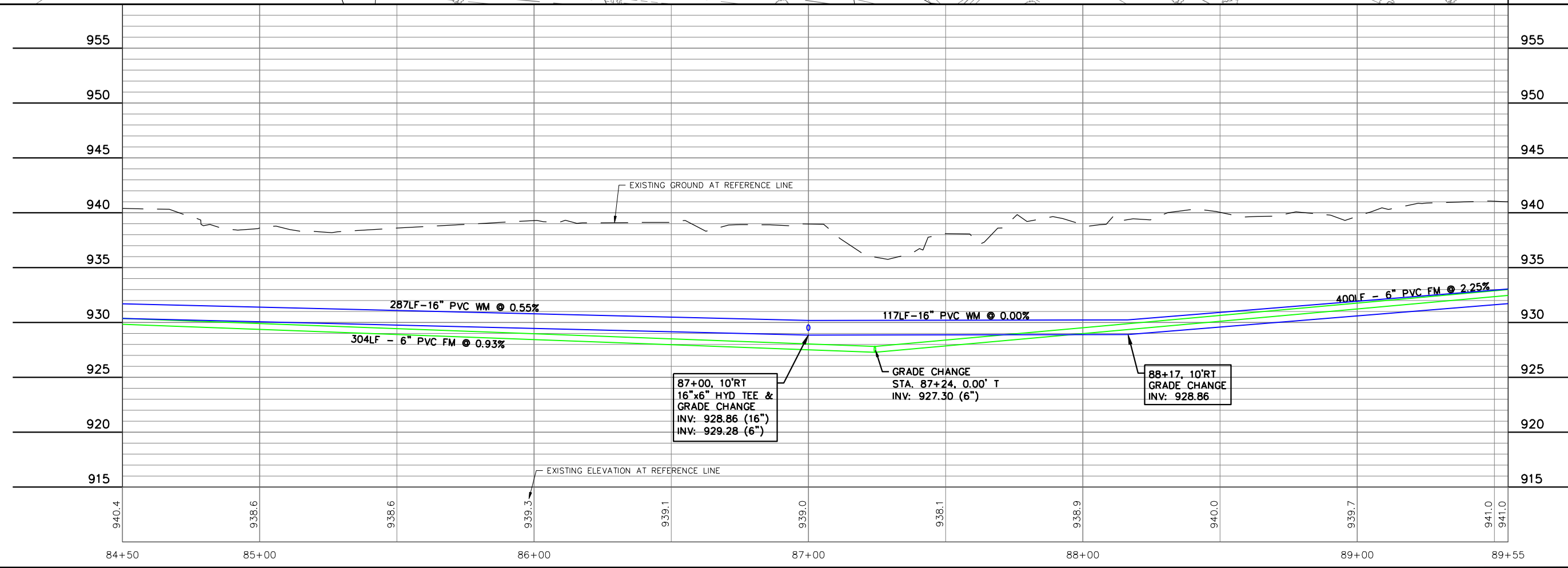


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HOLY HILL SELF STORAGE



87+00, 16'RT  
HYDRANT ASSEMBLY  
6LF - 6" HYD LEAD  
16"x6" TEE  
6" GV  
6.5' BURY



87+00, 10'RT  
16"x6" HYD TEE &  
GRADE CHANGE  
INV: 928.86 (16")  
INV: 929.28 (6")

GRADE CHANGE  
STA. 87+24, 0.00' T  
INV: 927.30 (6")

88+17, 10'RT  
GRADE CHANGE  
INV: 928.86

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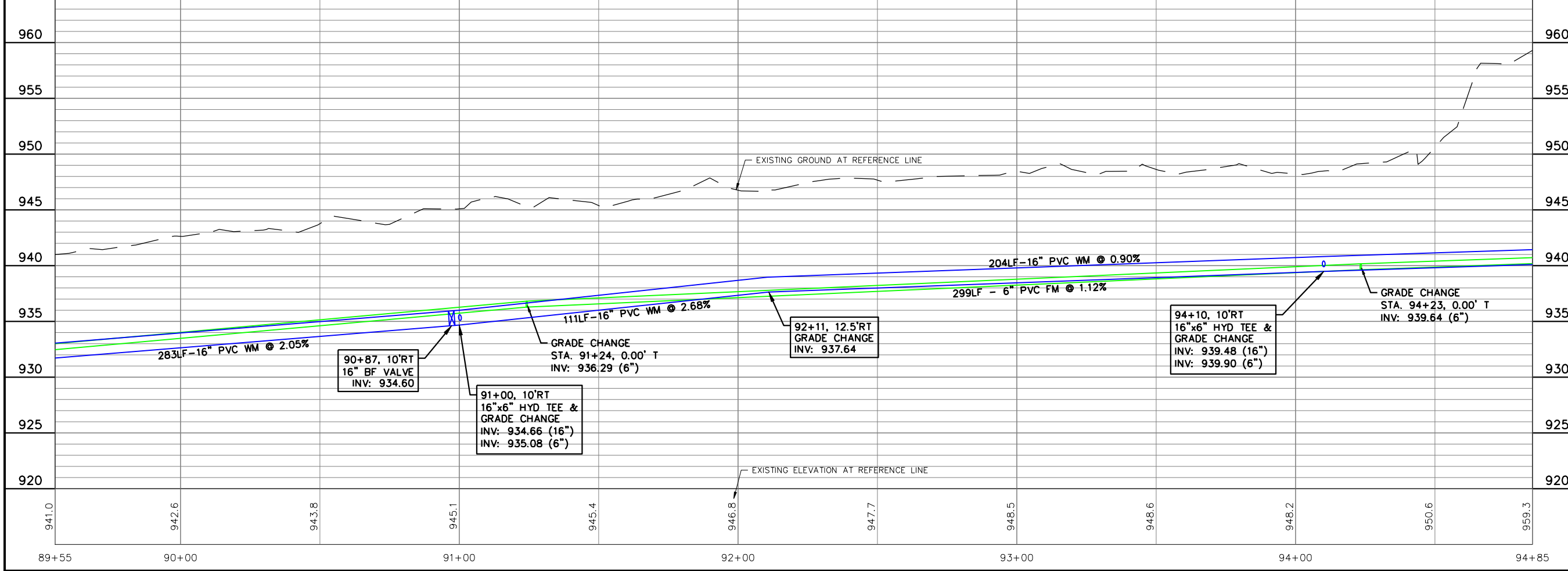
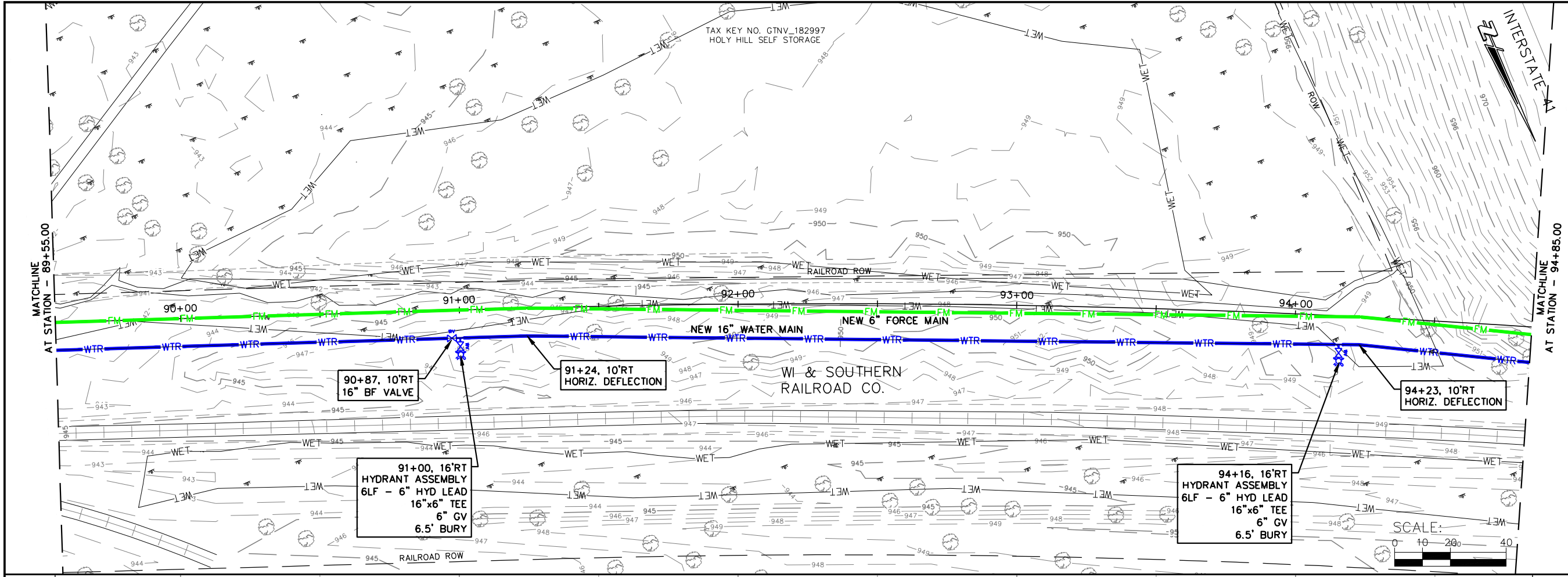
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FAX: 608-249-2688

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RAILROAD EASEMENT PLAN AND PROFILE

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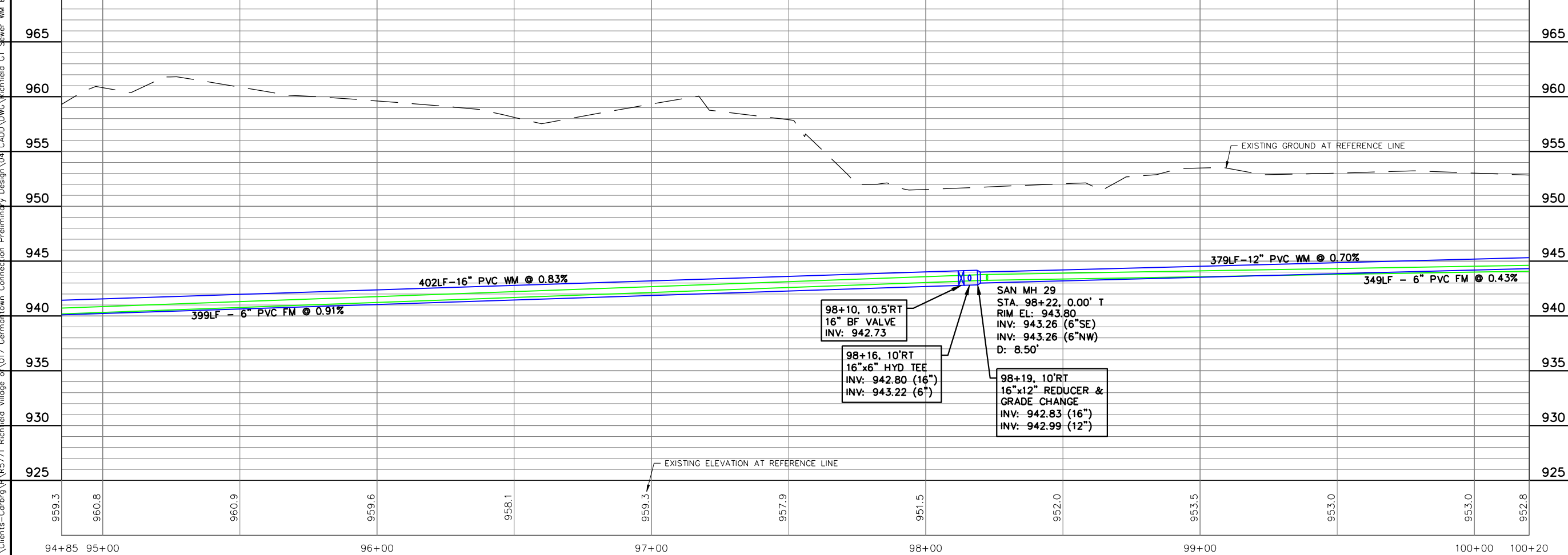
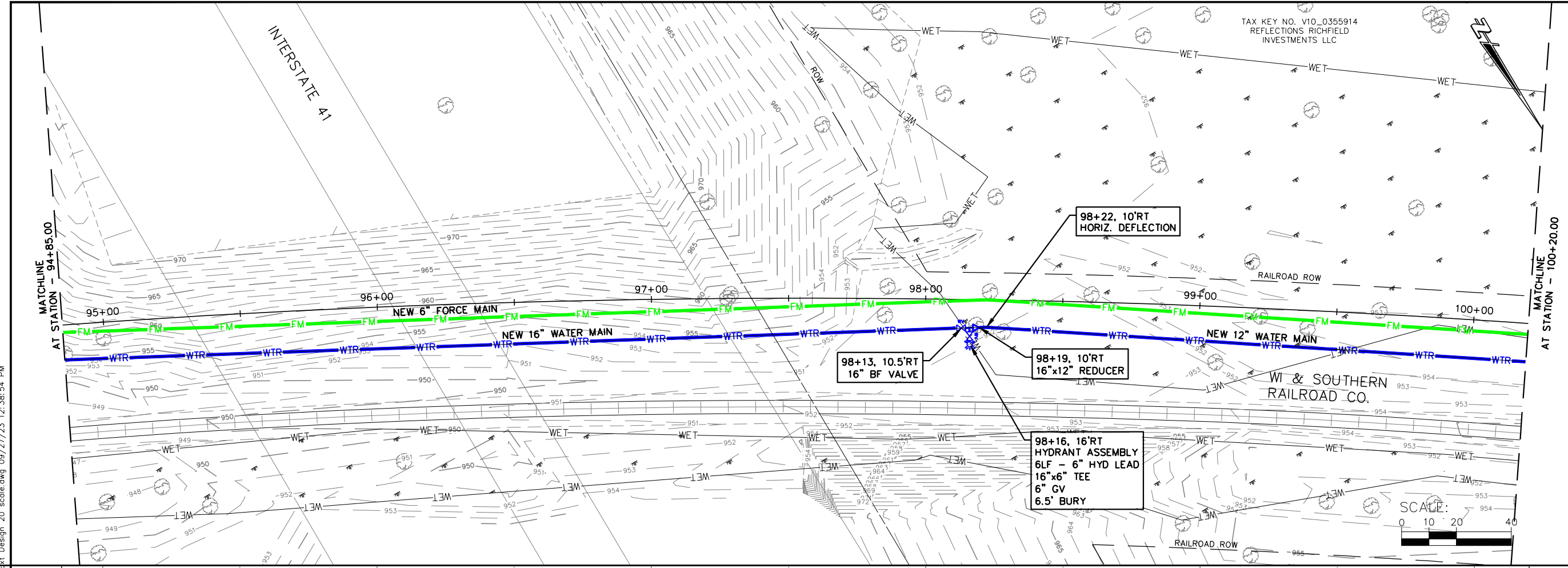
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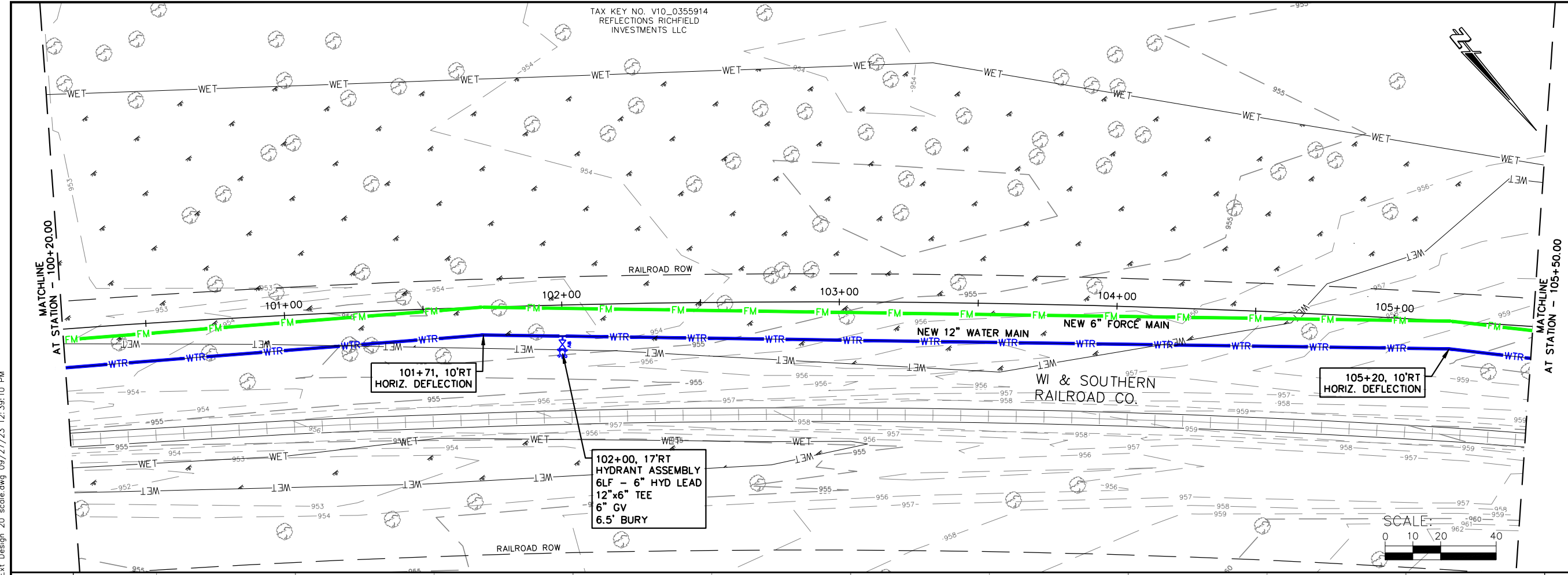


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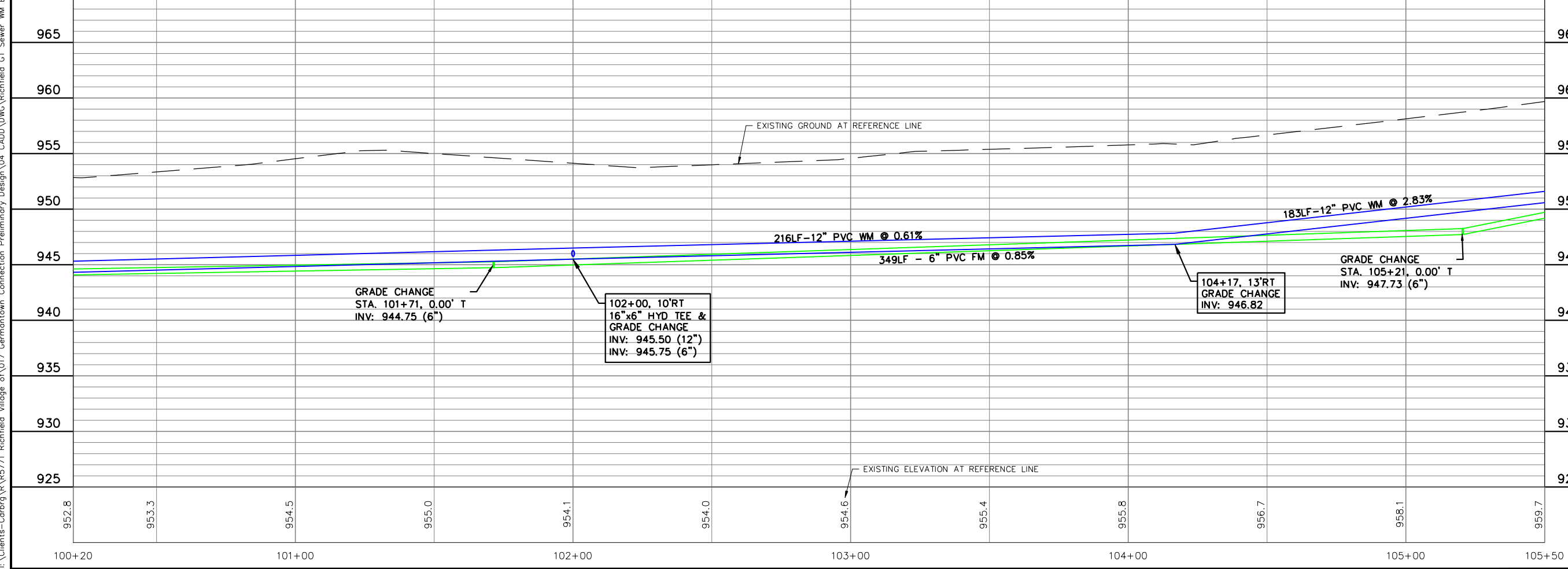
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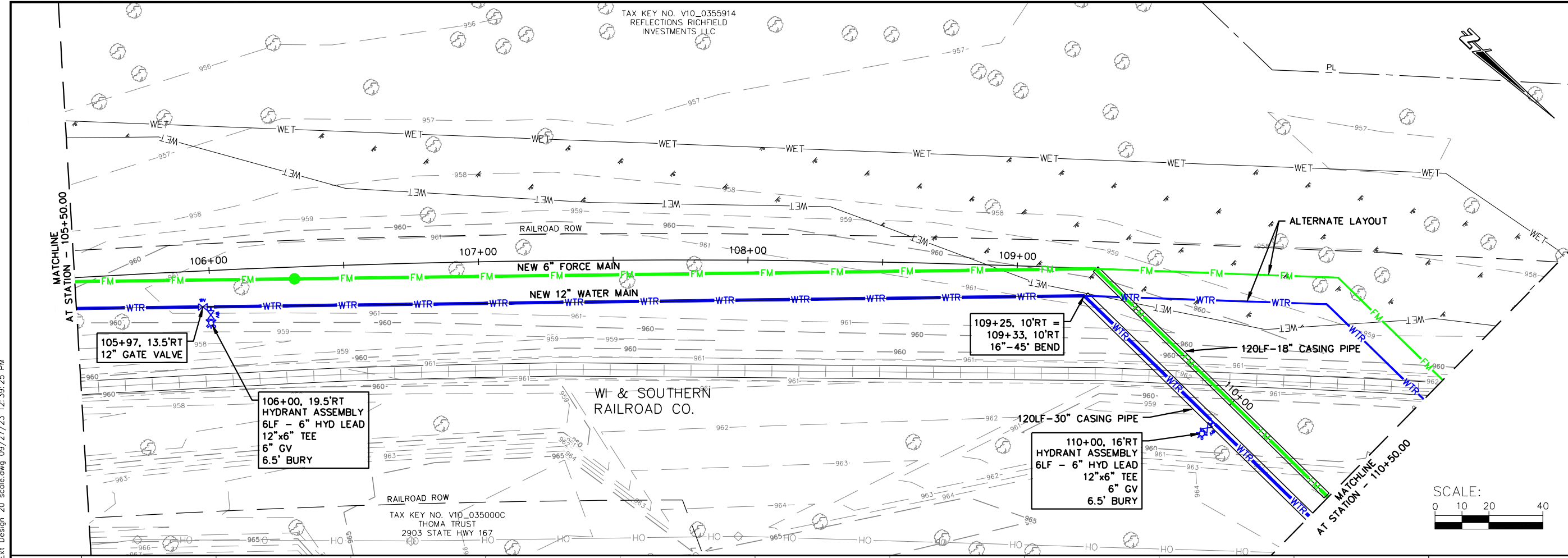
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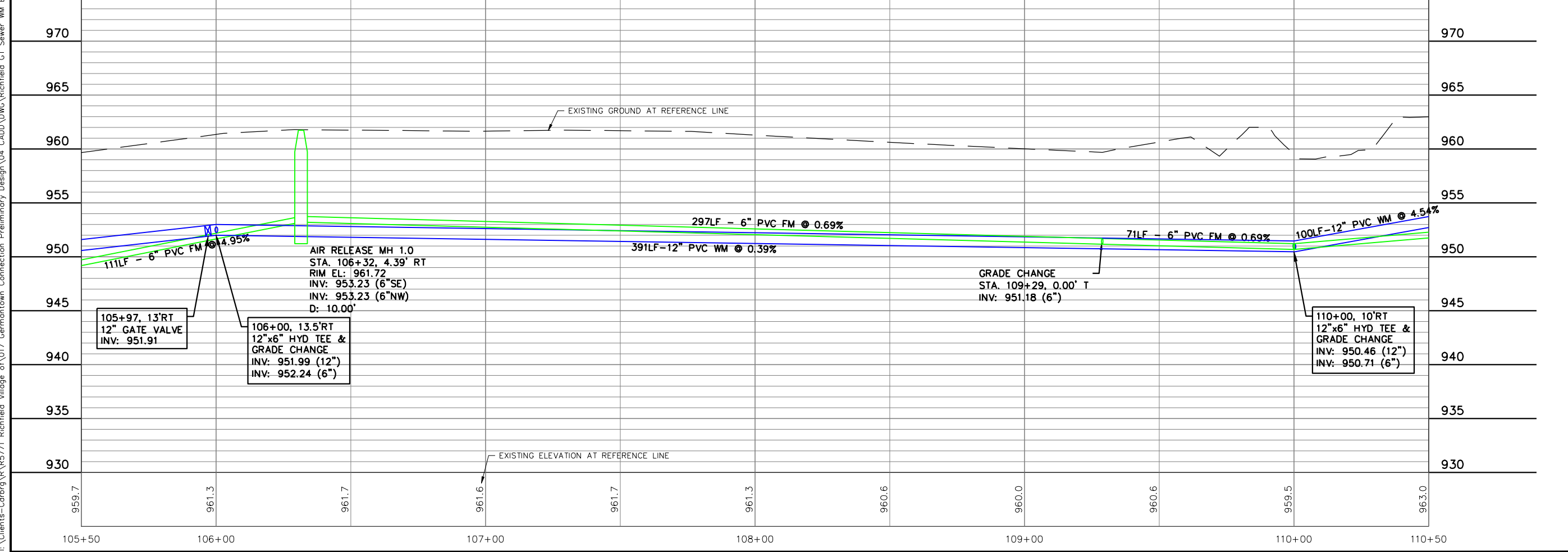
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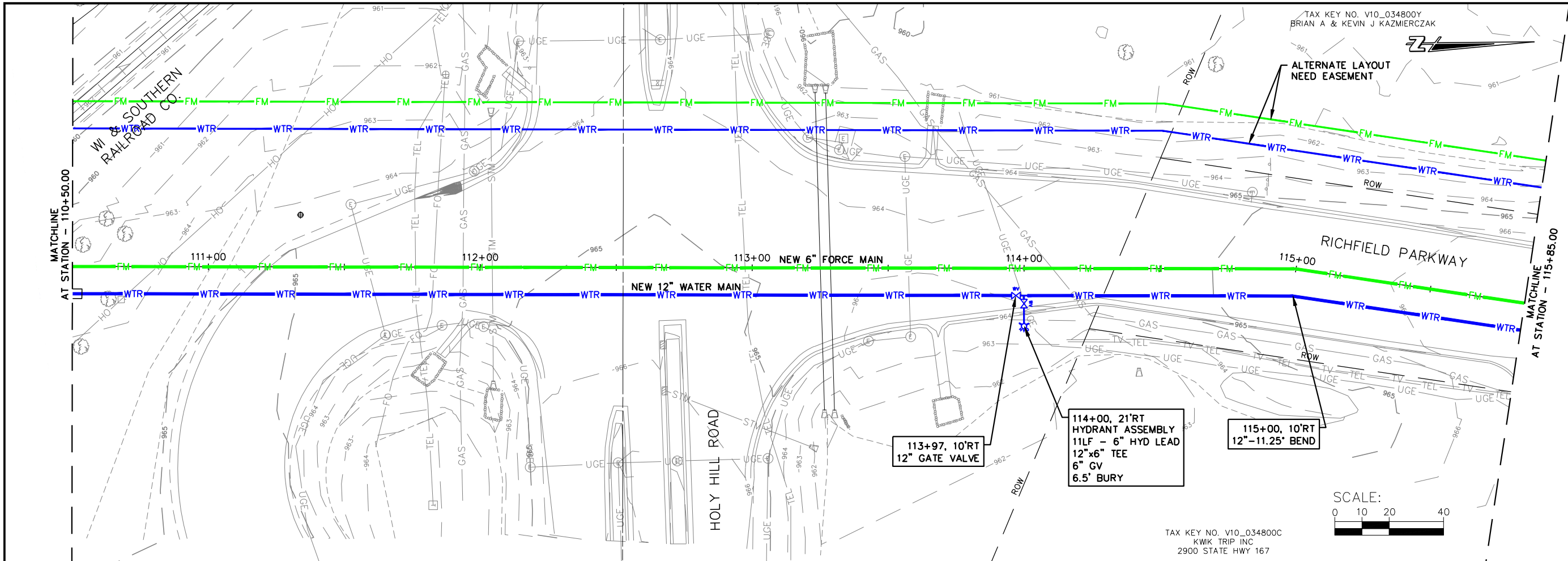
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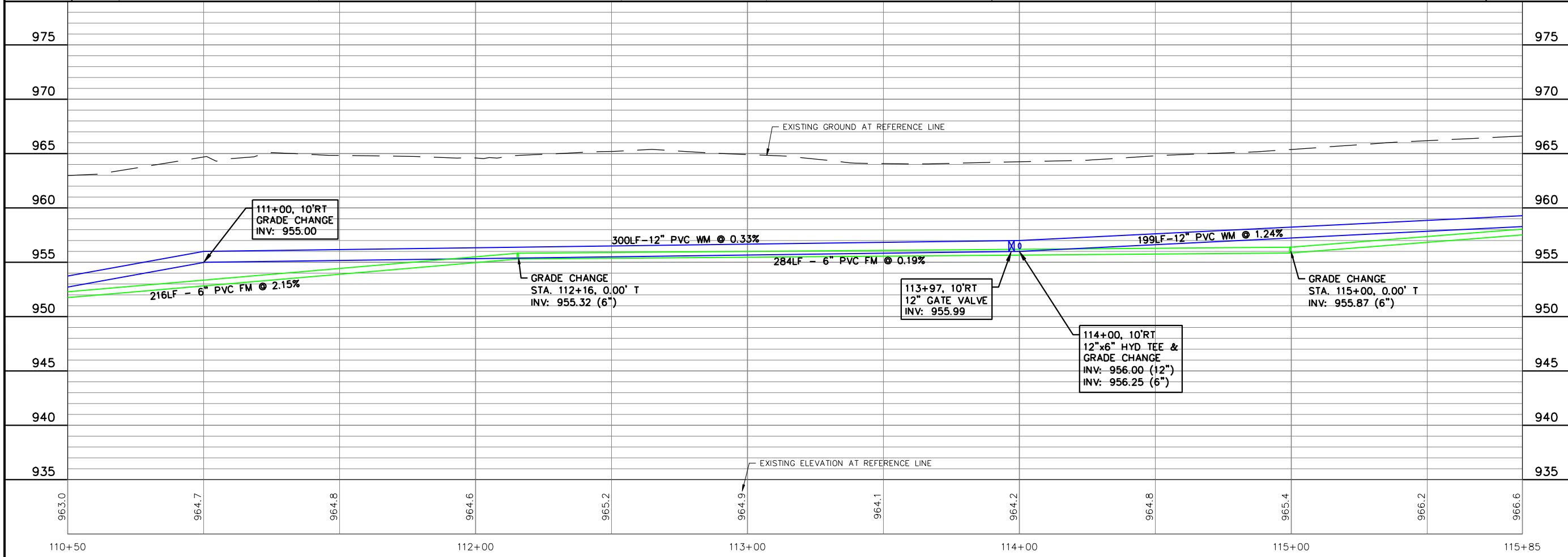
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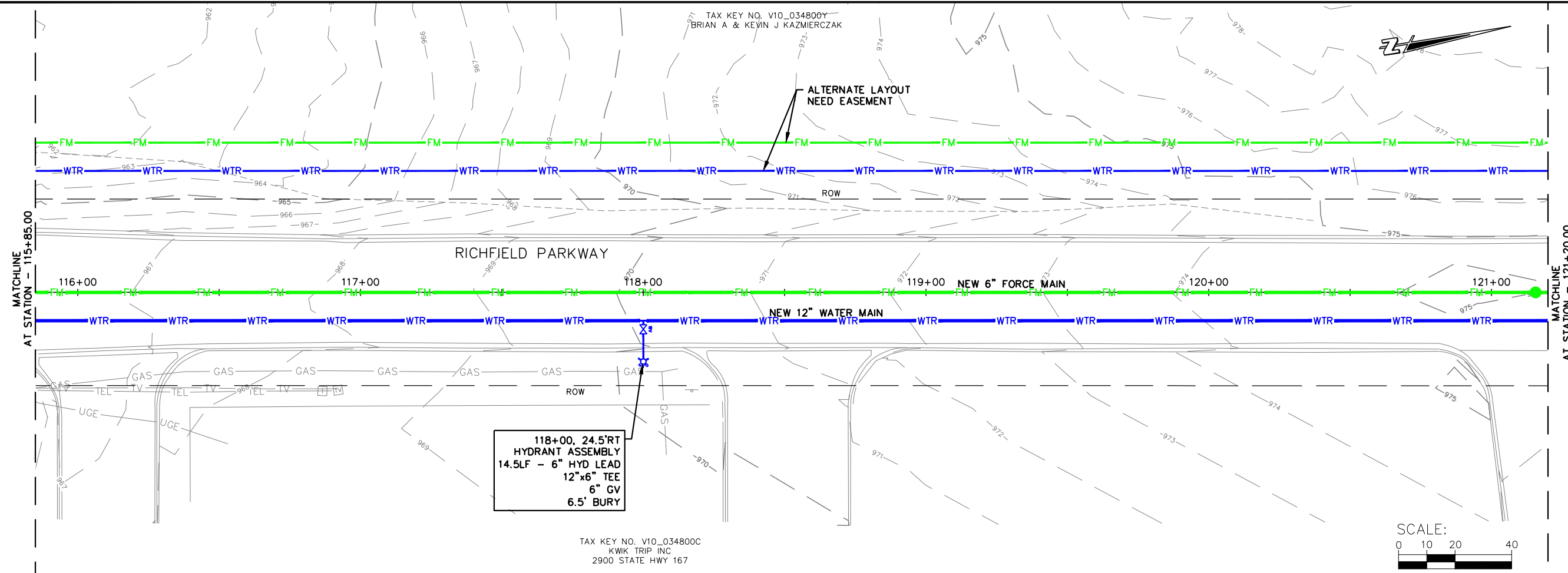
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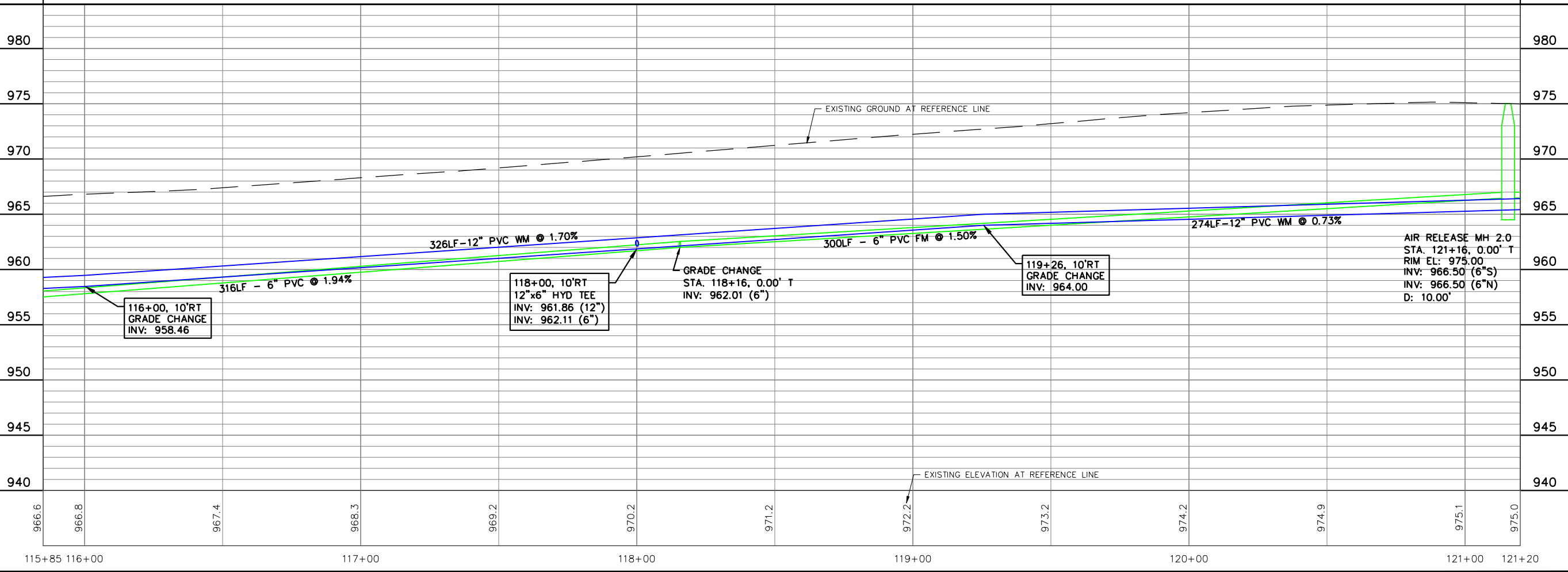
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118+00, 24.5'RT  
HYDRANT ASSEMBLY  
14.5LF - 6" HYD LEAD  
12"x6" TEE  
6" GV  
6.5' BURY

TAX KEY NO. V10\_034800C  
KWIK TRIP INC  
2900 STATE HWY 167



116+00, 10'RT  
GRADE CHANGE  
INV: 958.46

118+00, 10'RT  
12"x6" HYD TEE  
INV: 961.86 (12")  
INV: 962.11 (6")

GRADE CHANGE  
STA. 118+16, 0.00' T  
INV: 962.01 (6")

119+26, 10'RT  
GRADE CHANGE  
INV: 964.00

AIR RELEASE MH 2.0  
STA. 121+16, 0.00' T  
RIM EL: 975.00  
INV: 966.50 (6"S)  
INV: 966.50 (6"N)  
D: 10.00'

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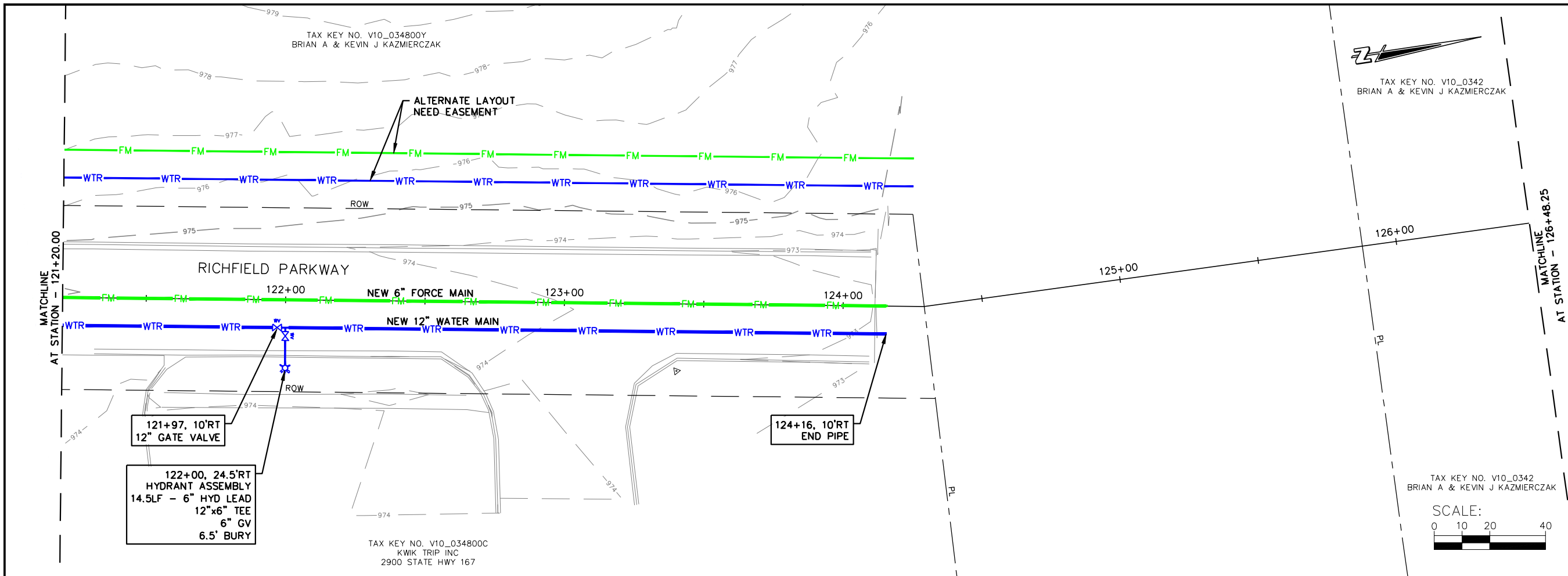
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BRIAN A & KEVIN J KAZMIERCZAK

TAX KEY NO. V10\_034800Y  
BRIAN A & KEVIN J KAZMIERCZAK

ALTERNATE LAYOUT  
NEED EASEMENT

121+97, 10'RT  
12" GATE VALVE

122+00, 24.5'RT  
HYDRANT ASSEMBLY  
14.5LF - 6" HYD LEAD  
12"x6" TEE  
6" GV  
6.5' BURY

124+16, 10'RT  
END PIPE

TAX KEY NO. V10\_034800C  
KWIK TRIP INC  
2900 STATE HWY 167

TAX KEY NO. V10\_0342  
BRIAN A & KEVIN J KAZMIERCZAK



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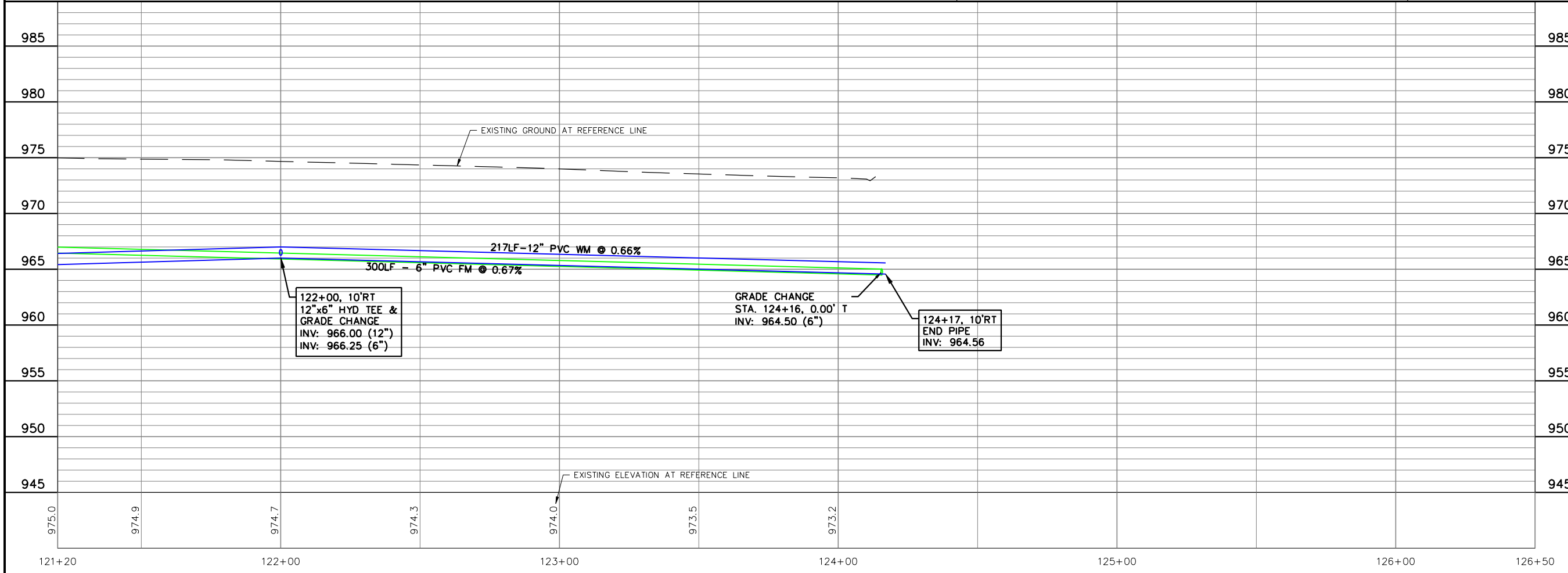
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604 Wilson Ave.  
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Phone: 781-225-2727  
FAX: 781-225-2727



122+00, 10'RT  
12"x6" HYD TEE &  
GRADE CHANGE  
INV: 966.00 (12")  
INV: 966.25 (6")

GRADE CHANGE  
STA. 124+16, 0.00' T  
INV: 964.50 (6")

124+17, 10'RT  
END PIPE  
INV: 964.56

VILLAGE OF RICHFIELD  
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RICHFIELD PARKWAY PLAN AND PROFILE

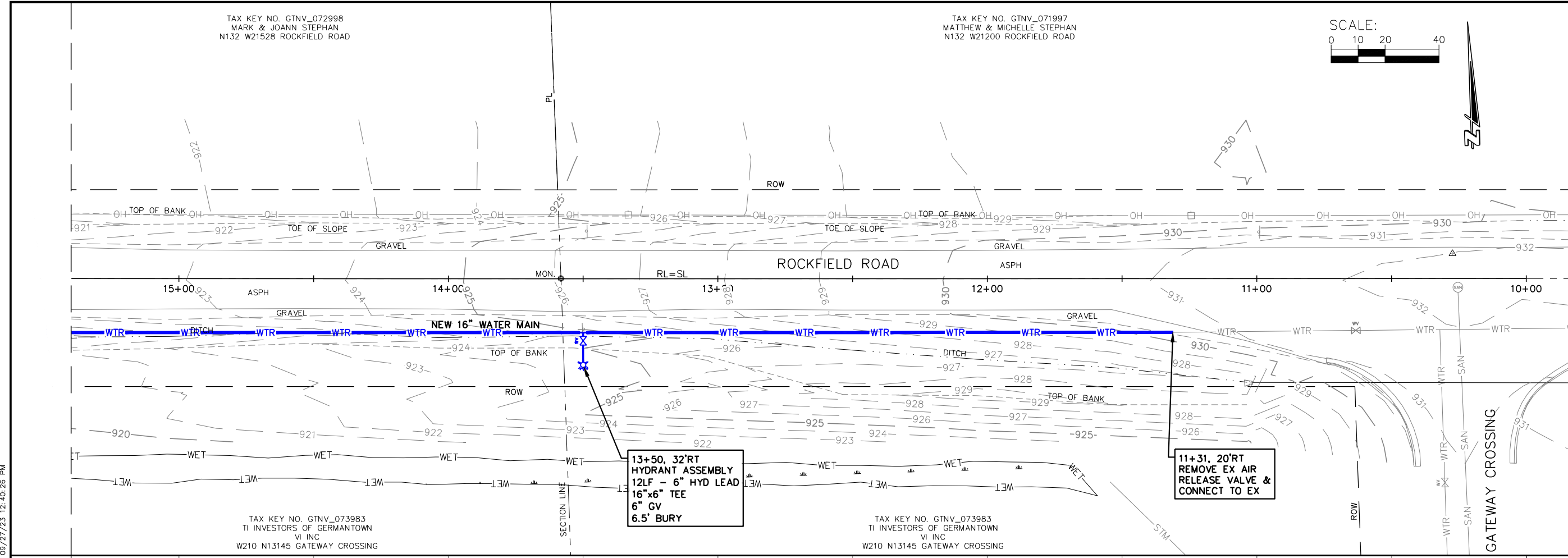
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 MARK & JOANN STEPHAN  
 N132 W21528 ROCKFIELD ROAD

TAX KEY NO. GTNV\_071997  
 MATTHEW & MICHELLE STEPHAN  
 N132 W21200 ROCKFIELD ROAD



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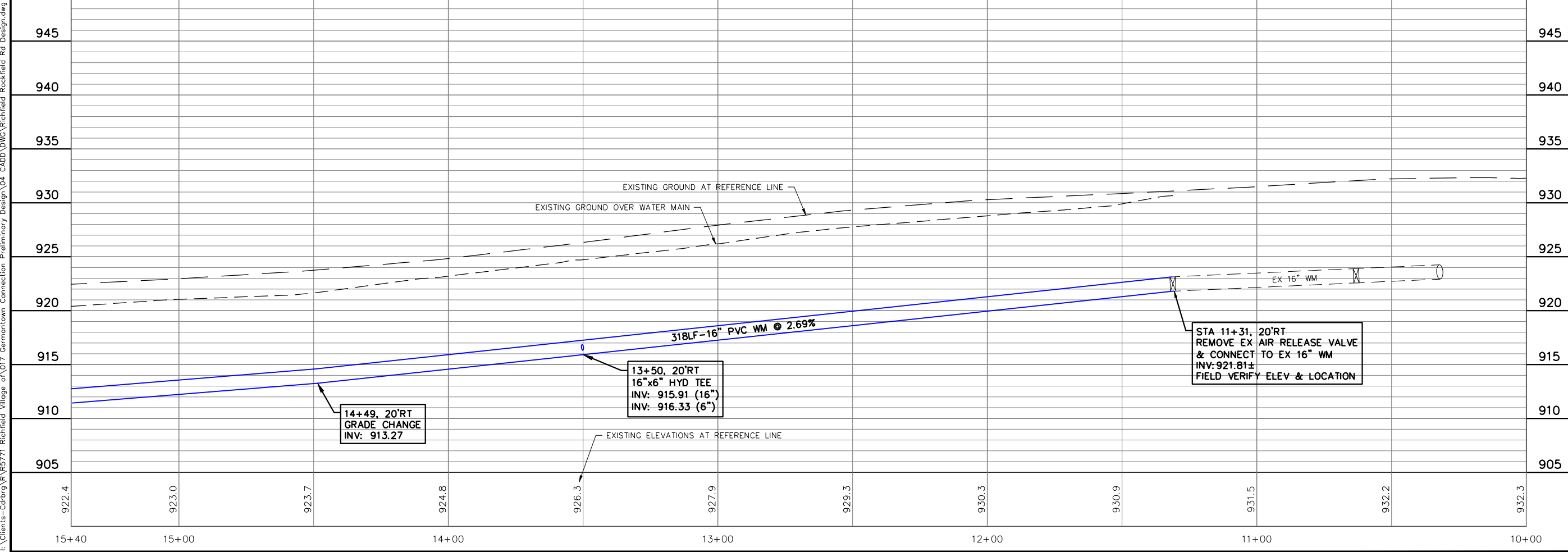


13+50, 32'RT  
 HYDRANT ASSEMBLY  
 12LF - 6" HYD LEAD  
 16"x6" TEE  
 6" GV  
 6.5' BURY

11+31, 20'RT  
 REMOVE EX AIR  
 RELEASE VALVE &  
 CONNECT TO EX

TAX KEY NO. GTNV\_073983  
 TI INVESTORS OF GERMANTOWN  
 VI INC  
 W210 N13145 GATEWAY CROSSING

TAX KEY NO. GTNV\_073983  
 TI INVESTORS OF GERMANTOWN  
 VI INC  
 W210 N13145 GATEWAY CROSSING



14+49, 20'RT  
 GRADE CHANGE  
 INV: 913.27

13+50, 20'RT  
 16"x6" HYD TEE  
 INV: 915.91 (16")  
 INV: 916.33 (6")

STA 11+31, 20'RT  
 REMOVE EX AIR  
 RELEASE VALVE  
 & CONNECT  
 TO EX 16" WM  
 INV: 921.81±  
 FIELD VERIFY ELEV & LOCATION

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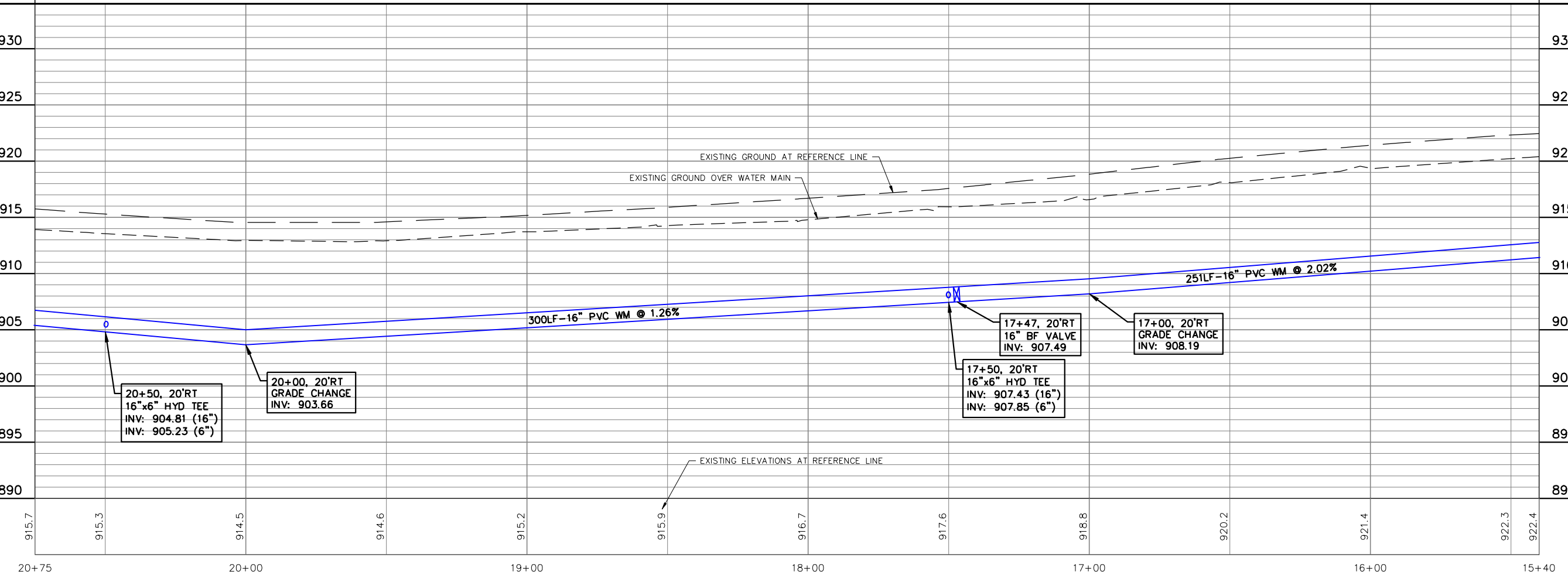
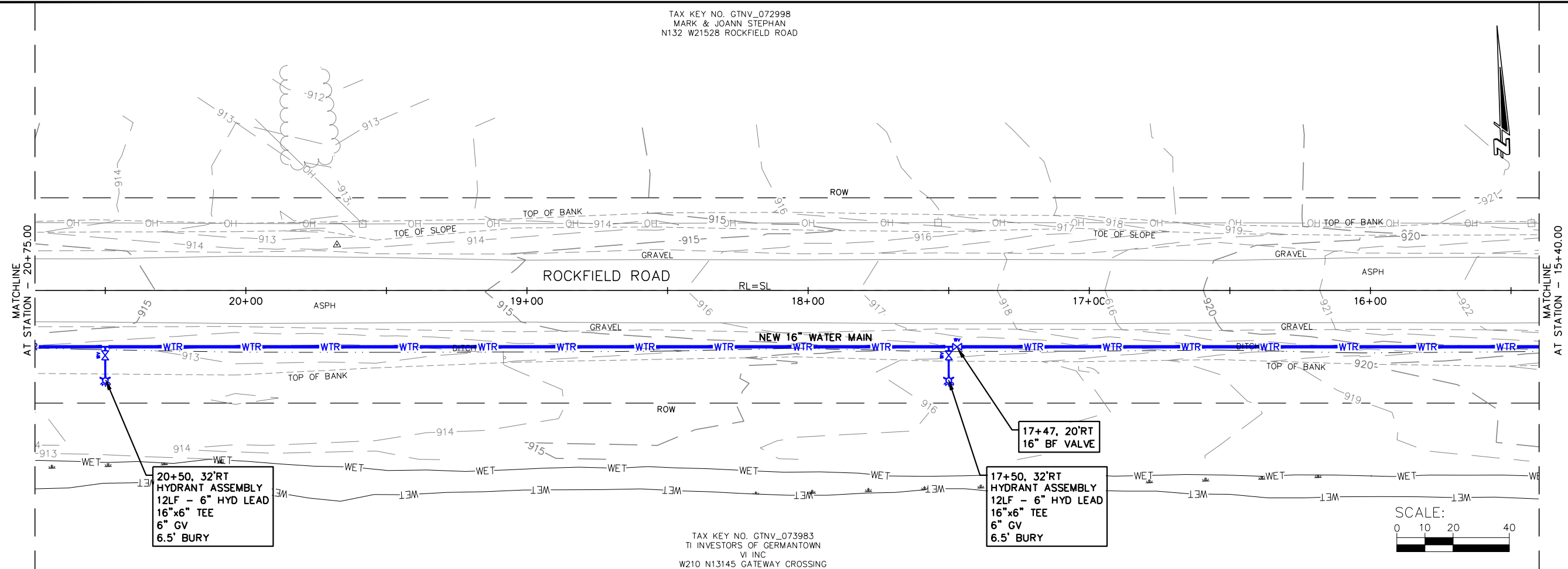
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 MARK & JOANN STEPHAN  
 N132 W21528 ROCKFIELD ROAD

TAX KEY NO. GTNV\_073983  
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 VI INC  
 W210 N13145 GATEWAY CROSSING

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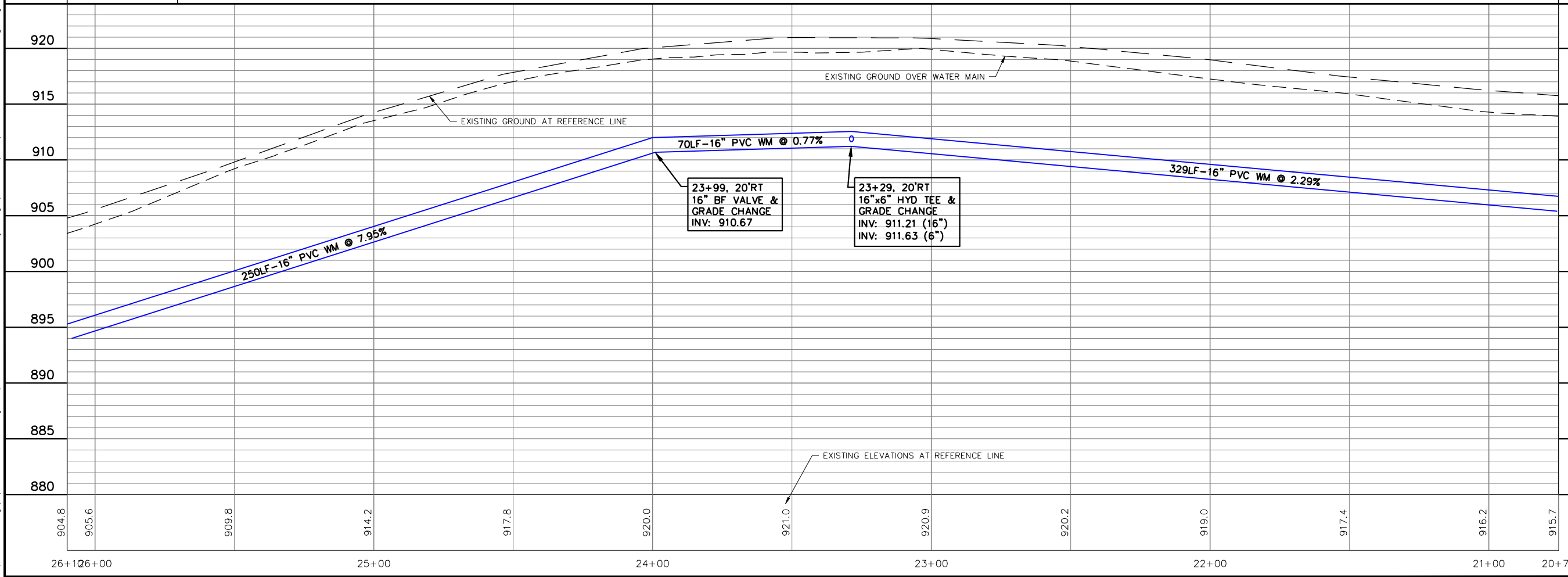
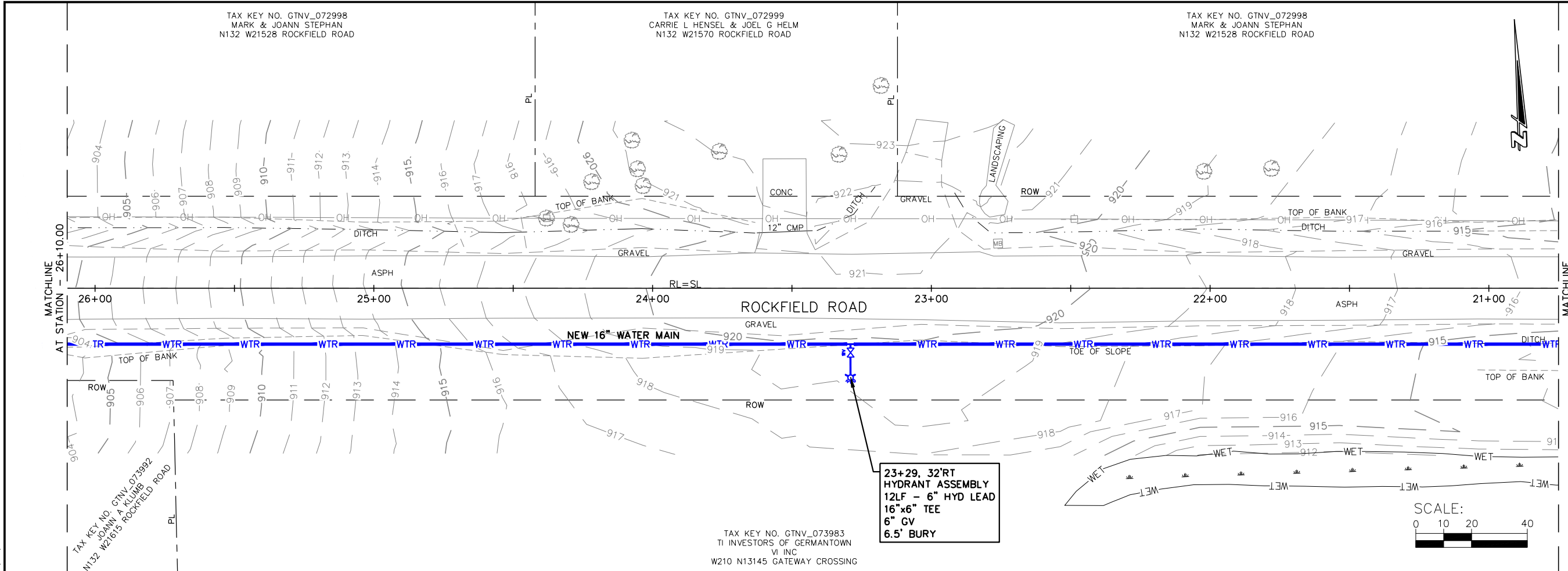
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 Menomonie, WI 54751  
 FAX: 715-232-1088

920 1st St.  
 Menomonie, WI 54751  
 FAX: 715-232-2727

VILLAGE OF RICHFIELD  
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 WASHINGTON COUNTY, WISCONSIN  
 ROCKFIELD ROAD PLAN AND PROFILE

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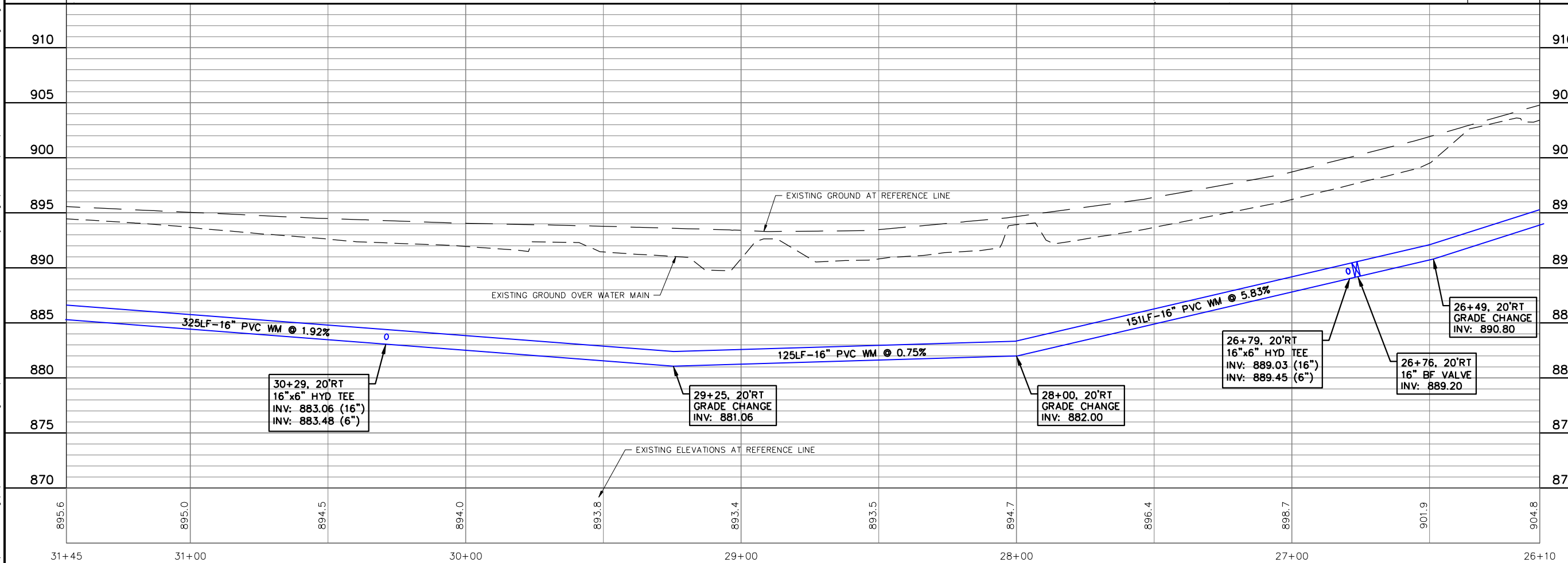
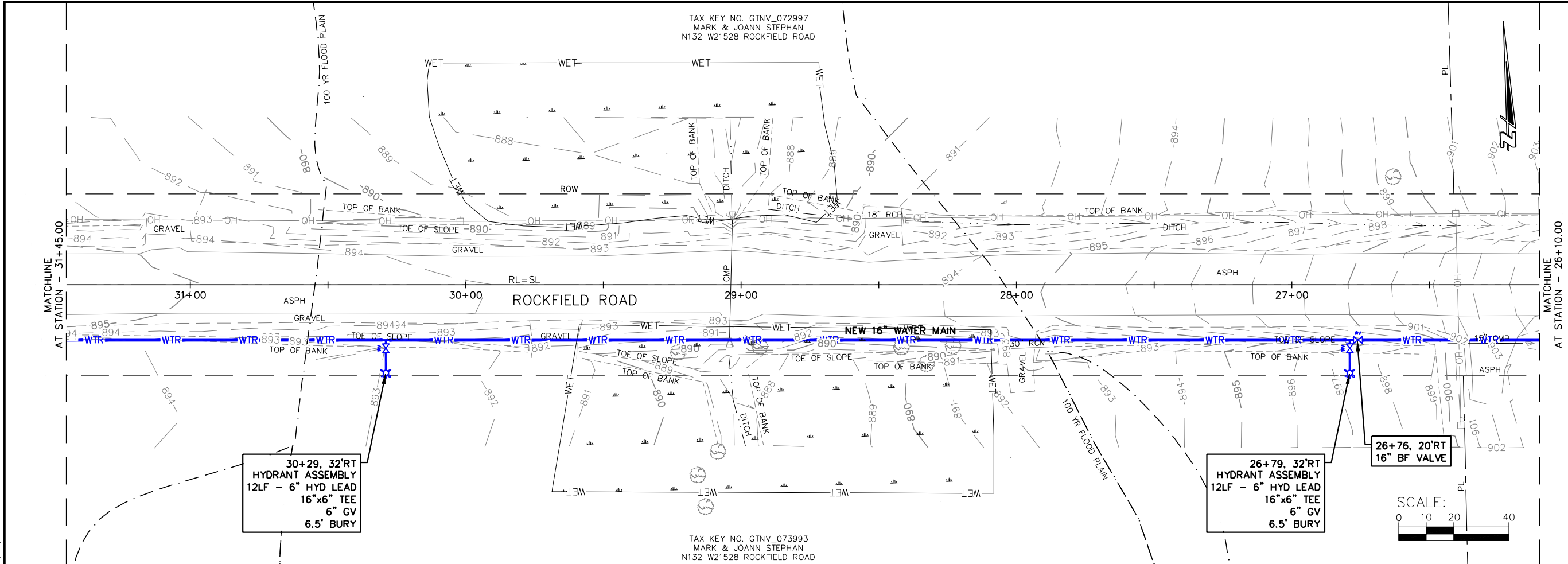
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Fax: 920-891-2727

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Manomonia, WI 54751  
Fax: 715-235-3086

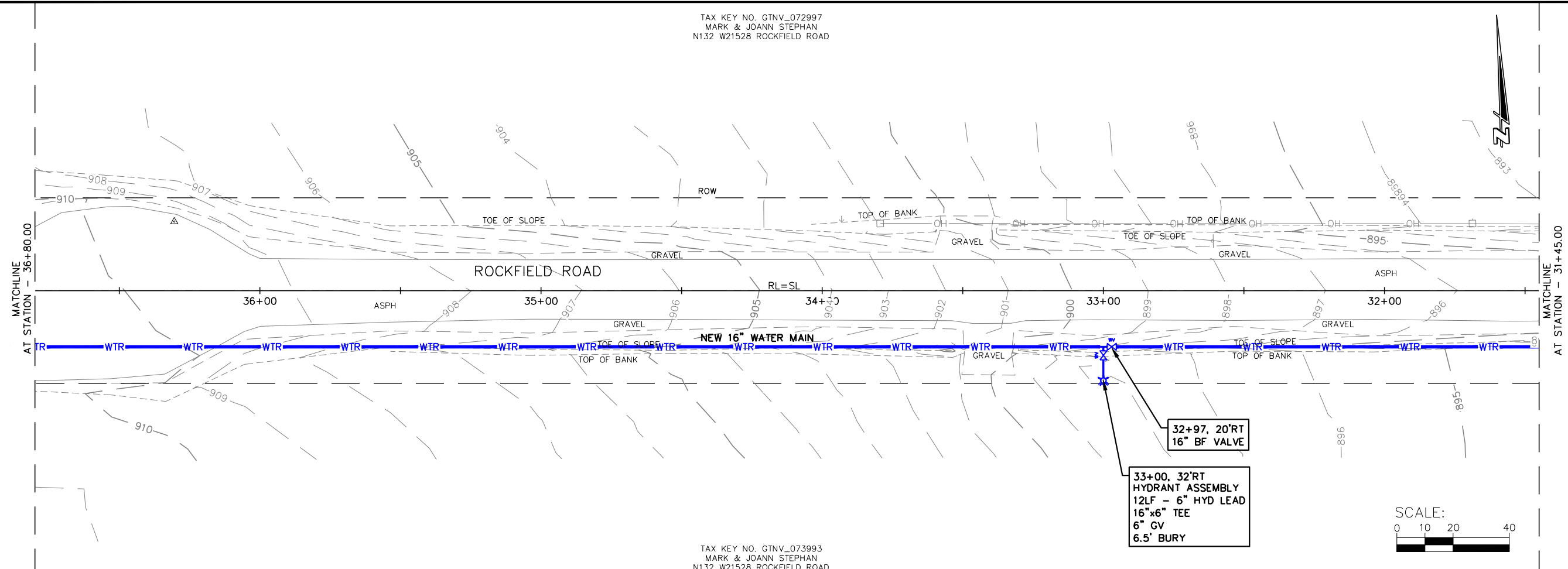
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Fax: 920-892-2272

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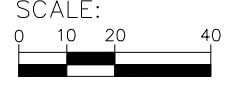
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 MARK & JOANN STEPHAN  
 N132 W21528 ROCKFIELD ROAD

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 MARK & JOANN STEPHAN  
 N132 W21528 ROCKFIELD ROAD

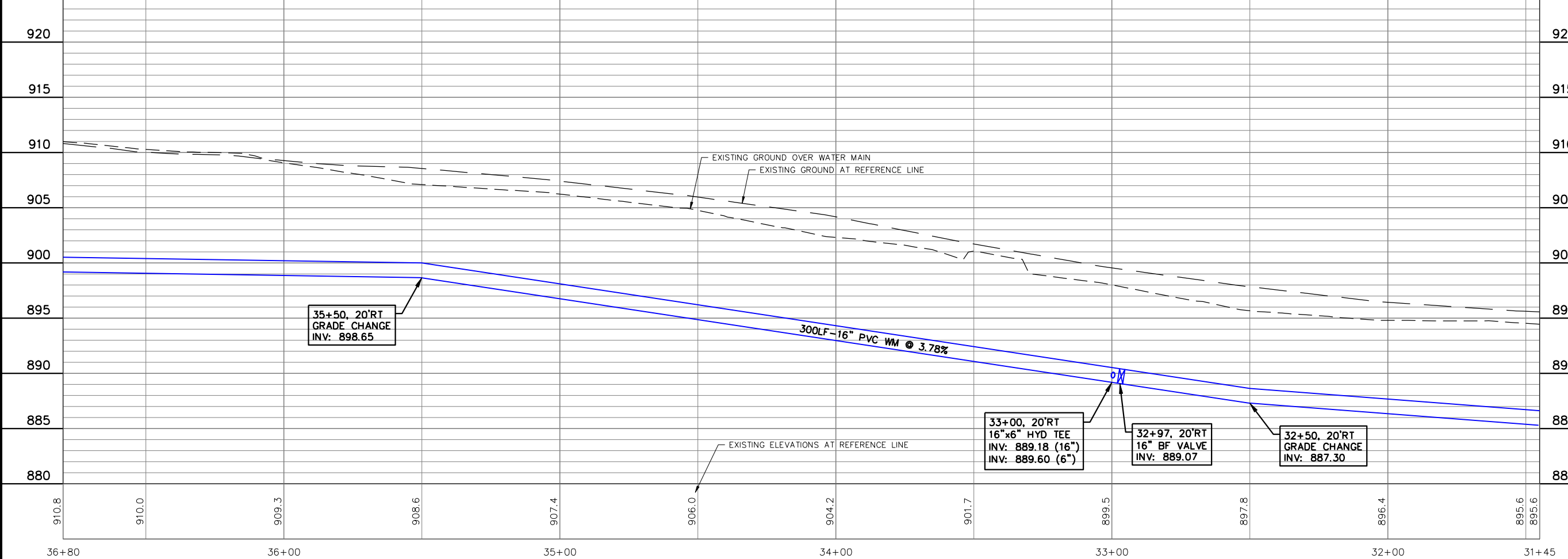


32+97, 20'RT  
 16" BF VALVE

33+00, 32'RT  
 HYDRANT ASSEMBLY  
 12LF - 6" HYD LEAD  
 16"x6" TEE  
 6" GV  
 6.5' BURY



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35+50, 20'RT  
 GRADE CHANGE  
 INV: 898.65

33+00, 20'RT  
 16"x6" HYD TEE  
 INV: 889.18 (16")  
 INV: 889.60 (6")

32+97, 20'RT  
 16" BF VALVE  
 INV: 889.07

32+50, 20'RT  
 GRADE CHANGE  
 INV: 887.30

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 F1 920-898-2484  
 F2 920-898-2484  
 F3 920-898-2484

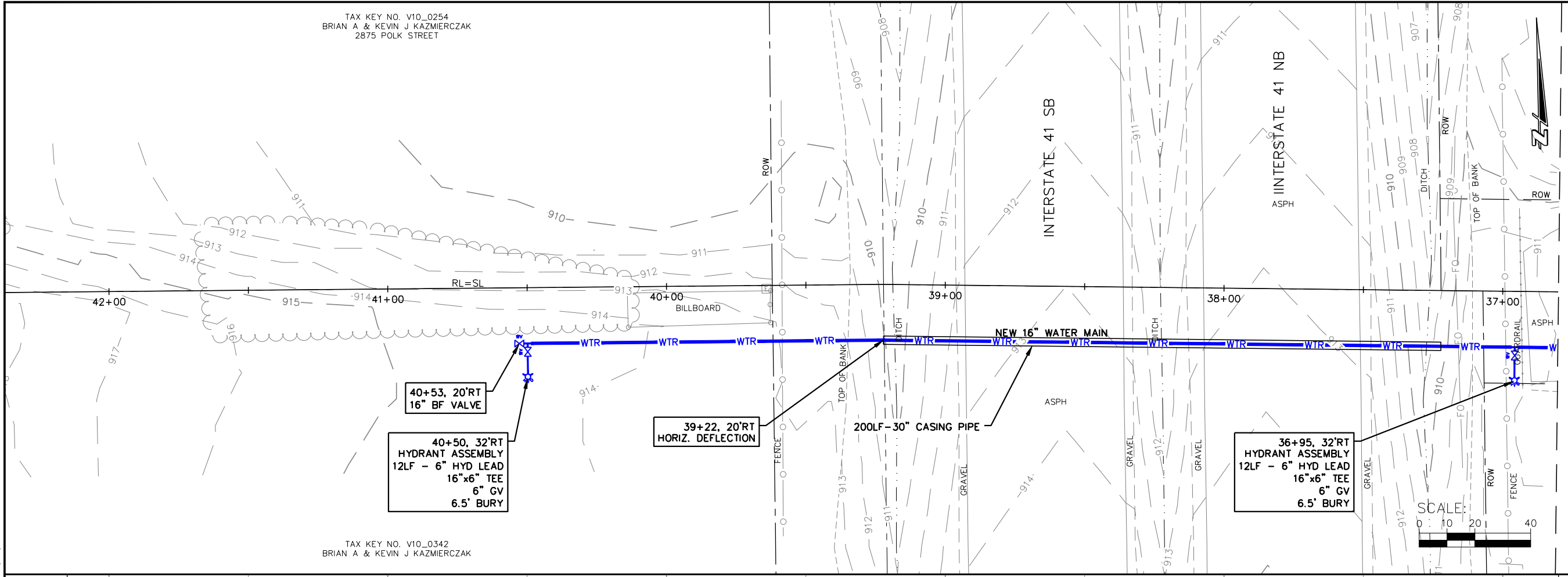
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TAX KEY NO. V10\_0254  
 BRIAN A. & KEVIN J. KAZMIERCZAK  
 2875 POLK STREET

TAX KEY NO. V10\_0342  
 BRIAN A. & KEVIN J. KAZMIERCZAK



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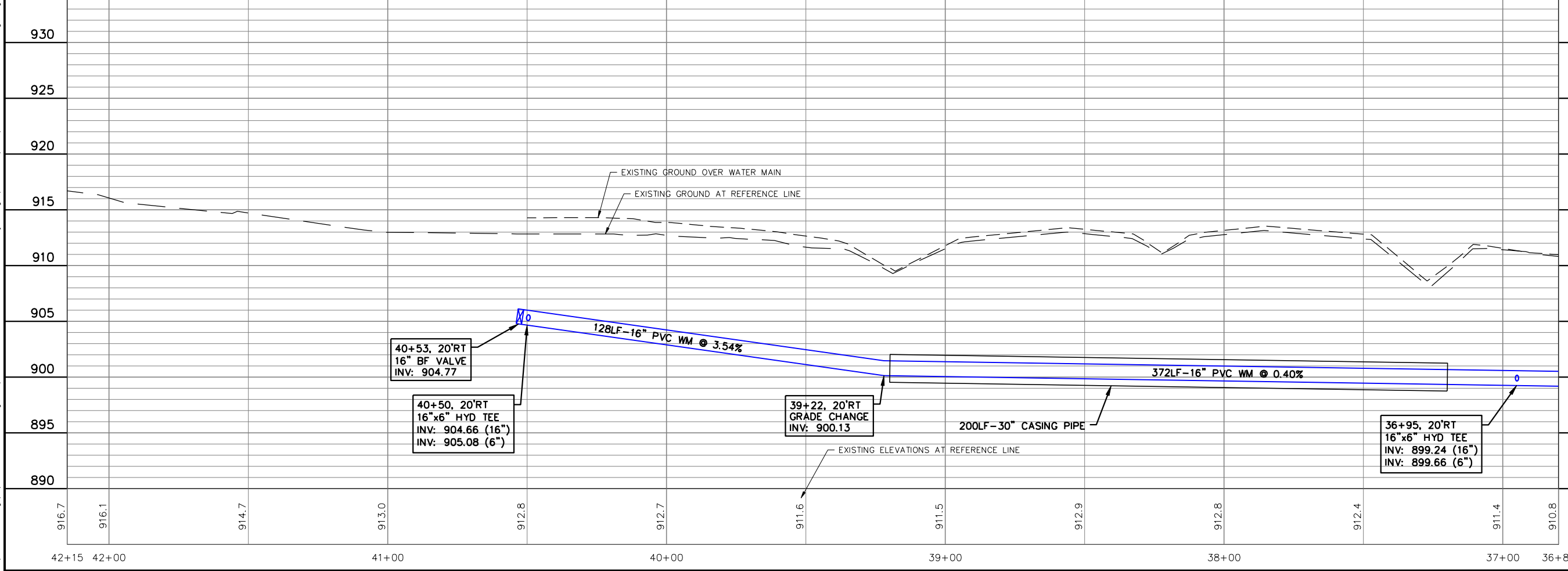
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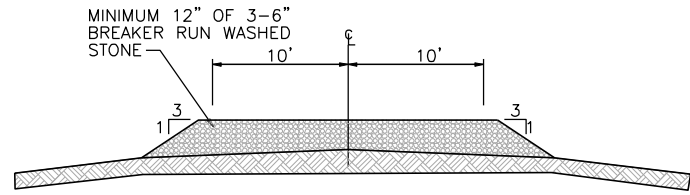
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 2009 - 213-235-0808  
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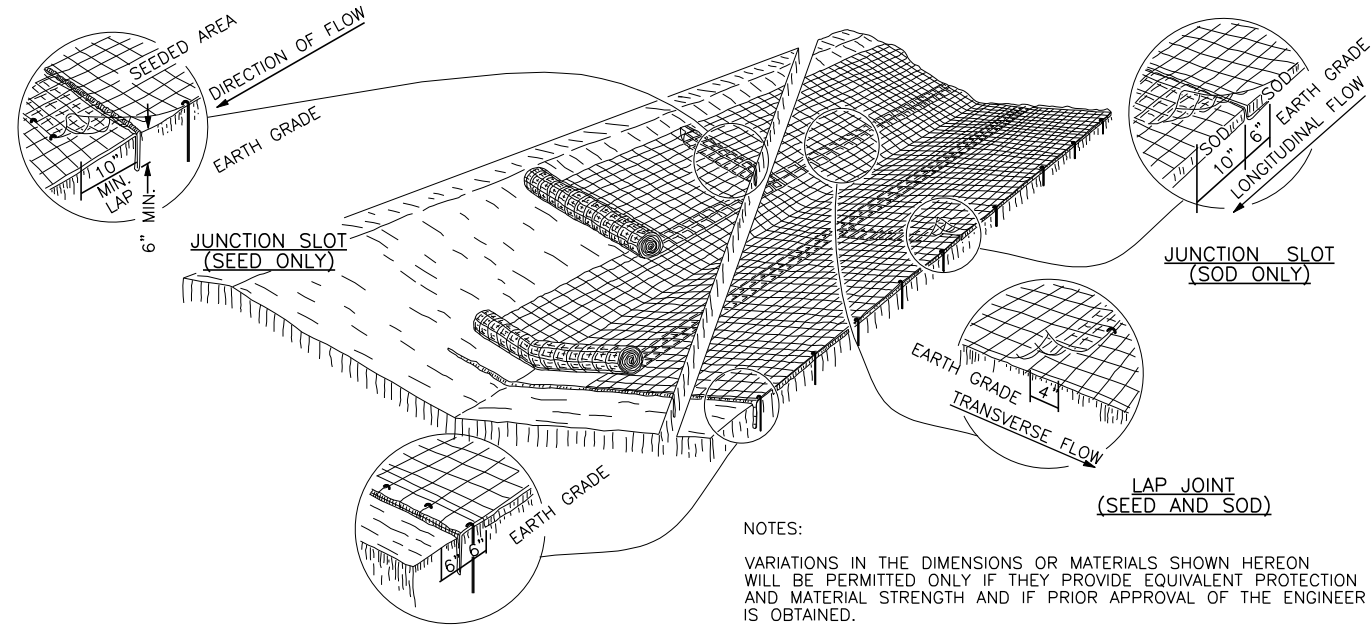
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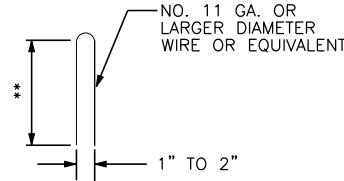
- NOTES:
1. TRACKING PAD TO BE A MINIMUM LENGTH OF 50'.
  2. REMOVE & REPLACE AGGREGATE WHEN VOIDS BECOME FILLED W/ SEDIMENT OR IF SURFACE OPENINGS BECOME PLUGGED SO THAT TRACKING AREA DOES NOT FUNCTION.
  3. REMOVE TRACKING PAD AND RESTORE AREA UPON COMPLETION OF THE PROJECT.

**TYPICAL TRACKING PAD**



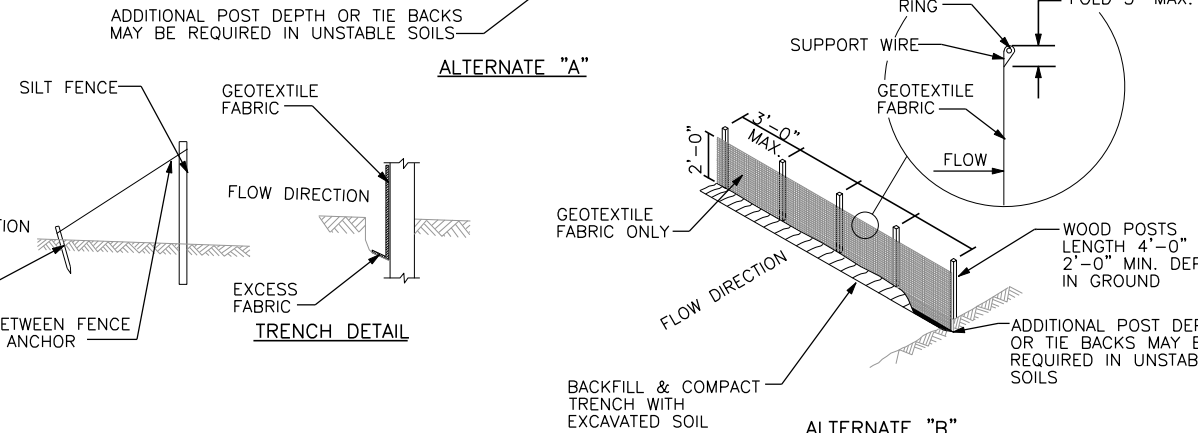
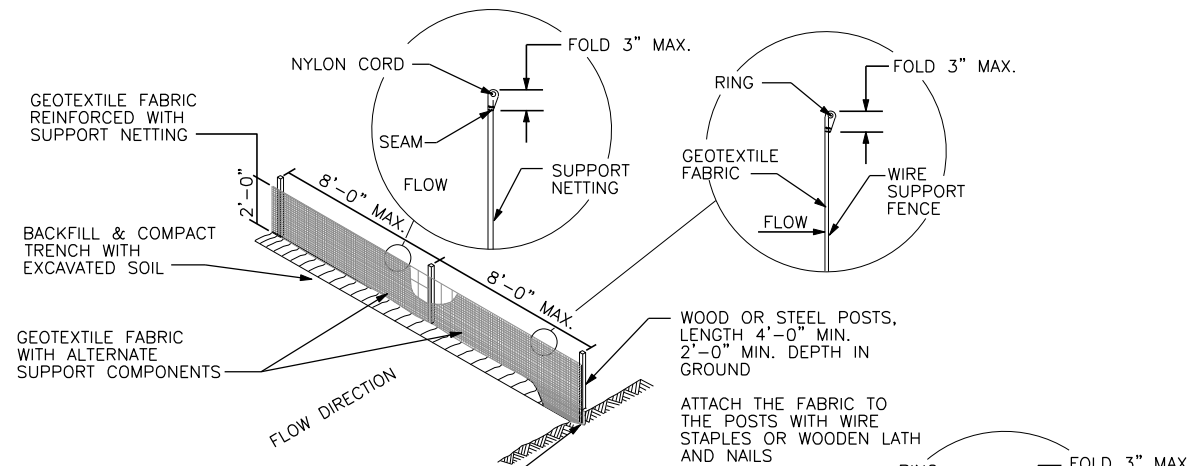
- NOTES:
- VARIATIONS IN THE DIMENSIONS OR MATERIALS SHOWN HEREON WILL BE PERMITTED ONLY IF THEY PROVIDE EQUIVALENT PROTECTION AND MATERIAL STRENGTH AND IF PRIOR APPROVAL OF THE ENGINEER IS OBTAINED.
- DO NOT PLACE LAP JOINTS AT THE BOTTOM OF V-SHAPED DITCHES.
- JUNCTION SLOTS ON ADJACENT STRIPS OF MATTING WILL BE STAGGERED A MINIMUM OF 4 FEET APART
- IMPRESS ALL EDGES OF THE EROSION MAT INTO THE SOIL.
- EROSION MAT OVER SOD**
- ONLY JUTE FABRIC WILL BE PERMITTED OVER SOD
- WOOD STAKES FOR SOD MAY BE OMITTED IF THE EXISTING SLOPE AND SOIL CONDITIONS SO WARRANT.
- THE WIDTH OF THE EROSION MAT SHALL EQUAL THE SOD WIDTH.
- SOD STRIPS MAY BE PLACED EITHER LONGITUDINALLY OR TRANSVERSELY TO THE FLOW LINE OF THE DITCH.
- EROSION MAT OVER SEEDING**
- JUNCTION OR ANCHOR SLOTS WILL BE AT MINIMUM INTERVALS OF 100 FEET ON GRADES UP TO AND INCLUDING 3 PERCENT, AND 50 FEET ON GRADES EXCEEDING 3 PERCENT.

**ANCHOR SLOT AT BEGINNING AND END OF EROSION MAT (SEED AND SOD)**

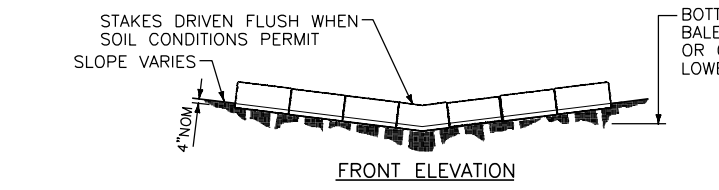
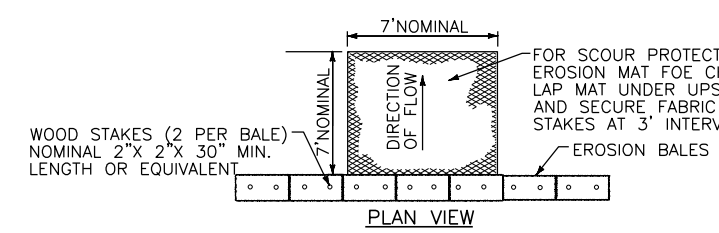
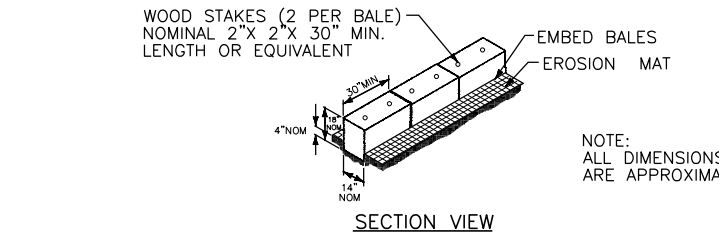
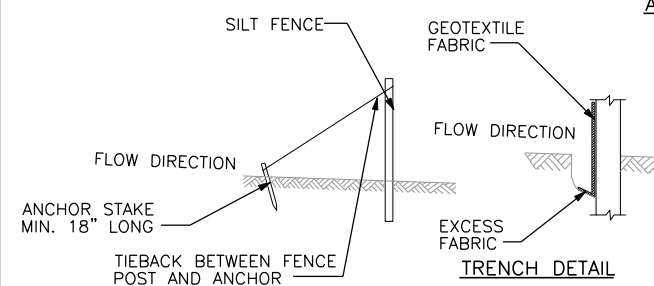


- \*\* NO. 11 GA. OR LARGER DIAMETER WIRE OR EQUIVALENT
- \*\* 6" MIN. FOR FIRM SOILS  
12" MIN. FOR LOOSE SOILS  
8" MIN. WHERE BOTH SOD AND MATS ARE USED
- DETAIL OF TYPICAL STAPLE**

**EROSION MAT**



**SILT FENCE**



**TEMPORARY DITCH CHECK DETAIL**

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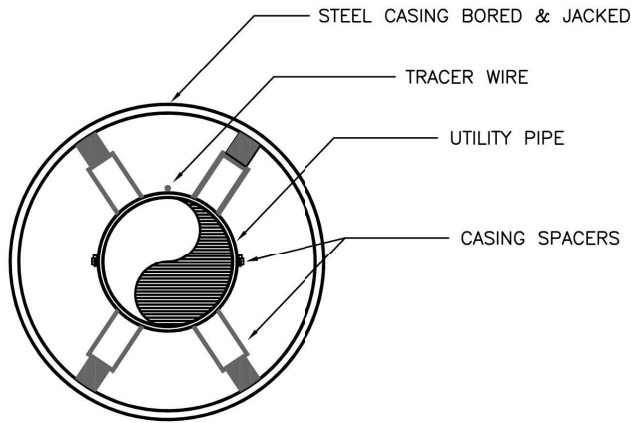
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WE19497 Washington Ave.  
Cedarburg, WI 53012  
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VILLAGE OF RICHFIELD  
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STANDARD DETAILS

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STEEL CASING PIPE SHALL MEET THE REQUIREMENTS AS DESCRIBED IN THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN SECTION 6.2.3 AND DRAWING FILE NO. 19.

THE PIPE SHALL BE SUPPORTED AND BRACED USING CASING SPACERS AS MANUFACTURED BY ADVANCE PRODUCTS & SYSTEMS OR EQUAL, AS APPROVED BY THE ENGINEER.

A TRACER WIRE SHALL BE INSTALLED AS PER THE VILLAGE SPECIFICATIONS.

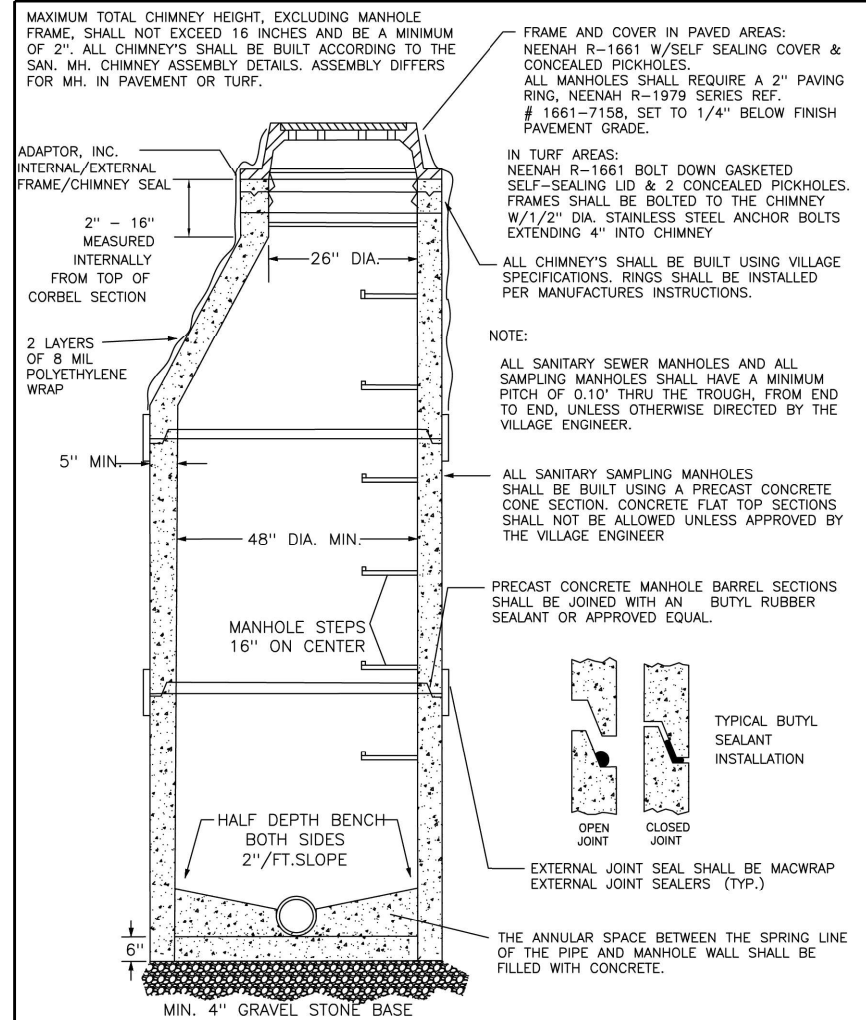
EACH END OF THE CASING SHALL RECEIVE A 12" CONCRETE OR BRICK MORTARED BULKHEAD. NEW UTILITY PIPE TO BE CENTERED IN THE CASING PIPE.

REV. 10/10/2018 RCB



**BORING OR JACKING CASING PIPE WITH CASING SPACERS**

NOT TO SCALE



SPRAY EPOXY COATINGS MH EXTERIOR: 2 COATS (BLACK) OF AMERON INTERNATIONAL, AMERCOAT 78 HB AT 8-10 MILS EA. MH INTERIOR: 2 COATS (WHITE) OF PERMITE PCS-9043 TYPE II PERMOX PIPE GLAZE AT 20 MILS EA. COATINGS SHALL BE APPLIED BY SUPPLIERS AT THE PLANT.

REVISED DATE: 10/11/2019 FJR



**STANDARD SANITARY MANHOLE & SAMPLING MANHOLE DETAIL**

NOT TO SCALE

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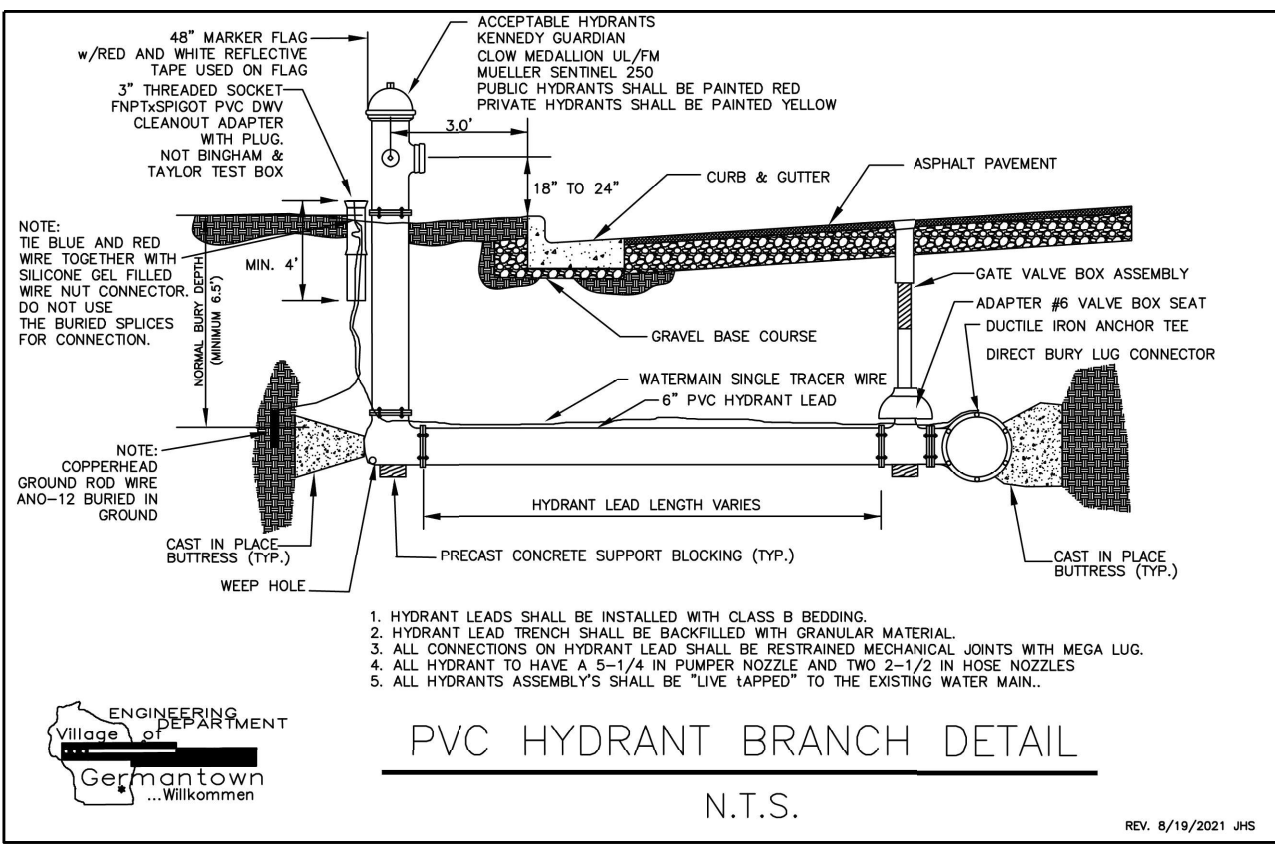
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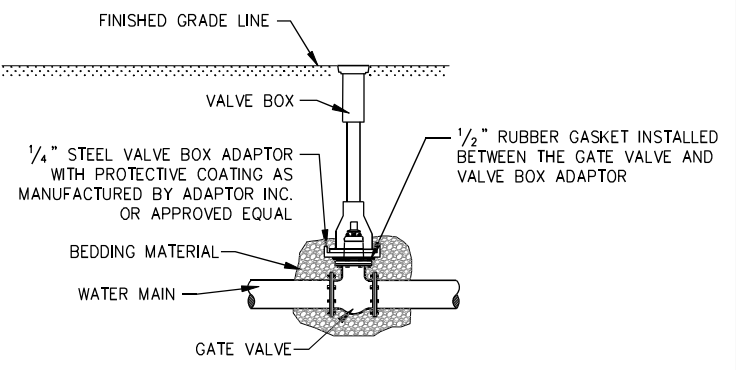
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PVC HYDRANT BRANCH DETAIL

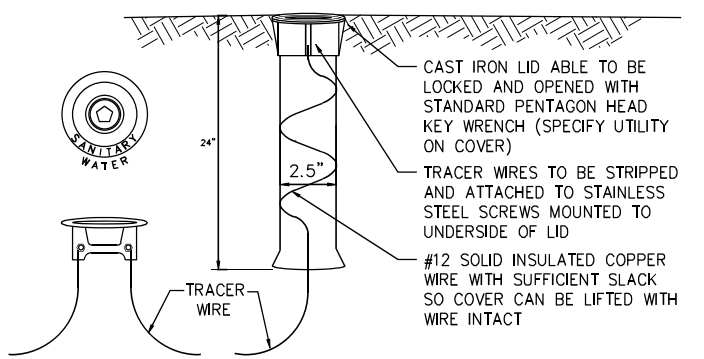
N.T.S.

REV. 8/19/2021 JHS



VALVE BOX WITH ADAPTOR

NO SCALE

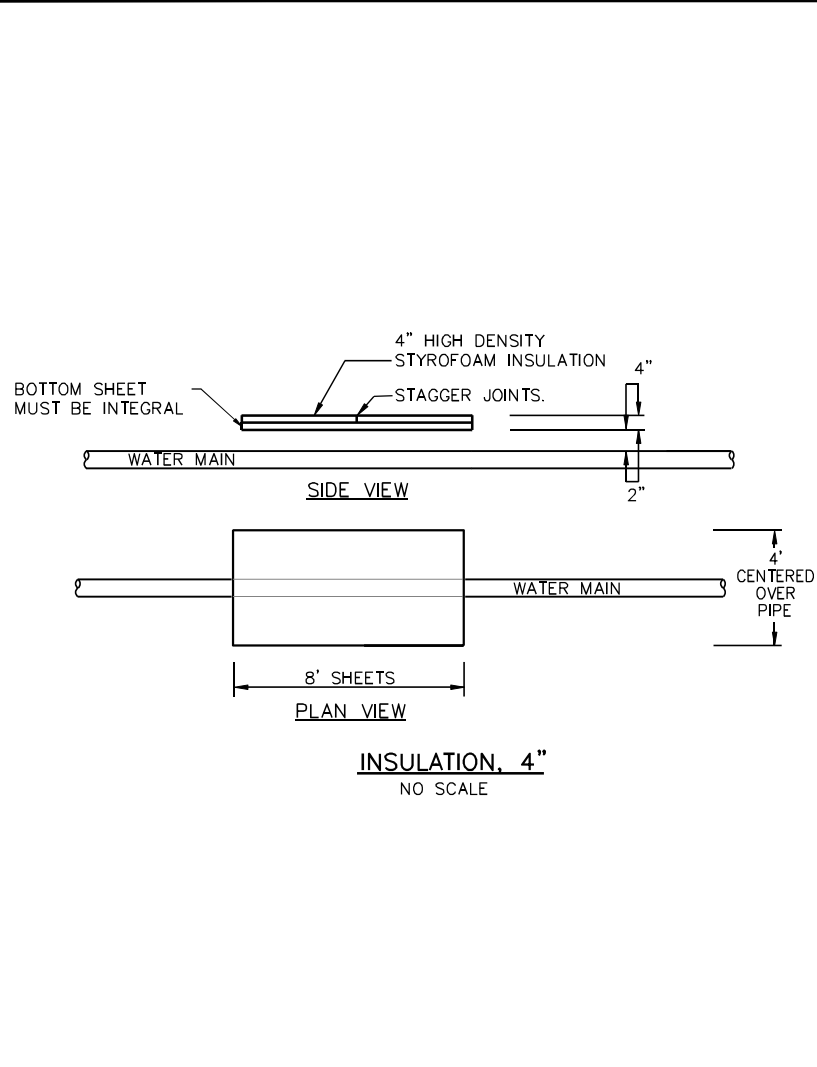


TRACER WIRE ACCESS BOX

NO SCALE

TRACER WIRE & ACCESS BOX NOTES

- \* TRACER WIRE SHALL BE ATTACHED TO ALL PLASTIC PIPE EVERY 10 FT. & AT EVERY BEND.
- \* SPLICES IN TRACER WIRE SHALL BE MADE W/ SPLIT BOLT OR COMPRESSION-TYPE CONNECTORS. ALL SPLICES SHALL BE WATER PROOF.
- \* TRACER WIRE SHALL HAVE ACCESS POINTS TO GRADE AT A MIN. OF EVERY 300' W/ VAULTS, CLEANOUTS, MANHOLES, VALVE BOXES OR OTHER COVERED ACCESS.
- \* TRACER WIRE AND ACCESS BOX SHALL BE SUPPLIED AND INSTALLED AS PER WI COMM. 82.30(11)(h) LOCATING REQUIREMENTS.



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Appendix M – Germantown Connection Sewer & Water Extension Opinion of Probably Cost



# OPINION OF PROBABLE PROJECT COST

Community Infrastructure • Architecture • Environmental Services

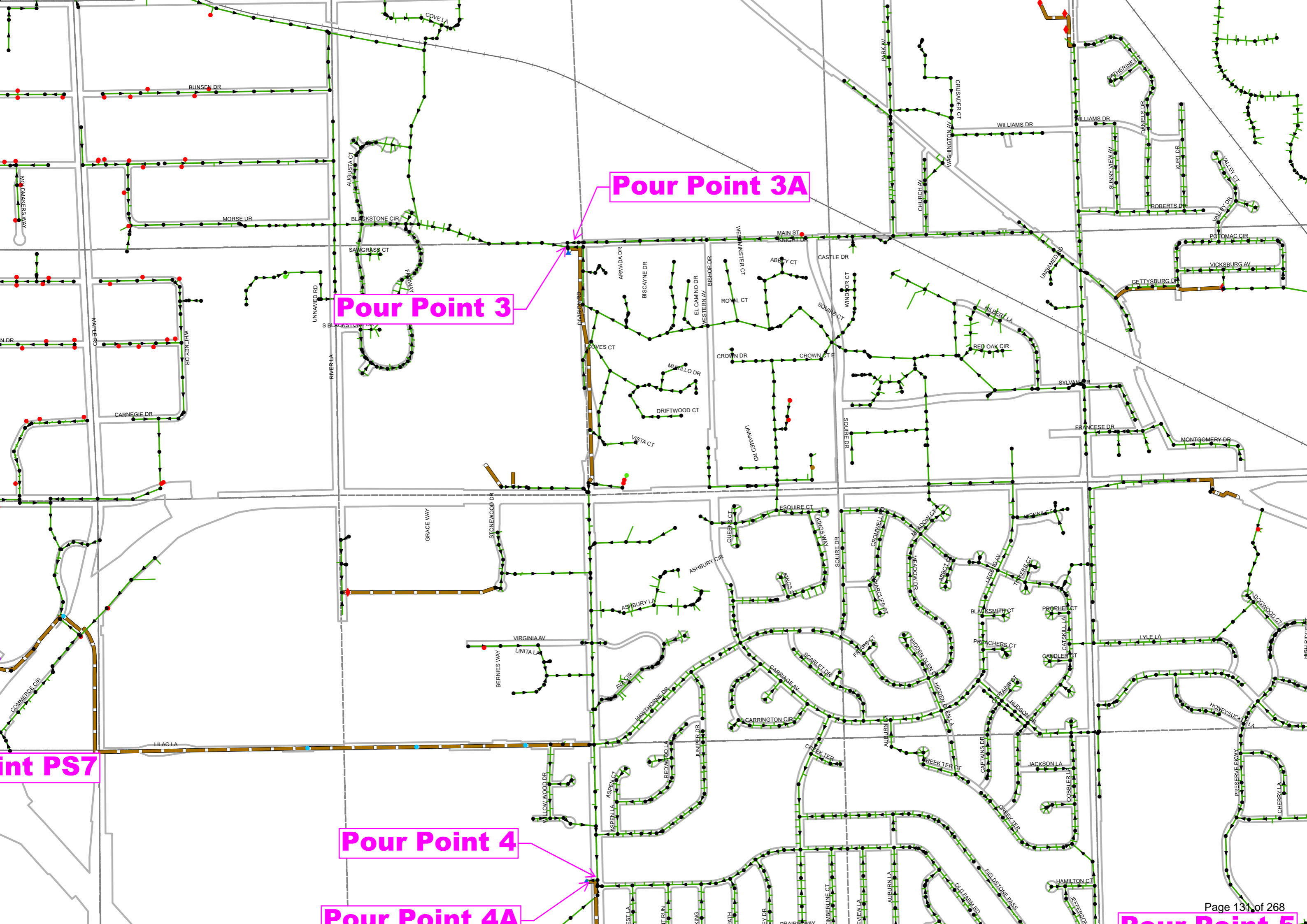
Client	Village of Richfield
Project	Germantown Sanitary and Water Connections
Prepared By	M. Stephan / B. Greisch

Project No.	R5771-0017
Date	9/27/2023
Revised Date	

Item	Unit	Qty	Unit Price	Cost
<b><u>Sanitary Sewer</u></b>				
Connection to Existing MH @ Freistadt	EA	1	\$20,000.00	\$20,000.00
12-inch PVC Sanitary Sewer	LF	7390	\$500.00	\$3,695,000.00
6-inch Force Main - Open Cut or Directional Drilled	LF	4000	\$200.00	\$800,000.00
Sanitary Sewer Manholes (25 Unit)	VF	435	\$600.00	\$261,000.00
Rock Excavation (Sanitary Sewer)	CY	1900	\$140.00	\$266,000.00
18-inch Steel Casing under RR	LF	120	\$900.00	\$108,000.00
Air Release / Air Vacuum Valve and Vault	EA	2	\$12,000.00	\$24,000.00
6-inch Plug Valve	EA	4	\$3,000.00	\$12,000.00
<b><u>Watermain - South</u></b>				
16-inch PVC Water Main - open cut	LF	7300	\$200.00	\$1,460,000.00
16-inch Water Main - Directional Drilled along RR and Under I-41	LF	1550	\$200.00	\$310,000.00
12-inch Water Main - Directional Drilled along RR and Richfield Parkway	LF	2560	\$180.00	\$460,800.00
Hydrant Assembly	EA	29	\$12,000.00	\$348,000.00
16-inch Butterfly Valve	EA	14	\$10,000.00	\$140,000.00
12-inch Gate Valve	EA	3	\$7,000.00	\$21,000.00
24-inch Steel Casing under RR	LF	120	\$1,250.00	\$150,000.00
<b><u>Watermain - From Rockfield Rd.</u></b>				
16-inch PVC Water Main - open cut	LF	2620	\$200.00	\$524,000.00
16-inch Water Main - Directional Drilled	LF	300	\$200.00	\$60,000.00
Hydrant Assembly	EA	9	\$12,000.00	\$108,000.00
16-inch Butterfly Valve	EA	4	\$10,000.00	\$40,000.00
30-inch Steel Casing under I-41	LF	200	\$1,500.00	\$300,000.00
<b><u>Street</u></b>				
Reconstruct Freistadt Road	LF	1400	\$250.00	\$350,000.00
Tracking Pads	EA	4	\$2,500.00	\$10,000.00
Silt Fence	LF	15000	\$2.50	\$37,500.00
Traffic Control	LS	1	\$20,000.00	\$20,000.00

Subtotal Construction	\$9,525,300
Contingency	\$800,700
Engineering and Administration	\$1,500,000
<b>TOTAL PROJECT COST</b>	<b>\$11,826,000</b>

Appendix N – Sanitary System Map with Flow Analysis Points



Pour Point 3A

Pour Point 3

Pour Point 4

Pour Point 4A

Point PS7

Pour Point 5

Appendix O – Conceptual Sanitary Sewer System Extension & Expansion – Northeast Area

"Country Aire" Basin  
 - Future SSSA Tributary to 24" interceptor  
 - Probable Pump Station "CA" required  
 - Approx. 2,100 LF 4" FM to existing 10" sewer in Country Aire Dr

Potential PS "CA" location

**Border of Expanded Future SSSA**

"Wrenwood" Basin  
 - Future SSSA tributary to Wrenwood LS, Partial  
 - Sewered in existing SSSA  
 - Gravity to existing sewers & WW Pump Station  
 - Approx. 2,300 LF 12" trunk sewer

**Node WW.4**  
 FG +/- 865.0  
 12" IE = 853.0  
 D = 12.0'

**Node WW.3**  
 FG +/- 866.0  
 12" IE = 851.6  
 D = 14.4'

**Node WW.2**  
 FG +/- 870.0  
 12" IE = 850.0  
 D = 20.0'

**Node WW.1**  
 FG +/- 876.0  
 12" IE = 847.7  
 D = 28.3'

**Conn. to Existing**  
 FG +/- 876.5  
 12" IE = 847.2  
 D = 29.3'

Country Aire Dr.

PARK

"Interceptor Gravity 4" Basin  
 - Existing Unsewered Area in SSSA, tributary  
 - to 24" interceptor  
 - Gravity to existing interceptor in Mequon Rd  
 - Possible future expansion to north  
 - Approx. 4,000 LF 12" trunk sewer

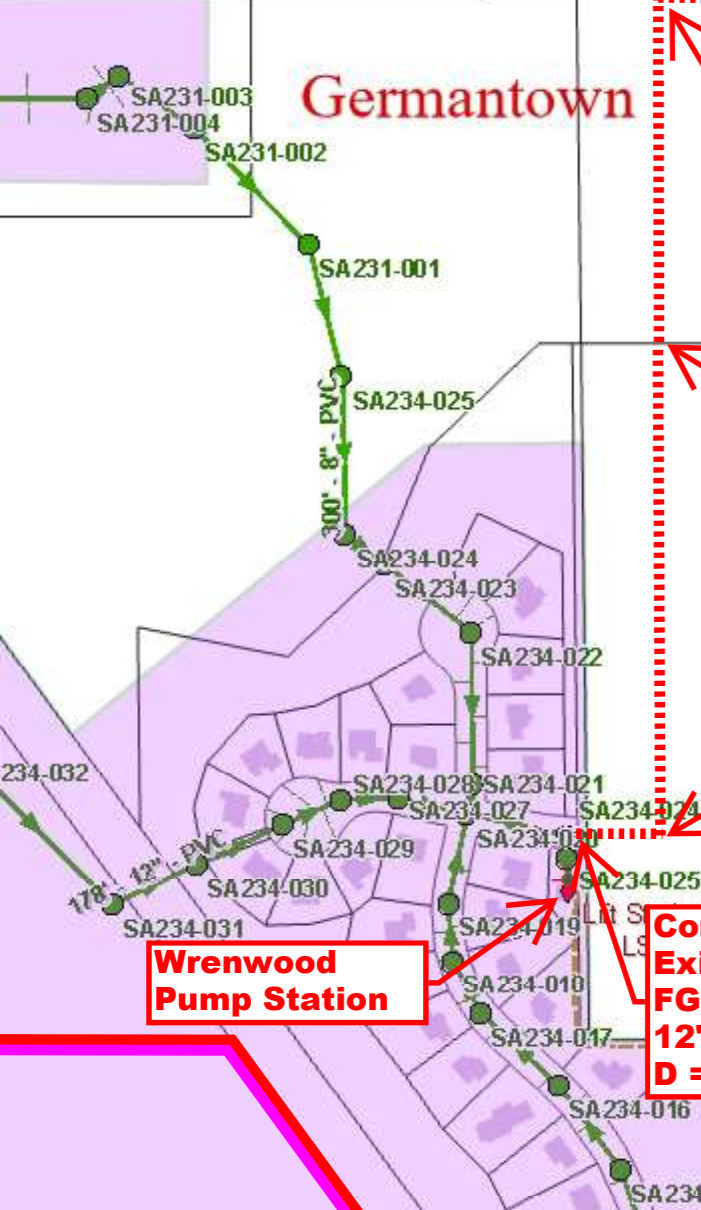
**Node IG-4.6**  
 FG +/- 888.5  
 12" IE = 872.6  
 D = 15.9'

**Node IG-4.5**  
 FG +/- 898.0  
 12" IE = 873.0  
 D = 25.0'

**Node IG-4.4**  
 FG +/- 894.0  
 12" IE = 870.6  
 D = 23.4'

**Wrenwood Pump Station**

Germantown



Appendix P – Conceptual Sanitary Sewer System Extension & Expansion – Northwest Area

**"Gateway North" Basin**

- Future SSSA Tributary to Main Street PS, Partial unsewered in existing SSSA
- New PS constructed in undeveloped area
- Approx. 6,500 LF 12" gravity sewer to new PS
- Approx. 1,600 LF 6" FM to new 12" sewer in Rockfield Rd.
- Approx. 1,400 LF 12" gravity sewer in Rockfield Rd. to existing 12" sewer in Gateway X-ing

**Rockfield Rd**

**"Gateway Central" Basin**

**Germantown**

**Goldendale Rd**

**"Gateway East" Basin**

- Future SSSA Tributary to Main Street PS
- New gravity sewers to existing 18" sewer in Goldendale Rd.
- Approx. 1,300 LF of 15" gravity sewer
- Approx. 8,700 LF of 12" gravity sewer

**NODE GW-E.9A**  
 FG +/- 952.0  
 12" IE = 920.2  
 D = 31.8'

**NODE GW-E.6**  
 FG +/- 960.0  
 12" IE = 934.6  
 D = 25.4'

**NODE GW-E.8A**  
 FG +/- 935.0  
 12" IE = 911.9  
 D = 23.1'

**NODE GW-E.7A**  
 FG +/- 936.0  
 12" IE = 907.6  
 D = 28.4'

**NODE GW-E.5**  
 FG +/- 945.0  
 12" IE = 923.4  
 D = 21.6'

**NODE GW-E.6A**  
 FG +/- 925.0  
 12" IE = 904.3  
 D = 20.7'

**Holy Hill Rd**

**NODE GW-E.4**  
 FG +/- 940.0  
 12" IE = 919.3  
 D = 20.7'

**NODE GW-E.5A**  
 FG +/- 926.5  
 12" IE = 903.9  
 D = 22.6'

**NODE GW-E.4A**  
 FG +/- 918.0

**BUSINESS OF THE UTILITY ADVISORY COMMITTEE**

MEETING DATE: August 15, 2024

PLACEMENT: Action Item

ITEM TITLE: Recommendation of the Sanitary Sewer System Facilities Plan Update

SUBMITTED BY: Matthew Mortwedt, Public Works Director

SUMMARY EXPLANATION:

Following discussion, and provided no additional follow-up is necessary, this item is presented to gain the recommendation of the Utility Advisory Committee.

ATTACHMENT:

1. Village of Germantown Sanitary Sewer System Facilities Plan Update DRAFT

STAFF RECOMMENDATION:

Staff suggest a positive recommendation of the Sanitary Sewer System Facilities Plan Update from the Utility Advisory Committee to the Public Works and Highways Committee.

ACTION BY Committee:

# DRAFT

## FACILITIES PLAN UPDATE



### Village of Germantown Sanitary Sewer System Facilities Plan Update

*April 17, 2024*

**PREPARED FOR:**

**Village of Germantown**  
N122 W17177 Fond Du Lac Avenue  
Germantown, WI 53022

**PREPARED BY:**

**Ruekert & Mielke, Inc.**  
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## SANITARY SEWER SYSTEM FACILITIES PLAN UPDATE

### INTRODUCTION AND NEED FOR UPDATED FACILITIES PLAN

The Village of Germantown has contracted with Ruekert & Mielke, Inc. (R/M) to complete an analysis of the existing sanitary sewer system facilities and plan for future development needs within the sanitary system facilities. The most recent Sanitary Sewer Service Plan report for the Village of Germantown was published in 1983 by the Southeastern Wisconsin Regional Planning Commission (SEWRPC), with multiple subsequent amendments to the refined Sanitary Sewer Service Area (SSSA) defined in the original 1983 report. The original report was planned for the year 2000.

The Village of Richfield has initiated the process of extending the Village of Germantown's sanitary sewer service to serve a recently proposed development within the Village of Richfield. This potential development, subsequent changes to the related sanitary sewer service area, and age of the original SEWRPC Sanitary Sewer Service Area Plan have served as an impetus to update Germantown's sanitary sewer facilities plan. The updated facilities plan will consider growth within Germantown as well as near- and long-term growth in a portion of Richfield. With the analysis of future development within the broad planning area, an accurate assessment for future improvements can be made.

The Villages of Germantown and Richfield have recently requested an immediate amendment to Germantown's (SSSA) to continue moving forward on the potential development in Richfield. A development entity has expressed sincere interest in developing a vacant area near the I-41/Holy Hill Road interchange for office and light industrial uses. Market conditions have necessitated the immediate amendment of the SSSA so that the developer can be assured sewer service will be approved by SEWRPC, Milwaukee Metropolitan Sewerage District (MMSD), and the Wisconsin Department of Natural Resources (WDNR) for the proposed development. This will allow them to proceed with their acquisition of the property and subsequent development plans in a timely manner. The Village of Germantown Sanitary Sewer System Facilities Plan Update is being completed as a trailing condition of said immediate SSSA amendment along with a full amendment to the Germantown SSSA consistent with the Village's 2050 Comprehensive Plan.

### INTERGOVERNMENTAL AGREEMENT

The Villages of Germantown and Richfield have entered into an Intergovernmental Agreement (IGA) to define the parameters for a cooperative approach in the extension of sanitary sewer into the Village of Richfield. Richfield desires to encourage commercial and light industrial development due to the subject area's proximity to I-41, a major transportation arterial. Germantown has determined that in serving a portion of Richfield to facilitate development, they can capitalize on the financial benefit of a larger customer base as well as having non-Germantown property owners bear a portion of their capital costs.

The IGA details how costs will be shared for design, construction, administration, approvals, and land acquisitions for extension of infrastructure into Richfield. Germantown's existing construction standards and practices must be utilized.

The incremental area within the Village of Richfield to be served is detailed within the IGA, however for the purpose of this Facilities Plan the entire section of land within Richfield will be used for the SSSA Planning Area. The quantity and strength of the domestic wastewater stream from Richfield is defined based on Germantown's and the MMSD's guidelines. The IGA allows a quantity of domestic wastewater not to exceed 0.4 MGD Average Daily Flow with 0.7 MGD allowable Daily Peak Flow. This allowable flow is relative to the immediate SSSA amendment and not inclusive of the entire incremental planning area. Flow will be metered at a strategic location to accurately track the volume of wastewater generated within the Richfield SSSA.

A general route for gravity sewer has been planned by the Village of Richfield to run through undeveloped areas of Germantown for connection to the Richfield portion of the SSSA. The remainder of the route

may flow by gravity or be delivered via force main at Richfield's discretion. The general route assumes a connection point to a recently installed interceptor sewer at the intersection of Goldendale and Freistadt Roads. Germantown will own, operate, and maintain the entire sanitary sewer system, including the sanitary sewer system within Richfield's boundaries. Germantown will also be responsible for any necessary improvements downstream of this connection point, which will be identified within this Facilities Plan. Permits and inspections for new connections to the sanitary sewer system within Richfield will be administered and approved by Germantown. Sewage treatment rates have been established within the IGA, as well as determinations as to who will pay the costs for future expansions and upgrades to the system for development within Richfield.

## BACKGROUND

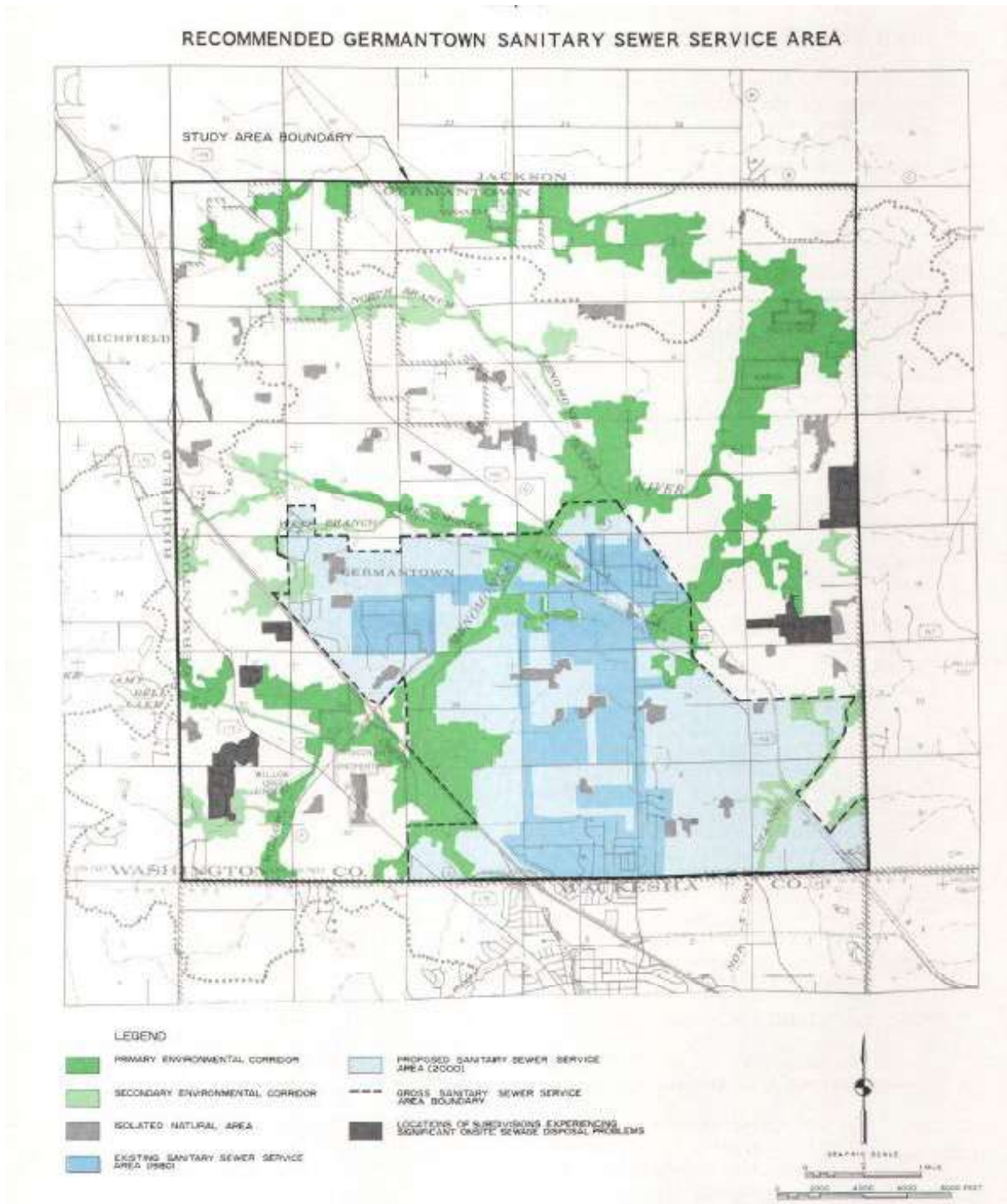
### History of the existing SSSA & Planning Area

The initial analysis and planning report for Village of Germantown's SSSA was authored by SEWRPC and published in July 1983. At the time, there was a recognized need for an area-wide water quality management plan, and in turn a need to accurately define future planned SSSA's for public sanitary sewer systems throughout Southeastern Wisconsin. The purpose of this report was to provide a framework for SSSA planning based on recommended land use through the year 2000.

At the time of the report, the area served by the Village's sanitary sewer system was approximately 1,984 acres. The Village operated its own wastewater treatment plant that was operating near its design capacity. With recommendations from SEWRPC and the MMSD, the Village concluded that a sewer connection should be made to the MMSD and that the Village's existing sewage treatment plant should be abandoned.

The delineation of the initial proposed SSSA considered not only current and future land use, but also failing septic systems, sewer tributary areas, existing and planned trunk sewers, and natural resource data. The resulting refined proposed SSSA totaled approximately 6,464 acres as shown in Figure 1 below:

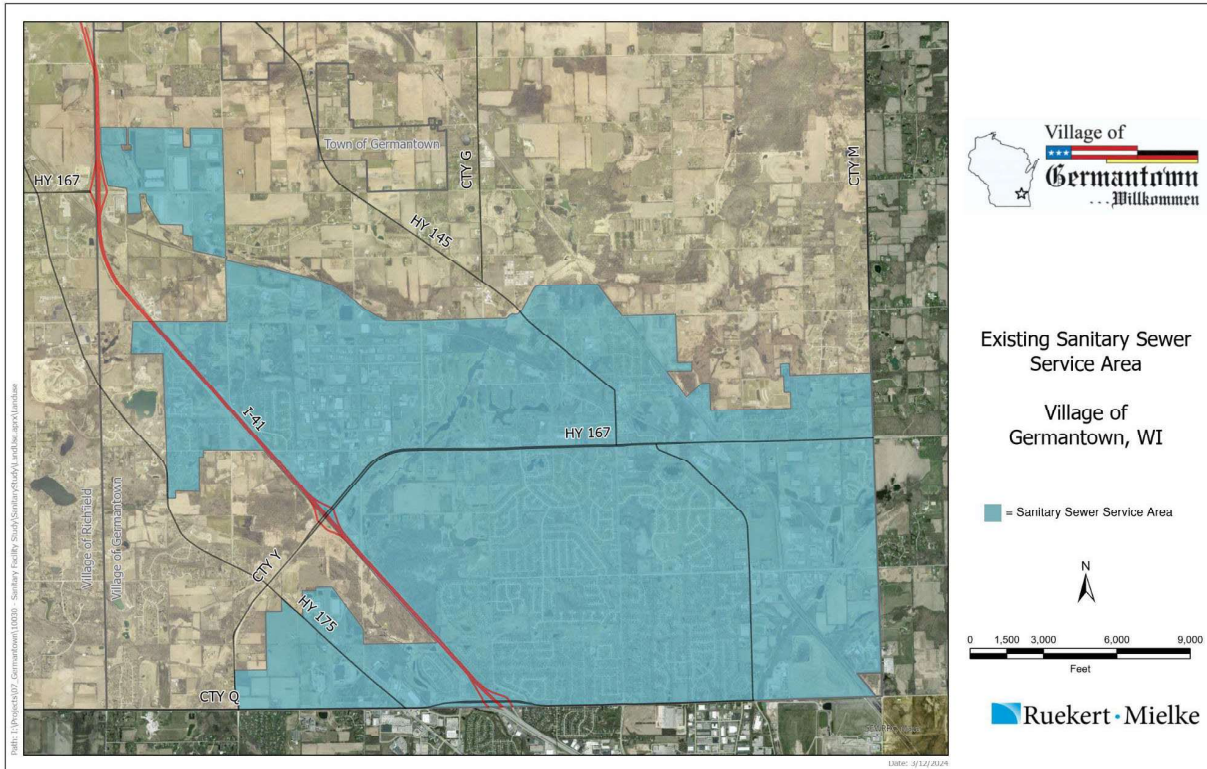
Figure 1 SEWRPC 1983 Planning Report - Sanitary Sewer Service Area



Source: SEWRPC 1983 Planning Report No. 70

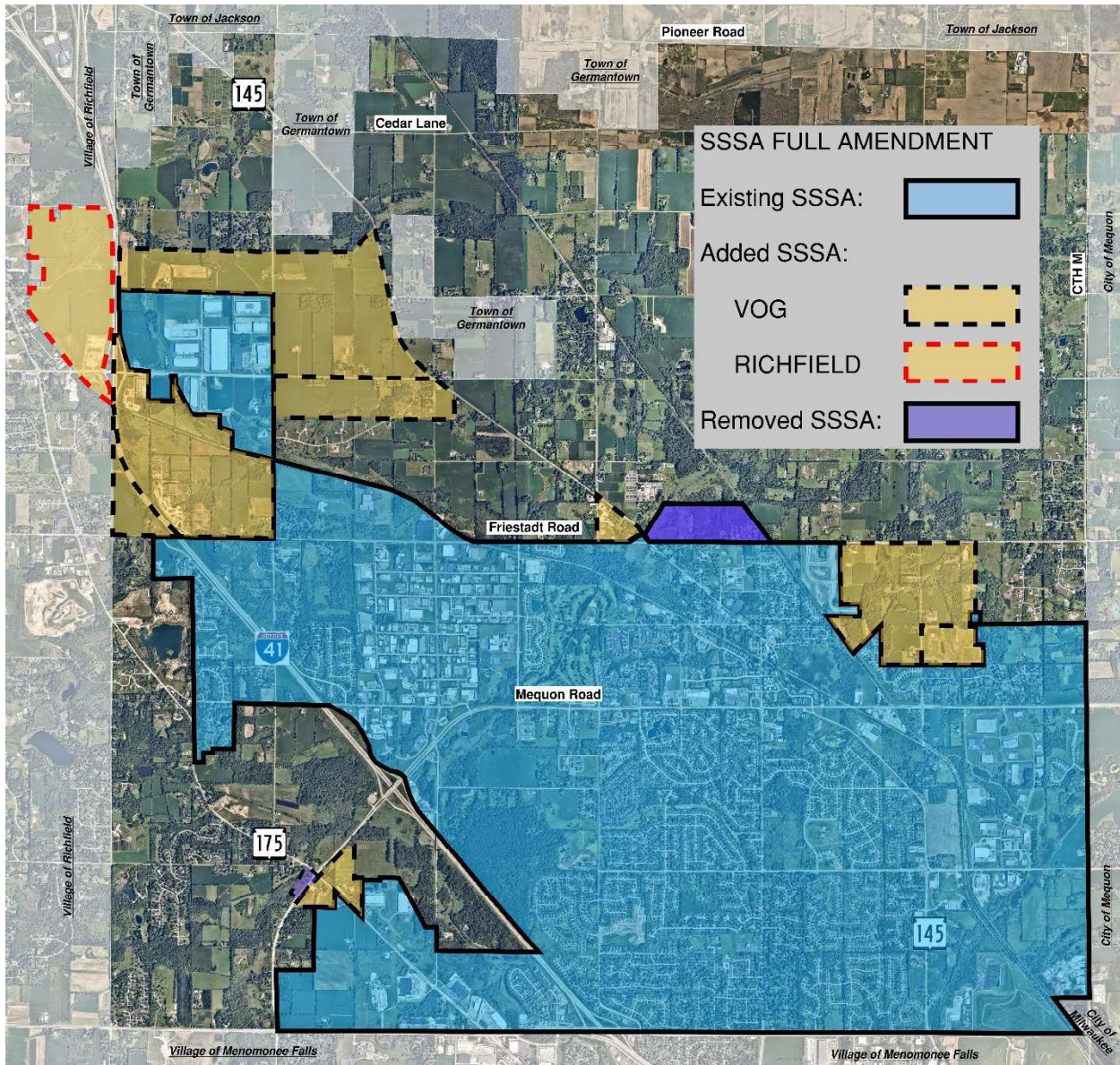
The proposed year 2000 SSSA was subsequently amended several times after the SEWRPC 1983 report was finalized. These amendments were approved in 1989, 1998, 2003, 2009, 2015, and most recently 2018 as the Village has expanded with development. The resulting Village of Germantown Sanitary Sewer Service Area is currently 9,432 acres and is delineated by SEWRPC as shown in Figure 2 below and included in Appendix A.

Figure 2 Existing Village of Germantown Sanitary Sewer Service Area



The pending immediate amendment, which is a portion of a larger full amendment, to the Germantown SSSA that is concurrent with this Facilities Plan will add a combined total of 814 acres to the SSSA, of which 526 acres are in the Village of Germantown and 288 acres are in the Village of Richfield. Beyond the immediate amendment, a full amendment has been defined for the 2050 planning term expansion to the existing SSSA and will be utilized as the future SSSA analysis area. The 2050 full amendment area is as shown in Figure 3 below and included in Appendix B:

Figure 3 2050 Full Sanitary Sewer Service Area Amendment

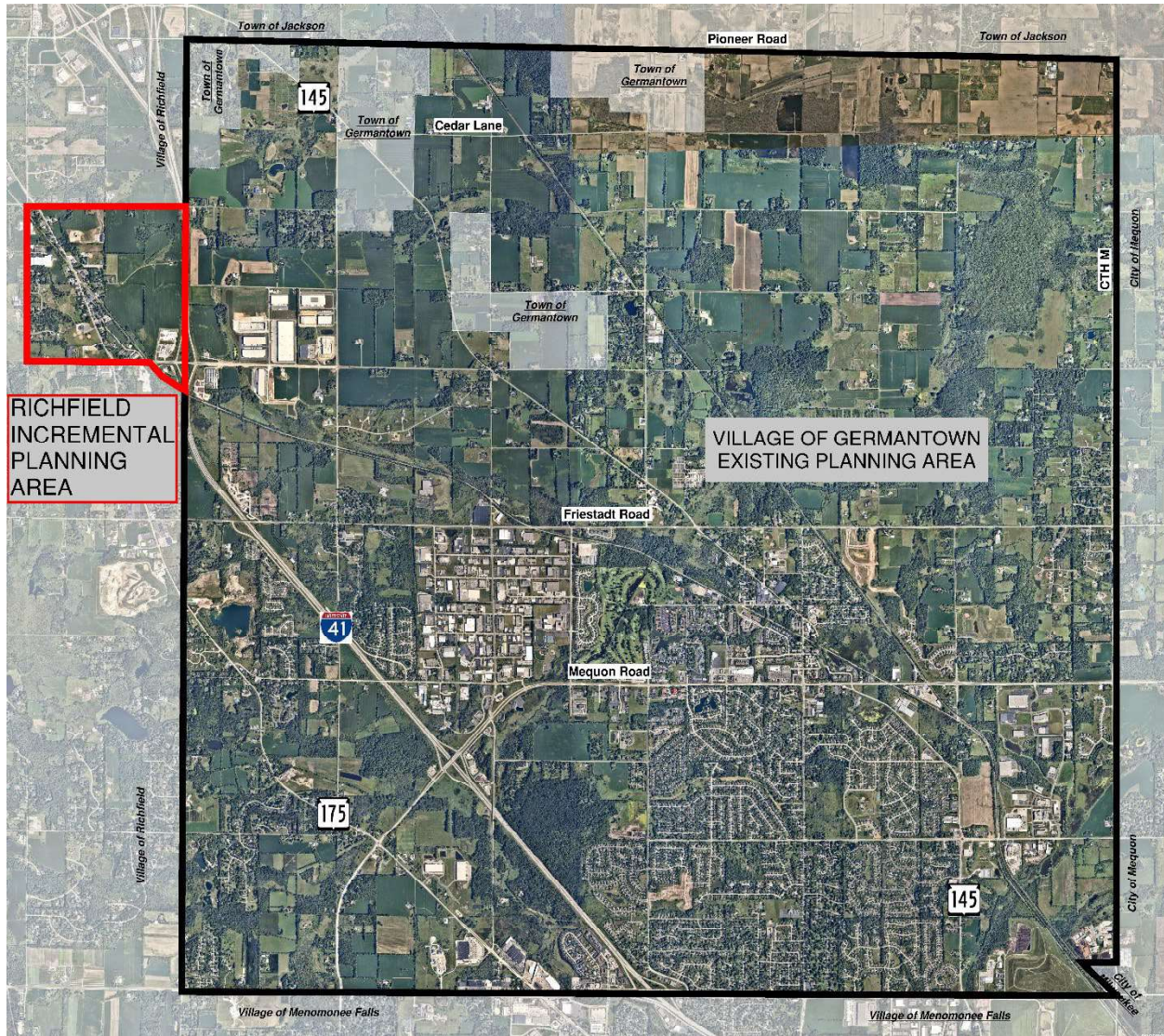


Source: Village of Germantown Planning

With the full amendment to the existing SSSA, the total area included in the Village of Germantown SSSA, herein referred to as the “expanded” SSSA could potentially be 10,964 acres.

For planning purposes, this Sanitary Sewer System Facilities Plan Update will also include the “Incremental Planning Area” within the Village of Richfield as a stand-alone incremental area tributary to the Village of Germantown’s expanded Future SSSA. This area of Richfield would potentially add another 665 acres in total to the fully amended Germantown SSSA described above. This area of Richfield is designated in Figure 4 below and included in Appendix C.

Figure 4 Village of Richfield Incremental Planning Area



Source: Village of Germantown Planning

Existing Sanitary Sewer System

In general, wastewater flow originates from the northwest region of the Village of Germantown near Holy Hill Road and I-41. The Richfield area to be added to the SSSA is located near this point, which makes adding sewer service in Richfield viable with the overall design of Germantown’s existing sanitary sewer system. Wastewater moves generally southeast through the network of trunk sewers, interceptors, and pump stations to a single connection point to the MMSD’s Metropolitan Intercepting Sewer (MIS) infrastructure at County Line Road and Wausaukee Road. At this connection point, the Village is allowed a peak hourly flow rate of 22.27 million gallons per day (MGD). Measured by a metering station at the connection point, the current average dry weather daily flow rate is 2.53 MGD with the peak hourly flow rate being approximately 12.67 MGD.

To determine peak flows, rain event data from the National Oceanic and Atmospheric Administration (NOAA) was used to verify if peak flow events corresponded to a rain event. Several rain events of note in 2022 and 2023 were observed at the Wastewater Utility Building weather station, with the most intense event being a 5.5-inch rainfall on September 12<sup>th</sup> of 2022. This event corresponded to the maximum

peak hourly flow observed during any rain events, and this maximum was used to calculate the peak hourly flow rate for the Wrenwood and the MMSD metering station.

The existing sewerage area within the Village of Germantown SSSA is served by approximately 99.2 miles of gravity sewer ranging in size from 8-inch to 48-inch diameter, and approximately 4.4 miles of force main sewer ranging in size from 6-inch to 20-inch diameter, as broken down by size category in Table 1. The system was constructed beginning in the mid-1960's with the largest portion of the system being constructed in the 1990's and 2000's. Pipe materials are largely Polyvinyl Chloride (PVC), Reinforced Concrete Pipe (RCP), and Ductile Iron, with a minimal quantity of Vitrified Clay, Nonreinforced Concrete Pipe, and ABS Truss pipe. The majority of the Village's 48" RCP interceptor has been rehabilitated with Cured-In-Place-Pipe. The Village has also completed a considerable amount of sewer replacement and extension projects to eliminate pump stations, provide service for new development, and upgrade capacity for undersized and outdated sewers.

*Table 1 Existing Village of Germantown Sanitary Sewer Pipe Sizes & Lengths*

Gravity Sewer		Force Main	
Diameter	Miles	Diameter	Miles
		6"	0.9
8"	59.3		
10"	6.5	10"	0.7
12"	9.2	12"	1.5
15"	5.1		
		16"	0.5
18"	4.8		
		20"	0.8
21"	2.0		
24"	2.1		
27"	2.1		
30"	3.6		
36"	0.9		
48"	3.5		
	<b>99.2</b>		<b>4.4</b>

Critical Sewer Flow Path

As the Village of Germantown's sanitary sewer system is analyzed, a critical path method can be used to identify the route conveying the bulk of the flow through the Village. This path is also the one most affected by future development, as the origin is in a largely undeveloped area of the Village, including the adjoining Village of Richfield area to be amended into the SSSA. Once this critical path through various trunk sewers, interceptors, and pump stations is determined, it can be used for analysis of future predicted flow conditions to identify any areas where future development may create a need for improvements.

At the northeast extents of the Village, the critical path begins just east of I-41 on Holy Hill Road with an 18-inch sanitary sewer that flows east and south continuing along Goldendale Road south to Freistadt Road. At Freistadt Road, the 18-inch sanitary sewer turns east to follow Freistadt Road. At the intersection of Freistadt Road and McCormick Drive, the sewer upsizes to 24-inch and continues to flow east following Freistadt Road. At the Wisconsin & Southern Railroad right-of-way (ROW), the sanitary

sewer deflects to the southeast and upsizes to 27-inch diameter. The 27-inch sewer continues southeast in alignment with the railroad ROW to a point approximately 1,000 feet east of River Road. At this point, the sewer turns to flow south and increases to 30-inch diameter.

The 30-inch sewer continues south through easement areas and along the east extents of the Blackstone Creek Subdivision. On the east side of the intersection of Blackstone Circle And Prestwick Court, the 30-inch sanitary sewer turns east and increases to 36-inch in diameter. The 36-inch sewer then flows east through the Blackstone Creek golf course and converges with a 30-inch sewer and 18-inch sewer that serve portions central to the Village before it terminates at the Main Street Pump Station at the intersection of Main Street and Division Road.

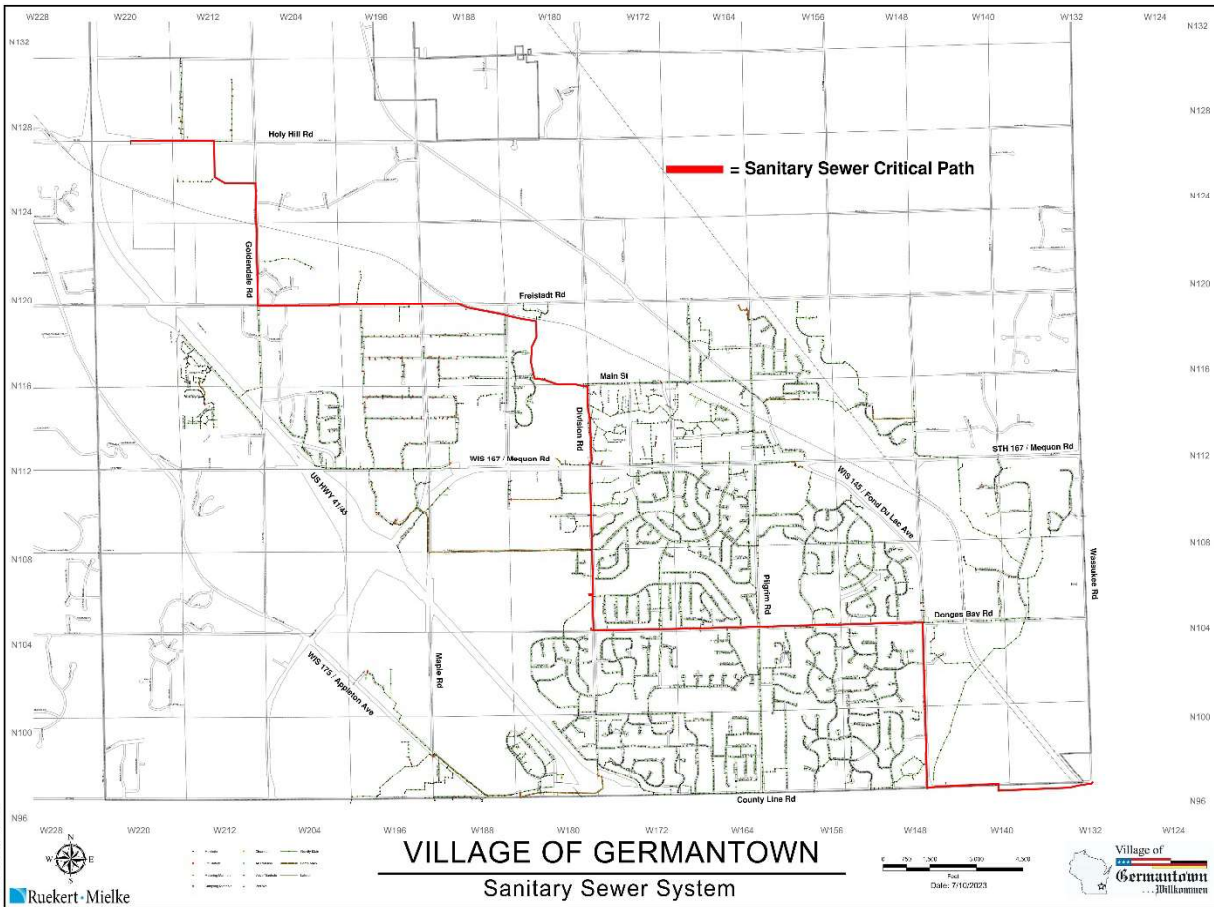
From the Main Street Lift Station, the wastewater is conveyed south through a 16-inch force main following Division Road until discharging into a manhole located approximately 100 feet north of State Highway 167, also known as Mequon Road where it returns to gravity flow through a 30-inch diameter sanitary sewer. This 30-inch sewer continues to flow south along Division Road until it reaches a convergence point at Old Farm Road where it meets a separate 36-inch sewer and combines with flow from the adjacent 36-inch sewer into the Old Farm Pump Station.

Wastewater flowing into the Old Farm Pump Station is discharged via a 20-inch diameter force main directed south along Division Road. At the intersection with Donges Bay Road, the force main turns east to follow Donges Bay Road until a point approximately 250 feet east of Ridgeview Lane where the force main discharges into a manhole that is located at the upstream end of a 48-inch diameter interceptor sewer.

The 48-inch interceptor sewer gravity flows east along Donges Bay Road to Fond Du Lac Avenue where it turns to the south and follows Fond Du Lac Avenue to County Line Road. At County Line Road, the 48-inch interceptor turns east. At the east side of the intersection of Fond Du Lac Avenue and County Line Road, a separate 30-inch sanitary sewer connects to the 48-inch interceptor and the conjoined flows continue in the easterly direction along County Line Road. The 48-inch interceptor follows the County Line Road (ROW) flowing east and meanders from the north side of County Line Road to the south side where it runs through a portion of the Old Orchard Landfill site. On the east extent of the Old Orchard Landfill Site, the interceptor flows through a metering station and then connects to a 54-inch diameter MIS sewer owned by the MMSD at the intersection of County Line Road and Wausaukee Road. This point is the singular connection point for all flow conveyed by the Village of Germantown's sanitary sewer system.

The Village of Germantown's full sanitary system map including the Critical Path as described can be found in Figure 5 below and in Appendix D.

Figure 5 Village of Germantown Sanitary Sewer System Map



### Pumping Stations

Another critical aspect of future analysis and planning is the existing pump station facilities within the sanitary sewer system. The Village owns and operates 6 pump stations of various sizes and capacities within the collection system. Germantown conducted a study of 5 of the 6 pump stations owned by the Village in 2022. The data collected within that study is being presented in summary within the Sanitary Sewer System Facilities Plan Update. The study included Pump Stations 3, 6, 7, Main Street, and Old Farm. The Village's newest pump station, Wrenwood, was not part of the study area. For this report, data for the Wrenwood Pump Station has been collected independently of the pump stations included in the study.

GIS data from the Village of Germantown was utilized in the study to approximate the sewer service areas attributed to each pump station. Pump Stations 3, 7, Wrenwood, and Main Street handle flows exclusively from their respective sewershed basin. Pump Station 6 handles flow from its sewershed basin as well as flow from Pump Station 3. Old Farm Pump Station handles flow from its sewershed basin as well as Pump Stations 3, 6, 7, and Main Street.

Flow data was collected from the Village's Supervisory Control and Data Acquisition (SCADA) system for Pump Stations 3, 6, 7, Main Street, and Old Farm for analysis related to the Pump Station study. Data for the Wrenwood Pump Station and the MMSD connection point was collected independently of the data included in the previous referenced study. The data collected included average dry weather flow, peak hourly flow during selected heavy rainfall events, and pumping capacities of each pump station. An

hourly peaking factor and remaining peak capacity were established for each pump station. The tributary area for each pump station includes all land use types, including wetlands and ROW.

The peaking factors have been determined from the prior pump station study utilizing flow data from the Village’s SCADA system; however this study did not include the Wrenwood Pump Station or the MMSD metering station. To determine peak flows at those locations, rain event data from NOAA was used to verify if peak flow events corresponded to a rain event. Several rain events of note in 2022 and 2023 were observed at the Wastewater Utility Building weather station, with the most intense event being a 5.5” rainfall on September 12<sup>th</sup> of 2022. This event corresponded to the maximum peak hourly flow observed during any rain events, and this maximum was used to calculate the peak hourly flow rate for the Wrenwood and the MMSD metering station. Table 2 summarizes the data collected and calculated.

*Table 2 Pumping Station Capacity Summary*

Pump Station	Existing Tributary Area (Ac)	Existing Dry Weather Flow (GPM)	Peak Flow from Analyzed Rain Events (GPM)	Peaking Factor	Existing Maximum Capacity (GPM)	Peak / Capacity	Remaining Peak Capacity (GPM)
PS 3	292.3	13	83	6.38	310	27%	227
PS 6	146.0	60	203	3.75	950	24%	725
PS 7	486.0	143	504	3.52	1,300	39%	796
Wrenwood	157.4	47	267	5.68	410	65%	143
Main Street	2461.1	1,007	2,818	2.80	6,250	45%	3432
Old Farm	4567.3	1,464	4,858	3.32	7,400	65%	2542
Connection to MMSD	9432.0	1,832	8,801	4.80	15,465	57%	6664

The analyzed data shows that in the current condition, there is some room for growth and, in turn, increased flow at each pump station. Analysis of the wastewater flow within the fully amended SSSA and Richfield SSSA will be incrementally compared to the existing design capacities to assess what, if any, upgrades may be required in the future to accommodate planned development. The need for upgrades will be assessed based on a threshold of 80 percent of design flow on a peak hour basis.

**BASIS OF ANALYSIS FOR INCREMENTAL PLANNING AREA & UNSEWERED AREAS**

To analyze future theoretical flow conditions for the Village of Germantown’s sanitary sewer system, certain parameters must be established for the basis for the analysis. Establishing a design period consistent with the Village’s 2050 Comprehensive Plan provides a cohesive analysis with the Village’s future overall plan. Both existing and future land uses are utilized to predict how the Village will develop over time and provide a basis for where improvements may be needed. Flow calculations will utilize factors for land use types, and population density assumptions can be made using occupancy factors. Base parameters established for design of new sewer facilities aid in preliminary concepts for potential future sewer facilities.

**Design Period**

For this Facilities Plan, a 20-year design period has been chosen. This design period coincides closely with Village of Germantown’s 2050 Comprehensive Plan for future growth and development.

## Land Use

Land use is assigned assuming a fully developed condition using a combination of existing land use information and known future planning for the respective municipalities. Land use is assigned on a parcel-by parcel basis and individual land parcels are not broken into smaller land use fractions. The exception is those parcels which contain wetlands, which were separated into a single land use category and a wetland category to exclude wetland areas from flow generation calculations.

In existing developed areas, the actual quantity of transportation corridor has been calculated for the respective areas and included in the land use calculations. Areas that are mostly undeveloped in their current condition have been assumed to contain 30% public transportation corridors in the future fully developed condition. This gives a more accurate depiction of future flow conditions as public transportation corridors have also been excluded from calculations related to flow generation.

Village of Germantown - For determination of future land use of undeveloped areas, the Village's 2050 Comprehensive Plan is used as a guide to the fully developed land use condition for those areas currently undeveloped within the unsewered expanded SSSA. For residential areas, dwelling units per acre can be calculated based on future planned density. Population within these residential areas can be estimated using existing and future planned dwelling unit density and occupancy factor. Residential areas have been split into a "Single-Family" category and a "Multifamily" category to account for more densely populated areas containing apartments, senior housing, or condominiums.

Village of Richfield - The area of the Village of Richfield included in the expanded planning area has been analyzed for future land use characteristics as well. Richfield's 2033 Comprehensive Plan includes an adopted future land use plan specifically related to its incremental planning area. The future land use in the planning area is generalized into broad categories of land use types. For residential areas, a density of one dwelling unit per three acres has been determined by the Village of Richfield. Population within these residential areas can be estimated using the planned unit density and occupancy factor.

## Flow Factors

In determining the future requirements for capacity within the existing sanitary sewer system and any required new sanitary sewer extensions, the potential flow must be calculated to determine if adequate capacity exists or if there is a future need for upgraded infrastructure. Flow factors used in this Facilities Plan are based on the MMSD's methodology for flow calculation:

### Base Flow

- Occupancy Factor – 2.50 people per dwelling unit (single-family).
- Occupancy Factor – 1.80 people per dwelling unit (multifamily).
- Residential – 68 gallons per capita, per day.
- Commercial – 1500 gallons per acre, per day.
- Industrial – 1000 gallons per acre, per day.
- Institutional – 1000 gallons per acre, per day.

Once the base flow is calculated using the above parameters and future determined land uses, a peaking factor is then applied to calculate the theoretical peak hourly flow within the system.

## Sanitary Sewer Design Criteria

Additions to the existing sanitary sewer system will be necessary for development within the unsewered portions of the existing SSSA as well future additions to the SSSA. The design should consider anticipated flows for the existing & future land use in a fully developed condition. Preliminary design of trunk sewers related to the expansion of the SSSA into the Village of Richfield has been completed by the Village of Richfield and provided to the Village of Germantown for use in this report.

The following criteria for future sewer extensions are assumed for analysis purposes:

- Minimum slope per Wisconsin Administrative Code.
- Minimum velocity: 2 feet per second when flowing full.
- Mannings “N” Value: Concrete Pipe – 0.013, PVC Pipe – 0.011.

### COST ESTIMATING METHODOLOGY

#### Sanitary Sewer Force Main, Trunk & Interceptors

Unit costs for gravity sanitary sewers are based on bids and information from recent projects. In estimating costs for future projects, consideration is also given to consider depth of excavation, size of pipe, pipe material, groundwater conditions, bedrock, and soil type. Preliminary cost estimates related to the expansion of the SSSA into the Village of Richfield have been completed by the Village of Richfield and provided to the Village of Germantown for use in this Facilities Plan.

#### Pump Station Upgrades & Construction

Costs associated with upgrades to existing pump stations and/or construction of new Pump Stations are based on historical R/M project information tabulated into graphical format. The estimated costs for pumping stations consider the same general parameters that affect gravity sewer construction as mentioned above.

### LAND USE ANALYSIS OF UNSEWERED AREA IN EXISTING AND EXPANDED SSSA

In analyzing the existing and full amendment the Village of Germantown SSSA, there are areas currently not served by sanitary sewers that may be sewerred in the future according to the Village’s 2050 Comprehensive Plan. The analysis will incrementally analyze these areas in a fully developed condition prior to adding in the incremental planning area from the Village of Richfield. Future land use is assigned to the undeveloped portions using the 2050 Plan as well as existing land uses as a guide to determine what future land use will most likely be as shown in Figure 6 and Appendix E.

Figure 6 Village of Germantown Future Land Use Map

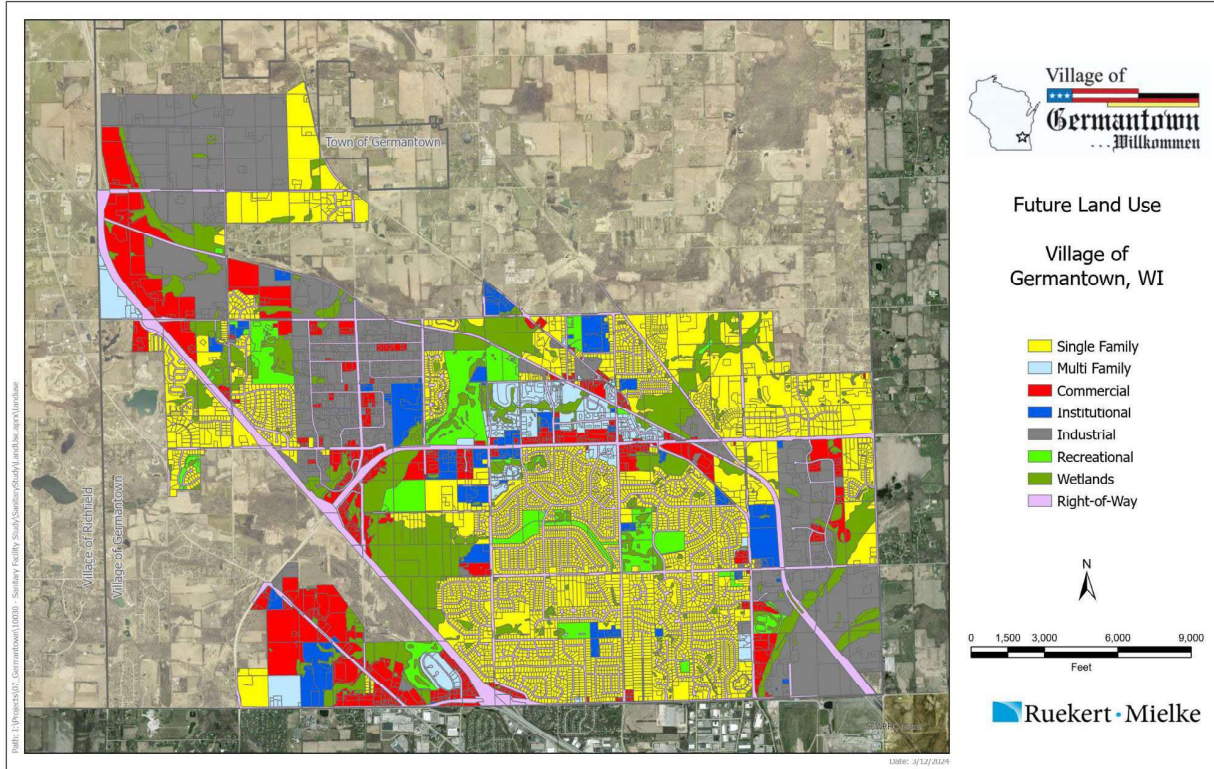


Table 3 breaks down the categories of assumed future land use conditions in the fully developed existing and expanded Germantown SSSA.

Table 3 Village of Germantown Future Land Use by Category

Germantown SSSA Fully-Developed Future Land Use (Acres) (Not including Richfield)							
Commercial	Industrial	Institutional	Multifamily	Recreational	Transportation	Single-Family	Wetlands
1,000.8	1,803.2	430.7	353.9	504.4	2,185.9	3,307.1	1,377.5
<b>Total Expanded SSSA</b>				<b>10,963.5</b>			
<b>Net Flow Generation Area*</b>				<b>6,895.8</b>			

\*Excludes Recreational, Transportation, and Wetlands land use categories

### Estimating Population

For single-family residential land use, an average density factor of 3.0 dwelling units/acre is appropriate based on the existing and desired density ranges described in the Village of Germantown's 2050 Comprehensive Plan. Most of the future development of residential areas falls into this category.

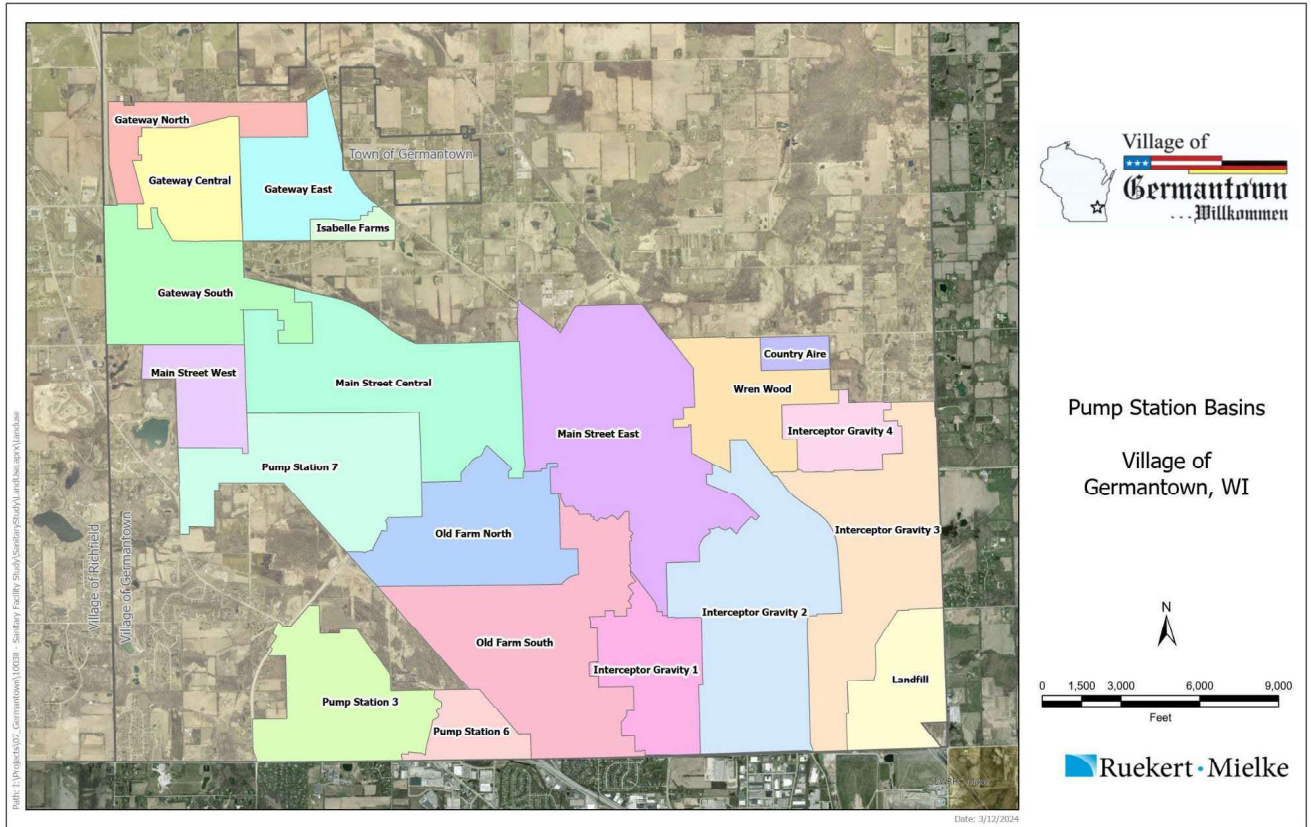
For multifamily residential land use, an average density factor of 8.0 dwelling units/acre is appropriate based on density ranges described in the Village of Germantown's 2050 Comprehensive Plan. Large-scale addition of multifamily residential development is not consistent with the Village's future plan, however, there is a potential for pockets of medium density residential mixed-use development within the Holy Hill Gateway Corridor. Because the Holy Hill Gateway Corridor has the potential for higher density residential development, the future multifamily land use in this basin alone was assigned a density of 16 dwelling units/acre.

Using the land use area, occupancy factor of 2.50 (single-family) or 1.80 (multifamily) people/dwelling unit and residential density factors described above, the total population of the fully developed existing and expanded Germantown SSSA is approximately 30,482. This is consistent with SEWRPC's Vision 2050 recommended population of 29,080 and high-growth population of 34,500. This population projection does not include the Richfield Incremental Planning Area (IPA).

### Identifying Analysis Basins

To provide a more comprehensive analysis of the future tributary areas and flow conditions for the entire system, the expanded Germantown SSSA is divided into analysis basins based on physical characteristics of each respective basin. Direction of flow, existing pump station locations, sewer system configuration, existing and future SSSA borders, and future "conceptual" pump station basins all were considered when delineating each basin. Figure 7 depicts the basin delineations and naming convention used for analysis within this Facilities Plan. The Sanitary Sewer Analysis Basin Map is also included in Appendix F.

Figure 7 Sanitary Sewer Analysis Basin Map



The basins can then be broken down into a more detailed description of future fully-developed land use using the same categories as the broad future land use breakdown. Table 4 details the future land use break-down of each individual basin.

*Table 4 Future Land Use by Analysis Basin*

<b>Germantown SSSA Future Land Use (Acres) (Not including Richfield)</b>									
<b>Basin Name</b>	<b>Commercial</b>	<b>Industrial</b>	<b>Institutional</b>	<b>Multifamily</b>	<b>Recreational</b>	<b>Right-of-Way</b>	<b>Single-Family</b>	<b>Wetlands</b>	<b>Basin Total</b>
Country Aire					1.2	13.4	31.2	30.5	76.2
Gateway Central	9.0	245.5				109.1		15.6	379.2
Gateway East		113.0				114.7	154.7	13.3	395.7
Gateway North	36.7	132.4				72.5	0.1	5.4	247.2
Gateway South	187.6	129.1		40.4	1.6	155.0	4.7	101.2	619.6
Interceptor Gravity 1	4.6		18.9		21.1	67.8	316.9	4.7	434.0
Interceptor Gravity 2	43.5	46.8	77.8	16.8	75.6	200.7	596.7	51.4	1109.3
Interceptor Gravity 3	75.3	257.7	2.9		17.3	226.4	192.5	128.9	900.9
Interceptor Gravity 4					0.1	68.8	160.5	8.3	237.8
Isabelle Farms						19.5	45.4	2.9	67.7
Landfill		279.9				37.5		44.1	361.5
Main Street Central	49.5	341.6	85.2	3.6	154.4	104.9	102.4	147.0	988.5
Main Street East	97.8	28.9	91.6	205.6	75.0	188.8	357.6	156.2	1201.7
Main Street West	48.7	0.0	5.9	0.5	2.6	64.9	96.4	61.4	280.4
Old Farm North	75.7		67.3	22.6	100.8	76.9	162.2	153.0	658.5
Old Farm South	21.2	3.4	17.0	1.6	12.9	206.6	603.7	193.0	1059.3
Pump Station 3	221.5	9.9	57.4	29.4	0.1	152.9	36.1	86.5	593.8
Pump Station 6	52.3	4.5	0.3	33.3	29.1	50.5	0.2	16.0	186.2
Pump Station 7	77.7	209.7	6.4		10.3	158.6	222.0	48.4	733.1
Wrenwood		0.7	0.0	0.0	2.2	96.3	223.9	109.7	432.9
<b>Total</b>	<b>1000.8</b>	<b>1803.2</b>	<b>430.7</b>	<b>353.9</b>	<b>504.4</b>	<b>2185.9</b>	<b>3307.1</b>	<b>1377.5</b>	<b>10963.5</b>

**Pump Station Tributary Area**

With the expansion of the Village of Germantown, the aggregate tributary for each pump station is inclusive of not only the immediate area tributary directly to the pump station, but also those areas upstream in other pump station basins that are tributary to more than one pump station. The acreages calculated include all land use types within the basin, including wetlands and ROW. The increase in tributary area includes areas within the existing SSSA that are currently unsewered as well as areas that will be amended into the expanded SSSA. The connection point to the MMSD contains all lands assumed to be included in the fully amended, fully developed SSSA. Summary of the changes to each pump station’s tributary area is calculated in Table 5.

*Table 5 Future Change in Pump Station Tributary Areas*

Existing Pump Station	Existing Aggregate Tributary Area (Ac)	Future Expanded SSSA Aggregate Tributary Area (Ac)	Future Richfield IPA Tributary Area (Ac)	Total Future Increase in Aggregate Tributary (Ac)	Percent Increase in Tributary Area
LS 3	292.3	593.8		301.5	103.1%
LS 6	438.3	780.0		341.7	78.0%
LS 7	486.0	733.1		247.1	50.8%
Wrenwood	157.4	432.9		275.5	175.0%
Main Street	2,461.1	4,180.0	665.4	2,384.3	96.9%
Old Farm	4,567.3	7,410.8	665.4	3,508.9	76.8%
Connection to MMSD	9,432.0	10,963.5	665.4	2,196.6	23.3%

A detailed analysis of the changes within each pump station's aggregate basins follows:

**Pump Station #3** - The area tributary to Pump Station #3 would increase approximately 301.5 acres to a total of 593.8 acres in a fully developed expanded SSSA. This area has substantial potential for development and expansion, with most of potential development already being within the existing SSSA, but not currently sewered. The incremental future land use in the tributary area is planned as a mixture of commercial, single-family residential, and multifamily residential development. This increase in area would subsequently be added to Pump Station #6.

**Pump Station #6** - The area tributary to Pump Station #6 would increase 341.7 acres to a total of 780 acres in a fully developed expanded SSSA. Most of this increase comes from the expansion of the area tributary to Pump Station #3. The tributary area for Pump Station #6 is largely fully developed and unlikely to undergo any significant future growth. The increase in tributary area to Pump Station #6 is primarily the area added to the Pump Station #3 tributary area that flows in aggregate through Pump Station #6. This increase in area would subsequently be added to the Old Farm Lift Station.

**Pump Station #7** - The area tributary to Pump Station #7 would increase 247.1 acres to a total of 733.1 acres in the fully developed expanded SSSA. The incremental increase in area tributary to Pump Station #7 is mostly developed and falls within the existing SSSA. The area contains unsewered areas of single-family residential homes and mobile homes that would become part of the tributary area to Pump Station #7 with a future sewer extension. This increase in area would subsequently be added to the Old Farm Pump Station.

**Main Street Pump Station** - The area tributary to the Main Street Pump Station would increase 2,384.3 acres to a total of 4,180 acres in the fully developed expanded SSSA and Richfield incremental planning area. This pumping station could see a substantial increase in flow from the future development of the Richfield planning area as well as large areas of Commercial and Residential development within the "Gateway" district in the northwestern portions of the expanded SSSA for the Village. This increase in area would subsequently be added to the Old Farm Pump Station.

**Old Farm Pump Station** - The area tributary to the Old Farm Pump Station would increase 3,508.9 acres to a total of 7,410.8 acres in the fully developed expanded SSSA and Richfield incremental planning area. While this pumping station's immediate tributary has a relatively small area with any potential development of single-family residential homes, most of the future flow to the Old Farm Pump Station will come in aggregate from Pump Stations 3, 6, 7, and Main Street.

Wrenwood Pump Station - The area tributary to the Wrenwood Pump Station would increase 275.5 acres to a total of 432.9 acres in the fully developed expanded SSSA. The incremental future land use in the tributary area is planned as predominately single-family residential development. The Wrenwood Pump Station ultimately contributes to gravity flow to the Village's interceptor, and currently does not accept flow from any basins other than its own.

## FLOW ANALYSIS OF UNSEWERED AREA IN EXISTING AND EXPANDED SSSA

### Flow Calculation Methodology

Flows calculated for the expanded Germantown SSSA are a blend of existing developed land uses as well as the additional development potential and associated future land use within the expanded SSSA. The entire expanded SSSA is assumed in a full-developed condition for the theoretical future flow conditions.

Theoretical flows are calculated for each analysis basin separately using the applicable occupancy and flow factors for each existing and future land use type and population within each basin. A spreadsheet method is utilized to calculate an average daily base flow, which is the total of flows within each land use category multiplied by their respective flow factor per acre or calculated population multiplied by gallons per capita. The average daily base flow is then multiplied by an applicable peaking factor to account for inflow and infiltration and calculate the peak hourly flow. Capacity analyses of sewers and pumping stations are made utilizing this peak hourly flow.

At the direction of Village Staff, a single point user was added into the calculated flow for the Gateway South Basin. This manufacturing operation consumes approximately 28 million gallons of water per year, so the associated sanitary wastewater flows equating to 53 GPM have been incorporated into the total calculated average base flow for the Gateway South Basin. At the time of this Facilities Plan, the Village does not have any other substantial single point users to be incorporated into the flow calculations.

Peaking factors for basins with mostly existing development have been determined using known flow data measured at each pump station and the MMSD metering station. The factors are calculated based on the largest increase in measured flow noted during multiple heavy rain events. Where no existing flow data is available, factors for basins which are mainly undeveloped were assigned a value of 2.50 based on the Wisconsin Administrative Code (range of 2.0-2.5) for municipalities with a population of 10,000 to 100,000.

Some exceptions to these determinations are the peaking factors for the Pump Station 3 Basin and the Wrenwood Basin. These basins currently have a very low dry weather flow, and therefore even a small amount of inflow and infiltration can cause an unusually high peaking factor. The Pump Station 3 basin in this case has a peaking factor of 6.38 determined by the R/M Lift Station Study. The Wrenwood Pump Station has a calculated peaking factor of 5.68 from recent flow metering data from the Village's SCADA system. Because both basins have the potential to develop to a size more than double the existing condition, some attenuation in the peaking factor can be expected. To provide a realistic estimate of future flow, a peaking factor of 3.50 was chosen for these basins.

Using the parameters as described to calculate generated theoretical future flows, Table 6 summarizes average flow, peaking factors, and theoretical peak-hour flow rate for each respective basin.

*Table 6 Summary of Future Sanitary Sewer Flows by Analysis Basin*

Basin Name	Total Basin Area (Ac)	Net Flow Generation Area (Ac)	Applied Peaking Factor	Theoretical Peak-Hour Flow Rate Fully Developed (GPM)	Theoretical Peak-Hour Flow Rate - SSSA Fully Developed (CFS)
Country Aire	76.2	31.1	2.50	28	0.06
Gateway Central	379.2	254.5	2.50	449	1.00
Gateway East	395.7	267.7	2.50	333	0.74
Gateway North	247.2	169.3	2.50	326	0.73
Gateway South	619.6	361.8	2.50	907	2.02
Interceptor Gravity 1	434.0	340.4	4.80	625	1.39
Interceptor Gravity 2	1,109.3	781.6	4.80	1,702	3.79
Interceptor Gravity 3	901.0	528.4	4.80	1,572	3.50
Interceptor Gravity 4	237.8	160.5	4.80	273	0.61
Isabelle Farms	67.7	45.4	2.50	40	0.09
Landfill	361.5	279.9	4.80	933	2.08
Main Street Central	988.5	582.2	2.80	1,083	2.41
Main Street East	1,201.7	781.5	2.80	1,266	2.82
Main Street West	280.4	151.5	2.80	250	0.56
Old Farm North	658.5	327.8	3.32	659	1.47
Old Farm South	1,059.3	646.9	3.32	834	1.86
Pump Station 3	593.8	354.3	3.50	1,086	2.42
Pump Station 6	186.2	90.6	3.75	302	0.67
Pump Station 7	733.1	515.8	3.52	1,090	2.43
Wrenwood	432.9	224.7	3.50	280	0.62
Total	10,963.5	6895.8		14,036	31.27

The theoretical peak-hour flow rate for the fully-developed future expanded Village of Germantown SSSA is 31.27 cubic feet per second (CFS). This equates to 20.21 MGD, which is below the MMSD's allowable peak hour flow rate of 22.27 MGD at the Village of Germantown's connection point to the MIS.

**VILLAGE OF RICHFIELD INCREMENTAL PLANNING AREA**

The area within the Village of Richfield that will be served by the Village of Germantown sanitary sewer system, the Richfield IPA, requires a more detailed analysis of the characteristics of the planning area. This area of Richfield has not been part of any other sanitary sewer planning area, whereas the entire Village of Germantown is within an existing planning area that has been previously analyzed by SEWRPC in the 1983 Planning Report.

The Richfield IPA is best described as all of Section 12 of Township 9 North, Range 19 East within the Village of Richfield, also including one individual parcel of land at the Northeast corner of Section 13 Township 9 North Range 19 East, also known as Tax Parcel #035000C. The individual parcel has been included within the IPA due to it being a probable location for sanitary sewer to enter the Village of Richfield. The pending amendment to the Germantown SSSA does not include the entire IPA at this point in time, however the entire IPA is being included in calculations and analysis in this Facilities Plan for simplicity of future expansion within the IPA in Richfield.

### Topography

The area of Richfield encompassed by the IPA has a variety of terrain and changing topographical features. In general, the land is rolling and hilly with slopes ranging from 2% to 20%. From Washington County's Geographical Information System (GIS) topographical data based on the NAVD 88 Datum, the lowest point within the IPA is at the very Northeast corner with an elevation of +/- 862.0. The highest elevation found within the IPA is +/- 1,018.0 located in the Southwest portion of the IPA near the eastern extent of Evergreen Court. The topography slopes from higher elevations in the west and south towards lower elevations in the east and north. There are multiple intermittent low and high glacial features of kettles and hills that may provide challenges when providing sewer service to the entire IPA. The topographical map included in Appendix G gives an overall view of the IPA in 5' contours.

### Soil Types

Soil types within the Richfield IPA are predominately within the Ozaukee, Hochheim, Lamartine, Mayville, Theresa, Ashkum, and Brookston series. These soils series generally classify as Silt Loam, Loam, and Silty Clay Loam which range widely from well-drained to poorly drained. With exception to drainageways and lowlands, most of the IPA is defined as well-drained or moderately well-drained. Seasonal perched water tables are consistently noted in the soils throughout the IPA. Soils of this nature are typically not conducive to in-ground (conventional) Private Onsite Wastewater Treatment Systems (POWTS), and typically would require construction of a Mound type POWTS or Holding Tank if adequate area is not available for a Mound type POWTS. Extension of sewer service in areas with such soil conditions provides greater opportunity for larger scale development. A complete map of the soil types in the Richfield IPA is included in Appendix H.

### Wetlands & Flooding Areas

Wetlands and floodways also play an important role in planning for sewer service in any area. The map included in Appendix I shows WDNR delineated wetlands within the Richfield IPA, as well floodways where a flood elevation has been determined by the WDNR. The IPA has few waterways and surface water. The rolling, hilly topography is fairly protected from flooding. At the far Northeast corner of the IPA, there is a drainageway that lies on the west side of Hwy 41. This drainageway is the only area noted as a floodway within the entire IPA. There are multiple scattered, relatively small areas of wetlands delineated in lowland areas and drainageways. These areas must be further investigated and considered during development and planning for sanitary sewer service.

### Transportation Corridors

One of the characteristics that makes the Richfield IPA desirable for large-scale development is its proximity to transportation corridors. The IPA is bordered on the east by US HWY 41, and on the south by STH 167. The intersection of US HWY 41 and STH 167 at the southeast corner of the IPA is an interchange providing easy access to both highways to and from the IPA. Other transportation corridors of note include STH 175 which generally bisects the IPA on an angle from southeast to northwest, and a railroad ROW owned by the State of Wisconsin running nearly in parallel with STH 175.

### Preliminary Environmental Screening

A preliminary environmental screening was conducted for the Richfield IPA. During the preliminary environmental screening, the following environmentally sensitive resources and assumptions were assessed:

- Presence of wetland and waterway features,
- Presence of 303d impaired waterways,
- Presence of areas of special natural resource interest,
- Documented wetland and waterway disturbance permits,

- Presence of Federal Emergency Management Agency (FEMA) floodplains, floodways, and flood fringe,
- Presence of WDNR Bureau of Remediation and Reclamation (BRR) Sites,
- Presence of Solid and Hazardous Waste Information System (SHWIMS) Sites,
- Presence of Shoreland Zoning,
- Presence of Planned or Existing County Trails,
- Presence of National Register of Historic Places,
- Presence of United States Department of Agriculture Drainage Districts, and
- Potential presence of Threatened and Endangered Species.

For wetlands and waterways, the WDNR Surface Water Data Viewer (SWDV) was accessed. Throughout the planning area, there are multiple wetland and waterway complexes. Wisconsin Wetland Inventory (WWI) listed wetlands include Emergent/wet meadow, Flats/unvegetated wet soil, Forested, and open water. The WWI also lists five unnamed waterways, three first order, and two second order waterways and three waterbodies. No features within the study area were identified as 303d impaired or are designated as an area of special natural resource interest.

The presence of FEMA designated floodplains, floodways and flood fringe were assessed for the study area. A study was conducted for the waterway in the northeast corner of the study area. The FEMA panels included in the study area are 55131C0264E effective 2/25/2022 and 55131C0268E effective 2/25/2022. Within panel 55131C0268E there are areas designated as Zone A and Zone AE.

The presence of shoreland zones were assessed for the study area. No known shoreland zones are provided by the Washington County GIS viewer. The Village of Germantown Code of Ordinance No. 24.04, defines the shoreland-wetland zoning district as all wetlands in the Village which are equal to or greater than 5 acres within 1,000 feet of the ordinary high-water mark (OHWM) of navigable lakes, ponds or flowages and within 300 feet of the OHWM of navigable rivers or streams, or the landward side of the floodplain, whichever distance is greater.

Using the National Register of Historic Places GIS viewer, the study area was assessed. There are no registered sites within the study area.

Using the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) Drainage Districts Interactive Map tool, the study area was assessed for presence of drainage districts. There are no drainage districts within the study area.

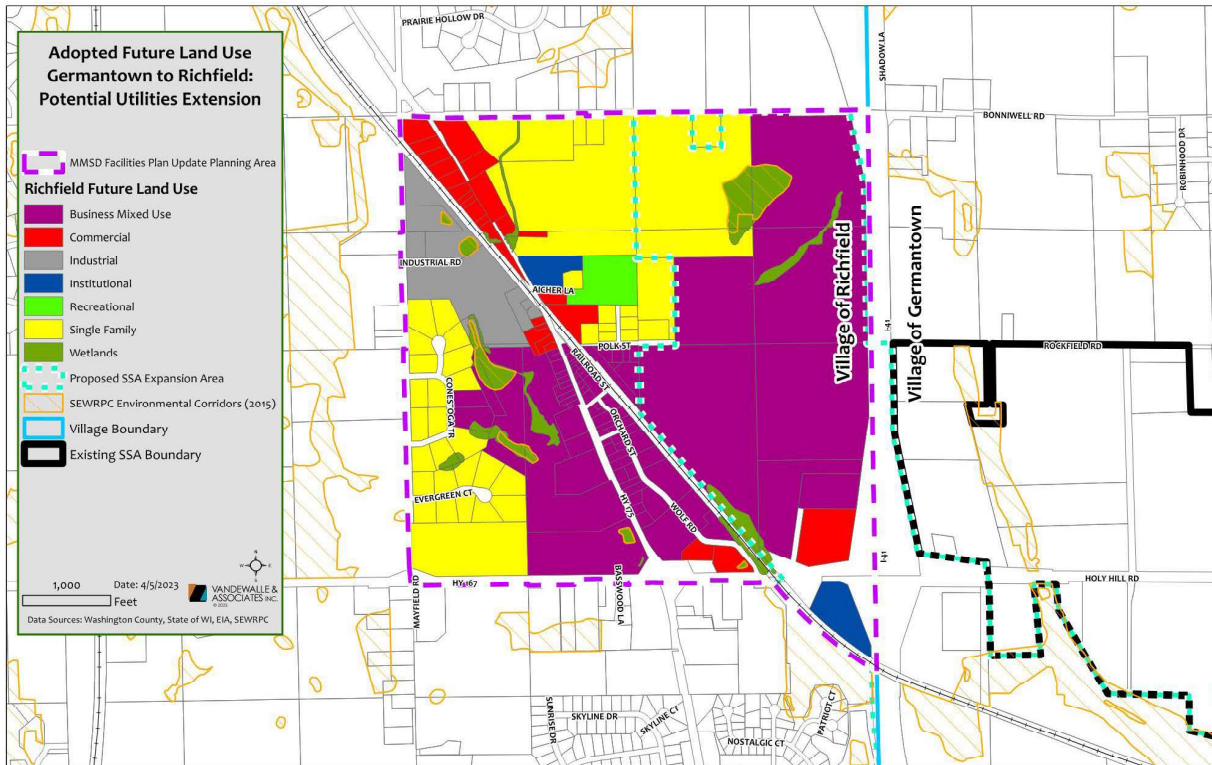
Using the Wisconsin Department Natural Resources Natural Heritage Inventory (NHI) Portal, the study area was assessed. Based on the assessment state endangered fish may be present within the study area. A preliminary Information for Planning and Consultation (IPaC) assessment was performed to identify potential habitat that may support federally threatened or endangered species. The IPaC results included the federally endangered northern long-eared bat, the proposed endangered tricolored bat, and the candidate endangered monarch butterfly. Further investigations will be needed to assess likelihood of presence, and potential impacts.

The complete Preliminary Environmental Screening report including referenced tables and listings can be found in Appendix J.

### [Land Use Analysis](#)

Similar to the future land use analysis for the Village of Germantown SSSA, the Village of Richfield IPA was also analyzed for future land use in a fully developed condition. In the case of the Richfield IPA, a future land use plan was available from SEWRPC, based on Richfield's 2033 Comprehensive Plan. The future land use for the Richfield IPA is shown in Figure 8 and included in Appendix K.

Figure 8 Richfield Incremental Planning Area Future Land Use Map



Source: Vandewalle & Associates, Inc. via SEWRPC

Table 7 breaks down the categories of assumed future land use conditions in the fully developed Richfield Incremental Planning Area.

Table 7 Richfield Incremental Planning Area Future Land Use by Category

Richfield IPA Fully-Developed Future Land Use (Acres)							
Commercial	Industrial	Institutional	Multifamily	Recreational	Transportation	Single-Family	Wetlands
255.5	26.1	9.1	N/A	8.8	199.6	138.1	28.2
<b>Total Expanded SSSA</b>				<b>665.4</b>			
<b>Net Flow Generation Area*</b>				<b>428.8</b>			

\*Excludes Recreational, Transportation, and Wetlands land use categories

\*Transportation area assumed at 30% of total land area

Population and Flow Calculation

For single-family residential land use, an average density factor of 1.0 dwelling unit / 3.0 acres is appropriate based on the desired density indicated by the Village of Richfield. Using the same occupancy factor of 2.50 as used in the Germantown calculations, we arrive at a population of 114. Likewise, the same flow factors are used for each non-residential land category as described for the flow calculations related to the Germantown Expanded SSSA.

For analysis purposes, the Richfield IPA is treated as its own basin to be incrementally added to the basins previously described for the Village of Germantown. As a stand-alone basin, the calculated flow from the Village of Richfield IPA is shown in Table 8 below:

*Table 8 Richfield Incremental Planning Basin Flow Summary*

Basin Name	Total Basin Area (Ac)	Net Flow Generation Area (Ac)	Applied Peaking Factor	Theoretical Peak-Hour Flow Rate Fully Developed (GPM)	Theoretical Peak-Hour Flow Rate - SSSA Fully Developed (CFS)
Richfield IPA	665.4	428.8	2.50	740	1.65

The theoretical peak-hour flow rate calculated in this report for the fully-developed future expanded Village of Germantown SSSA is 31.27 cubic feet per second (CFS). Adding the calculated peak-hour flow rate for the Richfield IPA, the total peak-hour flow rate at the Village of Germantown’s connection point to the MMSD’s MIS is 32.92 CFS, or 21.28 MGD. This flow rate is just below the MMSD’s allowable peak-hour flow of 22.27 MGD for the Village of Germantown. If development within the Village of Germantown and Richfield IPA is to progress in the manner set forth in this Facilities Plan, further coordination with the MMSD will be critical to preventing a hold on further development due to meeting or exceeding allowable flow allocations from the MMSD.

[Conceptual Sewerage System Serving Richfield IPA](#)

The Village of Richfield has undertaken planning and design of new sewerage facilities required to service the Richfield IPA. As a requirement of the IGA between Richfield and Germantown, the Village of Richfield must fund said planning and design. The design work led by the Village of Richfield is incorporated into this section of the Facilities Plan for efficiency.

Preliminary construction plans provided by Richfield show a feasible design for sanitary sewer extension to serve the Richfield IPA as well as the immediate Germantown SSSA amendment area. The 12-inch gravity sanitary sewer extension connects to the existing Germantown sanitary sewer system at the intersection of Goldendale Road and Freistadt Road, just upstream of Pour Point #2 analyzed within this report. The proposed gravity sewer runs generally west along Freistadt Road and then north and west through existing undeveloped lands until the gravity portion of the extension terminates at the Wisconsin & Southern Railroad ROW. This point will be the discharge point for a 6-inch force main which continues northwest following the Wisconsin & Southern Railroad ROW. The force main crosses underneath U.S. Highway 41 into the Richfield IPA and turns north to follow Richfield Parkway. The 6-inch force main will terminate at the location of a future pumping station within the Village of Richfield which will convey all sanitary sewer flows generated within the Richfield IPA. Figure 9 depicts the preliminary layout of the sanitary sewer extension. The full preliminary plans are included in Appendix L.

Figure 9 Preliminary Route of Sewer and Water Extensions to Serve the Richfield SSSA



Source: Cedar Corporation Preliminary Plans dated September 26<sup>th</sup>, 2023

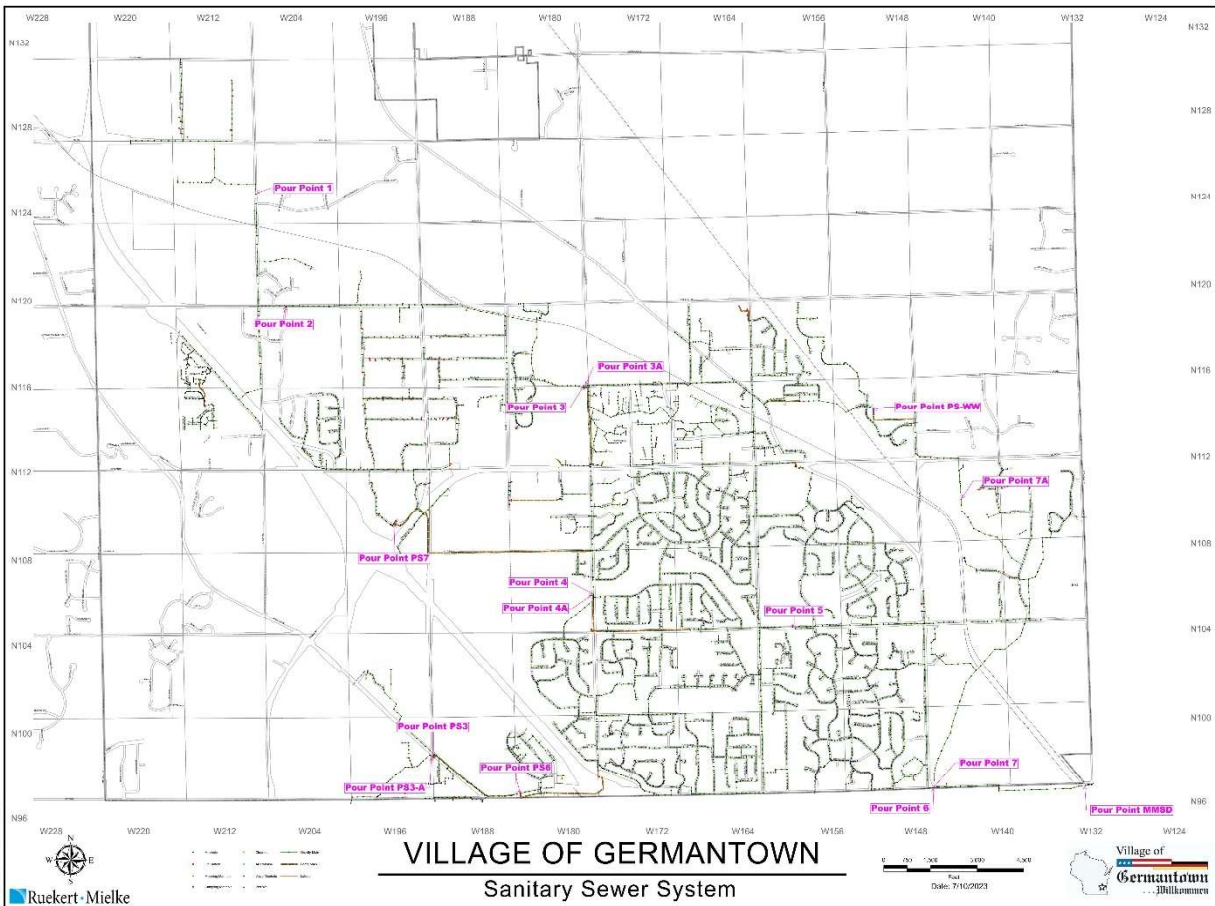
The Richfield IPA will be primarily served by gravity sewers that will flow to a common pumping station, ultimately pumping wastewater via connection to the 6-inch force main installed as part of the Richfield-Germantown Connection project as shown in the included Preliminary Plans. Per the IGA between Germantown and Richfield, the cost of installation of the Germantown Connection sewer and water infrastructure will be paid by the Village of Richfield. The Opinion of Probable Project Cost dated September 27<sup>th</sup>, 2023 is approximately \$5,186,000 in today's dollars for the sanitary sewer portion of the extension to Richfield. The project cost estimate document has been included in Appendix M.

The Richfield-Germantown Connection sanitary sewer extension project will not only allow the Village of Richfield to connect to sanitary sewer service, but also an area of the Village of Germantown that is currently undeveloped. The proposed sewer and water extension infrastructure will have a substantial positive impact on development of the Holy Hill Gateway Corridor for both Villages by facilitating development that would otherwise not be possible without sanitary sewer service available.

OVERALL FLOW AND CAPACITY ANALYSIS

With the expanded SSSA broken into the defined basins, tributary areas to each pump station as well as specific points within the sanitary sewer system can be analyzed with respect to current and future theoretical flows. Existing flow data was collected through the Village’s SCADA system at each pumping station as well as the metering station just upstream of the connection point to the MMSD. These points were used as analysis or “pour” points for theoretical future flow calculations, as well as other strategic points within the Village’s gravity sanitary sewer system. The pour points were chosen based on configuration of sewers, location of pumping stations, and contributory basin delineations. Typically, these points consist of an existing manhole or an existing pumping station. At pumping stations that receive flow from more than one nearby contributory sewer, multiple pour points are utilized to accurately calculate capacity in each contributory sewer. Figure 10 shows a map of the Village’s sanitary sewer system with the pour points identified for use in analysis and comparison throughout the system. The map has also been included in Appendix N.

Figure 10 Sanitary Sewer System Map with Flow Analysis Points



In prior steps, theoretical flows were calculated for each analysis basin independently. The individual theoretical flow from each basin can be added to calculate a combined theoretical flow for each “pour” point identified in Figure 10. The calculated theoretical future flow at each pour point can then be compared to sewer and lift station capacities to identify the need for upgrades or improvements to handle development growth within the planning period.

Gravity Sewers

Analysis of the existing capacity of the gravity sanitary sewer system is critical to determine future needs for upsizing of sewers, relief sewers, or other capacity improvements required to serve future planned development. With the Village of Germantown having a single connection discharge point to the MMSD, the analysis is equally important to determine the adequacy of the MMSD’s sanitary sewer infrastructure to handle future predicted peak flows originating from Germantown.

At each pour point, a sanitary sewer pipe capacity assessment is made using data derived from the Village of Germantown’s GIS as well as as-built information from available construction plans. The capacity is calculated at a point just upstream of the pour point. The following criteria have been assumed for existing sewer capacity calculations:

- “Full” capacity assumes pipe flow of 2/3 full.
- Mannings “N” Value: Concrete Pipe – 0.013, PVC Pipe – 0.011, CIPP Liner - 0.011.
- Length and diameter – From Village GIS.
- Invert Elevations – From GIS or available as-built plans, unknown inverts were assumed to have like slope of adjacent comparable sewers.
- Slope – From actual or assumed inverts.

Capacity is then calculated using the Manning Equation, and the average is taken for 2 or 3 pipe segments upstream of the pour point dependent upon the configuration of the sewers upstream of the pour point. Engineering judgement is used to eliminate anomalies in averaging and take a conservative approach. Any pipe segment having a considerably higher capacity in comparison to an adjacent segment was eliminated from the average. Table 9 below summarizes the existing sewer capacity available and analyzes future capacity using the theoretical flow for the fully developed expanded Germantown SSSA and Richfield IPA.

*Table 9 Gravity Sanitary Sewer Hydraulic Capacity Analysis*

Pour Point	Theoretical Peak-Hour Flow Rate - Germantown Expanded SSSA (cfs)	Estimated Capacity - Avg. of Applicable Spans (cfs) (2/3 full)	Theoretical Peak-Hour Flow Rate from Richfield Planning Area (cfs)	Theoretical Peak-Hour Flow Rate Including Richfield Planning Area (cfs)	Estimated Remaining Capacity (cfs)	% Remaining Capacity (to 2/3 full)
PS-3	0.80	4.45		0.80	3.65	82.0%
PS-3A	1.62	7.64		1.62	6.02	78.8%
PS-6	3.09	9.23		3.09	6.14	66.5%
PS-7	2.43	5.31		2.43	2.88	54.3%
PS-WW	0.62	2.52		0.62	1.90	75.3%
1	2.56	3.77		2.56	1.21	32.1%
2	5.14	8.33	1.65	6.79	1.54	18.5%
3	7.55	24.75	1.65	9.20	15.55	62.8%
3A	2.82	3.79		2.82	0.97	25.5%
4	14.26	27.62	1.65	15.91	11.70	42.4%
4A	4.95	44.61		4.95	39.66	88.9%
5	20.61	45.15	1.65	22.25	22.90	50.7%
6	24.40	65.49	1.65	26.05	39.44	60.2%
7	4.80	23.02		4.80	18.23	79.2%
7A	1.29	29.69		1.29	28.39	95.6%
MMSD	31.27	63.37	1.65	32.92	30.44	48.0%

Overall, Germantown’s sanitary sewer system appears to be adequate to serve the future fully developed and expanded Sanitary Sewer Service Area within the 20-year design period of this plan. Typically, maximum sanitary sewer capacity is based on a 2/3 full flow depth. In Table 9, the remaining capacity is shown as a percentage of two-thirds full flow. In the case of Germantown’s sanitary sewer system, none of the existing sanitary sewers are at or above the 2/3 full flow threshold during the theoretical peak-hour flow as calculated based on future land uses and peaking factors in Table 6. Of note, however, are pour points 1, 2, and 3A which are near enough to the threshold to warrant closer future study as development continues in the Village. Any substantial deviations from the land uses, densities, or SSSA used for flow and capacity calculations herein could impact sewers at these locations and render their capacity inadequate.

Pumping Stations

Like the sanitary sewer pipe capacity analysis, an analysis of the existing pumping stations is equally critical to determine the need for future capacity upgrades. Using the theoretical flows calculated for each Basin in Table 6, we can aggregate the flow from each basin that is tributary to a particular pumping station. Table 10 calculates the total flow to each lift station by summing the individual basin flows tributary to the respective lift station. This method allows a clear picture of which basins flow to any individual lift station, including wastewater that is conveyed by more than one pumping station.

*Table 10 Pumping Station Aggregate Peak Hour Theoretical Future Flow (GPM)*

Analysis Basin Name	Pumping Station (Flow in GPM)					
	PS-3	PS-6	PS-7	PS-WW	Main St	Old Farm
Gateway Central					449	449
Gateway East					333	333
Gateway North					326	326
Gateway South					907	907
Isabelle Farms					40	40
Main Street Central					1,083	1,083
Main Street East					1,266	1,266
Main Street West					250	250
Old Farm North						659
Old Farm South						834
Pump Station 3	1,086	1,086				1,086
Pump Station 6		302				302
Pump Station 7			1,090			1,090
Wrenwood				280		
Total Aggregate	1,086	1,388	1,090	280	4,654	8,624

The analysis basins that do not contribute flow to any existing pumping station have been omitted from Table 10. Flow from the Richfield IPA is also omitted in this calculation and will be added incrementally to the further capacity analysis. The summation for “Total Aggregate” is the theoretical peak-hour flow at each pumping station. This peak-hour flow is used in Table 12 as the basis for pumping station capacity analysis. Table 11 adds the Richfield IPA theoretical flow incrementally and then compares future theoretical flow to the existing pumping station capacities.

*Table 11 Sanitary Sewer Pumping Station Capacity Analysis*

Existing Pump Station	Theoretical Peak-Hour Flow Rate into Pump Station - Germantown Expanded SSSA (GPM)	Existing Maximum Capacity of Pump Station (GPM)	Theoretical Peak-Hour Flow Rate from Richfield Planning Area (GPM)	Theoretical Peak-Hour Flow Rate Including Richfield Planning Area (GPM)	Estimated Remaining Capacity (GPM)	% Capacity Utilized
PS-3	1,086	310		1,086	-776	350.3%
PS-6	1,388	950		1,388	-438	146.1%
PS-7	1,090	1,300		1,090	210	83.8%
Wrenwood	280	410		280	130	68.2%
Main Street	4,654	6,250	740	5,394	856	86.3%
Old Farm	8,624	7,400	740	9,364	-1,964	126.5%

At the 20-year design period, assuming a fully developed condition in the existing and expanded SSSA including the Richfield IPA, the Village’s pumping stations will very likely need major upgrades to provide adequate capacity for the predicted development. The typical threshold for action is at 80% of existing capacity utilized for a pump station. At the 80% threshold, a plan should be put in motion for upgrades to existing pump stations, new pump stations, or relief sewers to increase pump station capacities or reduce the amount of flow into the pump station.

In the Village of Germantown, the theoretical peak-hour flow for the future fully developed condition predicts all but one of the existing pump stations to exceed the 80% threshold. PS-3, PS-6, and Old Farm pump stations far exceed 100% of their existing capacity, indicating that the Village needs a plan in place for major upgrades or additions to the pumping station infrastructure to accommodate future development. These upgrades and additions are detailed in the alternatives analysis portion of this report.

**ALTERNATIVES ANALYSIS**

After analyzing the sanitary system flow and capacity in both gravity sanitary sewers and pump stations, a high-level analysis can be conducted for various options to improve capacity in areas of need to accommodate future development within the expanded SSSA and Richfield IPA.

**Existing Gravity Sanitary Sewer System**

Overall, the Village of Germantown’s existing gravity sanitary system has adequate capacity to support future development as theorized in this Facilities Plan. Significant variations from the assumed future land use, population, and SSSA used for calculations in this study may require more in-depth analysis to determine impacts to the capacity needs of the sanitary sewer system. In addition, any new single point users consuming significant capacity will need to be accounted for in addition to the results shown in this Facilities Plan. Because the existing gravity sanitary sewers can adequately support future growth in the Village of Germantown, no analysis of alternatives for relay or relief sewers has been completed within this study.

**Existing Pump Stations**

As mentioned in the flow and capacity analysis section of this report, there appears to be a substantial future weak point in the Village’s existing pump stations with respect to future capacity needs. Having a plan in place to reconstruct or upgrade these pump stations is critical to keeping the overall sanitary sewer system on pace with the anticipated future development in the Village and in Richfield. Alternatives presented in this Facilities Plan have been analyzed for feasibility and favorability factors at a high level.

As the Village continues to pursue these alternatives, more in-depth design and study will be needed to thoroughly detail and choose the most favorable alternatives.

Future capacity need for each pump station is sized based on setting the 80% threshold at the theoretical peak hour flow. This provides a 20% buffer of utilized capacity versus maximum capacity.

Pump Stations #3 & #6 – Alternative A (PS 3) – Upgrade of PS #3 from an existing capacity of 310 GPM to a future capacity need of 1,086 GPM would require two new 1,086 GPM pumps, new station discharge piping, new valves, a new standby generator and new controls with pump motor variable frequency drives (VFDs), and replacement of the existing 6” force main with approximately 3,200 LF of new 10” force main. It is assumed that a new building would be required for the generator, controls, and valves. It is assumed the existing wet well could accommodate the proposed upgrades with the incorporation of pump motor VFDs.

Alternative A (PS 6) – Upgrade of PS #6 from an existing capacity of 950 GPM to a future capacity need of 1,388 GPM would need to be done in tandem with upgrades to PS #3, as PS #6 is immediately downstream of the discharge point for PS #3. The existing 10” force main for PS #6 can accommodate a maximum capacity of 1,500 GPM. Upgrades to PS #6 would require two new 1,388 GPM submersible pumps, new station discharge piping, new valves, a new standby generator, and new controls with pump motor variable frequency drives. The station is a dry well/wet well station with the dry well consisting of a buried steel chamber housing the suction and discharge piping, valves, fittings, pumps, electrical components, and controls. The chamber is crowded and there is not space for larger piping, valves, and pumps. It is assumed that the station would be converted to a submersible style. It is assumed the existing wet well could accommodate the proposed upgrades with the incorporation of pump motor VFDs. A new building would be required for the generator, controls, and valves.

PS #6 is located on a relatively small parcel of land near the Menomonee River, so expansion of the station with the upgrades described may not be a viable alternative.

Alternative B (PS 3/6) – A more favorable alternative to the Village may be consolidation of PS #3 and #6 into one single pumping station. The proximity to one another creates an ideal opportunity to consolidate the two stations into one. In this alternative, land acquisition would likely be necessary to construct a new pumping station to replace existing PS #6. The Village has discussed utilizing the vacant commercial property just to the west of PS #6 for this purpose. A new pumping station of approximately 1,500 GPM capacity with submersible pumps, backup generator and control building, and valve building would be constructed in the vicinity of the existing PS #6. The existing 10” force main could be extended to the new pump station location and reused.

Elimination of PS #3 would then be possible by installation of approximately 3,400 LF of 18” sanitary sewer from the new pump station location along the path of existing 8” sanitary sewer west on County Line Road and then northwest along Appleton Avenue to connect to an existing 18” sanitary sewer that flows into PS #3. The new sewer installation would range in depth from 15-feet to 25-feet.

While the complexity and expense of this alternative may be greater than other alternatives for PS #3 and PS #6, there is considerable value in eliminating ongoing maintenance and operating costs with consolidation of the two pumping stations to one new reliable station.

Pump Station #7 – Alternative A (PS 7) – At the future theoretical peak-hour flow of 1,090 GPM, PS #7 will still be under its maximum capacity of 1,300 GPM. The predicted future utilized capacity is just over the 80% threshold at 83.8%. As development of the tributary basin for PS #7 happens, detailed data should be collected and monitored to see if peak-hour flow rates begin to approach the 80% threshold. As land uses, developments, and consumers may change from the predicted conditions, the peak-hour flow may or may not ever reach a threshold critical for upgrades. If PS #7 needed to be upgraded, it is feasible to expand the capacity to 1,750 GPM using the existing 12” force main and upgrading the three existing submersible pumps to 875 GPM each. A detailed analysis would have to be done to determine if the

existing 125kW standby generator would have to be replaced. For the purpose of this study, it is assumed the generator would not have to be replaced.

A secondary alternative for PS #7 has not been analyzed as this alternative is very likely to be the preferred alternative in this scenario.

Main Street Pumping Station – The Main Street Pumping Station is a major part of the sanitary sewer infrastructure in the Village. This pumping station is expected to convey approximately 40% of the Village's peak-hour flow in the future fully developed land use condition. At the future theoretical peak-hour flow of 5,394 GPM, the Main Street PS will still be under its existing maximum capacity of 6,250 GPM. It should be noted that the existing maximum capacity of 6,250 GPM creates a velocity greater than 6 feet per second in the existing 16-inch force main. Velocities greater than 6 feet per second can cause undesirable pressure transients in the force main and ultimately lead to catastrophic failure. A detailed pressure transient analysis is recommended for any peak flow at the Main Street PS more than 4,100 GPM.

The predicted future utilized capacity is over the 80% threshold, however, at 86.3%. This utilized capacity is based on the maximum capacity of 6,250 GPM. If the velocity limitation is used as the governing factor, the Main Street PS is 31.5% over the 4,100 GPM capacity determined in the prior R/M Lift Station Study report. This is cause for concern as a large portion of the tributary area to the Main Street PS is yet to be developed, so any deviations to the predicted land use, developments, and consumers could easily have an adverse impact on available capacity.

Alternative A(MS) – To increase the available capacity at the Main Street PS, velocities in the existing 16-inch force main would need to exceed the recommended 6 feet per second threshold. Installation of a new larger force main or a parallel force main would be needed to reduce total dynamic head (TDH) and maintain acceptable velocities in the force main.

To increase the capacity to meet future demand, approximately 2,650 LF of new parallel 14-inch force main could be installed along the path of the existing 16-inch force main. The reduction in TDH would provide adequate capacity for peak-flow events. The parallel force main would also provide redundancy in the event of maintenance or repairs on one of the two parallel lines. If this alternative were chosen, it would also be recommended to assess the structural condition of the existing 16-inch force main due to its age of approximately 37 years.

In conjunction with the installation of the new parallel force main, the existing force main could be rehabilitated with Cured-In-Place Pipe to extend its lifespan without the cost of full replacement. This alternative would likely be feasible without major upgrades to the wet well, pumps, generator, and controls unless otherwise desired by the Village. There would be miscellaneous upgrades to the station required to update the HVAC, plumbing, and to replace the bridge crane.

Alternative B(MS) – For comparative purposes, the Village could potentially replace the Main Street PS with a new PS with a capacity of approximately 5,400 GPM. While this would bear greater cost and complexity, it is a viable alternative given the availability of open space in the vicinity of the existing Main Street PS. A new pumping station would still require a new, larger force main, or similar parallel arrangement as described in Alternative A.

Old Farm Pumping Station – The Old Farm Pumping Station is the largest pumping station within the Village's sanitary sewer system. This pumping station is expected to convey approximately 67% of the Village's peak-hour flow in the future fully developed land use condition. The future theoretical peak-hour flow of 9,364 GPM will exceed Old Farm's maximum capacity of 7,400 GPM by 26.5%. It should be noted that the existing maximum capacity of 7,400 GPM creates a velocity greater than 6 feet per second in the existing 20-inch force main. Velocities greater than 6 feet per second can cause undesirable pressure transients in the force main and ultimately lead to catastrophic failure. A detailed pressure transient analysis is recommended for any peak flow at the Old Farm PS more than 6,300 GPM.

Alternative A (OF) – To increase the available capacity at the Old Farm PS, velocities in the existing 20-inch force main would need to exceed the recommended 6 feet per second threshold. Installation of a new larger force main or a parallel force main would be needed to reduce total dynamic head (TDH) and maintain acceptable velocities in both force mains while increasing the capacity to meet demand.

Approximately 4,400 LF of new parallel 16-inch force main could be installed along the path of the existing 20-inch force main. The parallel force main would also provide redundancy in the event of maintenance or repairs on one of the two parallel lines. If this alternative were chosen, it would also be recommended to assess the structural condition of the existing 20-inch force main due to its age of approximately 37 years. In conjunction with the installation of the new parallel force main, the existing force main could be rehabilitated with Cured-In-Place Pipe to extend its lifespan without the cost of full replacement.

In addition to a parallel force main, this alternative may require upgrades to the pumping station itself including three larger pumps and motors, larger suction piping, and a larger generator. Other miscellaneous upgrades to the station would be required to upgrade the HVAC, plumbing, and to replace the bridge crane. A detailed investigation would be needed to determine the feasibility of installing these upgrades within the existing building configuration. It is assumed that the existing wet well could be reused with the use of pump motor VFDs. This would have to be confirmed with a detailed analysis.

Alternative B (OF) – For comparative purposes, the Village could potentially replace the Old Farm PS with a new PS with a capacity of approximately 9,400 GPM. This alternative would be the most expensive option by far, but it is a viable alternative given the availability of open space in the vicinity of the existing Old Farm PS. A new pumping station would still require a new, larger force main, or similar parallel arrangement as described in Alternative A.

### Sanitary Sewer System Extensions & Expansion

For unsewered areas within the existing SSSA and areas to be added in the full SSSA amendment, sanitary sewer extensions will be required to offer sanitary sewer service to development within those areas. A preliminary general route and design has been analyzed for each of these areas based on each Analysis Basin used for flow calculation in earlier steps. The analysis determines where any new pumping stations may need to be constructed as well as the general route and feasibility of construction for sewers anticipated to be 12 inches in diameter or greater. Unsewered areas in the existing and expanded SSSA anticipated to be served by sewers less than 12 inches in diameter have not been analyzed for construction feasibility or costs for new sewers within this report. Unsewered or expanded basins anticipated to require a new pumping station to be served in the future have been analyzed at a high level for general placement and size of the pumping station.

Appendices O and P show layouts, locations, and general design of sewer extensions and pump stations in various basins as detailed below:

Country Aire Basin – A new pumping station would likely be needed to expand sanitary sewer service to this undeveloped basin. Topography limits the extension of gravity sewers into this basin, so a pumping station could be installed near the local low point within the basin on Country Aire Drive approximately 1,000 feet south of Freistadt Road. The pumping station would need a maximum capacity of approximately 30 GPM and would discharge through 2,100 LF of 4-inch force main to the south on Country Aire Drive. These proposed improvements are shown in Appendix O. With low predicted flow in this basin, the Village could also explore the option of publicly or privately owned individual grinder pumps and low-pressure sewers for properties developed within the basin.

Wrenwood Basin – This basin is partially developed and served by the Wrenwood PS. The portion of this basin that is currently undeveloped can be served by the existing Wrenwood PS with extended sanitary trunk sewers. Extension of approximately 2,300 LF of 12-inch diameter sanitary sewer, varying in depth from 12 to 29 feet, from the existing Wrenwood PS to the north could serve the future development within this basin. These proposed improvements are shown in Appendix O.

Interceptor Gravity 4 Basin – This basin is mostly developed with the majority being low-density residential homes currently served by septic systems. Extension of approximately 4,000 LF of 12-inch diameter sanitary sewer, varying in depth from 15 to 40 feet, could serve the entire basin and allow for future SSSA expansion to areas north of the basin. A 24-inch interceptor installed in 2019 offers a connection point on Mequon Road which would ultimately flow by gravity to the Village’s 48-inch interceptor sewer. These proposed improvements are shown in Appendix O.

Gateway North Basin – A new pumping station would likely be needed to expand sanitary sewer service into this undeveloped basin. Topography limits the extension of gravity sewers in this area, so a pumping station could be constructed at the far northwest corner of the basin. The pumping station would need a maximum capacity of approximately 350 GPM and would discharge through 1,600 LF of 6-inch force main to the south and east on Rockfield Road. From the discharge point of the 6-inch force main, 1,400 LF of 12-inch gravity sewer would need to be constructed in Rockfield Road to a connection point to the east at Gateway crossing. In addition, approximately 6,500 LF of 12-inch trunk sanitary sewer, varying in depth from 10 to 27 feet, would be installed from the new pumping station to the east along the northern border of the basin to serve the development within. These proposed improvements are shown in Appendix P.

Gateway East Basin – This undeveloped basin can utilize existing sanitary sewers in Goldendale Road to serve future development primarily by gravity. Serving this basin would include construction of approximately 1,300 LF of 15-inch and 8,700 LF of 12” trunk sanitary sewer, varying in depth from 16’ to 30’ starting at the connection point in Goldendale Road and routing two branches to the north and east. It may be possible to reduce the sewer depth in certain areas depending upon the configuration of future developments. These proposed improvements are shown in Appendix P.

Isabelle Farms Basin – This basin has some low-density residential development currently served by septic systems, as well as some undeveloped areas. A new pumping station would likely be needed to expand sanitary sewer service to this basin. Topography limits the extension of gravity sewers into this basin, so a pumping station could be installed near the local low point within the basin on Maple Road approximately 1,200 feet south of Holy Hill Road. The pumping station would need a maximum capacity of approximately 40 GPM and would discharge through 3,000 LF of 4-inch force main to gravity sewers constructed within the Gateway East Basin. These proposed improvements are shown in Appendix O. With low predicted flow in this basin, the Village could also explore the option of publicly or privately owned individual grinder pumps and low-pressure sewers for properties developed within the basin.

### Cost Analysis for Alternatives

After determining viable needed upgrades and extensions to serve future demands, estimated costs associated with the alternatives for improvements to existing Village sanitary sewer infrastructure are summarized in Table 12. Estimated costs for extensions and new infrastructure to support future development are summarized in Table 13. These costs are presented in today’s dollars using the cost estimating methodology described previously within this report. These estimates include a 30% engineering and contingency to account for modest price increases, engineering design, and engineering construction administration. The estimates do not account for land acquisition costs, environmental remediation, or ancillary utility relocations.

Table 12 Cost Estimate for Potential Improvements to Existing Infrastructure

Alternative	Improvement	Unit	Quantity	Unit Price	Cost
<b>Pump Stations #3 and #6</b>					
A (PS 3)	Replacement station with new 1,086 gpm pumps, piping, new generator, valves, electrical and controls.	EA	1	\$900,000	\$900,000
	New 10" Force Main	LF	3,200	\$265	\$848,000
A (PS 6)	Replacement station with new 1,388 gpm pumps, piping, generator, valves, electrical and controls all inside new building.	EA	1	\$1,820,000	\$1,820,000
<b>Alternative A Total</b>					<b>\$3,568,000</b>
B (PS 3/6)	Full Reconstruction of PS #6	LS	1	\$1,950,000	\$1,950,000
	18" Sanitary Sewer to Eliminate PS #3	LF	3,400	\$900	\$3,060,000
<b>Alternative B Total</b>					<b>\$5,010,000</b>
<b>Pump Station #7</b>					
A (PS 7)	875 GPM Submersible Pump Upgrade	EA	3	\$45,000	\$135,000
<b>Alternative A Total</b>					<b>\$135,000</b>
<b>Main Street Pump Station</b>					
A (MS)	Addition of Parallel 14" Force Main	LF	2,650	\$410	\$1,086,500
	CIPP Rehabilitation of 16" Force Main	LF	2,650	\$200	\$530,000
	Miscellaneous Upgrades to MS PS	LS	1	\$500,000	\$500,000
<b>Alternative A Total</b>					<b>\$2,116,500</b>
B (MS)	Full Reconstruction of MS PS	LS	1	\$6,100,000	\$6,100,000
	Addition of Parallel 14" Force Main	LF	2,650	\$420	\$1,113,000
	CIPP Rehabilitation of 16" Force Main	LF	2,650	\$200	\$530,000
<b>Alternative B Total</b>					<b>\$7,743,000</b>
<b>Old Farm Pump Station</b>					
A (MS)	Addition of Parallel 16" Force Main	LF	4,400	\$440	\$1,936,000
	CIPP Rehabilitation of 20" Force Main	LF	4,400	\$250	\$1,100,000
	Pump and Motor Upgrade	EA	3	\$110,000	\$330,000
	Generator Upgrade	LS	1	\$450,000	\$450,000
	Suction Piping Upgrade	LS	1	\$150,000	\$150,000
	Miscellaneous Upgrades to OF PS	LS	1	\$500,000	\$500,000
<b>Alternative A Total</b>					<b>\$4,466,000</b>
B (MS)	Full Reconstruction of OF PS	LS	1	\$8,060,000	\$8,060,000
	Addition of Parallel 16" Force Main	LF	4,400	\$440	\$1,936,000
	CIPP Rehabilitation of 20" Force Main	LF	4,400	\$250	\$1,100,000
<b>Alternative B Total</b>					<b>\$11,096,000</b>

*Table 13 Cost Estimate for Potential New Infrastructure for Future Development*

	Improvement	Unit	Quantity	Unit Price	Cost
<b>Country Aire Basin</b>					
	200 GPM Pumping Station	LS	1	\$750,000	\$750,000
	4" Force Main	LF	2,100	\$120	\$252,000
<b>Country Aire Basin Total</b>					<b>\$1,002,000</b>
<b>Wrenwood Basin</b>					
	12" Sanitary Sewer, 12'-29' depth	LF	2,300	\$650	\$1,495,000
<b>Wrenwood Basin Total</b>					<b>\$1,495,000</b>
<b>Interceptor Gravity 4 Basin</b>					
	12" Sanitary Sewer, 12'-40' depth	LF	4,000	\$800	\$3,200,000
<b>Interceptor Gravity 4 Basin Total</b>					<b>\$3,200,000</b>
<b>Gateway North Basin</b>					
	350 GPM Pumping Station	LS	1	\$925,000	\$925,000
	6" Force Main	LF	1,600	\$150	\$240,000
	12" Sanitary Sewer - Rockfield Road	LF	1,400	\$400	\$560,000
	12" Sanitary Sewer - 10'-27' depth	LF	6,500	\$650	\$4,225,000
<b>Gateway North Basin Total</b>					<b>\$5,950,000</b>
<b>Gateway East Basin</b>					
	15" Sanitary Sewer - 20' depth	LF	1,300	\$700	\$910,000
	12" Sanitary Sewer - 16'-30' depth	LF	8,700	\$650	\$5,655,000
<b>Gateway North Basin Total</b>					<b>\$6,565,000</b>
<b>Isabelle Farms Basin</b>					
	200 GPM Pumping Station	LS	1	\$750,000	\$750,000
	4" Force Main	LF	3,000	\$120	\$360,000
<b>Isabelle Farms Basin Total</b>					<b>\$1,110,000</b>

**SUMMARY OF ALTERNATIVES AND IMPLEMENTATION**

Through the data collection and analysis in this Facilities Plan, the Village of Germantown's future sanitary sewer infrastructure needs have been identified in detail, as well as feasible alternatives to meet these needs. With the addition of the Richfield IPA to Germantown's existing SSSA and subsequent development in those areas, the needs associated with the Germantown/Richfield connection are most critical in the near term.

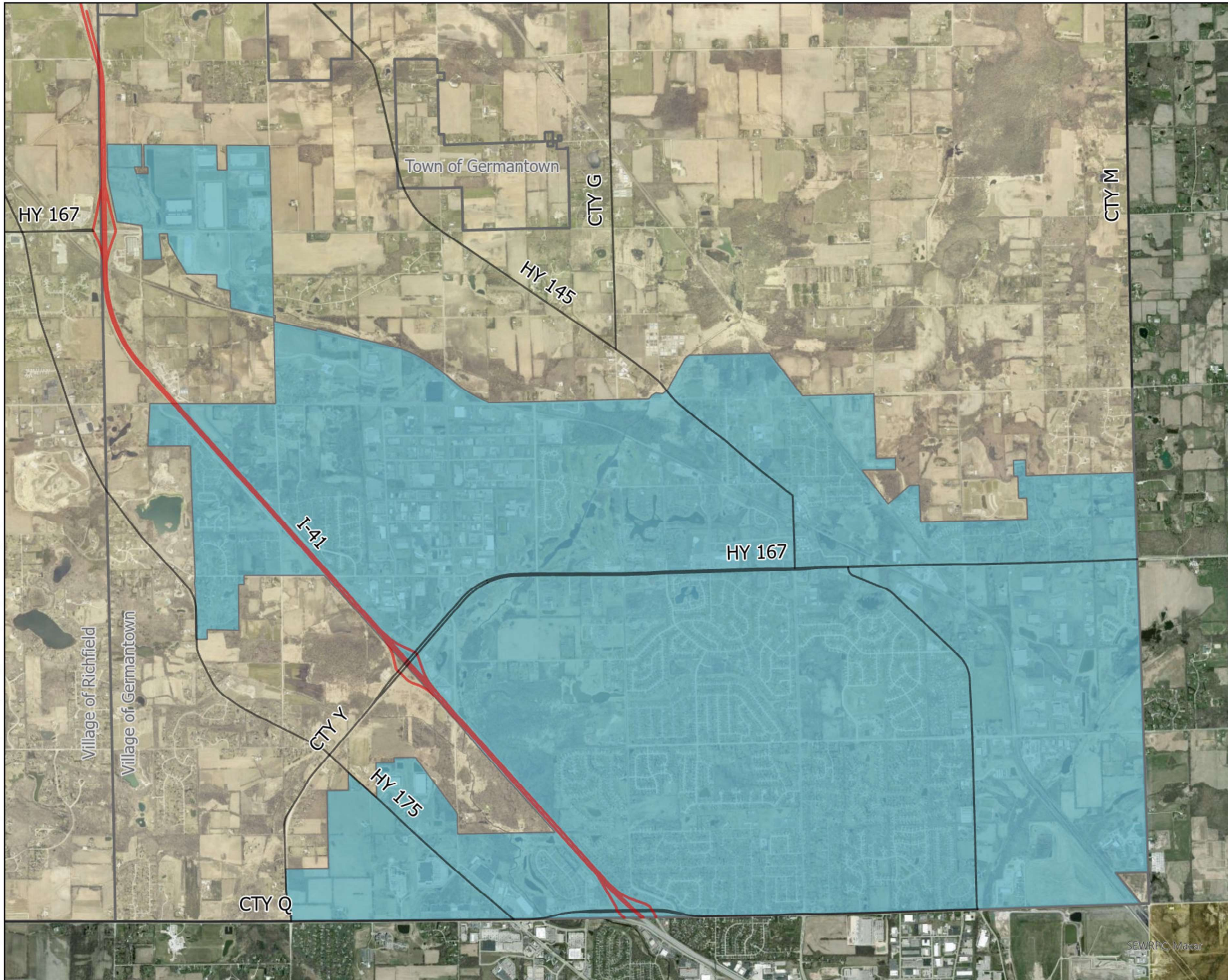
The most critical of these needs appear to be within the Village's two main pump stations, Main Street and Old Farm. With the bulk of near-term development likely within basins tributary to these two pump stations, measures should be taken as soon as possible to investigate the alternatives in detail so that plans for construction of upgrades and new facilities can take place well in advance of capacity issues. As development continues coincident with planning, design, and construction for capacity upgrades, the Main Street and Old Farm pump stations can be ready for increased capacity before reaching a critical point.

Pump stations #3, #6, and #7 are less critical for immediate analysis and planning, as their tributary basins are less likely to see considerable development in the near-term basis. In these basins, the Village can monitor the future potential for development and institute measures for detailed investigation of capacity upgrades as development proceeds.

The needs for new infrastructure in unsewered areas can be further assessed as proposals for development within those basins are brought to the Village. The new infrastructure in the unsewered basins identified in the alternatives analysis is not critical to development in the Village at this time.

The costs associated with construction of new sanitary sewers to connect Richfield are to be paid by Richfield per the IGA between the two municipalities. Costs associated with upgrades or capacity expansion of Germantown's existing sanitary sewer infrastructure will be the responsibility of Germantown. For improvements to existing infrastructure, the Village may be able to take advantage of low-interest Clean Water Fund loans or Bonds typical to municipal infrastructure projects. For new infrastructure, the Village may be able to defray all or a portion of the cost for sewer service extensions to the development entity proposing and construction the new developments in those areas.

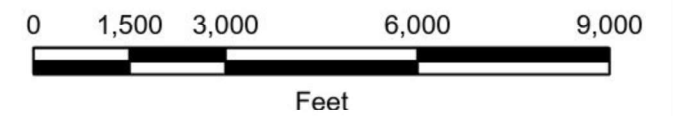
Appendix A – Village of Germantown Existing Sanitary Sewer Service Area Map



Existing Sanitary Sewer Service Area

Village of Germantown, WI

 = Sanitary Sewer Service Area



Appendix B – 2050 Full Sanitary Sewer Service Area Amendment Map

**Friestadt Road**

Appendix C – Village of Richfield Incremental Planning Area Map

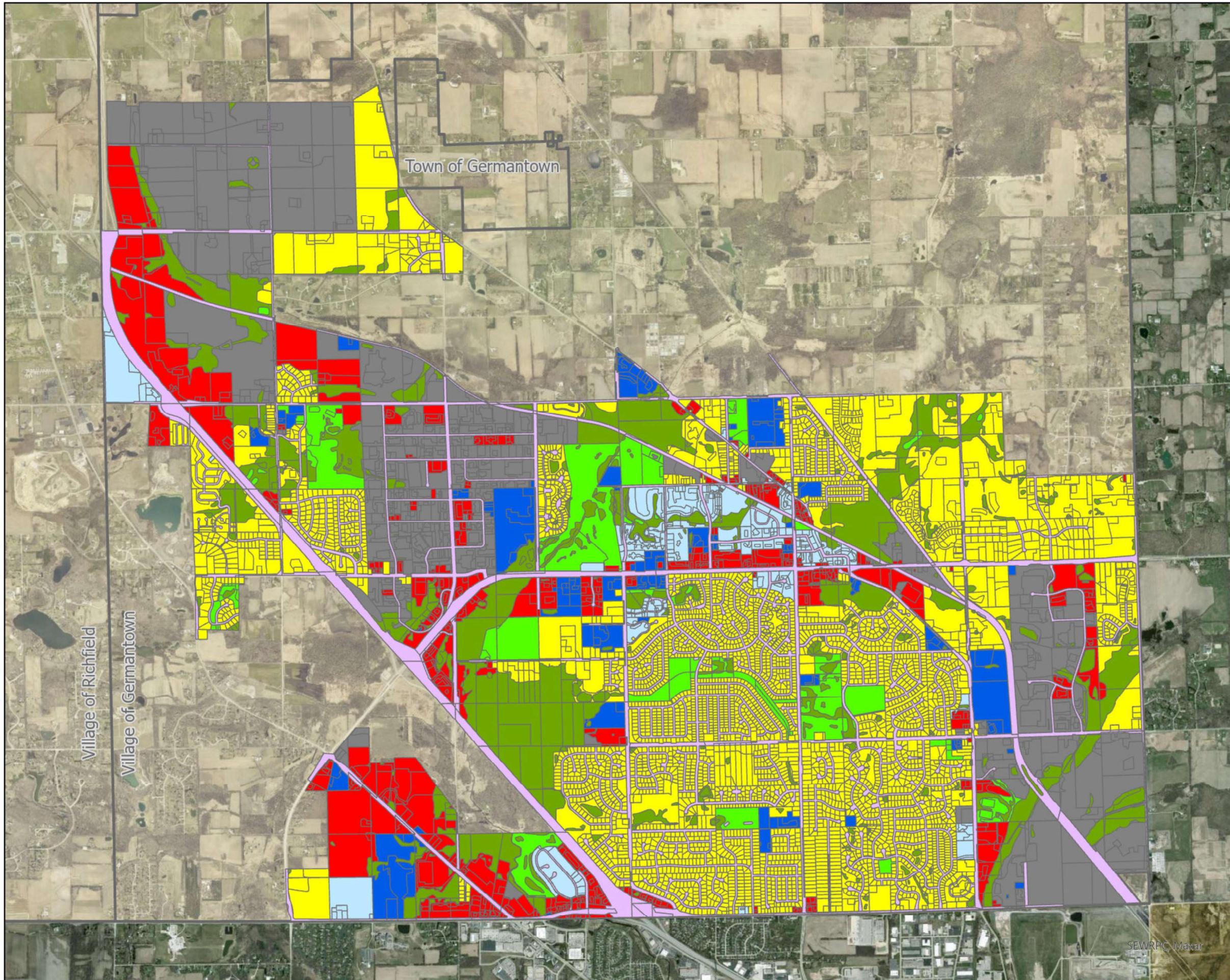
# Friestadt Road



Appendix D – Village of Germantown Sanitary Sewer System Map



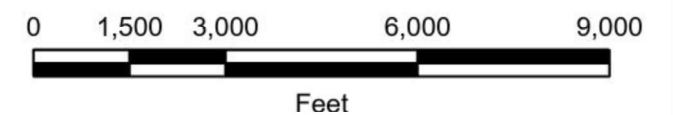
Appendix E – Village of Germantown Future Land Use Map



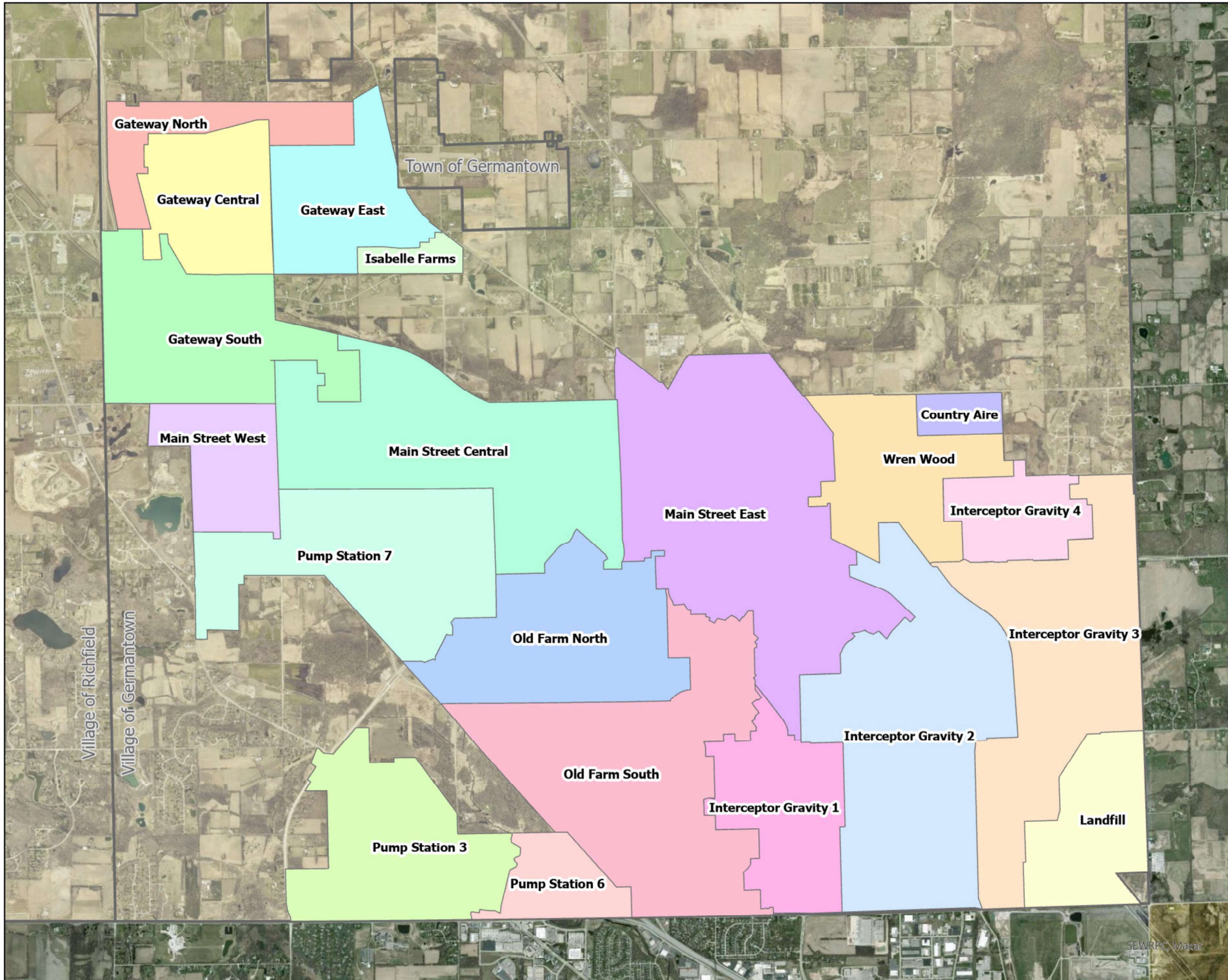
### Future Land Use

### Village of Germantown, WI

- Single Family
- Multi Family
- Commercial
- Institutional
- Industrial
- Recreational
- Wetlands
- Right-of-Way

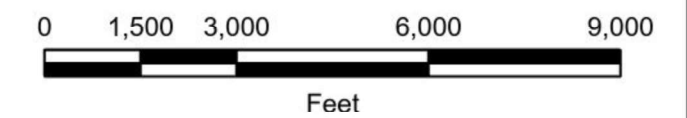


Appendix F – Sanitary Sewer Analysis Basin Map



### Pump Station Basins

Village of  
Germantown, WI



Appendix G – Richfield Incremental Planning Area Topographical Map



AICHER LA

WOODSIDE LA

POLK ST

RAILROAD ST

DEPOT ST

ELM ST

ORCHARD ST

HY 175

WOLF RD

Appendix H – Richfield Incremental Planning Area Soils Type Map



McB

HmC2

DcB

AICHER LA

OdD2

WOODSIDE LA

POLK ST

RaA

HY 115

ThB2

RAILROAD ST

DEPOT ST

HmB2

HmD2

LmA

ORCHARD ST

SvD2

ELM ST

ThB2

RICHFIELD SERVICE DR

McB

Ph

HmC2

McB

ThC2

WOLF RD

Appendix I – Richfield Incremental Planning Area FEMA Floodplain and Wetlands Map



AICHER LA

WOODSIDE LA

POLK ST

RAILROAD ST

HY 175

DEPOT ST

ORCHARD ST

ELM ST

RICHFIELD SERVICE DR

WOLF RD

Appendix J – Richfield Incremental Planning Area Environmental Review

The overall site is comprised of a large planning area to the east of the Town of Germantown, Washington County, Wisconsin.

General project location lat/long: 43.25828, -88.19166 (center), bounded by 43.26548, -88.20209; 43.26533, -88.18172; 43.25082, -88.20214; 43.25061, -88.18193.

Section / Township / Range: S12 T09N R19E

During the preliminary environmental screening, the following environmentally sensitive resources and assumptions were assessed:

- Presence of wetland and waterway features,
- Presence of 303d impaired waterways,
- Presence of areas of special natural resource interest,
- Documented wetland and waterway disturbance permits,
- Presence of FEMA floodplains, floodways and flood fringe,
- Presence of WDNR Bureau of Remediation and Reclamation (BRR) Sites,
- Presence of Solid and Hazardous Waste Information System (SHWIMS) Sites,
- Presence of Shoreland Zoning,
- Presence of Planned or Existing County Trails,
- Presence of National Register of Historic Places,
- Presence of United States Department of Agriculture Drainage Districts, and
- Potential presence of Threatened and Endangered Species.

A summary of findings is described below.

### Wetlands and Waterways

The WDNR Surface Water Data Viewer (SWDV) was accessed. Throughout the planning area, there are multiple wetland and waterway complexes. Wisconsin Wetland Inventory (WWI) listed wetlands include: Emergent/wet meadow, Flats/unvegetated wet soil, Forested, and open water. The WWI also lists five unnamed waterways, three first order, and two second order waterways and three waterbodies. No features within the study area were identified as 303d impaired or are designated as an area of special natural resource interest.

The SWDV maintains a list of permitted activities and informal decisions held by the WDNR. Please refer to Table 1 below for a summary of WDNR actions.

**Table 1. WDNR Actions**

Permit ID	Docket Number	Applicant	Permit Date	Activity	Permit Decision
6076221	GP-SE-2019-67-01338	Koehnke	5/29/2019	Wetland Fill - Residential/Commercial/Industrial	A - Approved
5013080	IP-SE-2007-67-0439	Riverwoods Parkway Group, LLC	12/12/2007	Wetland WQC (Federal)	A - Approved
5013081	GP-SE-2007-67-0440MW	Riverwoods Parkway Group, LLC	12/12/2007	Pond-stormwater	A - Approved
5013082	GP-SE-2007-67-0441MW	Riverwoods Parkway Group, LLC	12/12/2007	Pond-stormwater	A - Approved

Permit ID	Docket Number	Applicant	Permit Date	Activity	Permit Decision
5013083	GP-SE-2007-67-0442MW	Riverwoods Parkway Group, LLC	12/12/2007	Pond-stormwater	A - Approved
5013084	GP-SE-2007-67-0443MW	Riverwoods Parkway Group, LLC	12/12/2007	Culvert w/o engineering	A - Approved
5013085	GP-SE-2007-67-0444MW	Riverwoods Parkway Group, LLC	12/12/2007	Culvert w/o engineering	A - Approved
N/A	INF-SE-2006-67-1046	Baudhuin Incorporated	10/26/2006	Shoreland Zoning	N/A
N/A	INF-SE-2007-67-0354	J.D. Knowles	5/29/2007	Ordinary High Water Mark Determination	N/A
N/A	INF-SE-2005-67-1088	Bauduin Inc	9/27/2005	Jurisdictional Determination	N/A
N/A	INF-SE-2005-67-0987	Northern Lakes Development	9/12/2005	Wetland Delineation	N/A

Please note, this is not representative of all possible wetlands and waterways within the project area. Refer to Figures 1, 2, and 3.

#### FEMA Floodplains, Floodways and Flood fringe

The presence of FEMA designated floodplains, floodways and flood fringe were assessed for the study area. A study was conducted for the waterway in the northeast corner of the study area. The FEMA panels included in the study area are 55131C0264E effective 2/25/2022 and 55131C0268E effective 2/25/2022. Within panel 55131C0268E there are areas designated as Zone A and Zone AE.

Refer to Figure 4.

#### Bureau of Remediation and Reclamation and Solid and Hazardous Waste Information System

The Bureau of Remediation and Reclamation, and the Solid and Hazardous Waste Information System were assessed for the study area. There are multiple open and closed sites with continuing obligations present throughout the study area. Care needs to be taken when considering impacting listed sites.

**Table 2. Known BRRTs Sites**

DNR BRRTS #	Site Status	Site Name	Facility ID #	Start Date / End Date	Has Continuing Obligations (Yes/No)	X Coordinate (m, WTM91)	Y Coordinate (m, WTM91)
0367563012	Open	WI DOT Kosterman Parcel	267200120	12/16/2014 / N/A	N/A	666007	311840
0267578745	Open	Laubenheimers Garage**	267032480	2/3/2017 / N/A	N/A	666605	310833
0367107634	Closed	Wolf Brothers Fuel Inc	267056130	7/9/1996 / 6/5/2000	Y	666381	311217.7
0367168387	Closed	White, Robert Property	267162500	7/23/1997 / 11/20/2003	Y	665929	311161

DNR BRRTS #	Site Status	Site Name	Facility ID #	Start Date / End Date	Has Continuing Obligations (Yes/No)	X Coordinate (m, WTM91)	Y Coordinate (m, WTM91)
0367201172	Closed	Richfield Truck Stop	267026760	9/21/1998 / 3/20/2000	N	667398.7	310323.7
0367004277	Closed	Laubenheimers Garage**	267032480	6/13/1994 / 12/12/2017	Y	666586.3	310844.7
0367001520	Closed	Gotez Garage	267032700	4/22/1991 / 6/8/2018	Y	666878.6	310283.4
0367246102	Closed	Craden MFG Inc	267064930	3/10/2000 / 6/19/2009	N	666423.3	311115.7
0367583781	Closed	Richfield Truck Stop	267026760	5/20/2019 / 6/17/2019	N	667423.9	310343.3
0367585483	Closed	Exxon Richfield Truckstop Proposed KT 1013	267026760	12/16/2019 / 12/16/2019	N	667410.1	310366.7
0367000546	Closed	Richfield Truck Stop	267026760	12/29/1989 / 11/9/2012	Y	667412.5	310370.5
0367005194	Closed	Richfield Service	267150400	3/25/1995 / 10/21/2009	Y	667387	310212
** LAUBENHEIMERS GARAGE has been identified as impacting another property.							

Additionally, the study area was examined using the WDNR Solid and Hazardous Waste Information System (SHWIMS). This system provides access to information on sites, and facilities operating at sites, that are regulated by the Wisconsin DNR Waste and Materials Management (WMM) program. The following sites were identified within the study area:

**Table 3. SHWIMS Sites**

Status	Facility Name	Address	FID	Region
Operating	Craden MFG Inc	1961 STH 175	267064930	Southeast
Closed	Johnson Equipment	1704 STH 175	267032700	Southeast
Closed	Richfield Truck Stop	2900 STH 167	267026760	Southeast

Refer to Figure 5 and the SHWIMS Database Export.

### Shoreland Zoning

The presence of shoreland zones were assessed for the study area. No known shoreland zones are provided by the Washington County GIS viewer. The Village of Germantown Code of Ordinance No. 24.04, defines the shoreland-wetland zoning district as all wetlands in the Village which are equal to or greater than 5 acres within 1,000 feet of the ordinary high water mark (OHWM) of navigable lakes,

ponds or flowages and within 300 feet of the OHWM of navigable rivers or streams, or the landward side of the floodplain, whichever distance is greater.<sup>1</sup>

### Planned or Existing County Trails

Using the Washington County Adopted Bikeway and Trail Network Plan, Adopted June 2019<sup>2</sup>, the study area has two wide shoulder paths and one side path existing. No new paths are proposed for the study area.

### National Historic Register

Using the National Register of Historic Places GIS viewer, the study area was assessed. There are no registered sites within the study area.<sup>3</sup>

### United States Department of Agriculture Drainage Districts

Using the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) Drainage Districts Interactive Map tool, the study area was assessed for presence of drainage districts. There are no drainage districts within the study area.<sup>4</sup>

### Threatened and Endangered Species

Using the Wisconsin Department Natural Resources Natural Heritage Inventory (NHI) Portal, the study area was assessed. Based on the assessment state endangered fish may be present within the study area. A preliminary Information for Planning and Consultation (IPaC) assessment was performed to identify potential habitat that may support federally threatened or endangered species. The IPaC results included the federally endangered northern long-eared bat, the proposed endangered tricolored bat, and the candidate endangered monarch butterfly. Further investigations will be needed to assess likelihood of presence, and potential impacts.

Refer to the attachments for the NHI Portal assessment and the IPaC assessment.

---

<sup>1</sup> Reference: [https://library.municode.com/wi/germantown/codes/code\\_of\\_ordinances?nodeId=CH24SHTLZOCOCROR5-88\\_24.04SHTLZODI](https://library.municode.com/wi/germantown/codes/code_of_ordinances?nodeId=CH24SHTLZOCOCROR5-88_24.04SHTLZODI)

<sup>2</sup> Reference:

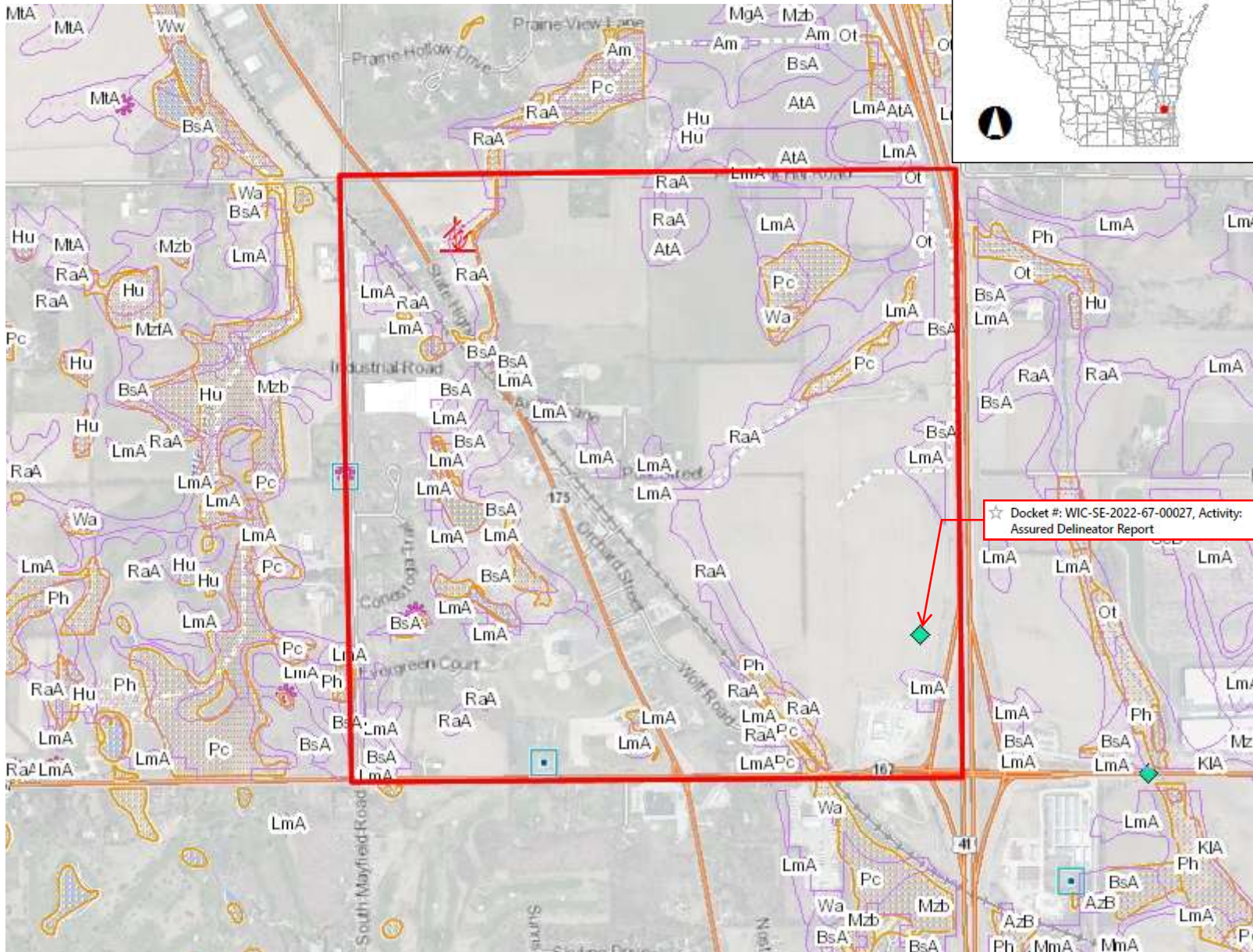
<https://www.washcowisconsin.gov/common/pages/DownloadFileByUrl.aspx?key=5xm1up4mTLLDgP3Y8GLTDcqwZlPhTR1nv9N17WjzjgHThLXmHzcSHnlll0qUmAHPXI4Ei2uaZtd1NZ3h2NIAzBGZYRMZ%2bk%2f90KZhIjusQa9K%2b0n3y13lBvBhuCbwVTr80aVZdiatZOUkhs6QP13w8v1IS%2bOmOjBkn%2fsmpliUj%2fL3jYs1VYHftEjKJo87tFBBQfLI5eeK%2ffUh81M0t%2bI2Q8F48Ks%3d>

<sup>3</sup> Reference: <https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466>

<sup>4</sup> Reference: <https://datcpgis.wi.gov/maps/?viewer=dd>

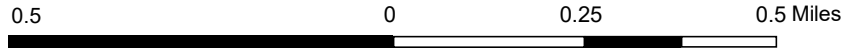


Figure 1: Wetlands and Waterways



- Legend**
- Wetland Indicators
  - Wetland Class Areas
  - Wetland Class Points
  - Dammed pond
  - Excavated pond
  - Filled/draind wetland
  - Wetland too small to delineate
  - Filled excavated pond
  - Filled Points
  - Wetland Class Areas
  - Filled Areas
  - Wetland Class Areas
  - Wetland Class Points
  - Dammed pond
  - Excavated pond
  - Filled/draind wetland
  - Wetland too small to delineate
  - Filled excavated pond
  - Filled Points
  - Wetland Class Areas
  - Filled Areas
  - Wetland Identifications and Confirmations
  - NRCS Wetspots
  - Municipality
  - State Boundaries
  - County Boundaries
  - Major Roads**
  - Interstate Highway
  - State Highway
  - US Highway
  - County and Local Roads**
  - County HWY
  - Local Road
  - Railroads

☆ Docket #: WIC-SE-2022-67-00027, Activity: Assured Delineator Report



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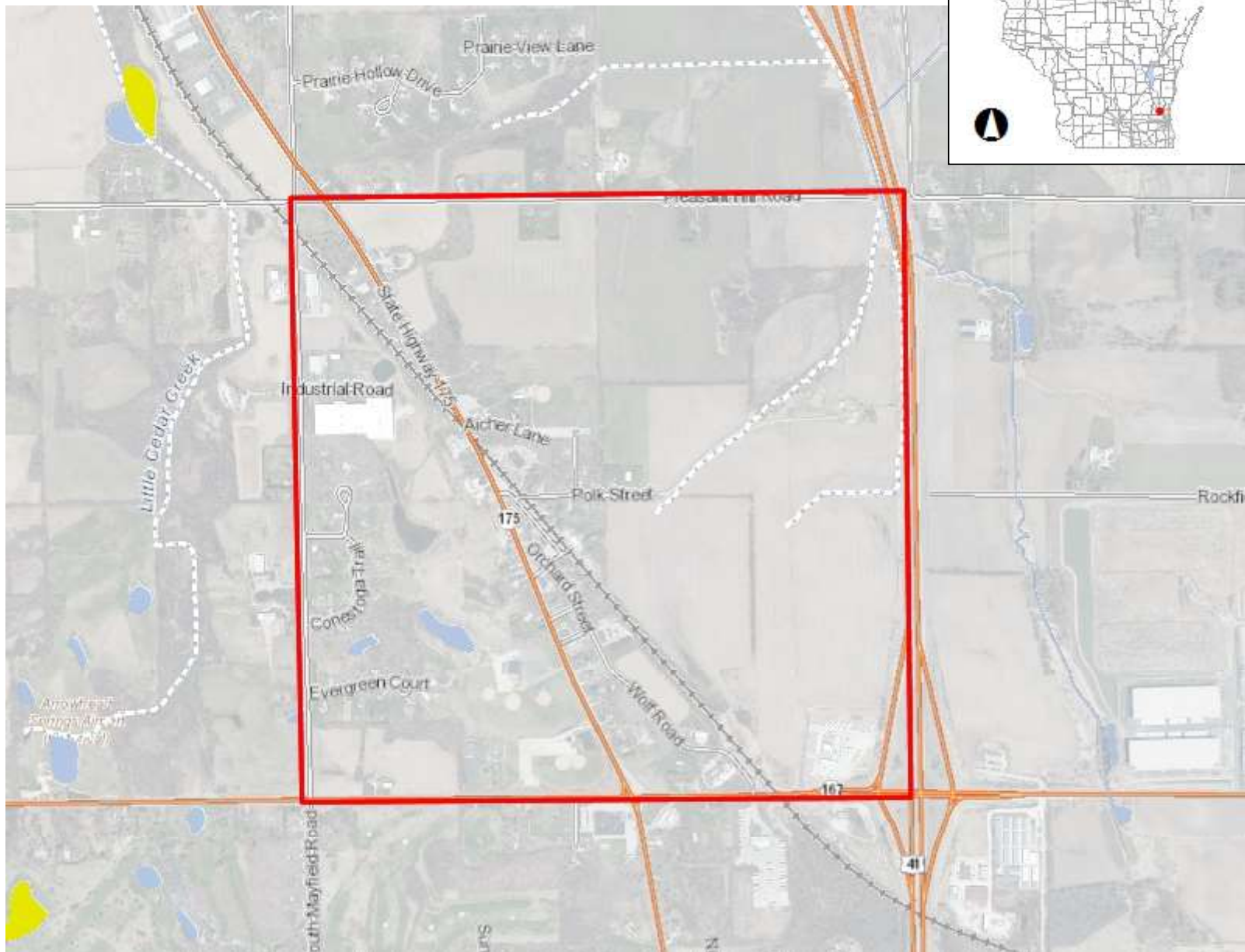
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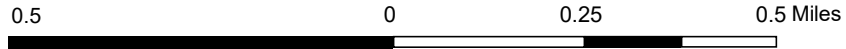
**Notes**  
Surface Water Data Viewer Layers:  
Wetlands, Hydric soils



Figure : Additional Surface Water Resources



- Legend**
- Impaired Rivers and Streams
  - Impaired Lakes
  - TMDL Category Lines**
    - Other or Multiple Factors
    - Contaminated Sediment Dominated
    - Atmospheric Deposition Dominated
    - Physical or Habitat Dominated
    - Nonpoint Source Dominated
    - Point and Nonpoint Source Blend
    - Point Source
    - Proposed for 303d listing
  - TMDL Category Areas**
    - Other or Multiple Factors
    - Contaminated Sediment Dominated
    - Atmospheric Deposition Dominated
    - Physical or Habitat Dominated
    - Nonpoint Source Dominated
    - Point and Nonpoint Source Blend
    - Point Source
    - Proposed for 303d listing
  - PNW-ASNRI Sensitive Areas of Lakes
  - PNW-ASNRI Wild and Scenic Rivers
  - PNW-ASNRI Outstanding and Exceptional Streams
  - PNW-ASNRI Trout Streams
  - PNW-ASNRI Wild Rice Streams
  - PNW-ASNRI Outstanding and Exceptional Lakes
  - PNW-ASNRI Special Area Management Plan Streams



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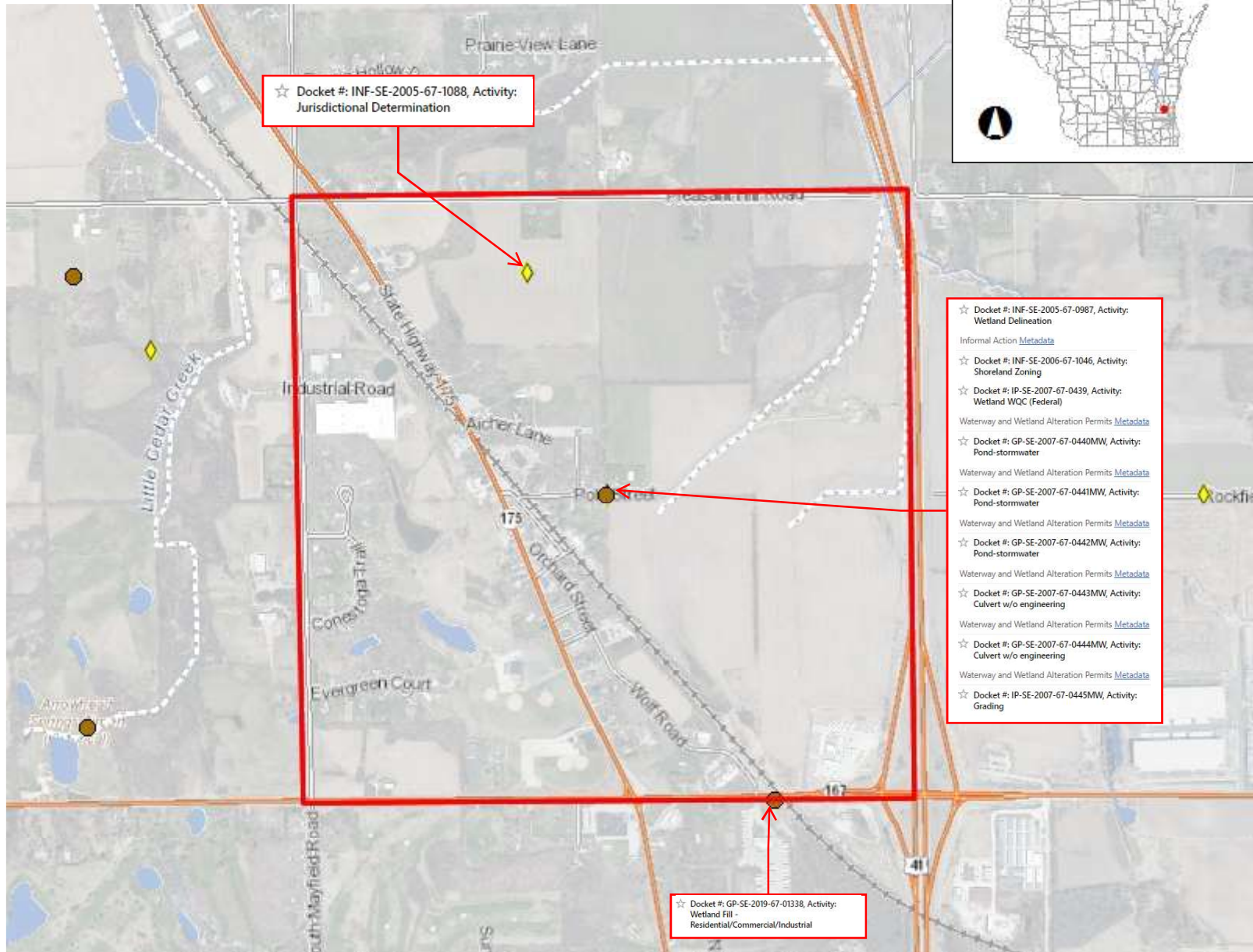
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**Notes**  
 Surface Water Data Water Layers:  
 Impaired Waterways, PNW-ASNRI,  
 Fisheries Management



Figure 3: WDNR Permits and Determinations



☆ Docket #: INF-SE-2005-67-1088, Activity: Jurisdictional Determination

☆ Docket #: INF-SE-2005-67-0987, Activity: Wetland Delineation  
Informal Action [Metadata](#)

☆ Docket #: INF-SE-2006-67-1046, Activity: Shoreland Zoning

☆ Docket #: IP-SE-2007-67-0439, Activity: Wetland WQC (Federal)

Waterway and Wetland Alteration Permits [Metadata](#)

☆ Docket #: GP-SE-2007-67-0440MW, Activity: Pond-stormwater

Waterway and Wetland Alteration Permits [Metadata](#)

☆ Docket #: GP-SE-2007-67-0441MW, Activity: Pond-stormwater

Waterway and Wetland Alteration Permits [Metadata](#)

☆ Docket #: GP-SE-2007-67-0442MW, Activity: Pond-stormwater

Waterway and Wetland Alteration Permits [Metadata](#)

☆ Docket #: GP-SE-2007-67-0443MW, Activity: Culvert w/o engineering

Waterway and Wetland Alteration Permits [Metadata](#)

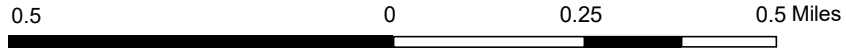
☆ Docket #: GP-SE-2007-67-0444MW, Activity: Culvert w/o engineering

Waterway and Wetland Alteration Permits [Metadata](#)

☆ Docket #: IP-SE-2007-67-0445MW, Activity: Grading

☆ Docket #: GP-SE-2019-67-01338, Activity: Wetland Fill - Residential/Commercial/Industrial

- Legend**
- Waterway and Wetland Alterations
  - ◆ Formal/Informal Actions
  - ▲ Exemption Determinations
  - Ordinary High Water Mark Determinations
- Navigability Determinations**
- Yes
  - Yes with Agricultural Exemption
  - No
- ▲ Surface Water Outfalls
  - Municipality
  - State Boundaries
  - County Boundaries
- Major Roads**
- Interstate Highway
  - State Highway
  - US Highway
- County and Local Roads**
- County HWY
  - Local Road
- Railroads
  - Tribal Lands
  - Rivers and Streams
  - Intermittent Streams
  - Lakes and Open water



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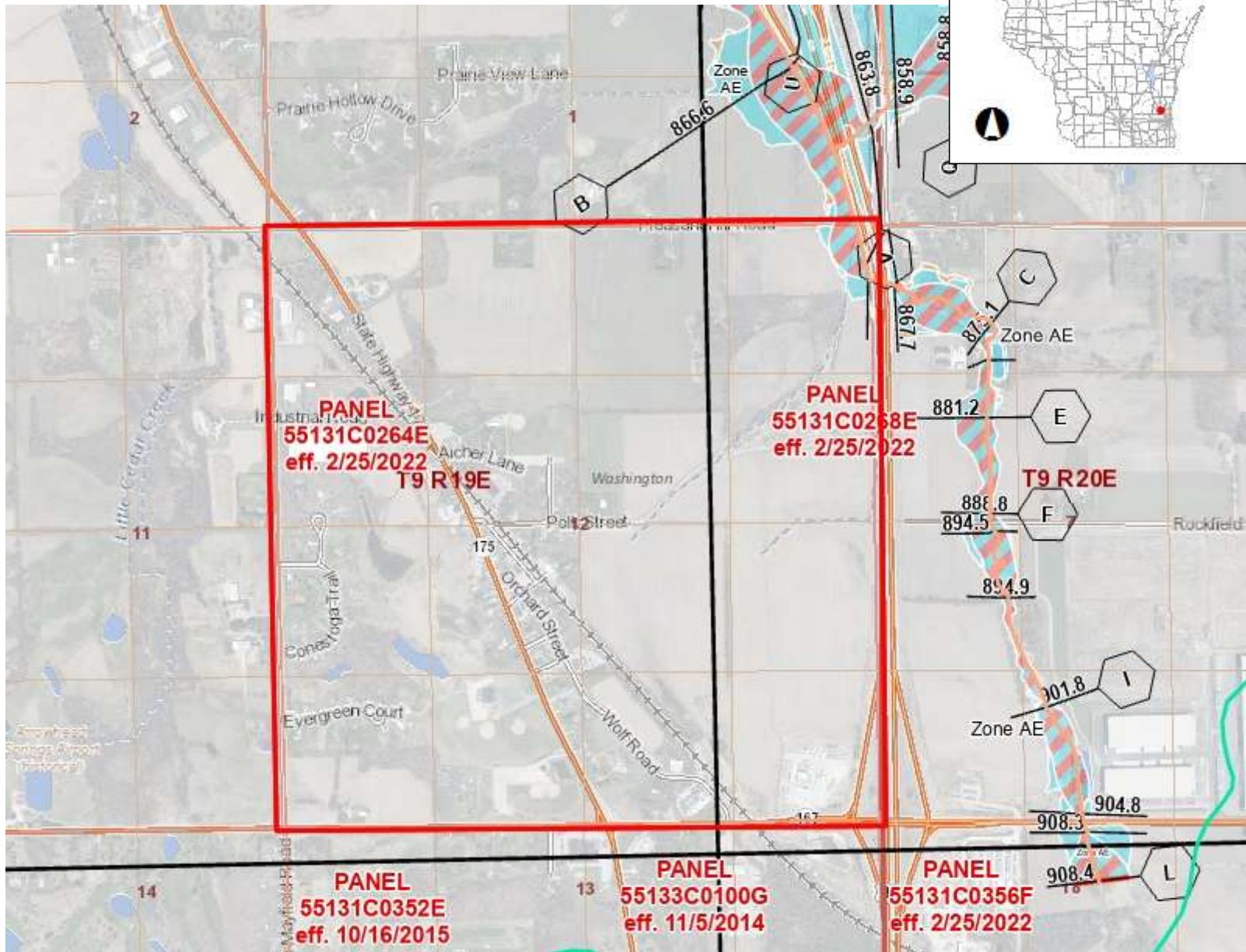
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**Notes**



Figure 4: FEMA Floodplain Firmette



Legend

- 2D Water Surface Elevation Grid
  - High : 937.629
  - Low : 853.184
- Dams
  - Dam
  - FERC and FERC Exempt Dam
  - Cranberry Dam
  - Removed Dam
  - Structure not on Waterway
  - <all other values>
- Levees
- Geomarks
- Floodplain Analysis Lines
  - Case by Case Analysis for Development in Floodplain
  - Dam Failure Analysis
  - Encroachment Analysis
  - Flood Insurance Study
  - Flood Storage Analysis
  - Floodplain Study (Locally Funded)
  - Hydrology/Hydraulics developed at a Dam
  - <all other values>
- Floodplain Analysis Catchments
- Floodplain Analysis Points
  - Case by Case Analysis for Development in Floodplain
  - Dam Failure Analysis
  - Encroachment Analysis
  - Flood Insurance Study
  - Flood Storage Analysis
  - Floodplain Study (Locally Funded)
  - Hydrology/Hydraulics developed at a Dam

0.5 0 0.25 0.5 Miles

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Notes

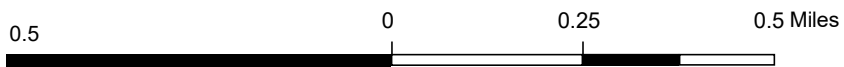


# Figure 5: BRRTs Export



### Legend

- Open Site
- Closed Site
- Continuing Obligations Apply
- Impacted Another Property(ies) or Right-
- Facility-wide Site



NAD\_1983\_HARN\_Wisconsin\_TM

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*Note: Not all sites are mapped.*

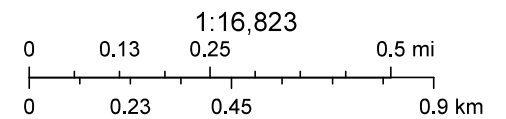
### Notes

# Shoreland Zoning



8/8/2023, 3:14:15 PM

- |                          |                                  |  |   |                     |
|--------------------------|----------------------------------|--|---|---------------------|
| Override 1               | Federal Highway                  | Intermittent Lake, Pond, Stream or Watercourse | Assessor Plat; Cemetery Plat; Subdivision | Local Road Labels   |
| Current Parcel           | Railroad Centerlines             | Perennial Lake, Pond, Stream or Watercourse    | Lot                                       | Local Road          |
| Road Centerline STH, CTH | Shoreland Zoning District        | Perennial Lake, Pond, Stream or Watercourse    | PLSS Boundary                             | Named Private Drive |
| State Highway            | Non-Navigable Stream in Ag. Area | Floodway Zoning District                       | PLSS Section                              |                     |
| Ramp                     | NNAGSTREAM                       | 100 Year Floodplane Zoning District            | Right-of-Way                              |                     |
| Road Centerline I, USH   | NOBUFFER; PLAKE; PSTREAM         | Plat   | Municipality                              |                     |
| Interstate               |                                  | Certified Survey Map                           |   |                     |



# ATTACHMENT

Wisconsin Department of Natural Resources

The Official Internet site for the Wisconsin Department of  
Natural Resources  
101 S. Webster Street . PO Box 7921 . Madison,  
Wisconsin 53707-7921 . 608,266,2621

**WDNR SHWIMS on the Web**Navigation: [SOTW Home](#) >> [Advanced Search](#) >> [Search Results](#) >> [Location Detail](#)**CRADEN MFG INC  
Facility Name**[HELP](#)

## General Information

Facility Name		County	WDNR Region	
CRADEN MFG INC		WASHINGTON	SOUTHEAST REGION	
Facility Status	FID	EPA ID	SIC Code	NAICS Code
OPERATING	267064930	WID063499693	NONE	NONE
Physical Address <a href="#">Find on Google Maps</a> [Exit DNR]		Municipality	State	Zip
1961 STH 175		RICHFIELD	WI	53076
Mailing Address		City	State	Zip
1961 HWY 175		RICHFIELD	WI	53076
Facility Owner Type	Public Land Survey System Desc.		Latitude and Longitude	
PRIVATE	SE 1/4 of the NW 1/4 of Sec 12, T9N, R19E		NOT AVAILABLE	

## Facility Owner(s)

**SOL CRADEN** 1961 HWY 175 RICHFIELD, WI 53076

## Waste Management Activities at this Location

Activity Type <a href="#">Click to view details</a>	<a href="#">Activity Status</a>	License No.
<a href="#">HW GENERATOR - VERY SMALL</a>	ACTIVE	N/A

## Other Activities at this Location

Activity Number and Name <a href="#">Click to view details on AW/RR BOTW</a>	Type/Status
<a href="#">03-67-246102 CRADEN MFG INC</a>	LUST - CLOSED

## WDNR SHWIMS on the Web

Navigation: [SOTW Home](#) >> [Advanced Search](#) >> [Search Results](#) >> [Location Detail](#)

### JOHNSON EQUIPMENT Facility Name

[HELP](#)

#### General Information

<b>Facility Name</b>		<b>County</b>	<b>WDNR Region</b>	
JOHNSON EQUIPMENT		WASHINGTON	SOUTHEAST REGION	
<b>Facility Status</b>	<b>FID</b>	<b>EPA ID</b>	<b>SIC Code</b>	<b>NAICS Code</b>
CLOSED	267032700	WID988597605	7538	NONE
<b>Physical Address</b> <a href="#">Find on Google Maps</a> [Exit DNR]		<b>Municipality</b>	<b>State</b>	<b>Zip</b>
1704 STH 175		RICHFIELD	WI	53076
<b>Mailing Address</b>		<b>City</b>	<b>State</b>	<b>Zip</b>
1704 HWY 175		RICHFIELD	WI	53076
<b>Facility Owner Type</b>	<b>Public Land Survey System Desc.</b>		<b>Latitude and Longitude</b>	
PRIVATE	SW 1/4 of the SE 1/4 of Sec 12, T9N, R19E		NOT AVAILABLE	

#### Facility Owner(s)

STEVEN & TERRY FASSBENDERS 1704 HWY 175 RICHFIELD, WI 53076
---

#### Waste Management Activities at this Location

<b>Activity Type</b> <small>Click to view details</small>	<b>Activity Status</b>	<b>License No.</b>
<a href="#">HW GENERATOR - VERY SMALL</a>	INACTIVE	N/A
<a href="#">HW GENERATOR - SMALL</a>	INACTIVE	N/A

#### Other Activities at this Location

<b>Activity Number and Name</b> <small>Click to view details on AW/RR BOTW</small>	<b>Type/Status</b>
<a href="#">03-67-001520 GOETZ GARAGE</a>	LUST - CLOSED

## WDNR SHWIMS on the Web

Navigation: [SOTW Home](#) >> [Advanced Search](#) >> [Search Results](#) >> [Location Detail](#)

### RICHFIELD TRUCK STOP Facility Name

[HELP](#)

#### General Information

<b>Facility Name</b>		<b>County</b>	<b>WDNR Region</b>	
RICHFIELD TRUCK STOP		WASHINGTON	SOUTHEAST REGION	
<b>Facility Status</b>	<b>FID</b>	<b>EPA ID</b>	<b>SIC Code</b>	<b>NAICS Code</b>
CLOSED	267026760	WIR000017699	NONE	NONE
<b>Physical Address</b> <a href="#">Find on Google Maps</a> [Exit DNR]		<b>Municipality</b>	<b>State</b>	<b>Zip</b>
2900 STH 167		RICHFIELD	WI	53076
<b>Mailing Address</b>		<b>City</b>	<b>State</b>	<b>Zip</b>
NONE		NONE	NONE	NONE
<b>Facility Owner Type</b>	<b>Public Land Survey System Desc.</b>		<b>Latitude and Longitude</b>	
UNKNOWN	SE 1/4 of the SE 1/4 of Sec 12, T9N, R19E		NOT AVAILABLE	

#### Facility Owner(s)

J-ARROW INC 2900 HWY 167 W RICHFIELD, WI 53076
--

#### Waste Management Activities at this Location

Activity Type <small>Click to view details</small>	Activity Status	License No.
<a href="#">HW GENERATOR - SMALL</a>	INACTIVE	N/A

#### Other Activities at this Location

Activity Number and Name <small>Click to view details on AWR/R BOTW</small>	Type/Status
<a href="#">03-67-000546 RICHFIELD TRUCK STOP</a>	LUST - CLOSED
<a href="#">03-67-201172 RICHFIELD TRUCK STOP</a>	LUST - CLOSED
<a href="#">03-67-583781 RICHFIELD TRUCK STOP</a>	LUST - CLOSED
<a href="#">03-67-585483 EXXON RICHFIELD TRUCKSTOP PROPOSED KT 1013</a>	LUST - CLOSED
<a href="#">04-67-551867 RICHFIELD TRUCK STOP</a>	SPILL - CLOSED



## Endangered Resources Preliminary Assessment

Created on **8/8/2023**. This report is good for one year after the created date.

*DNR staff will be reviewing the ER Preliminary Assessments to verify the results provided by the Public Portal. ER Preliminary Assessments are only valid if the project habitat and waterway-related questions are answered accurately based on current site conditions. If an assessment is deemed invalid, a full ER review may be required even if the assessment indicated otherwise.*

### Results

A search was conducted of the NHI Portal within a 1-mile buffer (for terrestrial and wetland species) and a 2-mile buffer (for aquatic species) of the project area. Based on these search results, below are your next steps.

**An ER Review is needed to ensure compliance** with Wisconsin's Endangered Species Law (s. 29.604 Wis. Stats.) and the Federal Endangered Species Act (16 USC ss 1531-43). Therefore you should request an Endangered Resources Review <https://dnr.wi.gov/topic/ERReview/Review.html>. The ER Review will list the endangered resources that have been recorded within the vicinity of the project area and follow-up actions may be necessary.

One (or more) of the following situations apply:

- The species recorded are state or federal threatened or endangered animals.
- The species recorded are state threatened or endangered plants on public land.
- The species recorded are federal threatened or endangered plants on federal land or involve federal funds or a federal permit.
- The project site overlaps the Karner Blue Butterfly High Potential Range.
- The project overlaps the Rusty Patched Bumble Bee High Potential Zone.

*A copy of this document can be kept on file and submitted with any other necessary DNR permit applications to show that the need for an ER Review has been met. This notice only addresses endangered resources issues. This notice does not constitute DNR authorization of the proposed project and does not exempt the project from securing necessary permits and approvals from the DNR and/or other permitting authorities.*

### Project Information

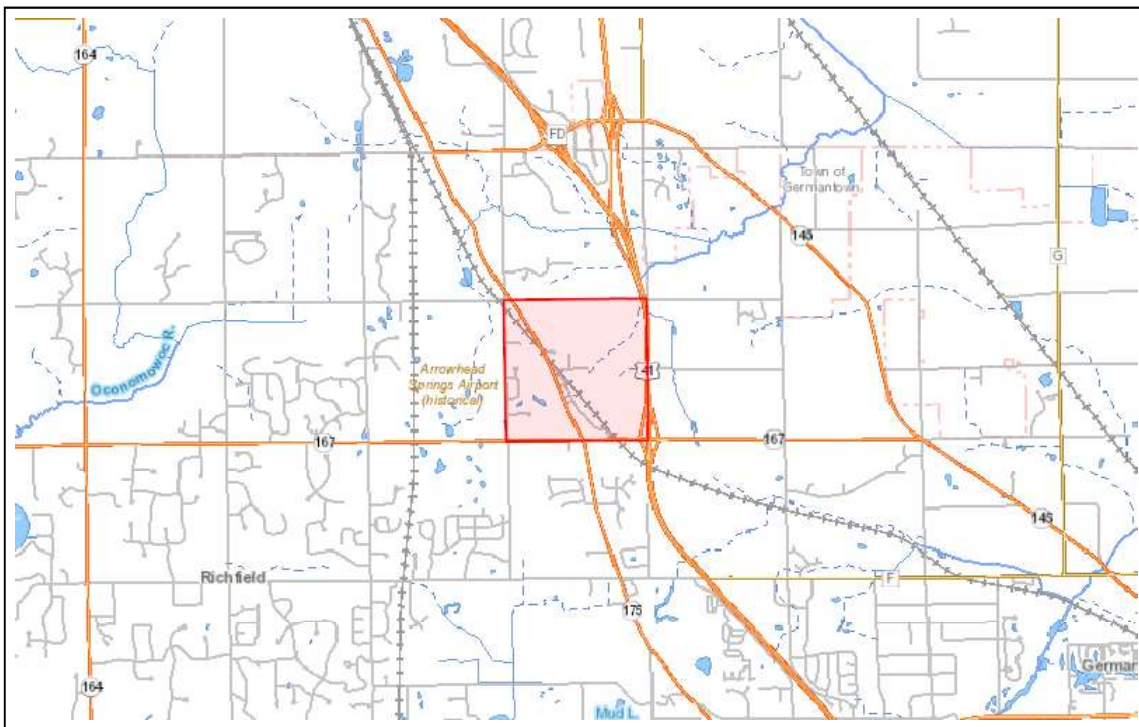
Landowner name	Village of Germantown
Project address	
Project description	Study area

### Project Questions

Does the project involve a public property?	Yes
Is there any federal involvement with the project?	Yes
Is the project a utility, agricultural, forestry or bulk sampling (associated with mining) project?	No
Is the project property in Managed Forest Law or Managed Forest Tax Law?	No
Project involves tree or shrub removal?	No
Is project near (within 300 ft) a waterbody or a shoreline?	Yes
Is project within a waterbody or along the shoreline?	Yes

Does the project area (including access routes, staging areas, laydown yards, select sites, source/fill sites, etc.) occur **entirely within** one or more of the following habitats?

Urban/residential	No
Manicured lawn	No
Artificial/paved surface	No
Agricultural land	No
Areas covered in crushed stone or gravel	No



The information shown on these maps has been obtained from various sources, and is of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. Users of these maps should confirm the ownership of land through other means in order to avoid trespassing. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: <http://dnr.wi.gov/legal/>.

<https://dnrx.wisconsin.gov/nhiportal/public>

101 S. Webster Street . PO Box 7921 . Madison, Wisconsin 53707-7921

# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

## Location

Washington County, Wisconsin



## Local office

Minnesota-Wisconsin Ecological Services Field Office

☎ (952) 858-0793

📅 (952) 646-2873

3815 American Blvd East

Bloomington, MN 55425-1659

NOT FOR CONSULTATION

# Endangered species

**This resource list is for informational purposes only and does not constitute an analysis of project level impacts.**

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries<sup>2</sup>).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

- 
1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

## Mammals

NAME	STATUS
<p>Northern Long-eared Bat <i>Myotis septentrionalis</i>            Wherever found            No critical habitat has been designated for this species.  <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a></p>	Endangered
<p>Tricolored Bat <i>Perimyotis subflavus</i>            Wherever found            No critical habitat has been designated for this species.  <a href="https://ecos.fws.gov/ecp/species/10515">https://ecos.fws.gov/ecp/species/10515</a></p>	Proposed Endangered

## Insects

NAME	STATUS
<p>Monarch Butterfly <i>Danaus plexippus</i>            Wherever found            No critical habitat has been designated for this species.  <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a></p>	Candidate

## Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

## Bald & Golden Eagles

There are no documented cases of eagles being present at this location. However, if you believe eagles may be using your site, please reach out to the local Fish and Wildlife Service office.

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds  
<https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide conservation measures for birds  
<https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

Bald and Golden Eagle information is not available at this time

**What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?**

The potential for eagle presence is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply). To see a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

**What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?**

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

**What if I have eagles on my list?**

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the [Eagle Act](#) should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

## Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

Migratory bird information is not available at this time

**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?**

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

### **What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

### **How do I know if a bird is breeding, wintering or migrating in my area?**

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

### **What are the levels of concern for migratory birds?**

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

## Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

## What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

## Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

# Facilities

## National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

## Fish hatcheries

There are no fish hatcheries at this location.

## Wetlands in the National Wetlands Inventory (NWI)

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

[PEM1F](#)

[PEM1C](#)

FRESHWATER FORESTED/SHRUB WETLAND

[PSS1Bg](#)

[PFO1C](#)

FRESHWATER POND

[PUBHx](#)[PUSC](#)[PUBGx](#)

RIVERINE

[R4SBC](#)[R5UBH](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

**NOTE:** This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

### Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

### Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

### Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should

seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION



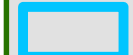

Appendix K – Richfield Incremental Planning Area Future Land Use Map

# Adopted Future Land Use Germantown to Richfield: Potential Utilities Extension

 MMSD Facilities Plan Update Planning Area

## Richfield Future Land Use

-  Business Mixed Use
-  Commercial
-  Industrial
-  Institutional
-  Recreational
-  Single Family
-  Wetlands

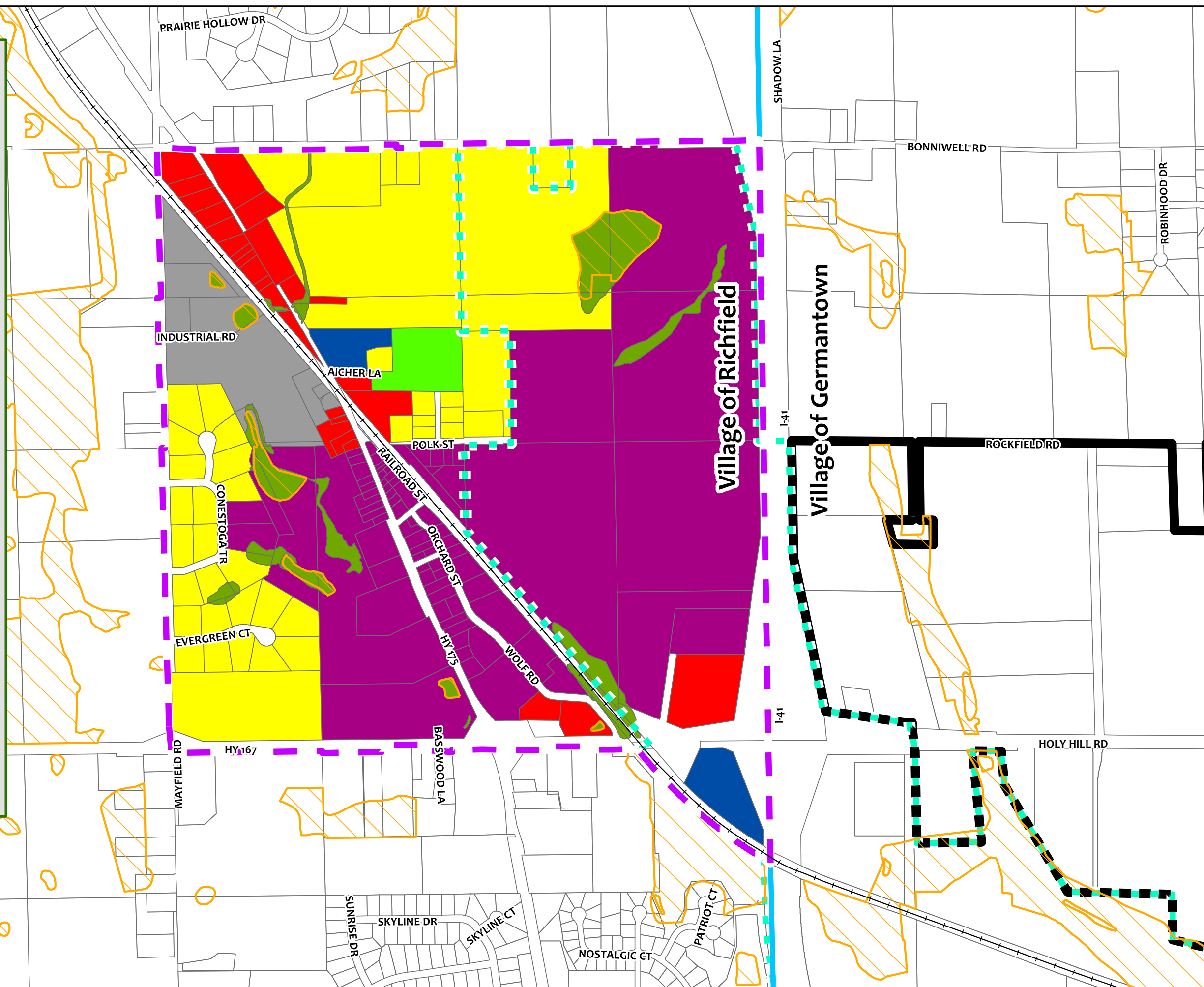
-  Proposed SSA Expansion Area
-  SEWRPC Environmental Corridors (2015)
-  Village Boundary
-  Existing SSA Boundary

1,000 Feet Date: 4/5/2023



 VANDEWALLE & ASSOCIATES INC.  
© 2022

Data Sources: Washington County, State of WI, EIA, SEWRPC



Appendix L – Preliminary Route of Sewer and Water Extensions to Serve the Richfield SSSA

# CONSTRUCTION DRAWINGS

## FOR

# GERMANTOWN CONNECTION

## VILLAGE OF RICHFIELD

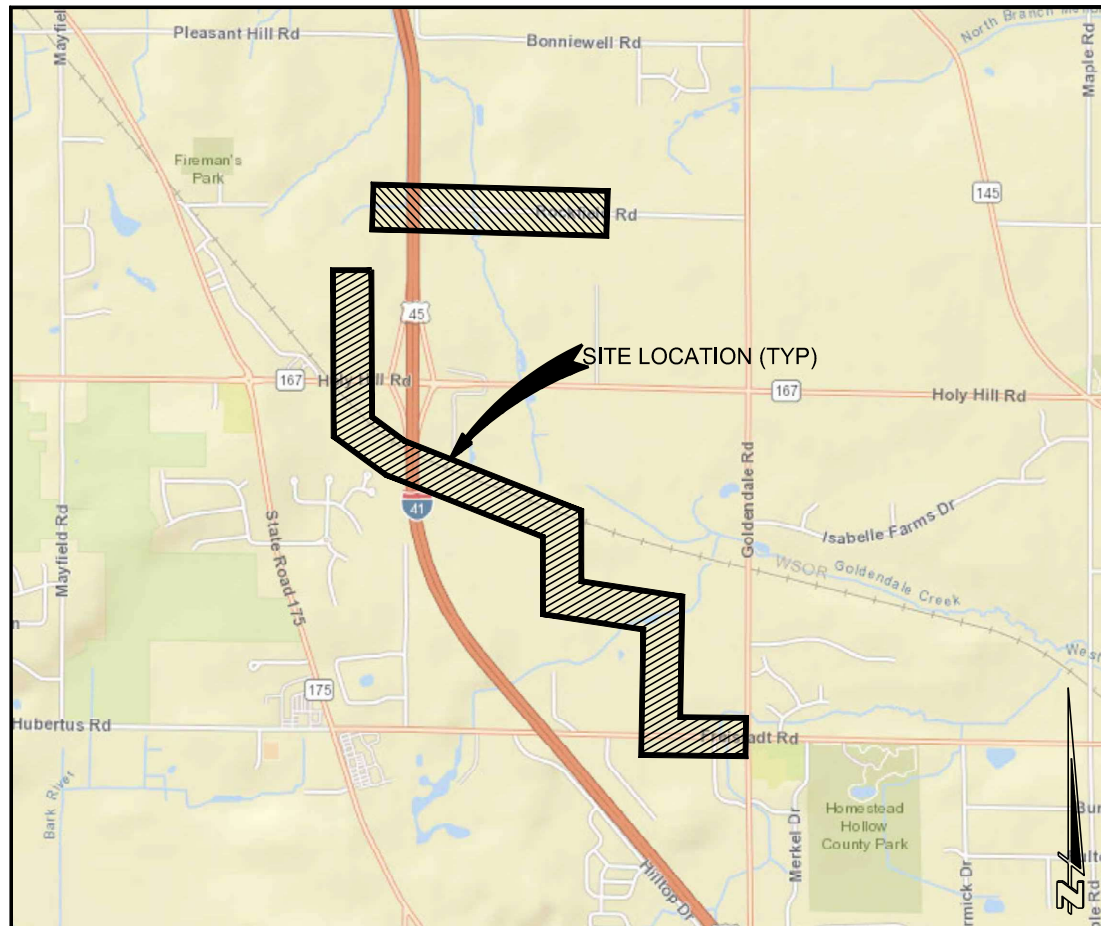
### WASHINGTON COUNTY, WI

September 26, 2023

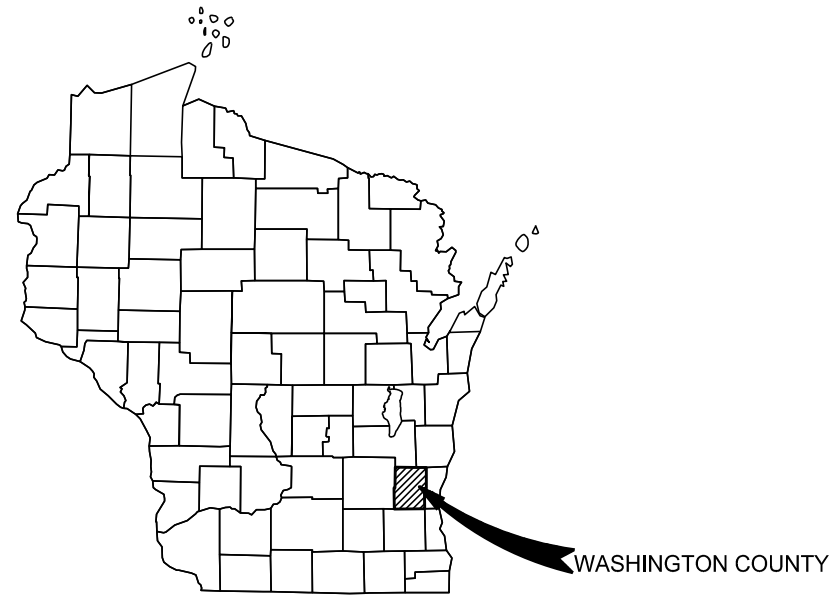
Prepared By



PROJECT I.D. 05771-0017



SITE LOCATION MAP



COUNTY LOCATION MAP

INDEX TO DRAWINGS	
SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	STANDARD SYMBOLS AND ABBREVIATIONS
3	OVERVIEW SHEET
4 - 6	FREISTADT ROAD PLAN AND PROFILE
7 - 18	FUTURE ROAD PLAN AND PROFILE
19 - 23	RAILROAD EASEMENT PLAN AND PROFILE
24 - 26	RICHFIELD PARKWAY PLAN AND PROFILE
27 - 32	ROCKFIELD ROAD PLAN AND PROFILE
33 - 35	STANDARD DETAILS

ATTENTION:  
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ENGINEER SHALL BE HELD RESPONSIBLE FOR THE SCALE OR PRINT  
QUALITY OF DOWNLOADED PLANS. ONLY PRINTED PLANS FROM CEDAR  
CORPORATION SHALL BE CONSIDERED TO BE SCALEABLE PLANS.

I:\Clients-Cedars\05771 Richfield Village of\017 Germantown Connection Preliminary Design\04 CADD\DWG\CoverDetails.dwg 09/27/23 12:33:50 PM

**MAPPING & TOPOGRAPHY SYMBOLOGY**

DESCRIPTION	SYMBOL	EXISTING	PROPOSED
SANITARY SEWER (PLAN) - LENGTH-DIA. MATERIAL @ GRADE	(SIZE & MAT'L.) SAN	→	→ LENGTH - SIZE MATL SAN
STORM SEWER (PLAN) - LENGTH-DIA. MATERIAL @ GRADE	(SIZE & MAT'L.) STM	→	→ LENGTH - SIZE MATL STM
WATER MAIN (PLAN)- LENGTH-DIA. MATERIAL-(FITTING-FITTING)	(SIZE & MAT'L.) WTR	→	→ LENGTH - SIZE MATL WTR
SANITARY SEWER (PROFILE) - LENGTH-DIA. MATERIAL @ GRADE	(SIZE & MAT'L.)	=====	XXX'- XX" PVC SAN @ 0.00%
SANITARY FORCEMAIN (PROFILE) - DIA. MATERIAL	(SIZE & MAT'L.)	=====	XXX'- XX" FORCEMAIN @ 0.00%
STORM SEWER (PROFILE) - LENGTH-DIA. MATERIAL @ GRADE	(SIZE & MAT'L.)	=====	XXX'- XX" RCP STM @ 0.00%
WATER MAIN (PROFILE)- DIA. MATERIAL	(SIZE & MAT'L.)	=====	X" PVC WM.
GAS MAIN	GAS	-----	-----
ELECTRIC - BURIED	UGE	-----	-----
ELECTRIC - OVERHEAD	OE	-----	-----
TELEPHONE - BURIED	TEL	-----	-----
TELEPHONE - BURIED (FIBER OPTIC)	FO	-----	-----
TELEPHONE - OVERHEAD	OH	-----	-----
CABLE TELEVISION - BURIED	TV	-----	-----
CABLE TELEVISION - OVERHEAD	OH	-----	-----
CENTERLINE		-----	-----
RIGHT-OF-WAY LINE		-----	-----
PROPERTY LINE		-----	-----
PAVEMENT (STREET, DRIVE, SIDEWALK, ETC.)		-----	-----
GRAVEL		-----	-----
CURB & GUTTER		=====	=====
RAILROAD			
GUARDRAIL		□	□
FENCE - AS LABELED		○	○

**CONTACTS**

xxxxx

**MAPPING & TOPOGRAPHY SYMBOLOGY**

DESCRIPTION	SYMBOL	EXISTING	PROPOSED
BENCHMARK		⊕	
CATCH BASIN/INLET		⊞	⊞
CONTROL POINT		▽	
CULVERT		(DIA. & TYPE)	(LENGTH-DIA. & TYPE)
CURB STOP		⊙	G OR W
ELECTRIC PEDESTAL		▽	
FIRE HYDRANT		⊕	⊕
IRON PIPE = IP		⊙ OR ⊙ <sub>IR</sub>	⊙ IP OR ⊙ <sub>IR</sub>
IRON ROD = IR			
LIGHT - ORNAMENTAL		⊕	⊕
LIGHT - STREET		⊙	⊙
MAILBOX		MB	
MANHOLE ELECTRIC		⊕	
MANHOLE GAS		⊕	
MANHOLE MISCELLANEOUS		⊕	⊕ MH
MANHOLE SANITARY		⊕	⊕ SAN MH
MANHOLE SIGNAL		⊕	⊕ SIG MH
MANHOLE STORM		⊕	⊕ STM MH
MANHOLE STORM INLET		⊕	
CATCH BASIN		⊞	
MANHOLE WATER		⊕	
MANHOLE TELEPHONE		⊕	
METER - GAS		⊕	
METER - WATER		⊕	
PEDESTAL CABLE TV		▽	
PEDESTAL TELEPHONE		▽	
SIGN		⊕	
BUSH CONIFER		⊕	
BUSH DECIDUOUS		⊕	
TREE DECIDUOUS/INCH DIA		⊕ 12"	
TREE CONIFEROUS/INCH DIA		⊕ 10"	
TREE LINE		~~~~~	
VALVE: W=WATER, G=GAS		⊕ OR ⊕ <sub>W</sub>	⊕ <sub>W</sub> OR ⊕ <sub>G</sub>
UTILITY POLE		⊕	
SILT FENCE		SF	SF
MAJOR CONTOURS		890	890
MINOR CONTOURS			
SPOT ELEVATIONS		+891.2	+891.22
INLET PROTECTION			□

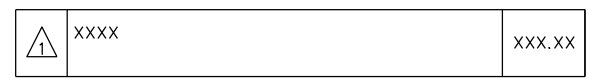
**GENERAL NOTES:**

1. THESE DRAWINGS ARE NEITHER A LEGALLY RECORDED MAP, NOR A SURVEY, AND IS NOT INTENDED TO BE USED AS ONE.
2. ALL PROPERTY LINES SHOWN ARE ESTABLISHED FROM COUNTY GIS FILES. PROPERTY LINES MAY NOT REFLECT ACTUAL LOT LINE LOCATIONS AND ARE FOR INFORMATIONAL PURPOSES ONLY.
3. UTILITY LOCATIONS SHOWN ON THE PLANS WERE PROVIDED BY THE UTILITY OWNER. FIELD LOCATIONS MAY VARY AND ADDITIONAL UTILITIES MAY EXIST. CONTRACTOR SHALL CONTACT DIGGERS HOTLINE A MINIMUM OF 3 WORKING DAYS PRIOR TO BEGINNING CONSTRUCTION.
4. ALL LENGTHS OF PROPOSED UTILITIES SHOWN ON THE PLANS ARE PER DESIGN, ACTUAL LENGTHS MAY VARY DURING CONSTRUCTION.

**LIST OF STANDARD ABBREVIATIONS**

ASPH	ASPHALT	NTS	NOT TO SCALE
B/B	BACK TO BACK	PC	POINT OF CURVATURE
BOC	BACK OF CURB	PCC	POINT OF COMPOUND CURVE
BLDG	BUILDING	PE	PEDESTAL
BM	BENCHMARK	PVMT	PAVEMENT
BSMT	BASEMENT	PI	POINT OF INTERSECTION
C	CUT	PL	PROPERTY LINE
C&G	CURB AND GUTTER	PP	POWER POLE
C/C	CENTER TO CENTER	PROP	PROPOSED
CABC	CRUSHED AGGREGATE BASE COURSE	PT	POINT OF TANGENCY
CB	CATCH BASIN	PVC	POLYVINYL CHLORIDE
CI	CAST IRON PIPE	PVI	POINT OF VERTICAL INTERSECTION
CL	CENTERLINE	PVT	POINT OF VERTICAL TANGENCY
CMP	CORRUGATED METAL PIPE	R	RANGE OR RADIUS
CO	CLEAN OUT	RCP	REINFORCED CONCRETE PIPE
CONC	CONCRETE	REBAR	REINFORCEMENT BAR
CP	CONTROL POINT	REOD	REQUIRED
CTH	COUNTY TRUNK HIGHWAY	RL	REFERENCE LINE
CTV	CABLE TV	ROW	RIGHT-OF-WAY
CS	CURB STOP	SAN	SANITARY
DIA	DIAMETER	WALK	SIDEWALK
DI	DUCTILE IRON PIPE	SF	SILT FENCE
EA	EACH	SL	SANITARY LATERAL
ELEC	ELECTRIC (E WHEN USED IN LINE STYLE)	SHLDR	SHOULDER
EP	EDGE OF PAVEMENT	STA	STATION
EXIST	EXISTING	STH	STATE TRUNK HIGHWAY
FH	FIRE HYDRANT	STM	STORM OR STORM SEWER
FL	FLOW LINE	TEL	TELEPHONE
FM	FORCE MAIN	TEMP	TEMPORARY
FO	FIBER OPTIC	TOC	TOP OF CURB
G	GAS	TYP	TYPICAL
GV	GAS VALVE	VC	VERTICAL CURVE
GW	GUY WIRE	WM	WATER MAIN
INV	INVERT	WS	WATER SERVICE
IP	IRON PIPE OR PIN	WV	WATER VALVE
L	LENGTH (OF CURVE)		
LC	LONG CHORD OF CURVE		
LP	LIGHT POLE		
MB	MAILBOX		
MG	METER-GAS		
MH	MANHOLE		

**BENCHMARKS**



NOTE: ALL BENCHMARK LOCATIONS ARE SHOWN ON PLAN

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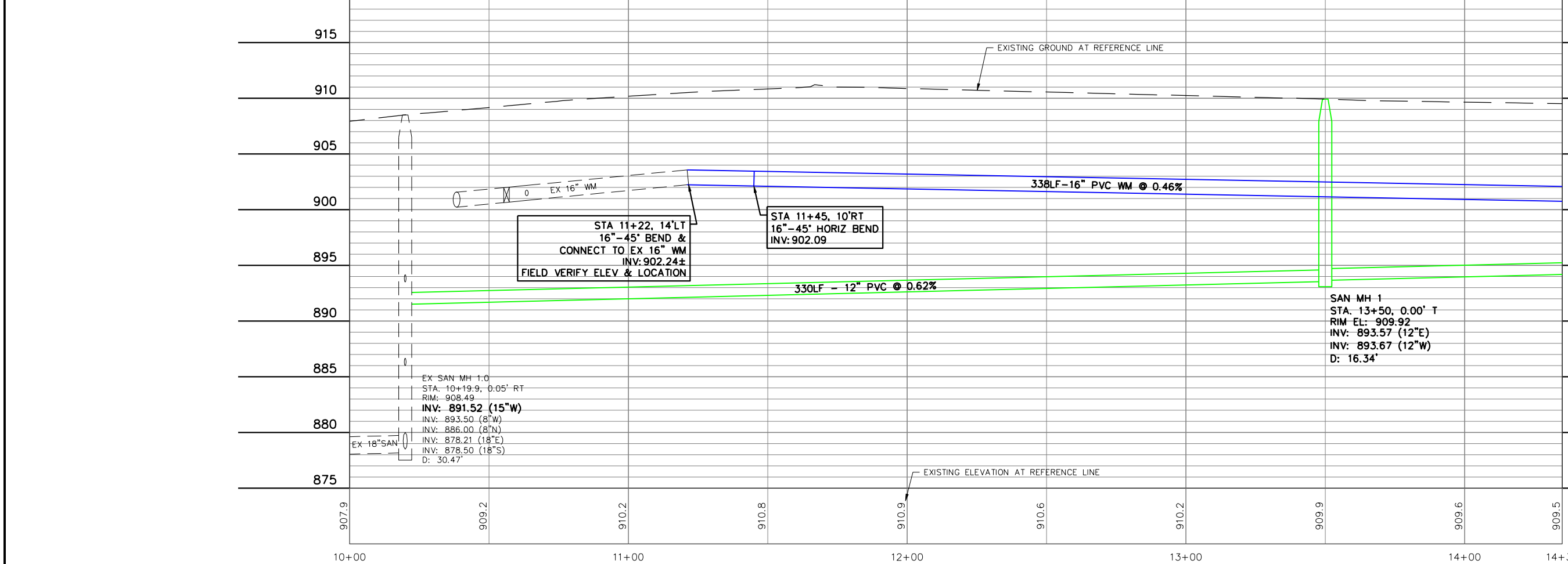
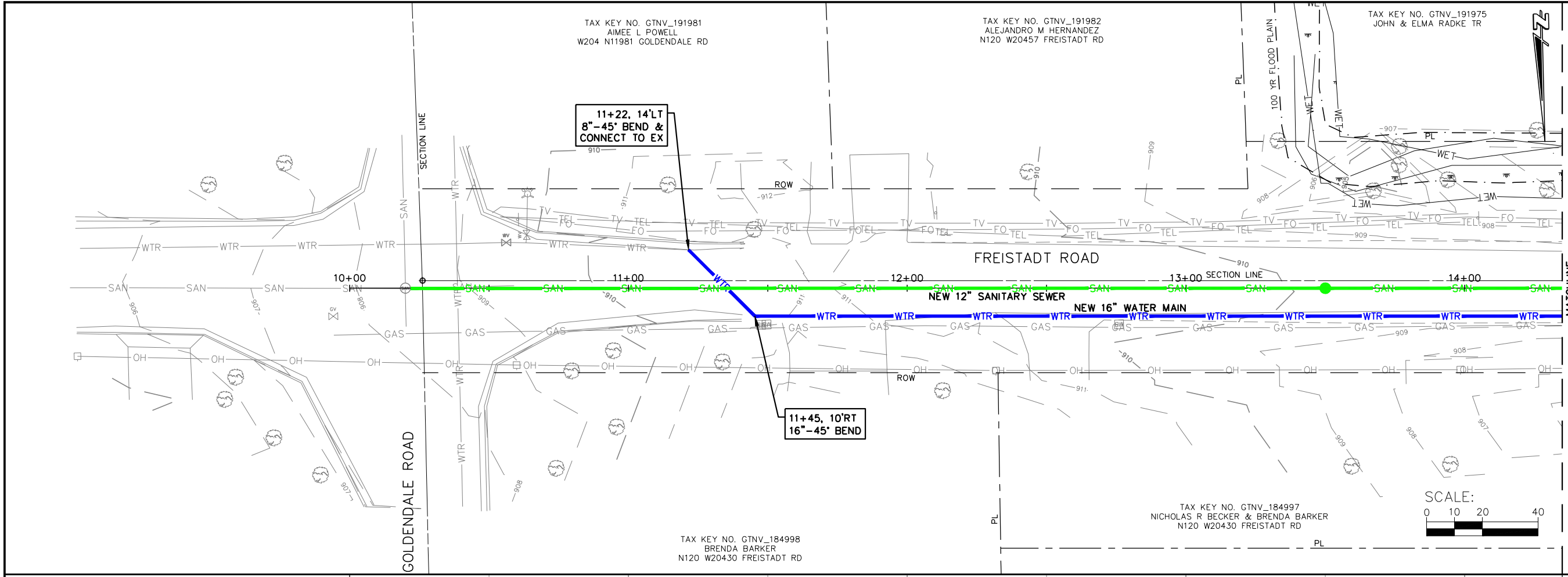
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STANDARD SYMBOLS AND ABBREVIATIONS

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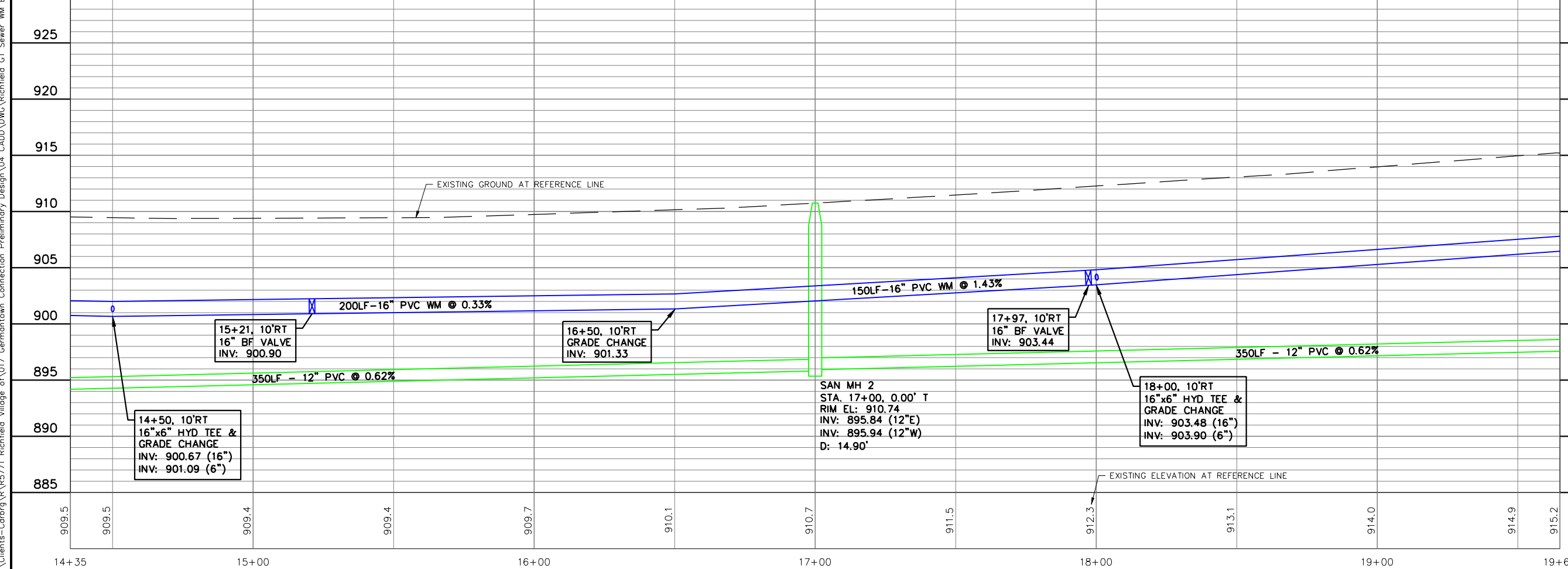
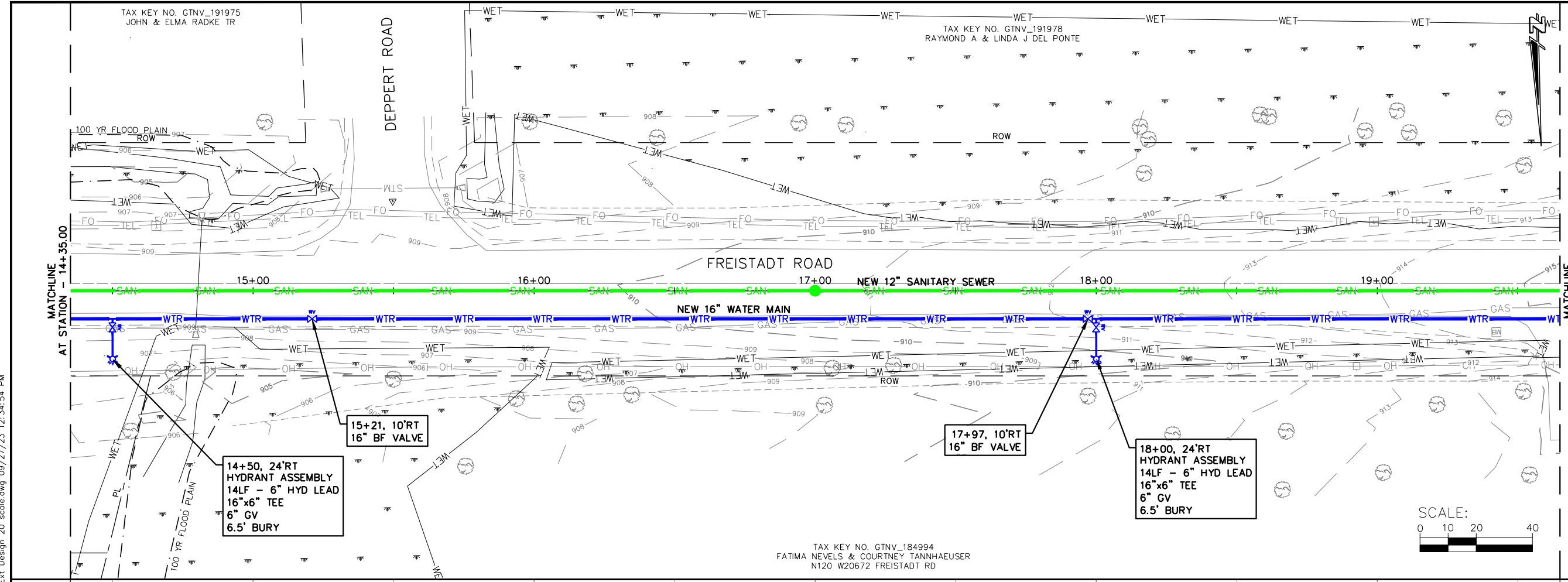
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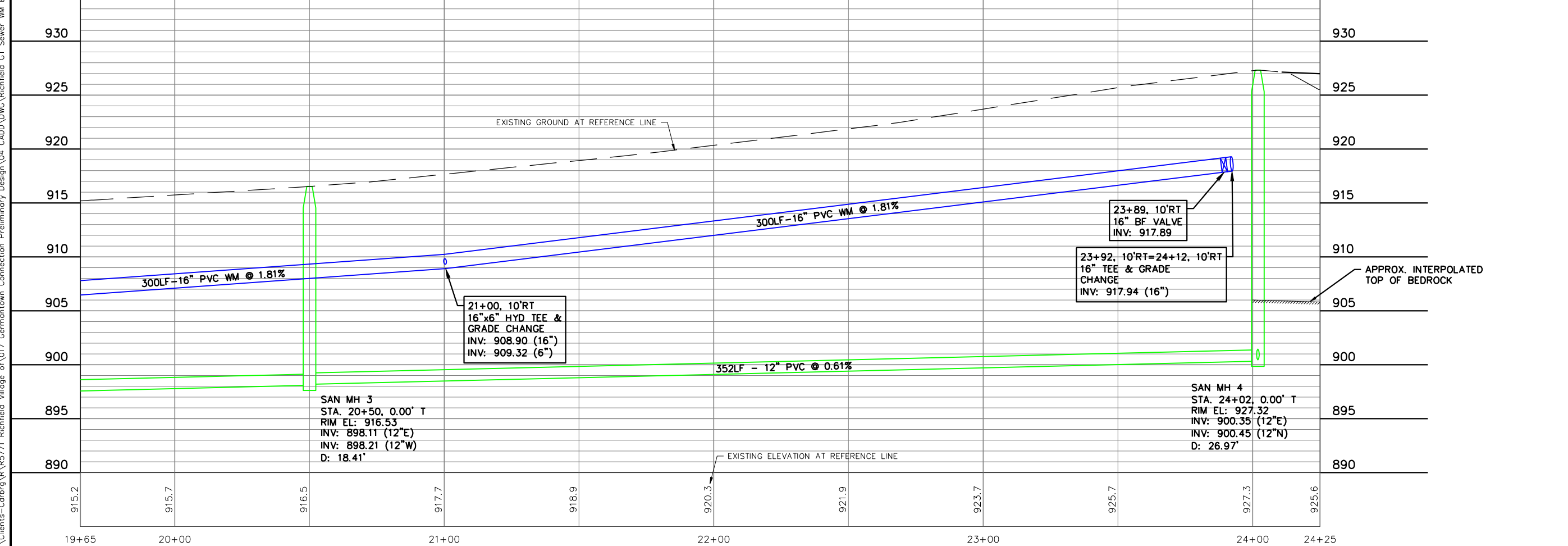
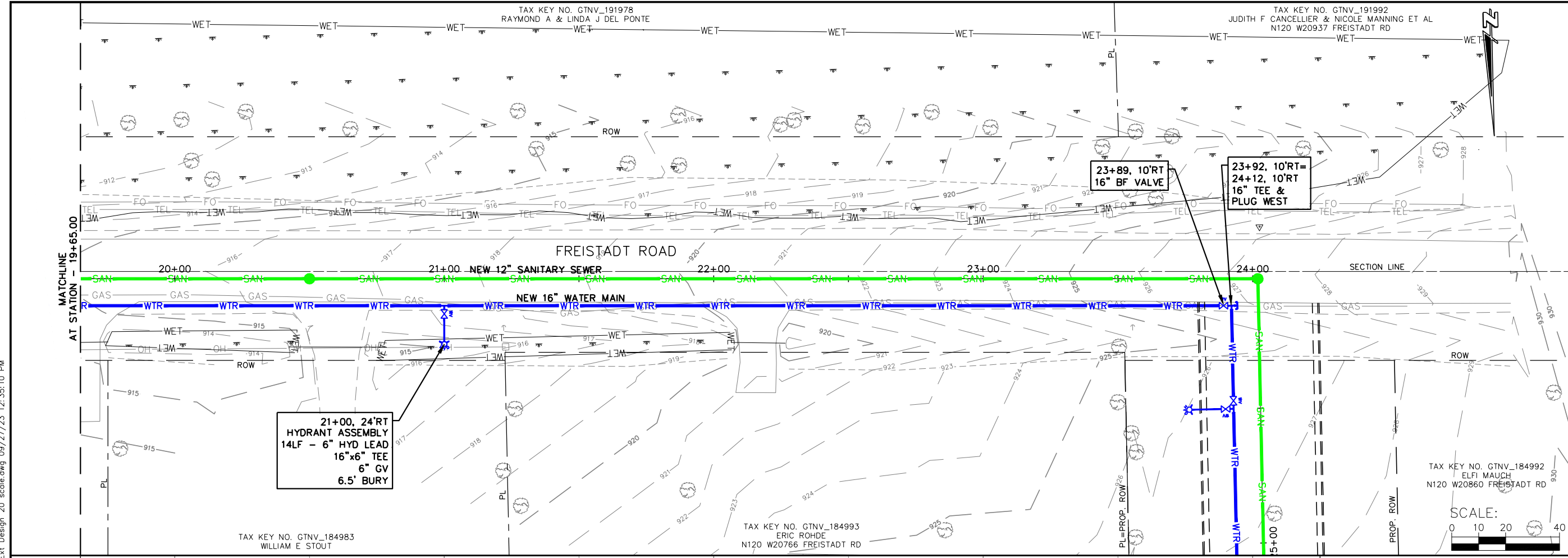
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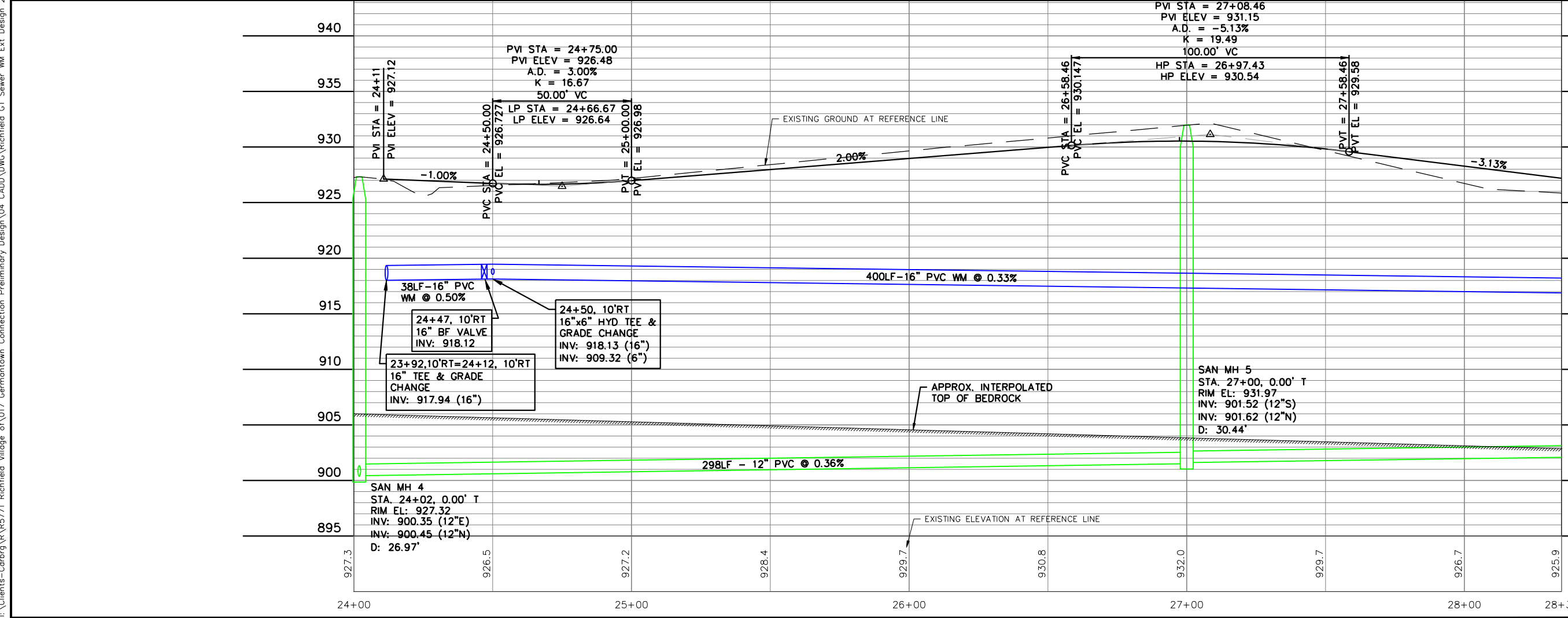
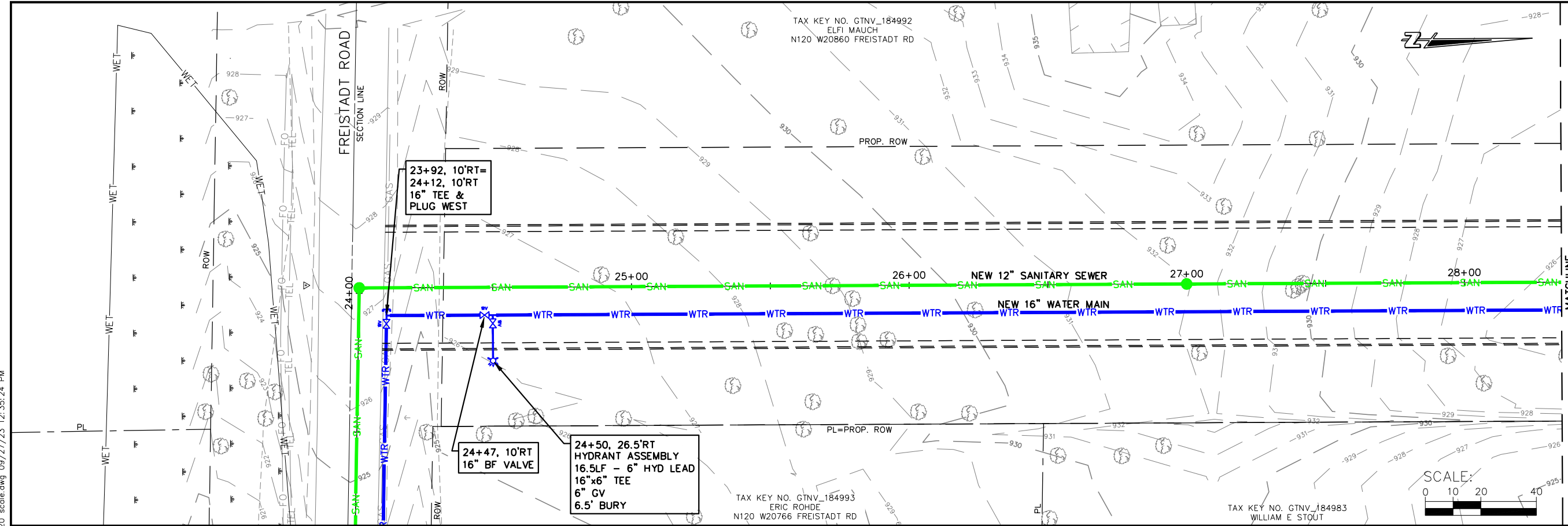
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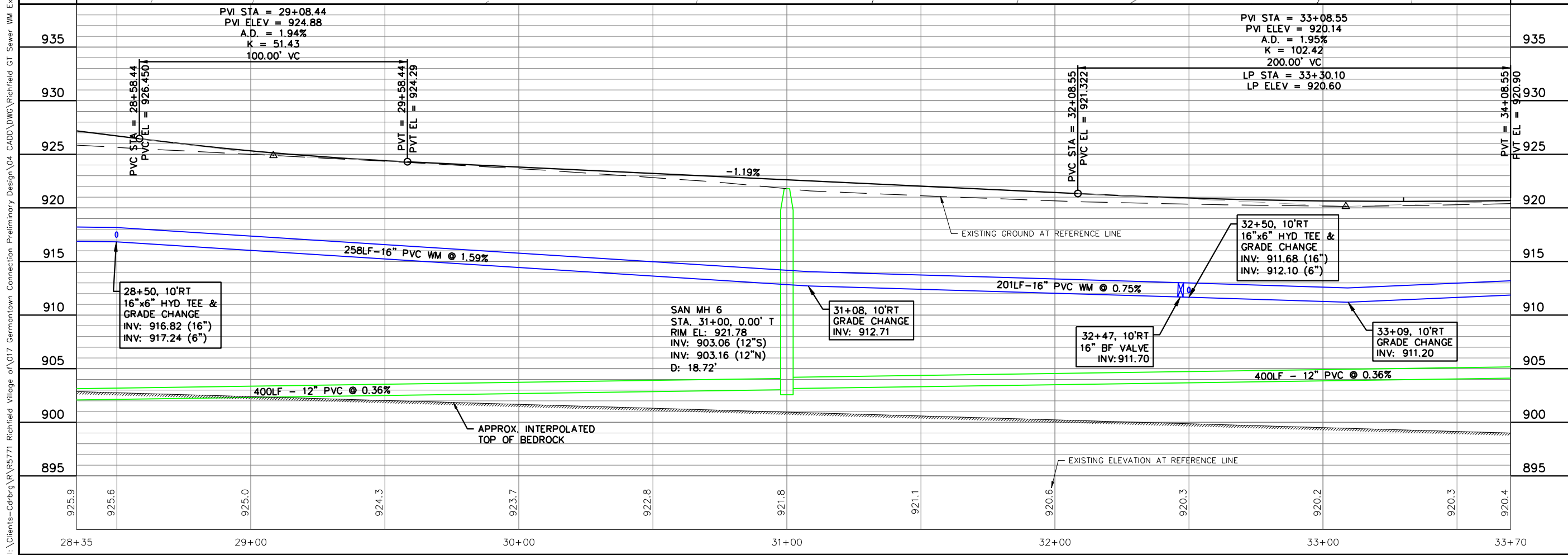
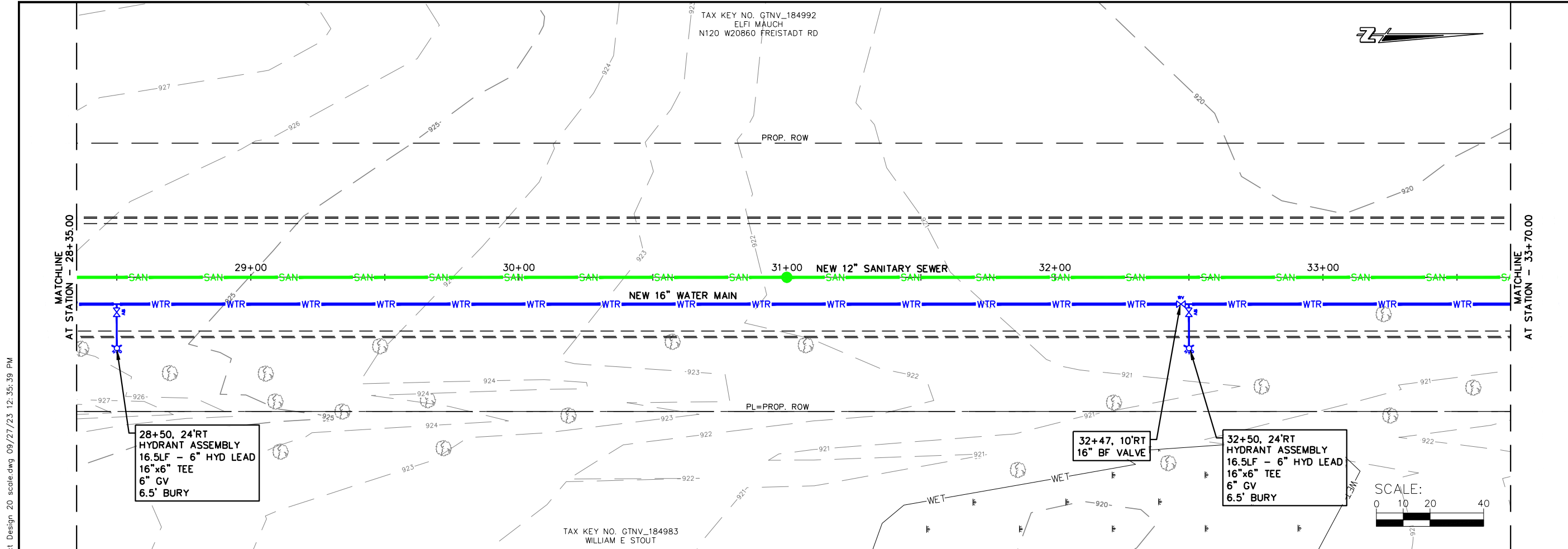
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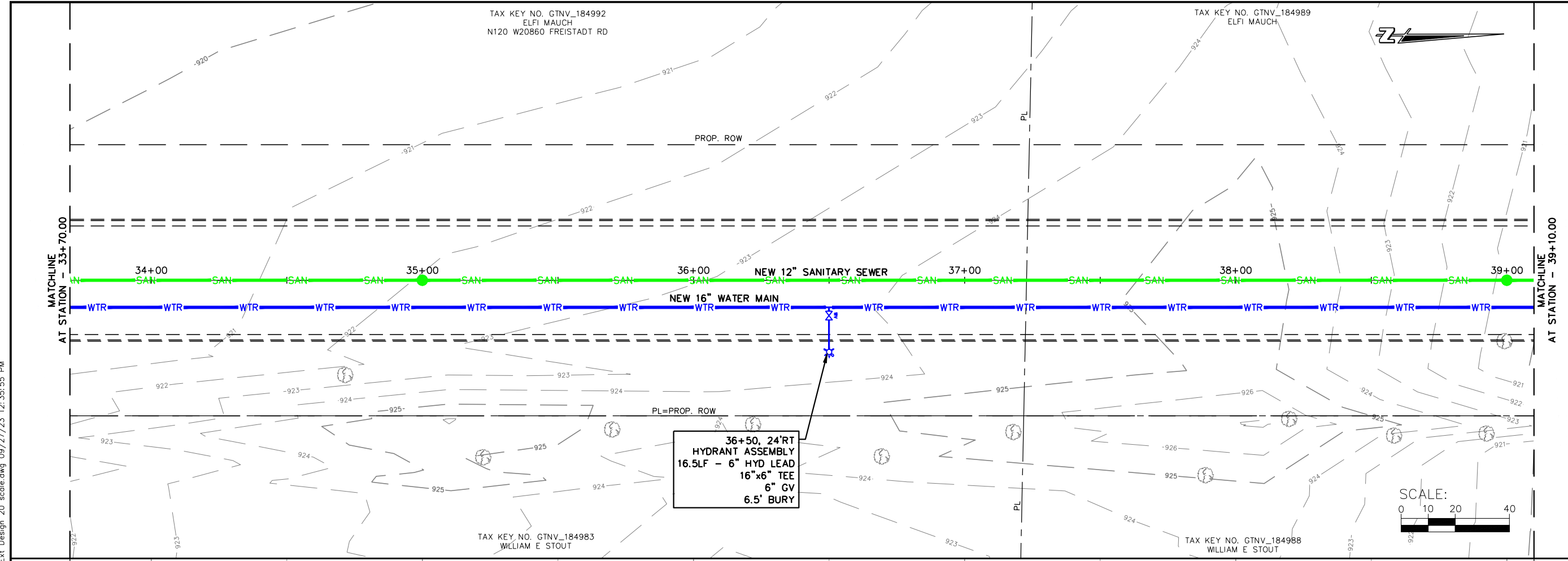
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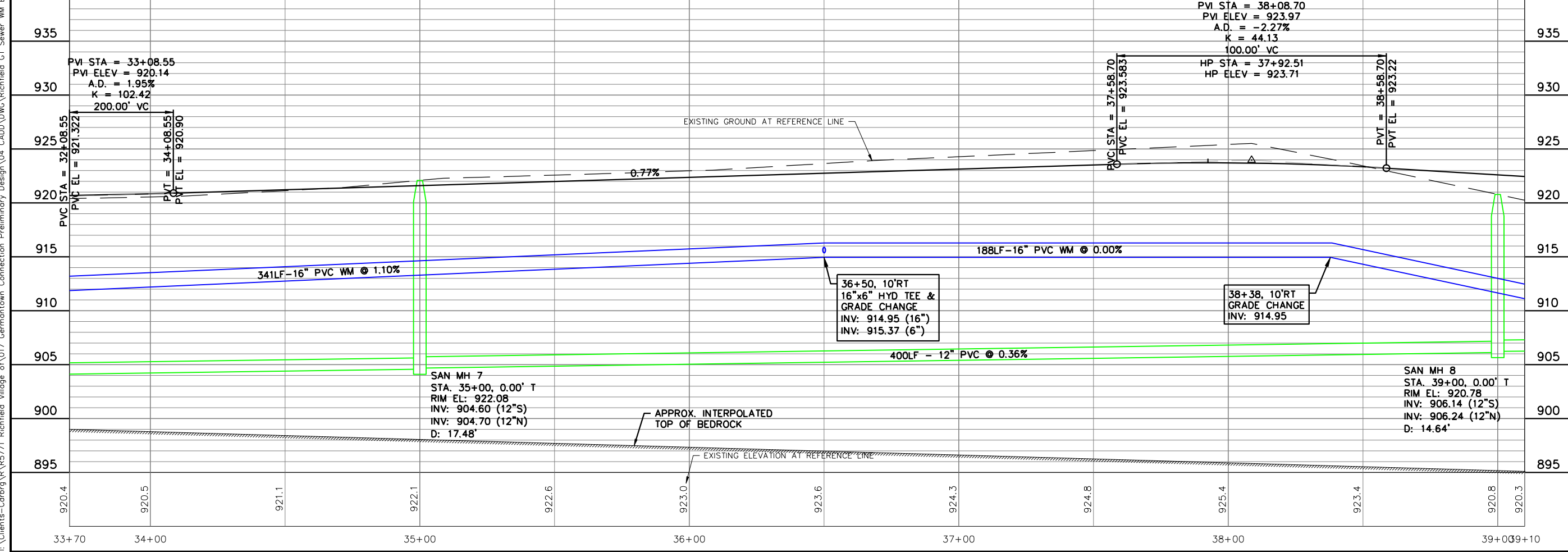
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36+50, 24'RT  
HYDRANT ASSEMBLY  
16.5LF - 6" HYD LEAD  
16"x6" TEE  
6" GV  
6.5' BURY



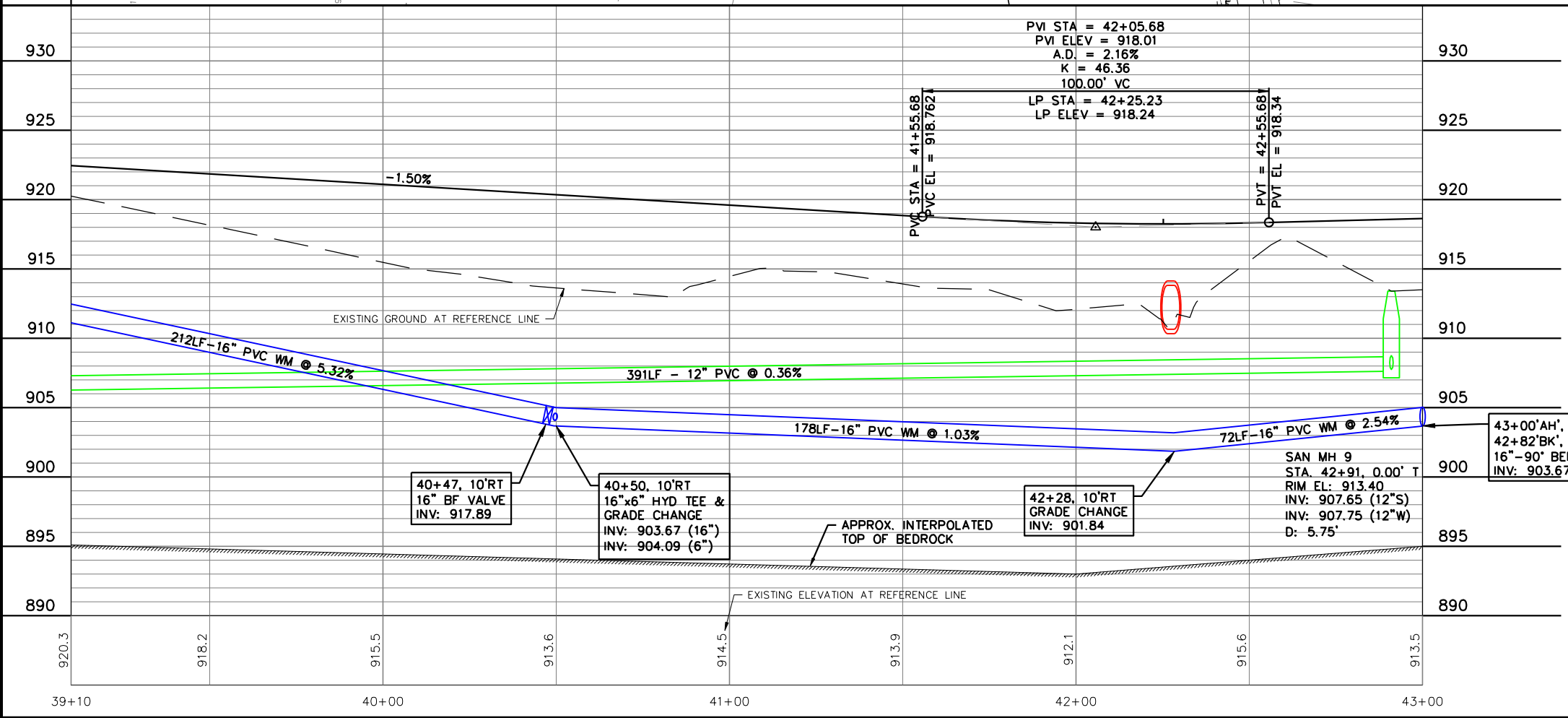
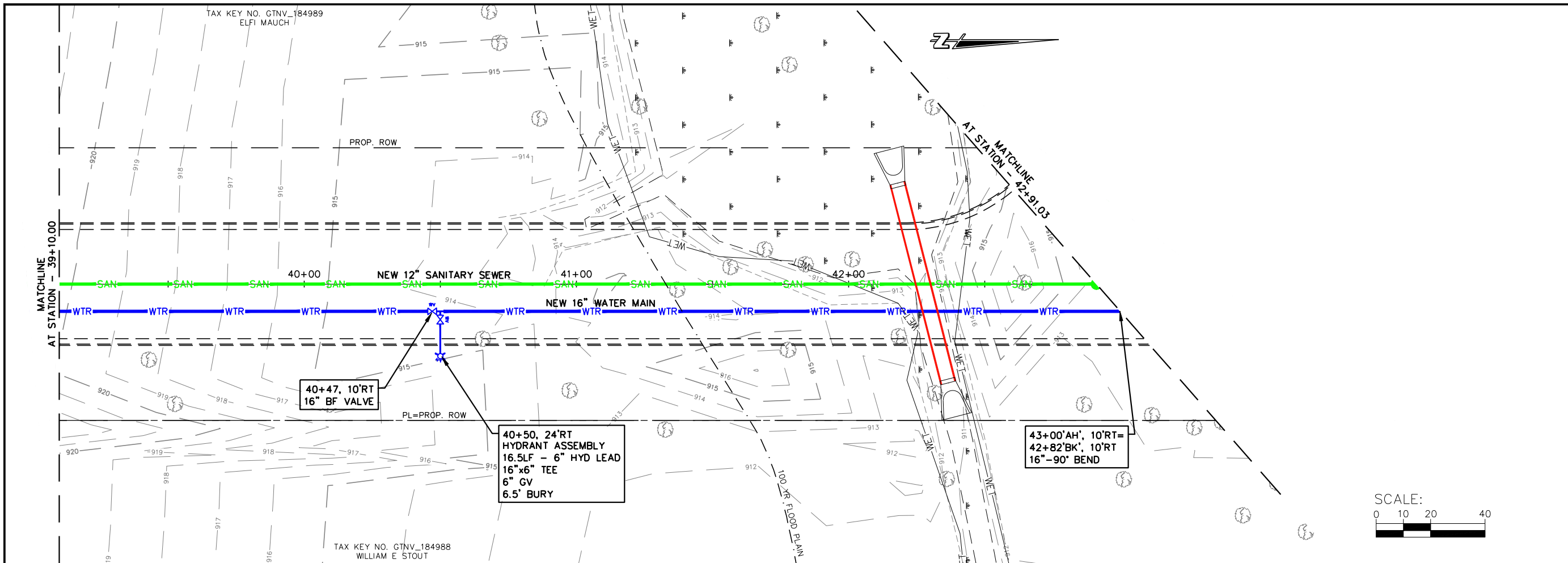
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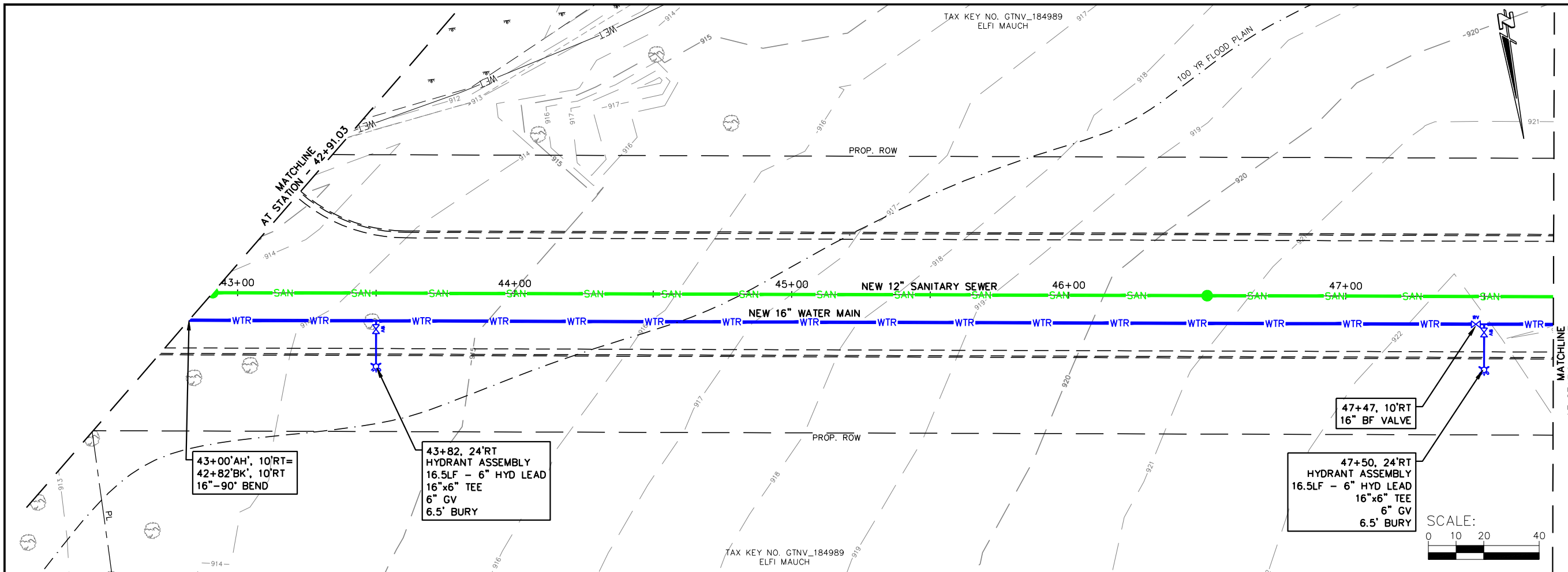
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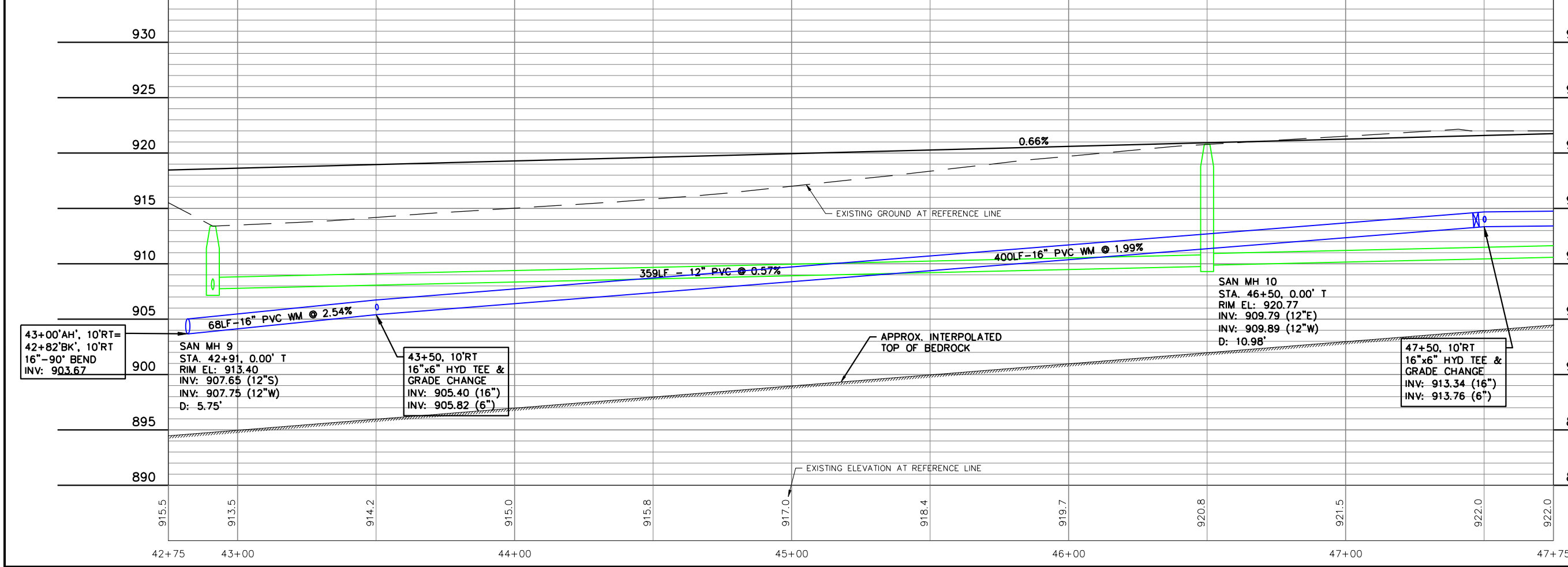
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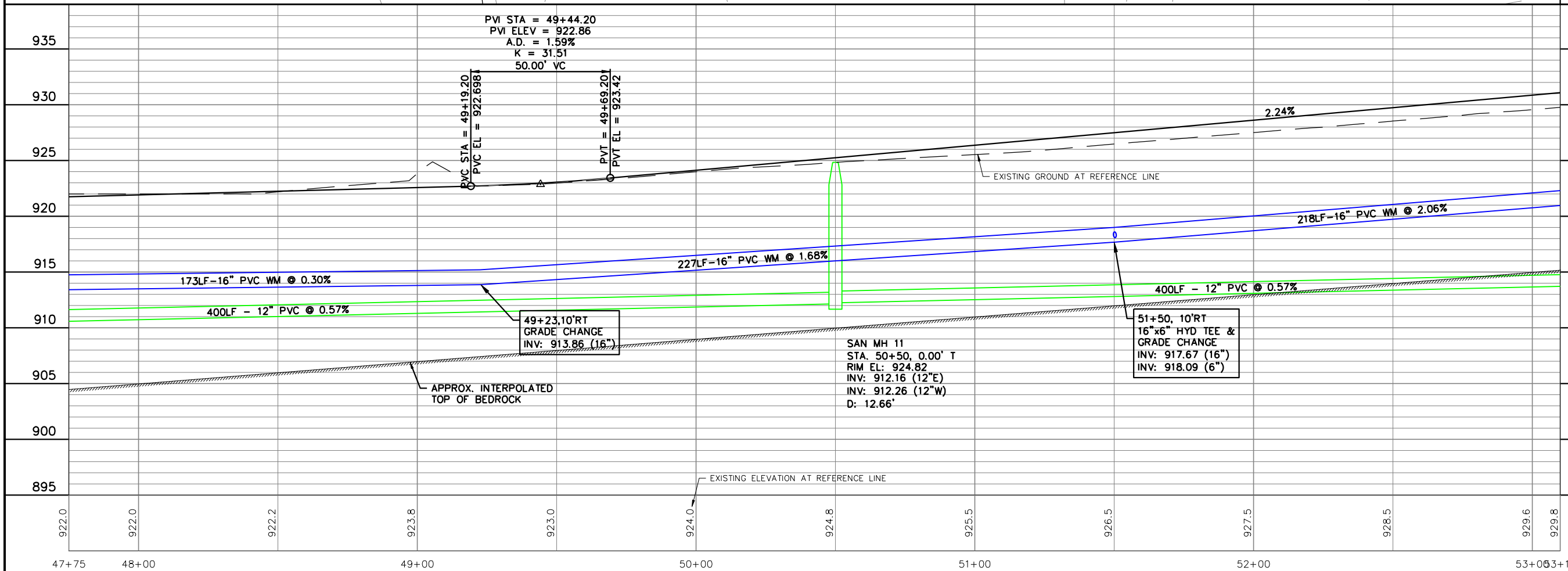
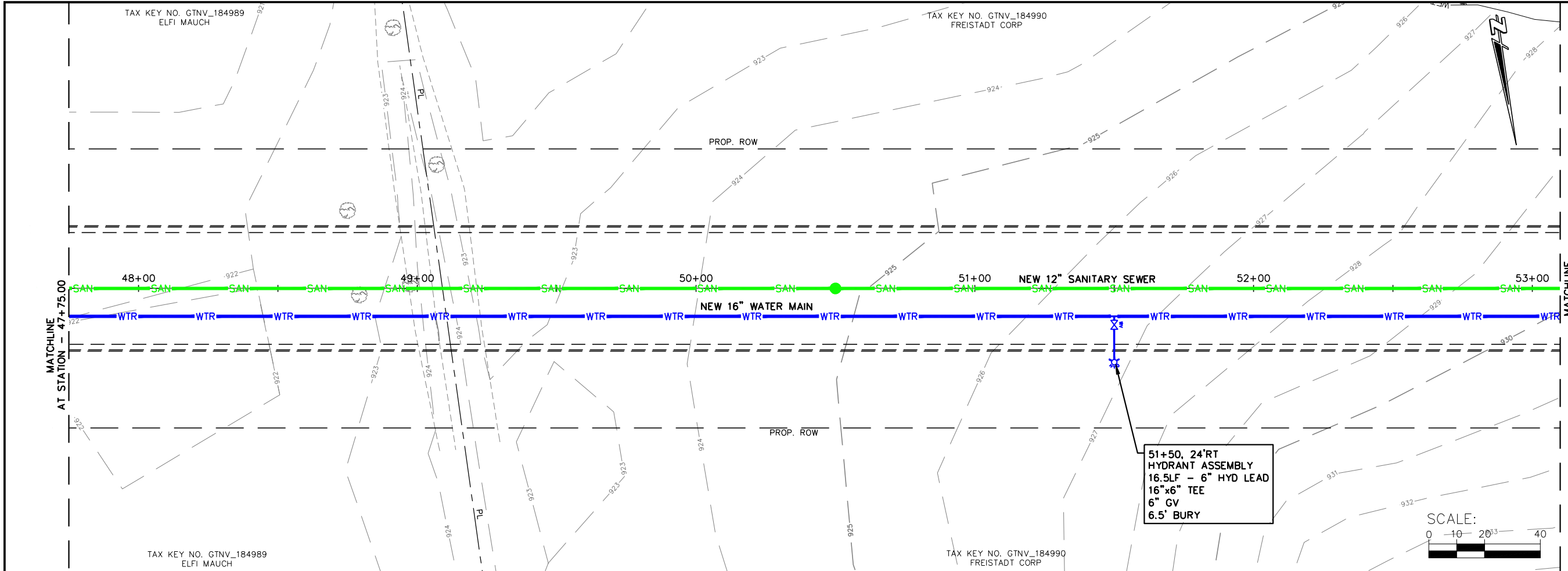


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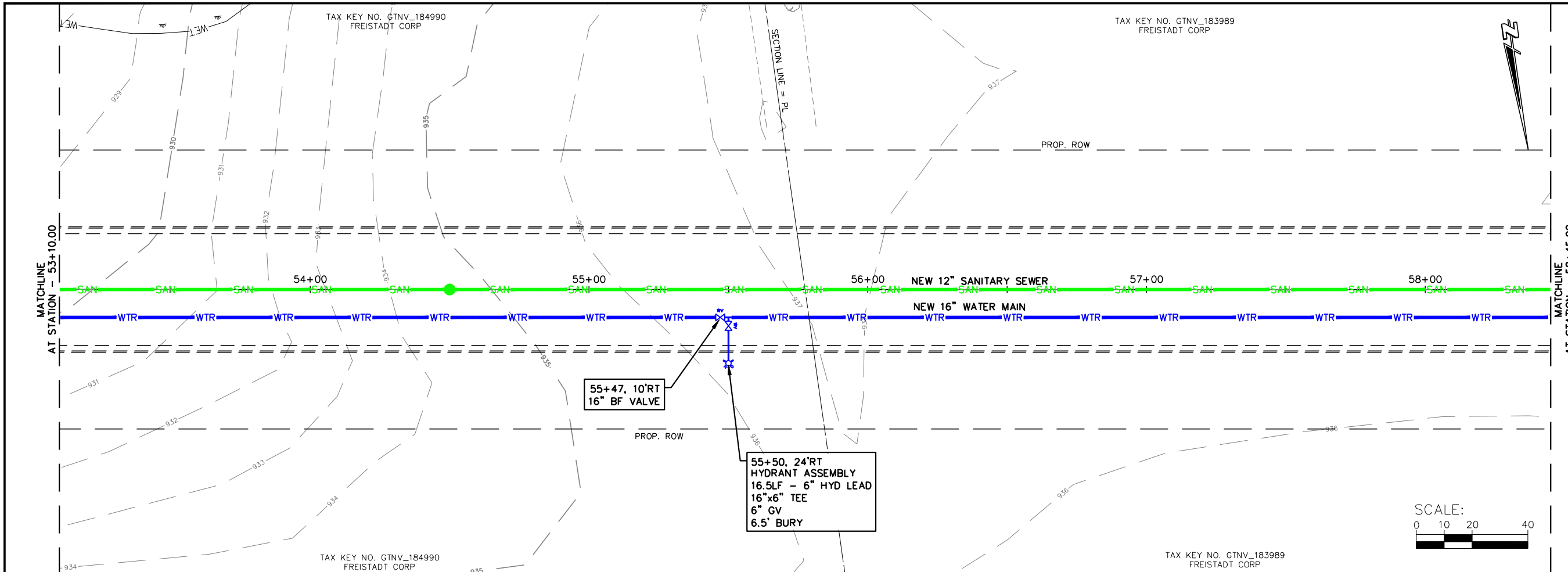
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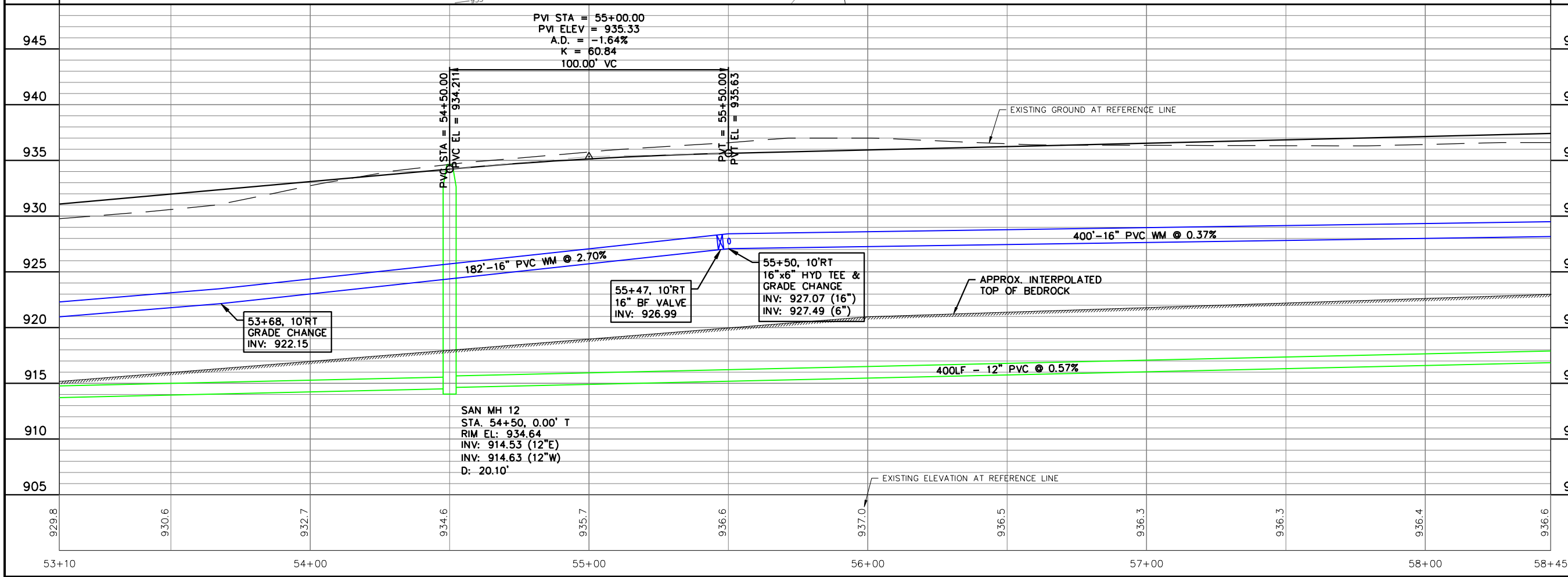
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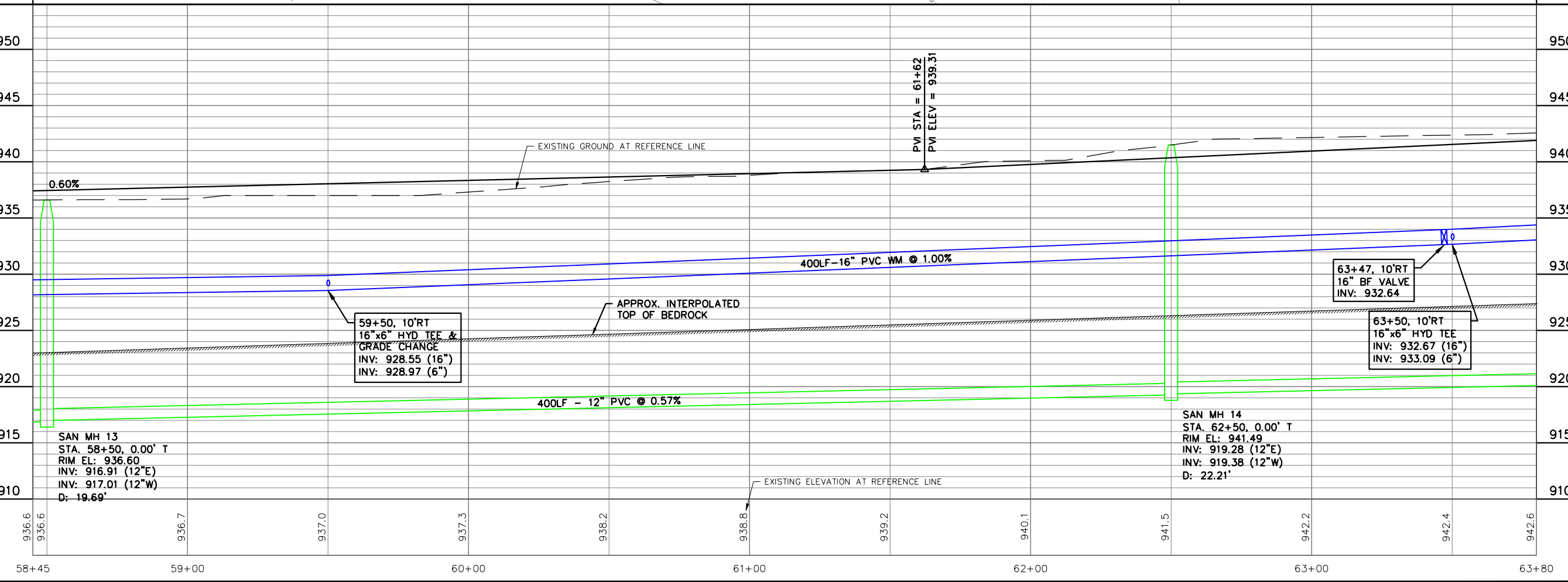
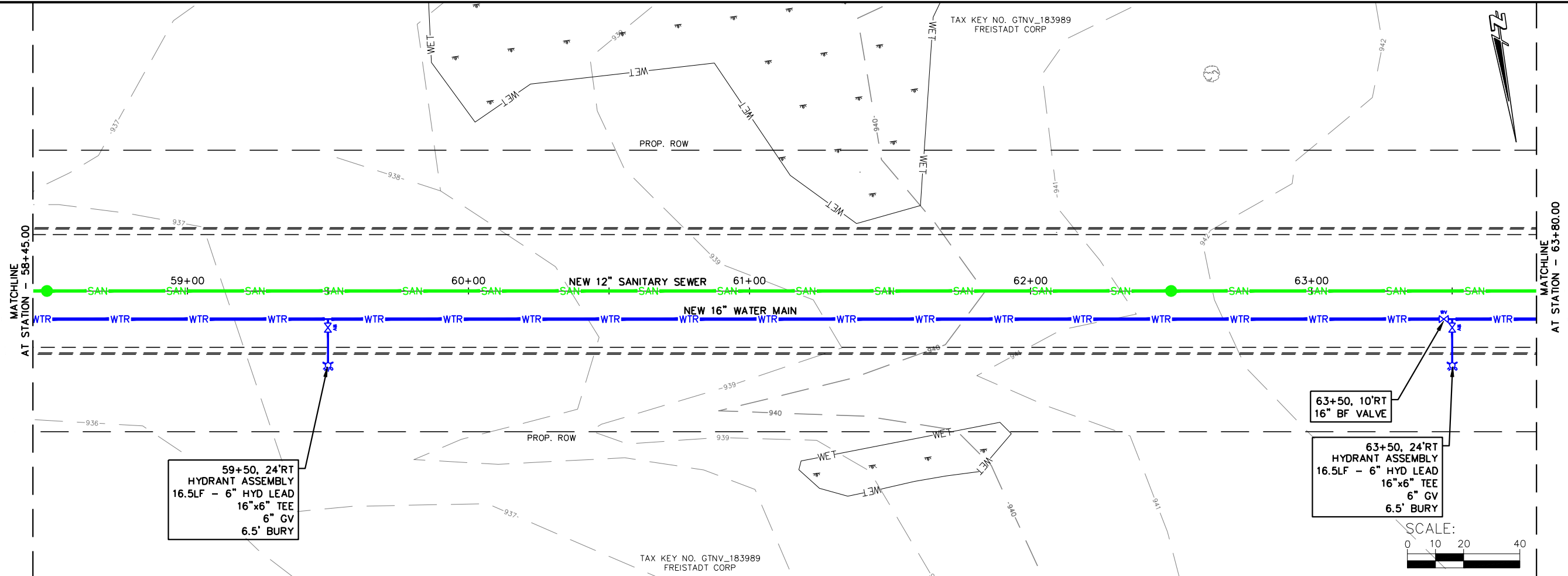
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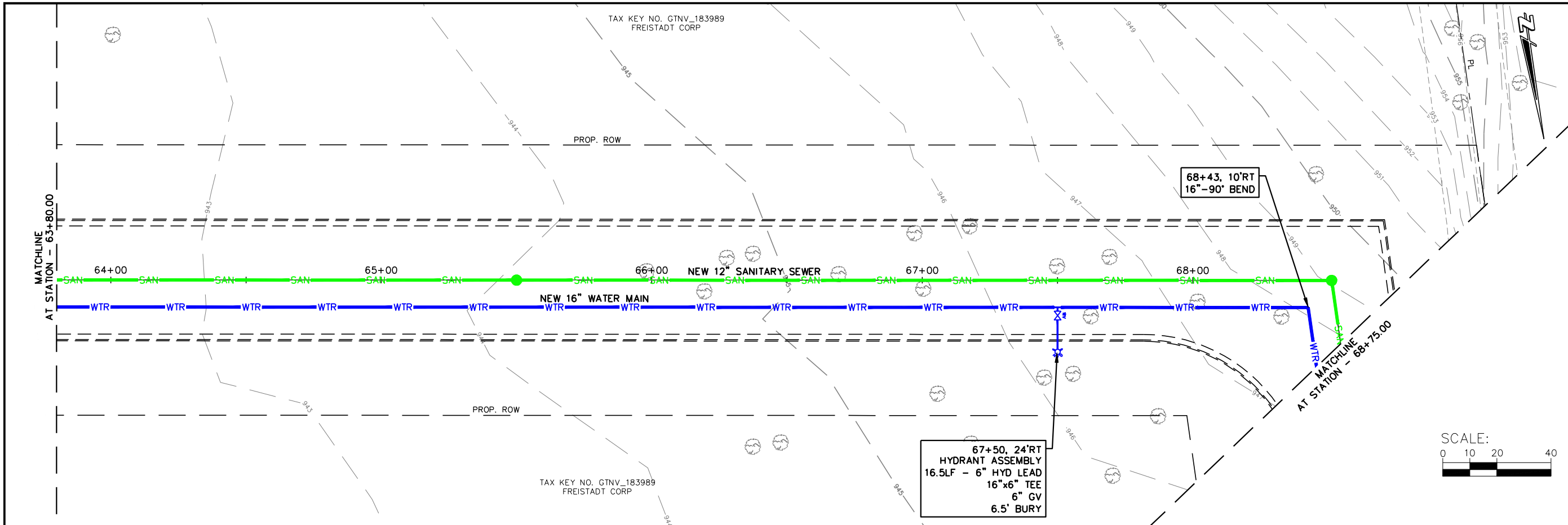
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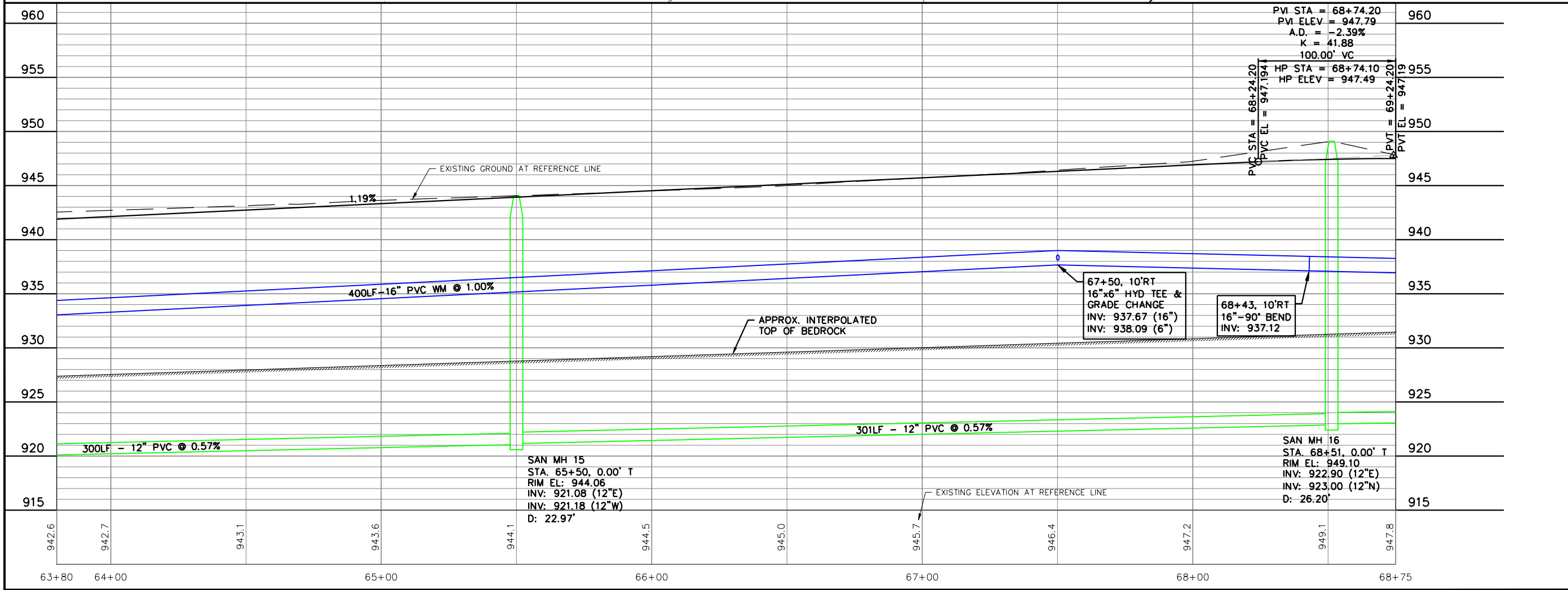
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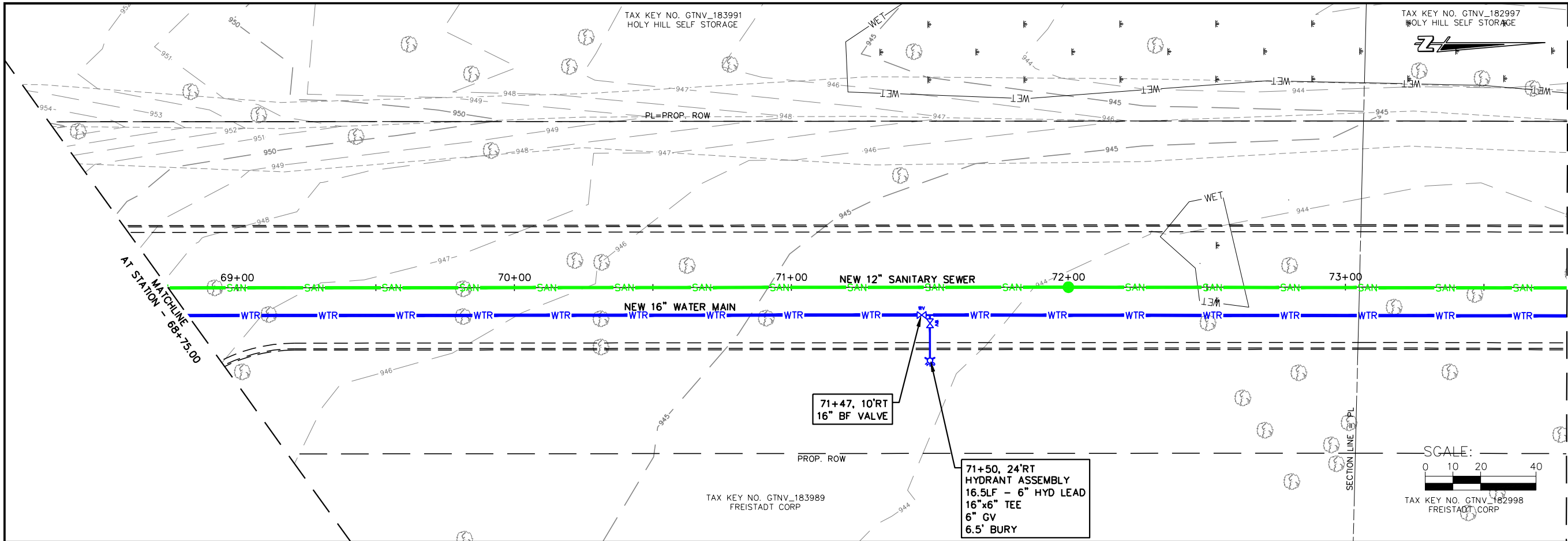
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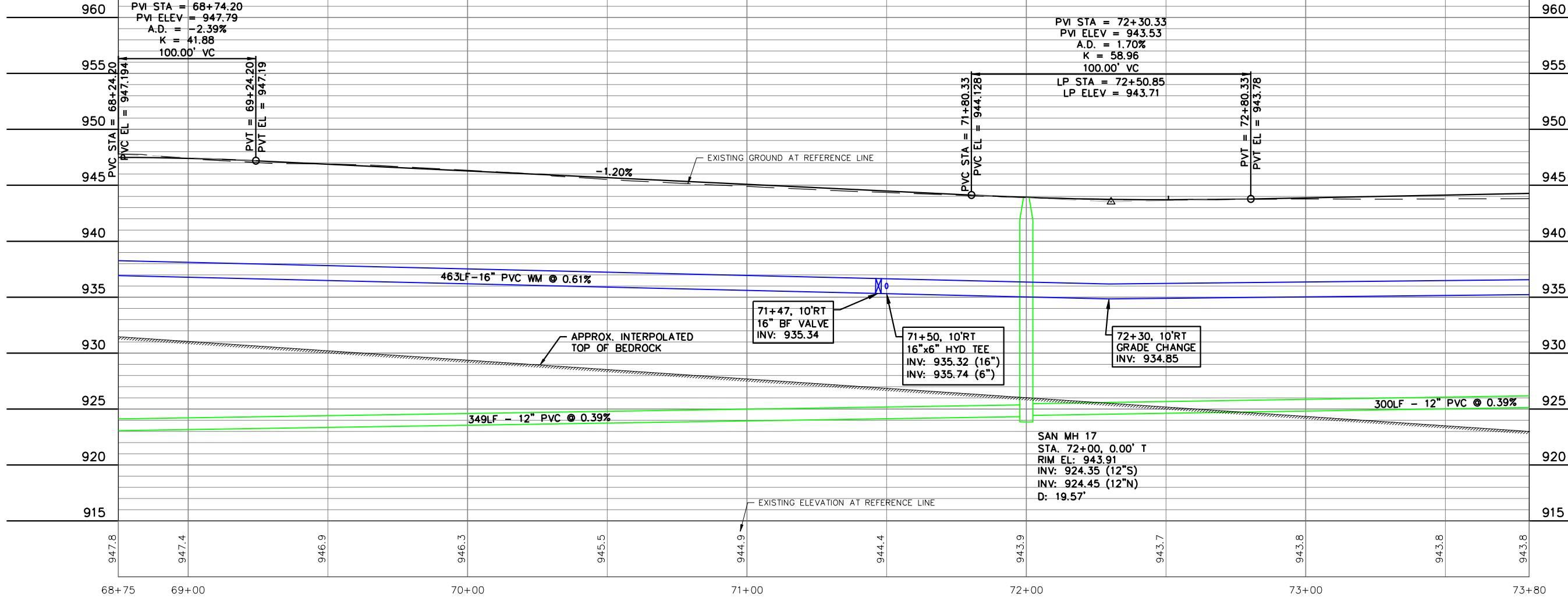
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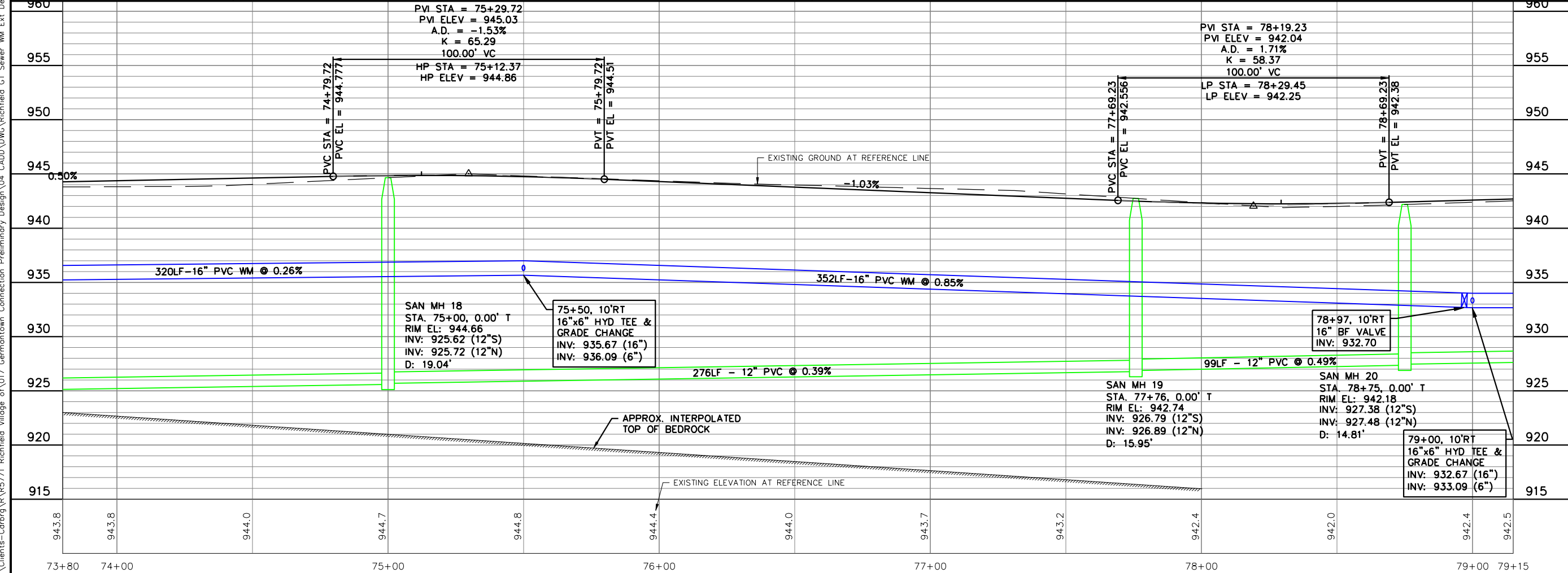
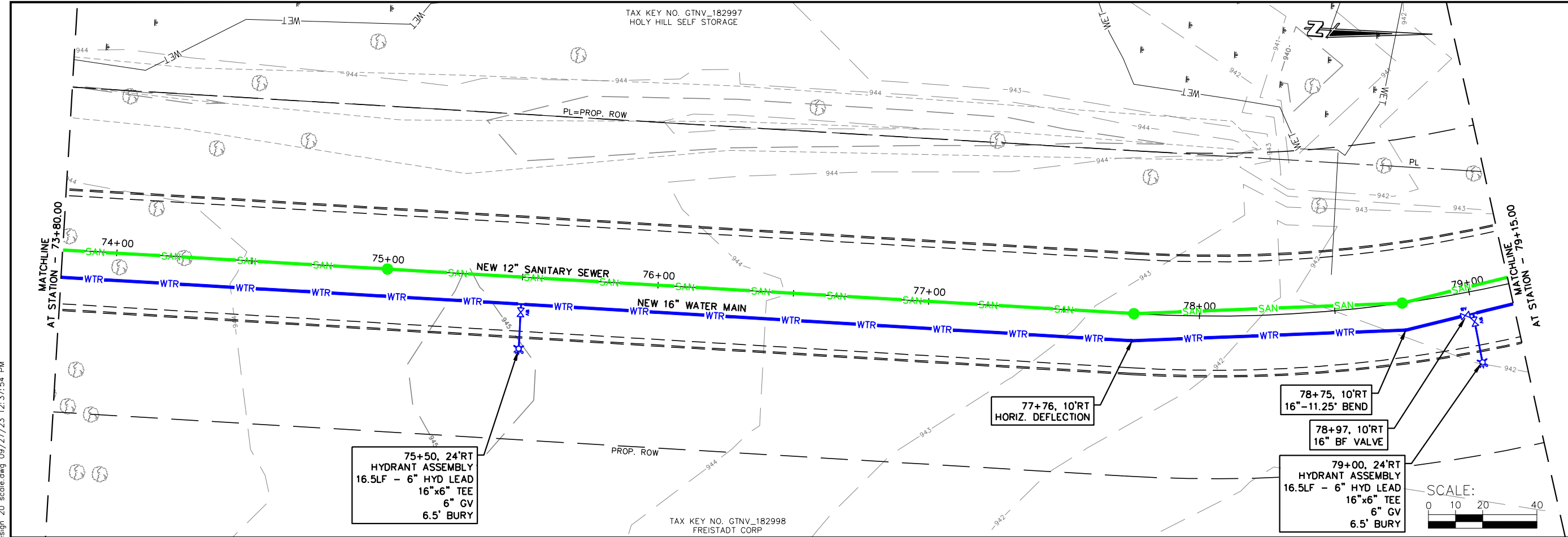
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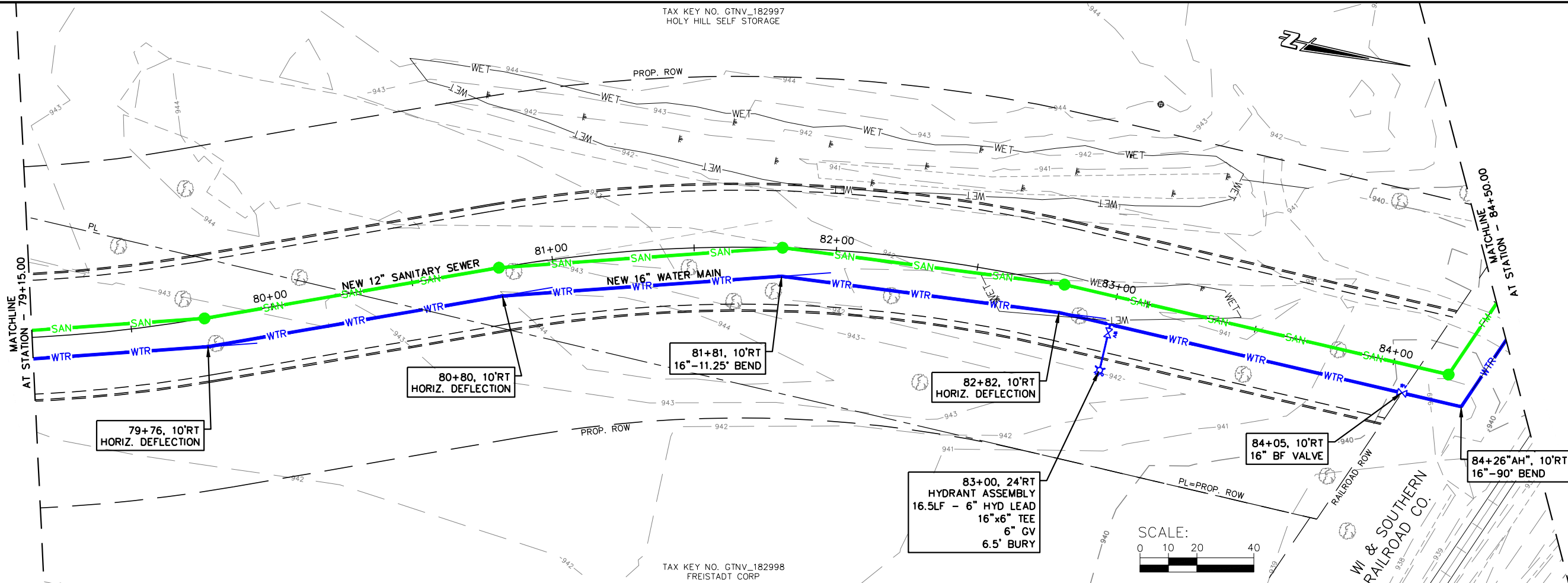
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TAX KEY NO. GTNV\_182997  
HOLY HILL SELF STORAGE

TAX KEY NO. GTNV\_182998  
FREISTADT CORP



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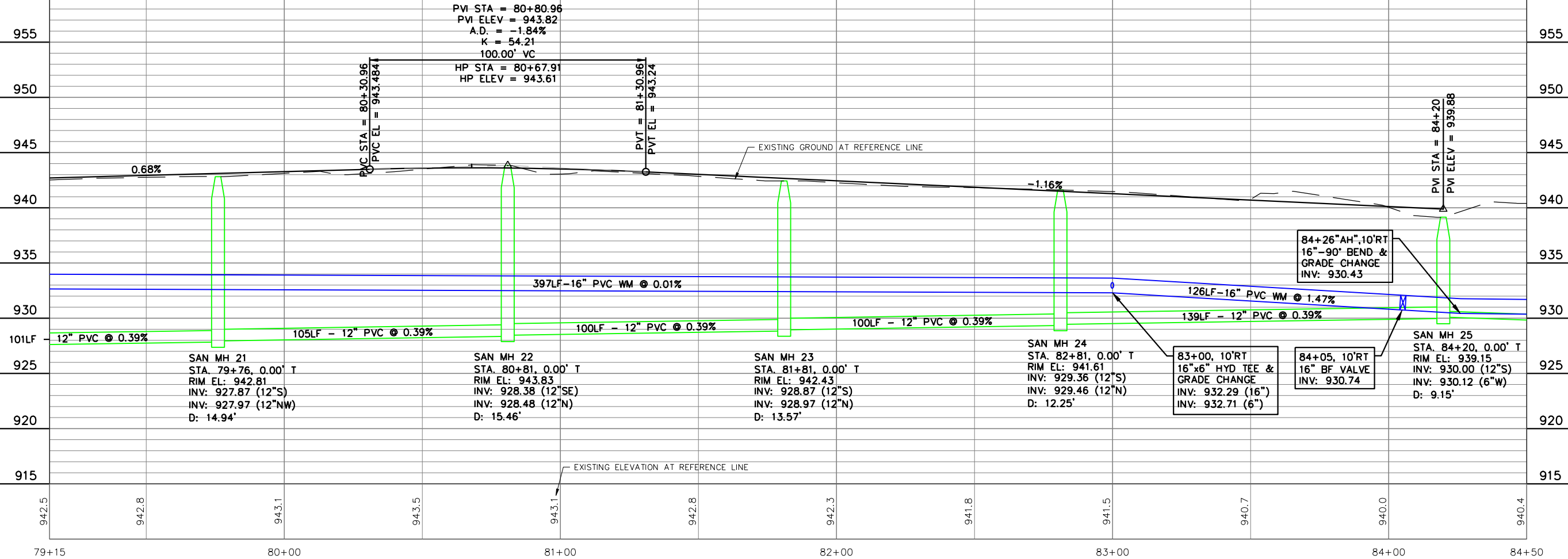
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FAX 608-249-9824

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FAX 920-491-9020

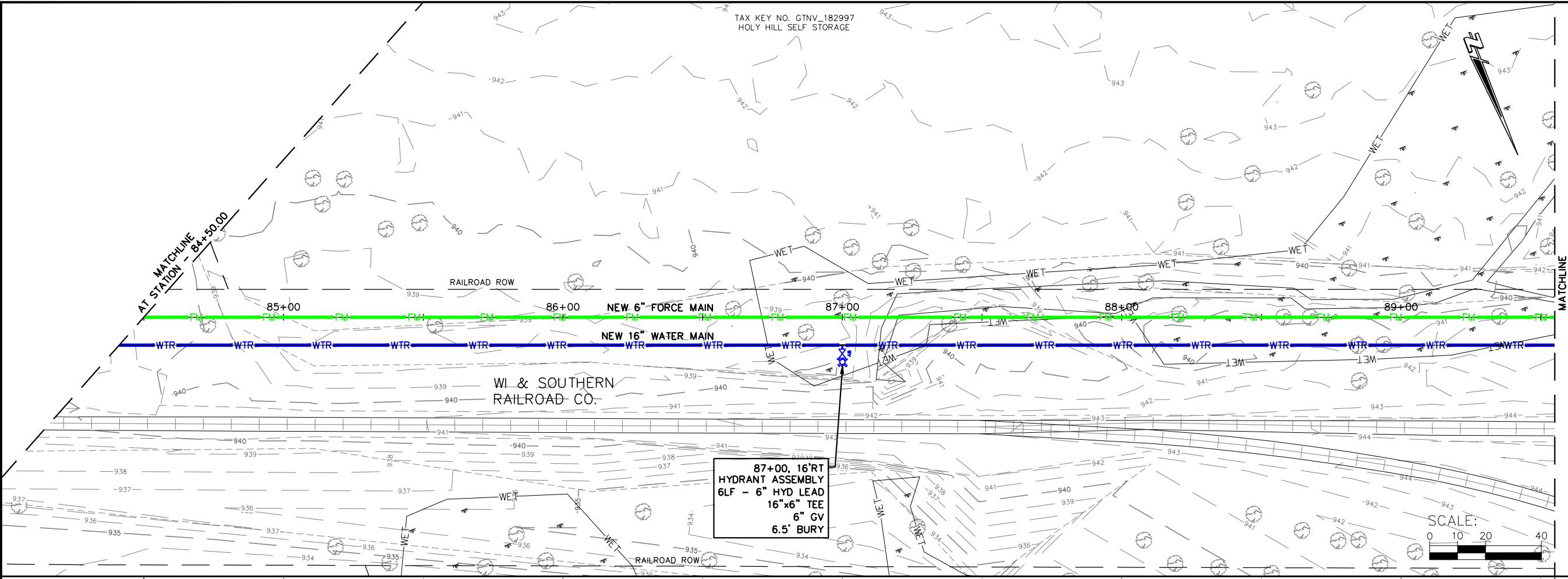
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GERMANTOWN CONNECTION  
WASHINGTON COUNTY, WISCONSIN  
FUTURE ROAD PLAN AND PROFILE

SHEET NO.  
18 of XX

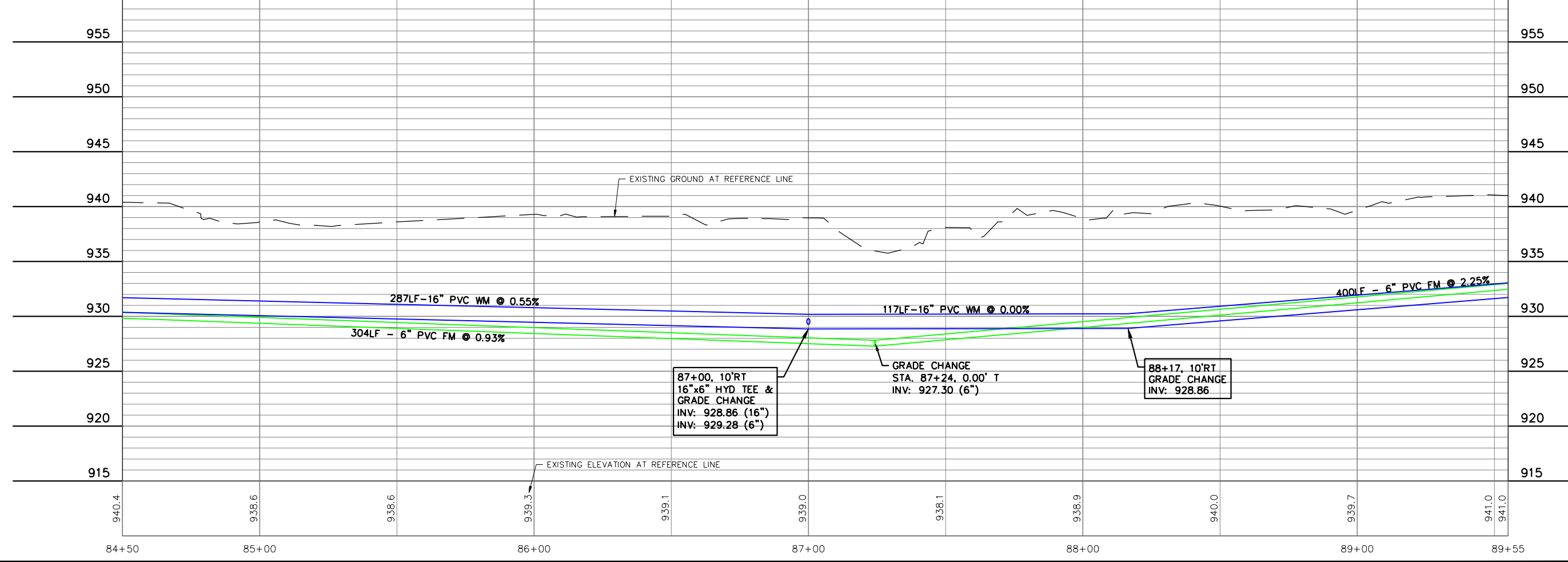
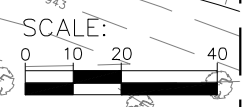


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TAX KEY NO. GTNV\_182997  
HOLY HILL SELF STORAGE



87+00, 16'RT  
HYDRANT ASSEMBLY  
6LF - 6" HYD LEAD  
16"x6" TEE  
6" GV  
6.5' BURY



87+00, 10'RT  
16"x6" HYD TEE &  
GRADE CHANGE  
INV: 928.86 (16")  
INV: 929.28 (6")

GRADE CHANGE  
STA. 87+24, 0.00' T  
INV: 927.30 (6")

88+17, 10'RT  
GRADE CHANGE  
INV: 928.86

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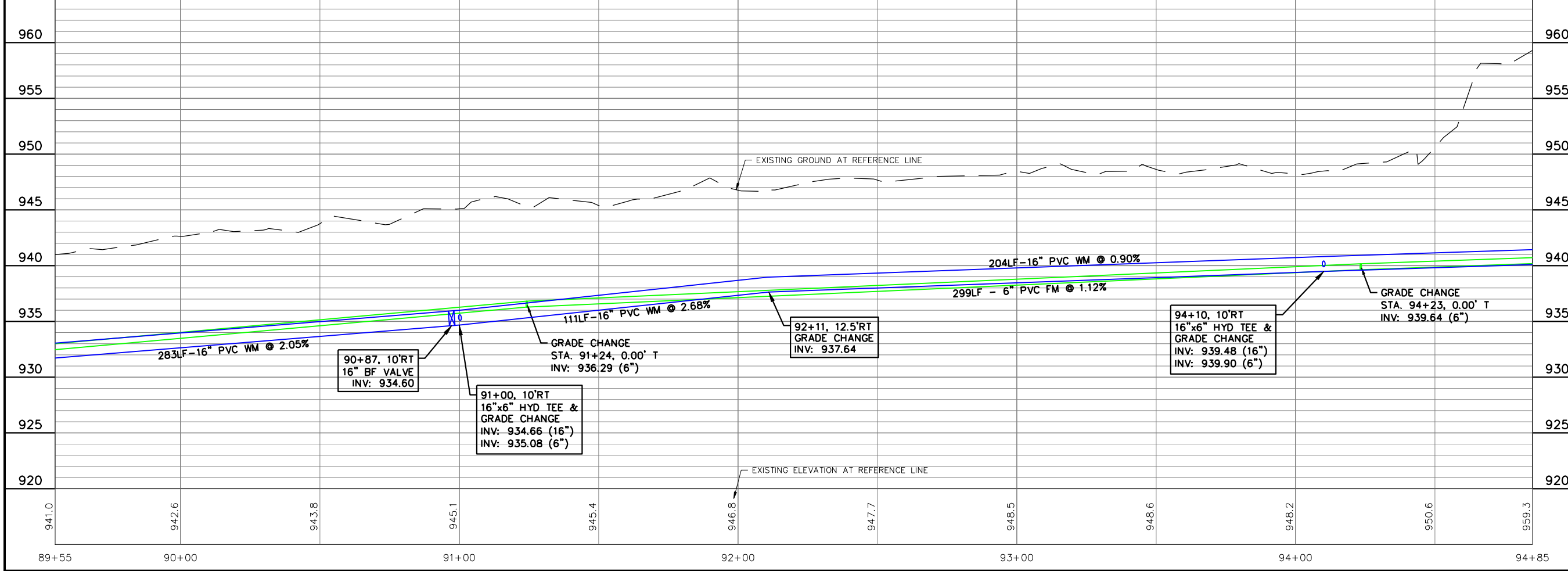
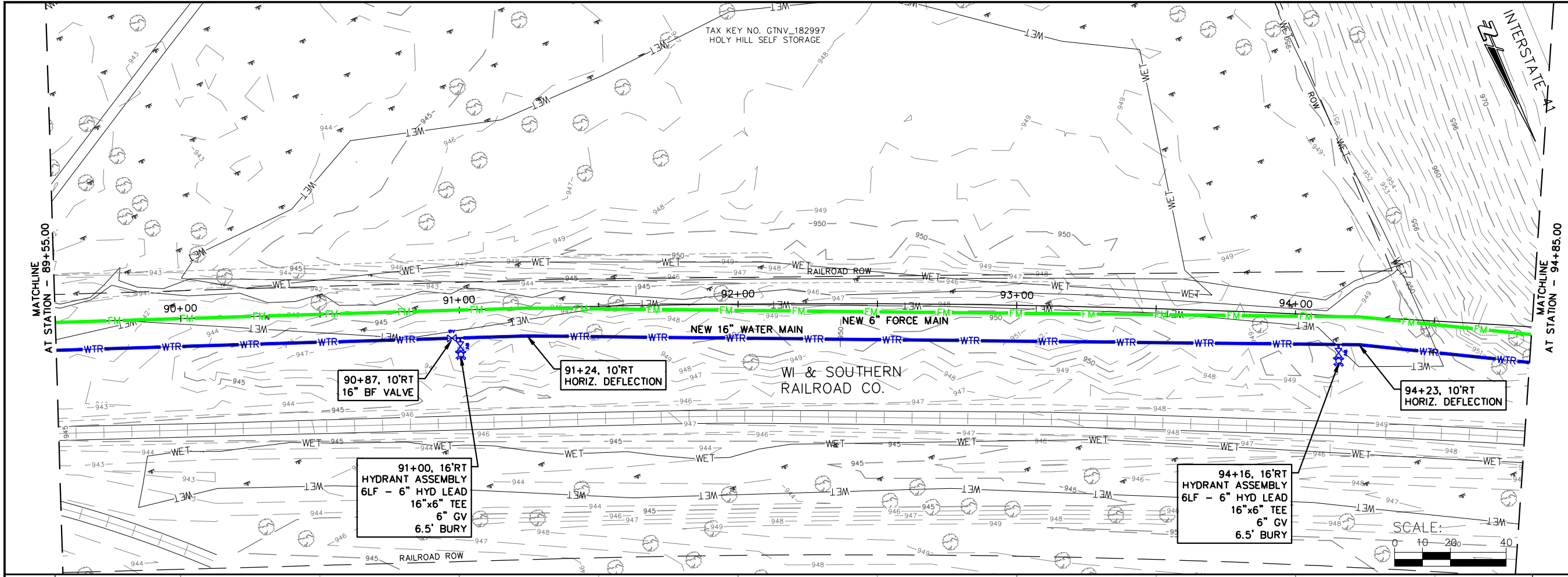
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FAX: 920-491-9020

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RAILROAD EASEMENT PLAN AND PROFILE

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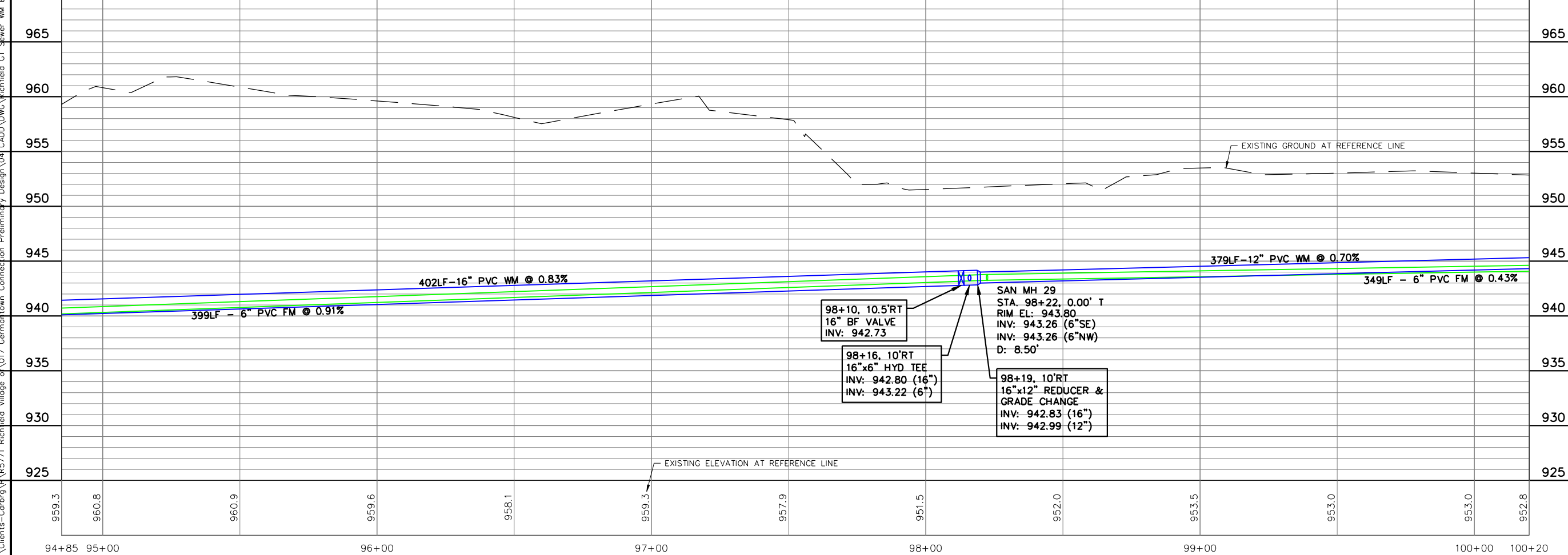
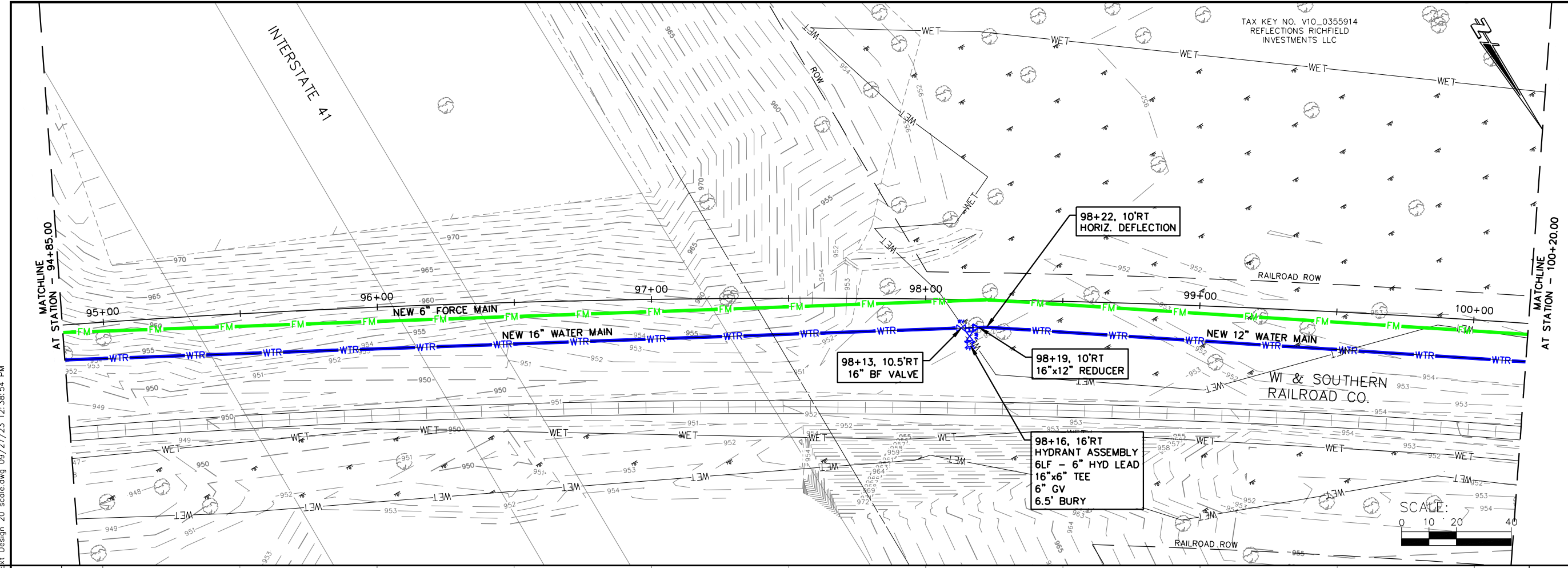
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FAX: 920-491-9020

604 Wilson Ave.  
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Phone: 608-249-8224  
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20 of XX

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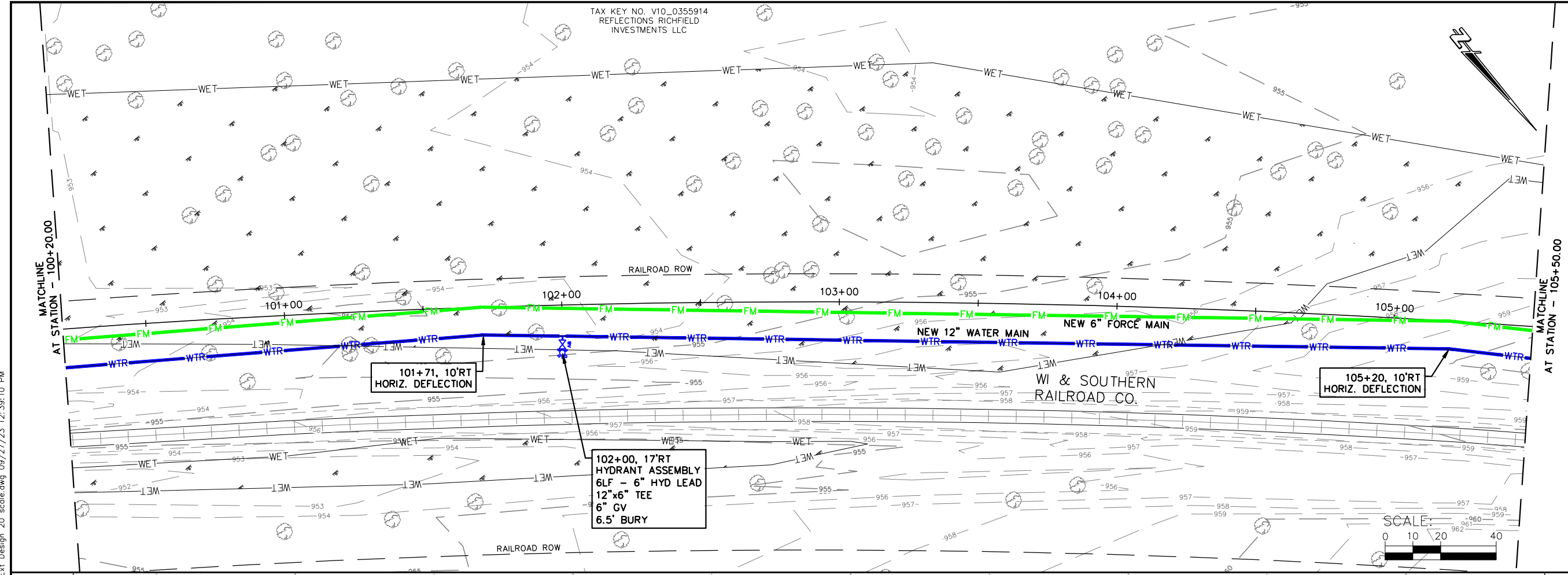


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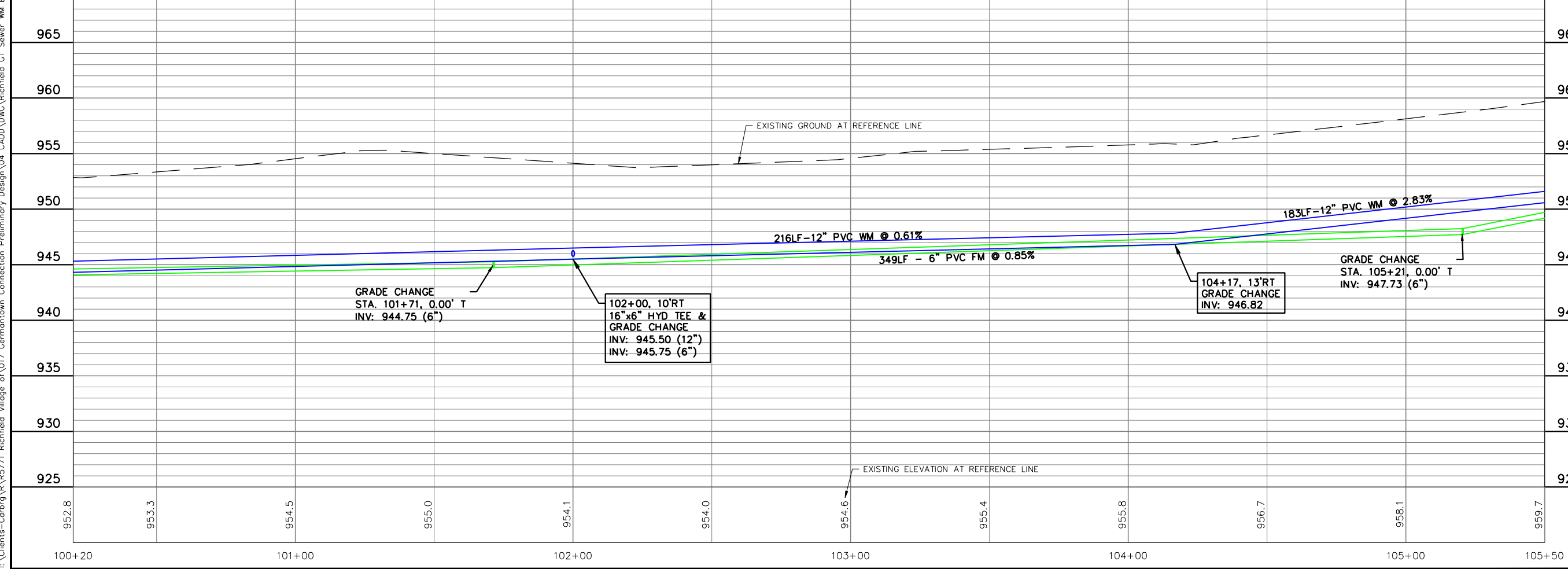
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Fax: 920-837-2688

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Green Bay, WI 54311  
Phone: 920-837-2688  
Fax: 920-837-2688

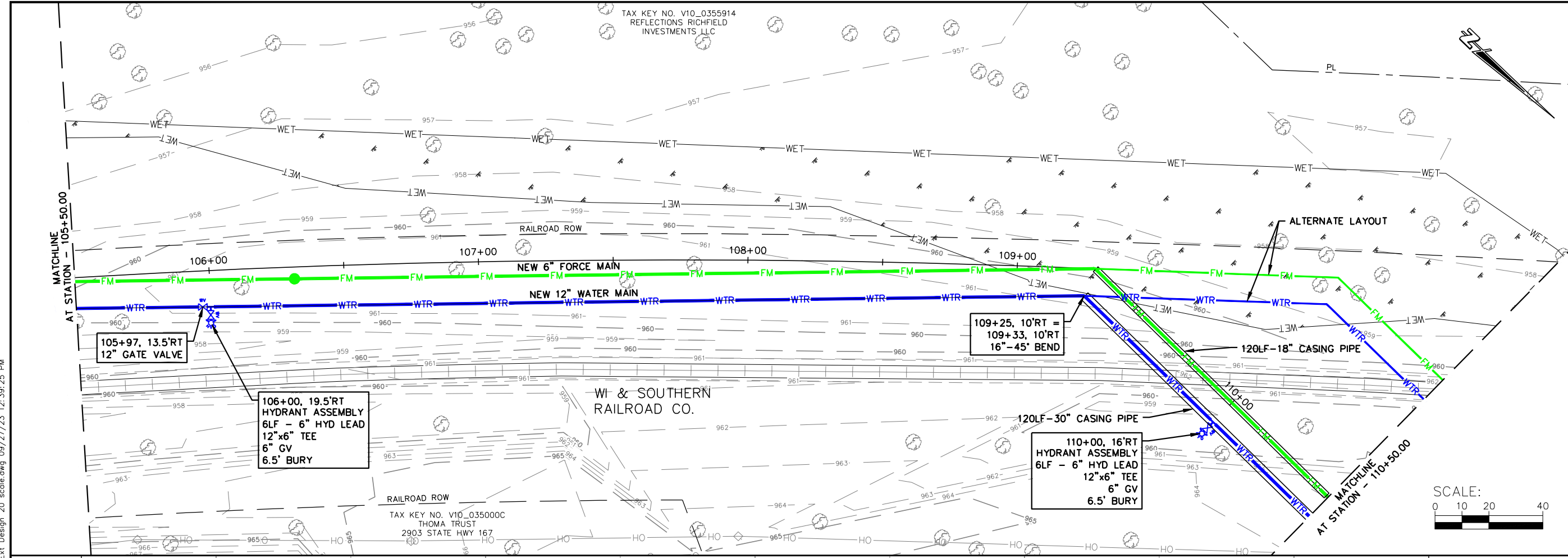
604 Wilson Ave.  
Winchester, MA 01890  
Phone: 978-235-2727  
Fax: 978-235-2727



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RAILROAD EASEMENT PLAN AND PROFILE

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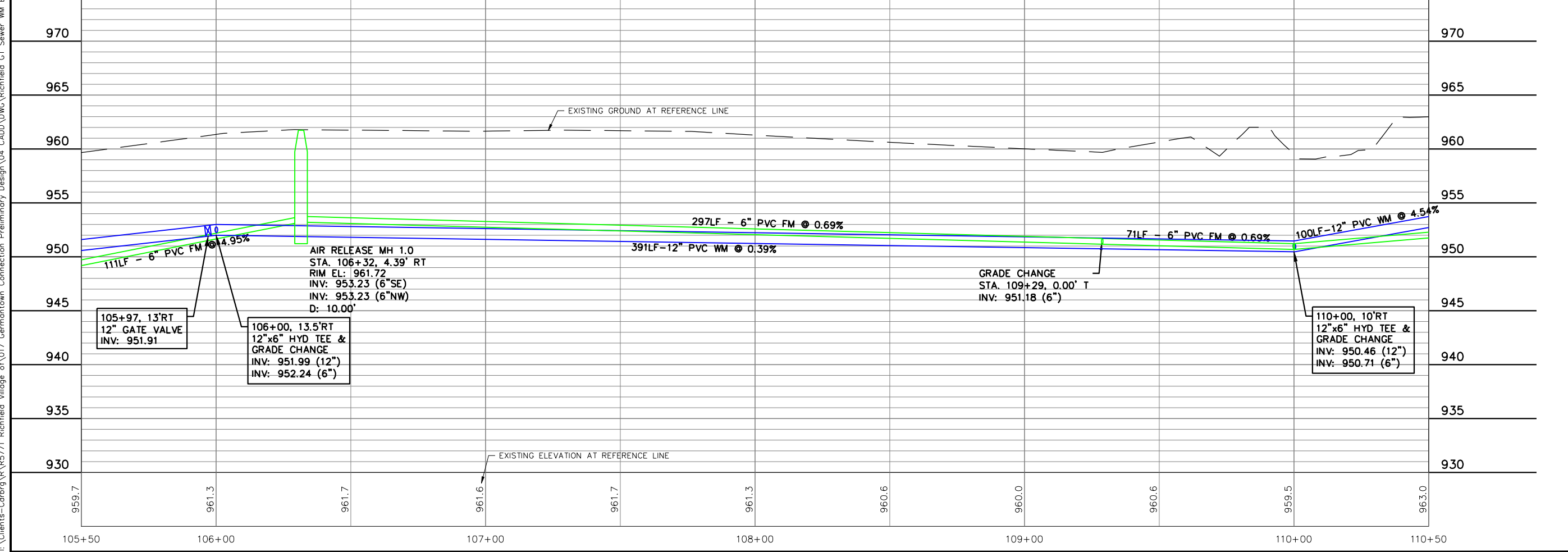
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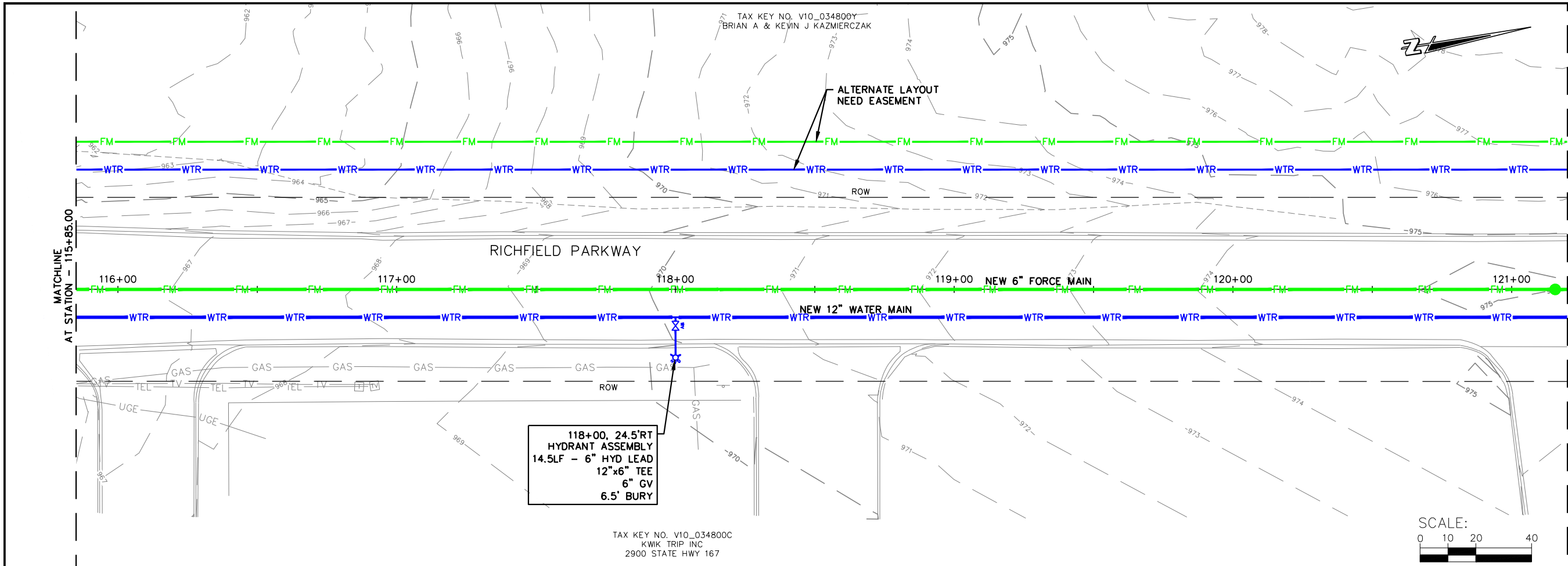
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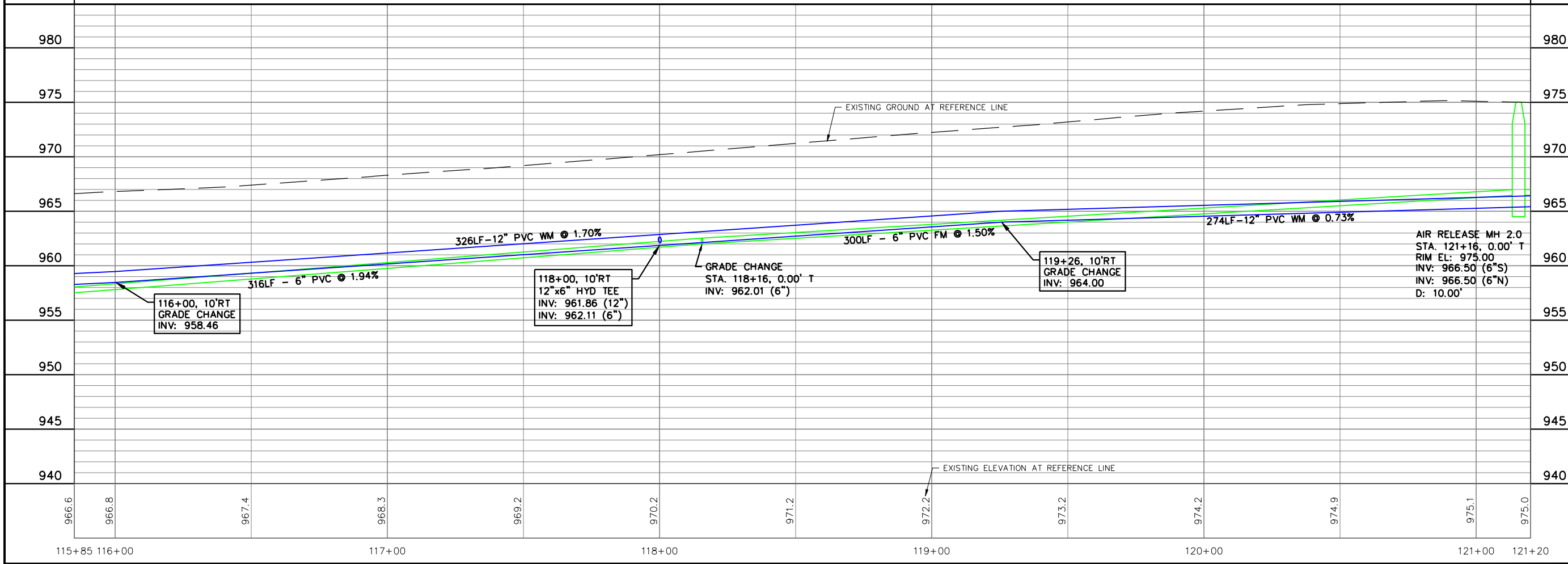


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118+00, 24.5'RT  
HYDRANT ASSEMBLY  
14.5LF - 6" HYD LEAD  
12"x6" TEE  
6" GV  
6.5' BURY

TAX KEY NO. V10\_034800C  
KWIK TRIP INC  
2900 STATE HWY 167



116+00, 10'RT  
GRADE CHANGE  
INV: 958.46

118+00, 10'RT  
12"x6" HYD TEE  
INV: 961.86 (12")  
INV: 962.11 (6")

GRADE CHANGE  
STA. 118+16, 0.00' T  
INV: 962.01 (6")

119+26, 10'RT  
GRADE CHANGE  
INV: 964.00

AIR RELEASE MH 2.0  
STA. 121+16, 0.00' T  
RIM EL: 975.00  
INV: 966.50 (6"S)  
INV: 966.50 (6"N)  
D: 10.00'

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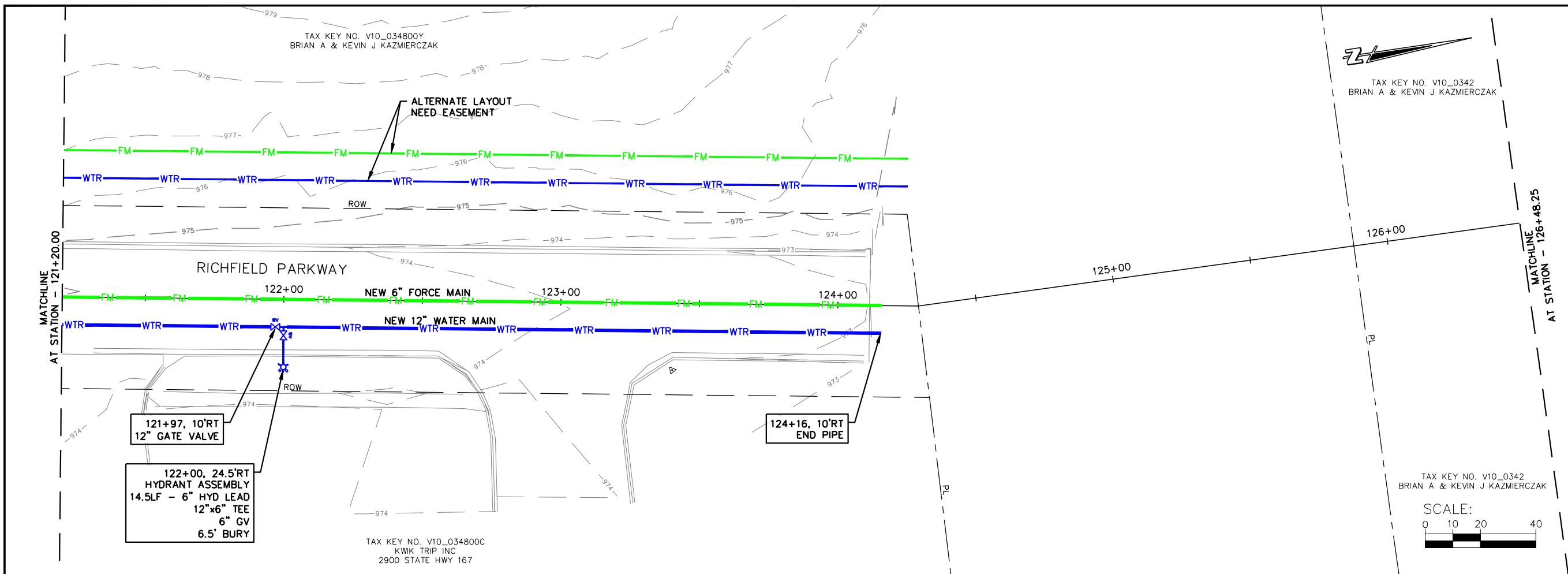
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RICHFIELD PARKWAY PLAN AND PROFILE

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TAX KEY NO. V10\_0342  
BRIAN A & KEVIN J KAZMIERCZAK

TAX KEY NO. V10\_034800Y  
BRIAN A & KEVIN J KAZMIERCZAK

ALTERNATE LAYOUT  
NEED EASEMENT

121+97, 10'RT  
12" GATE VALVE

122+00, 24.5'RT  
HYDRANT ASSEMBLY  
14.5LF - 6" HYD LEAD  
12"x6" TEE  
6" GV  
6.5' BURY

124+16, 10'RT  
END PIPE

TAX KEY NO. V10\_034800C  
KWIK TRIP INC  
2900 STATE HWY 167

TAX KEY NO. V10\_0342  
BRIAN A & KEVIN J KAZMIERCZAK



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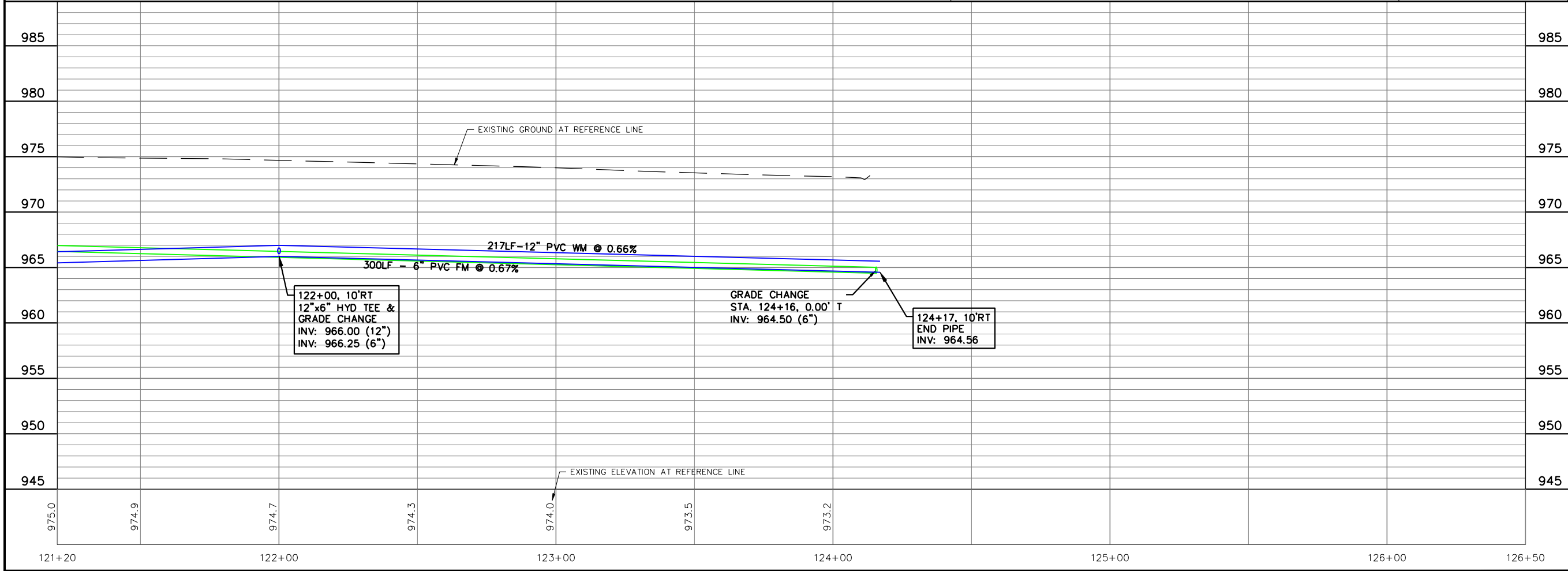
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Phone: 781-235-2727  
Fax: 781-235-2727



122+00, 10'RT  
12"x6" HYD TEE &  
GRADE CHANGE  
INV: 966.00 (12")  
INV: 966.25 (6")

GRADE CHANGE  
STA. 124+16, 0.00' T  
INV: 964.50 (6")

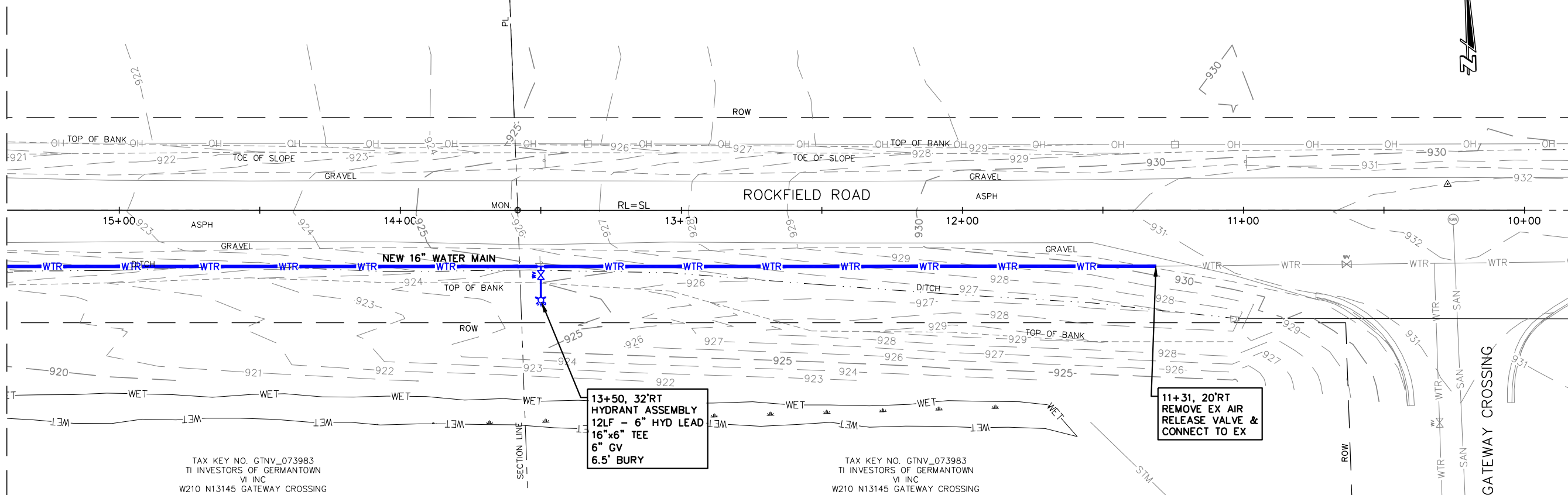
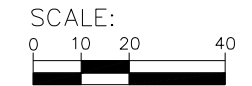
124+17, 10'RT  
END PIPE  
INV: 964.56

VILLAGE OF RICHFIELD  
GERMANTOWN CONNECTION  
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RICHFIELD PARKWAY PLAN AND PROFILE

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TAX KEY NO. GTNV\_072998  
 MARK & JOANN STEPHAN  
 N132 W21528 ROCKFIELD ROAD

TAX KEY NO. GTNV\_071997  
 MATTHEW & MICHELLE STEPHAN  
 N132 W21200 ROCKFIELD ROAD

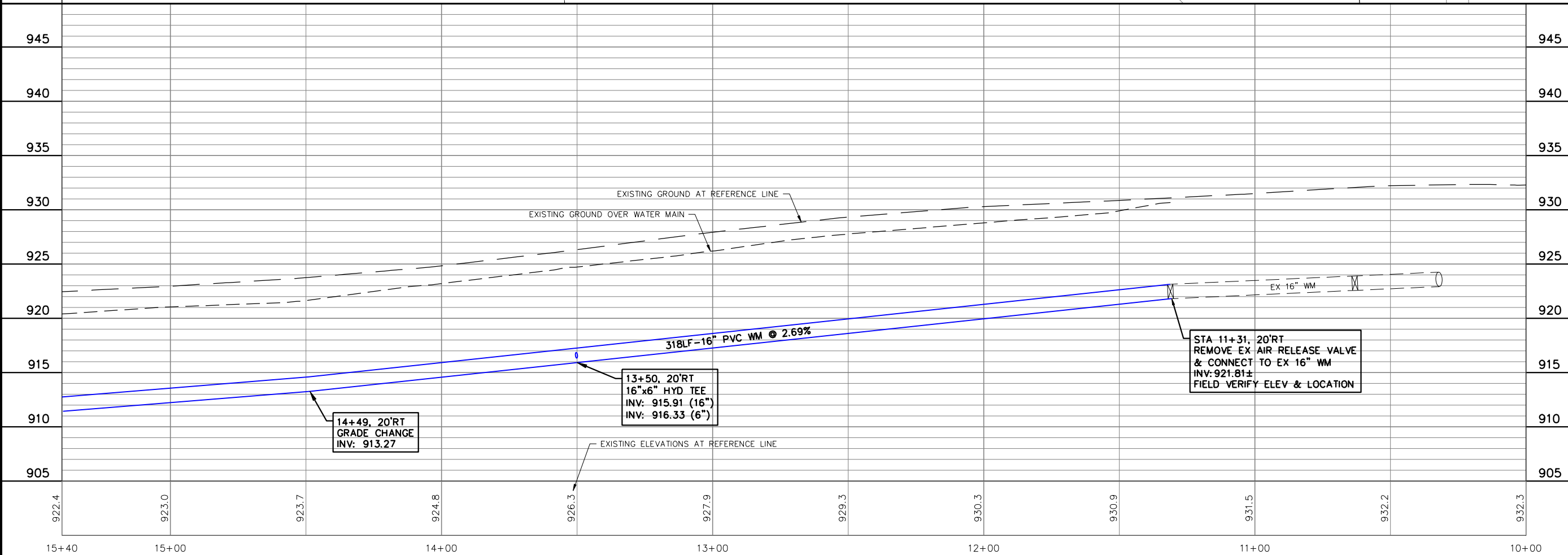


13+50, 32'RT  
 HYDRANT ASSEMBLY  
 12LF - 6" HYD LEAD  
 16"x6" TEE  
 6" GV  
 6.5' BURY

11+31, 20'RT  
 REMOVE EX AIR  
 RELEASE VALVE &  
 CONNECT TO EX

TAX KEY NO. GTNV\_073983  
 TI INVESTORS OF GERMANTOWN  
 VI INC  
 W210 N13145 GATEWAY CROSSING

TAX KEY NO. GTNV\_073983  
 TI INVESTORS OF GERMANTOWN  
 VI INC  
 W210 N13145 GATEWAY CROSSING



14+49, 20'RT  
 GRADE CHANGE  
 INV: 913.27

13+50, 20'RT  
 16"x6" HYD TEE  
 INV: 915.91 (16")  
 INV: 916.33 (6")

STA 11+31, 20'RT  
 REMOVE EX AIR RELEASE VALVE  
 & CONNECT TO EX 16" WM  
 INV: 921.81±  
 FIELD VERIFY ELEV & LOCATION

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 Fax: 920-831-2106  
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 ROCKFIELD ROAD PLAN AND PROFILE

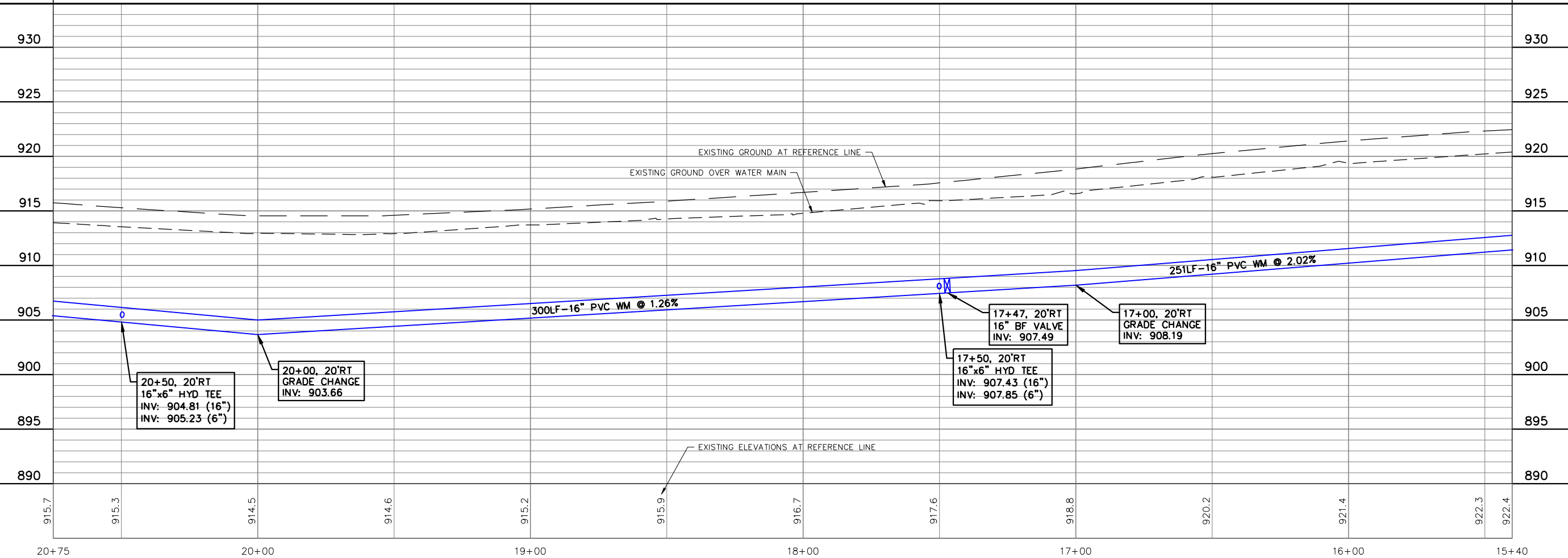
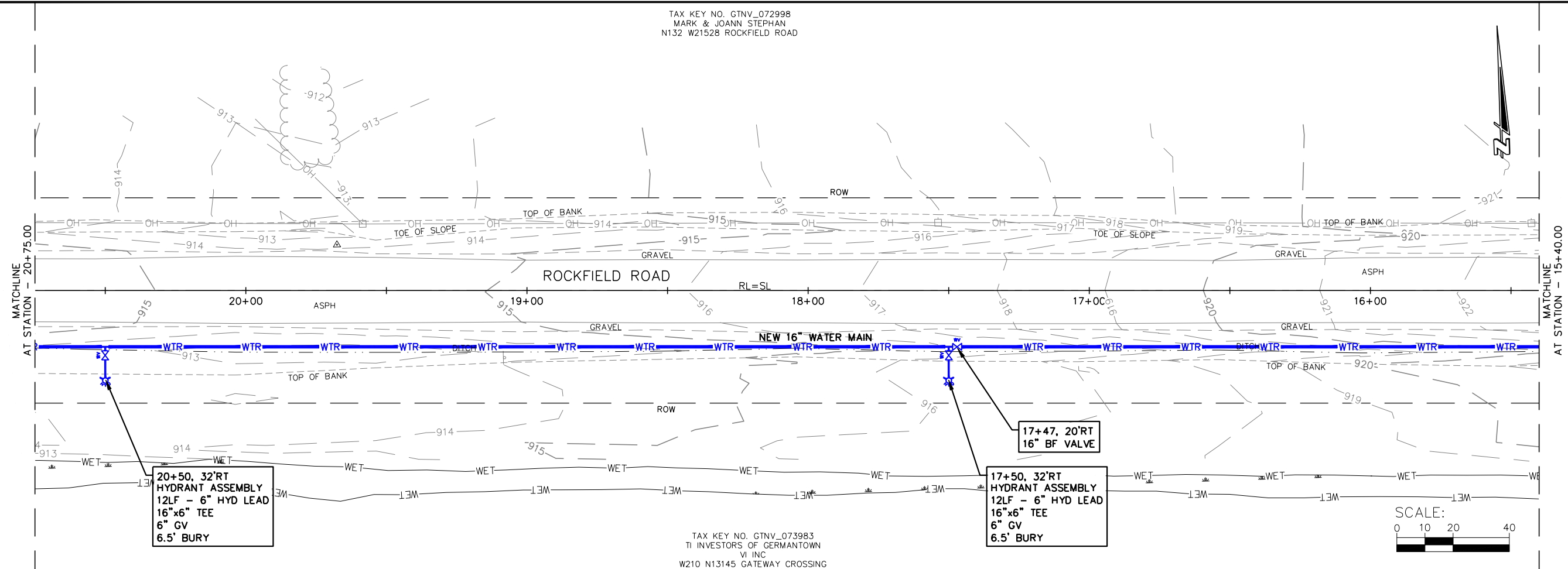
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 MARK & JOANN STEPHAN  
 N132 W21528 ROCKFIELD ROAD

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 VI INC  
 W210 N13145 GATEWAY CROSSING

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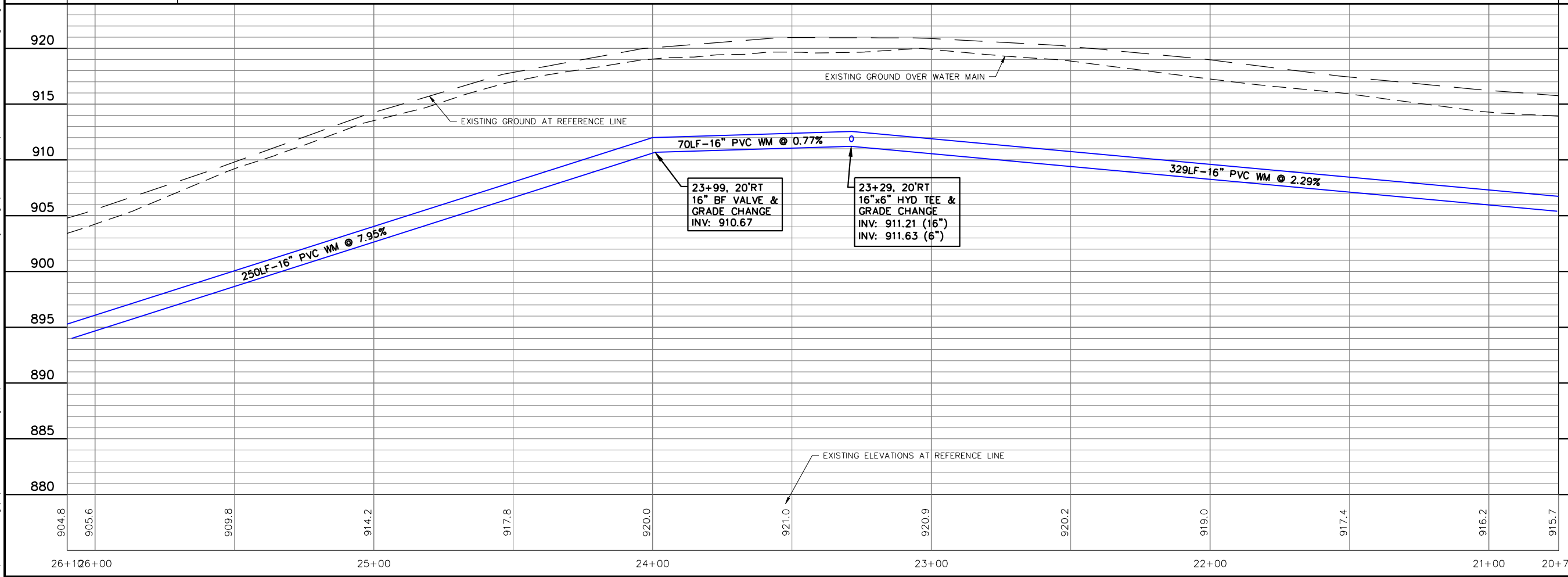
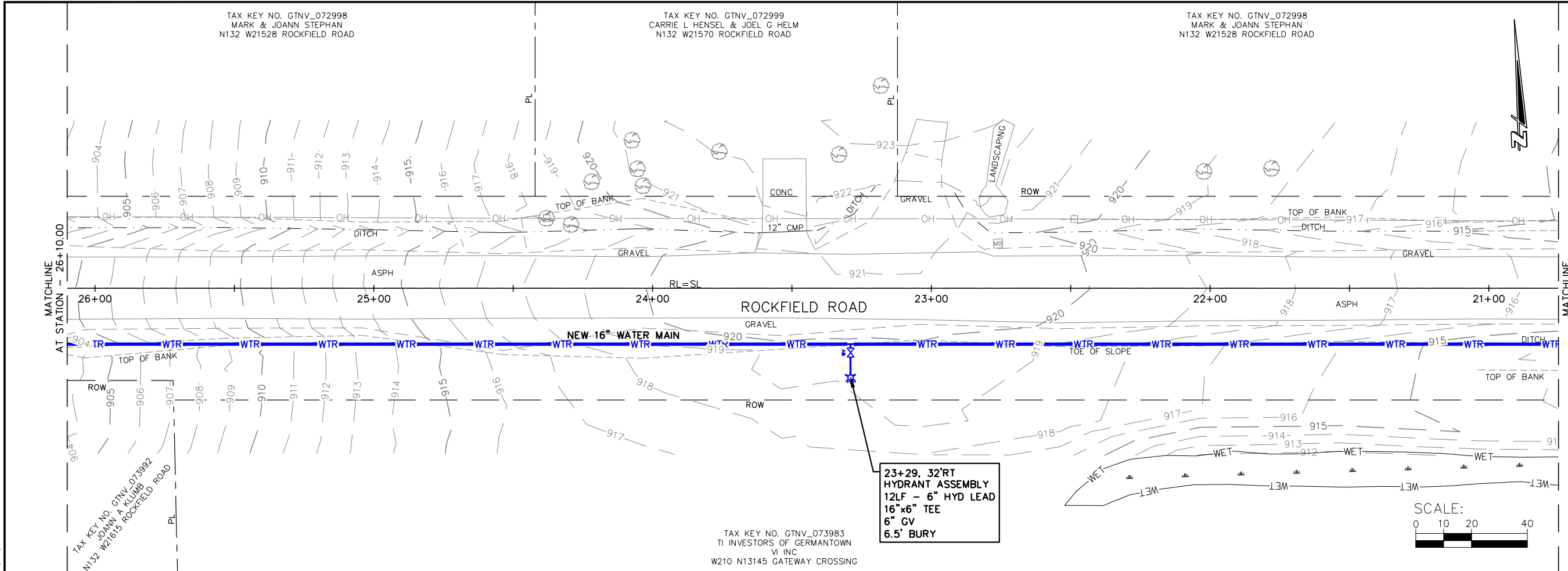
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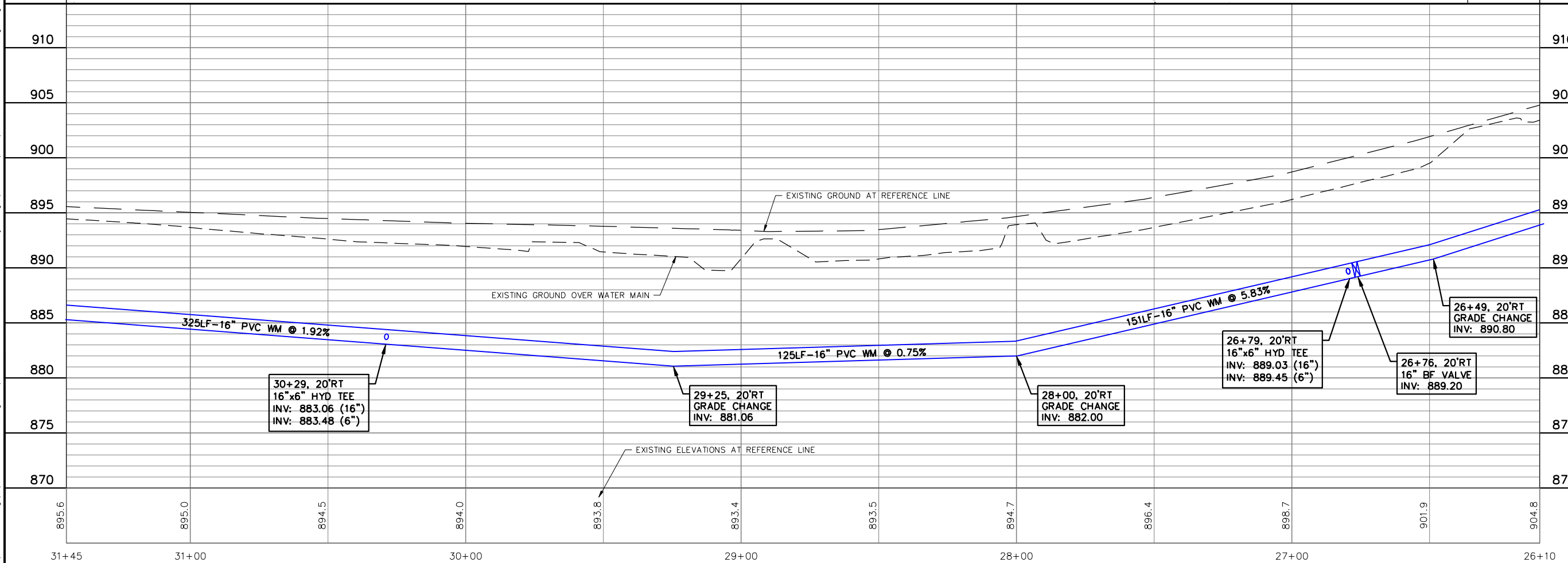
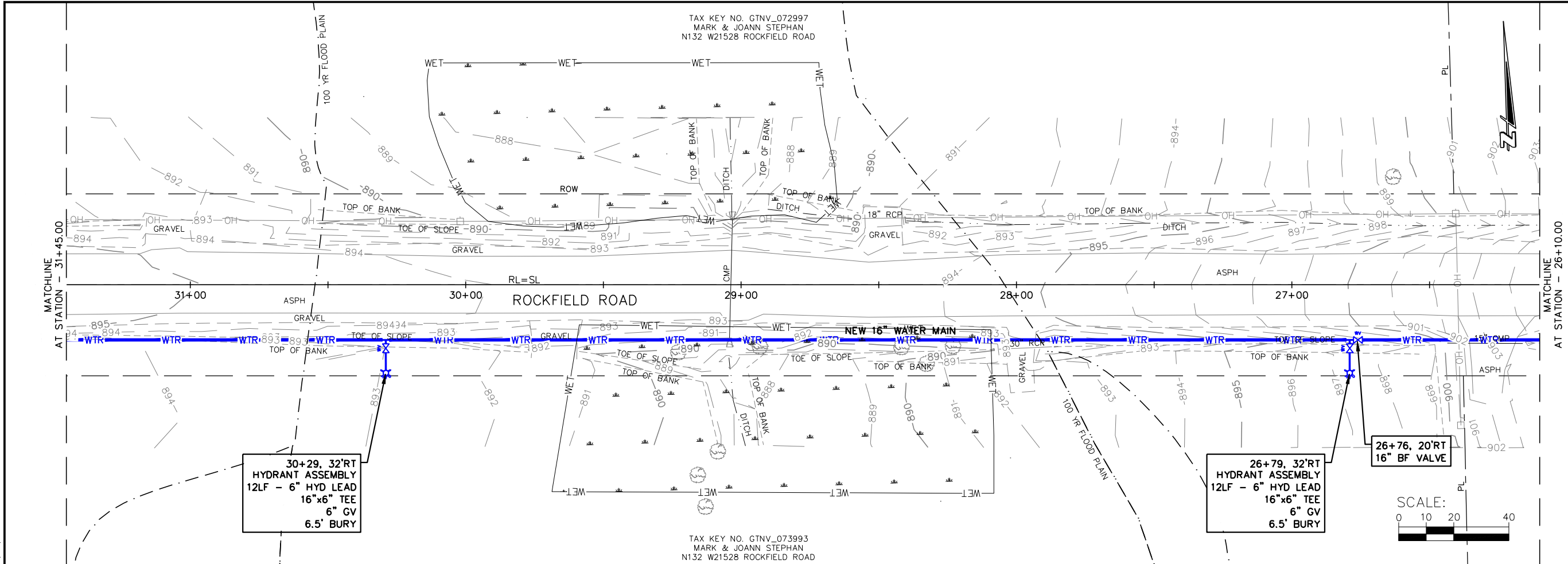
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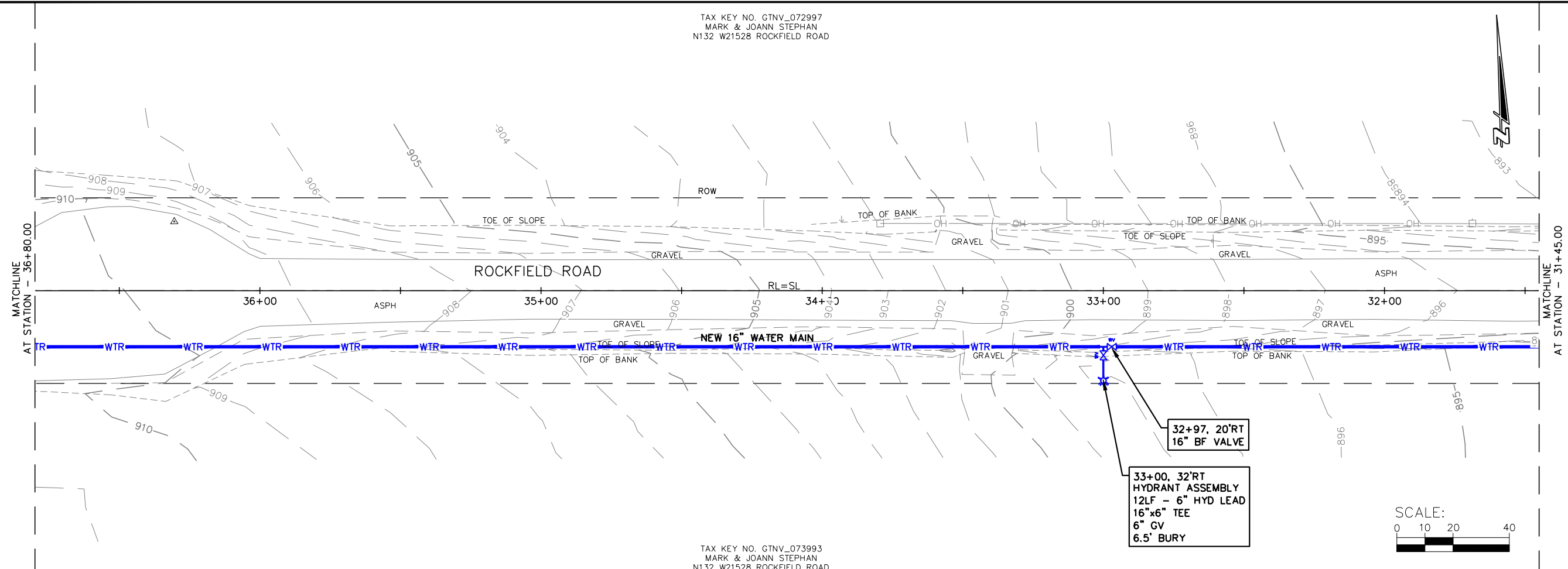
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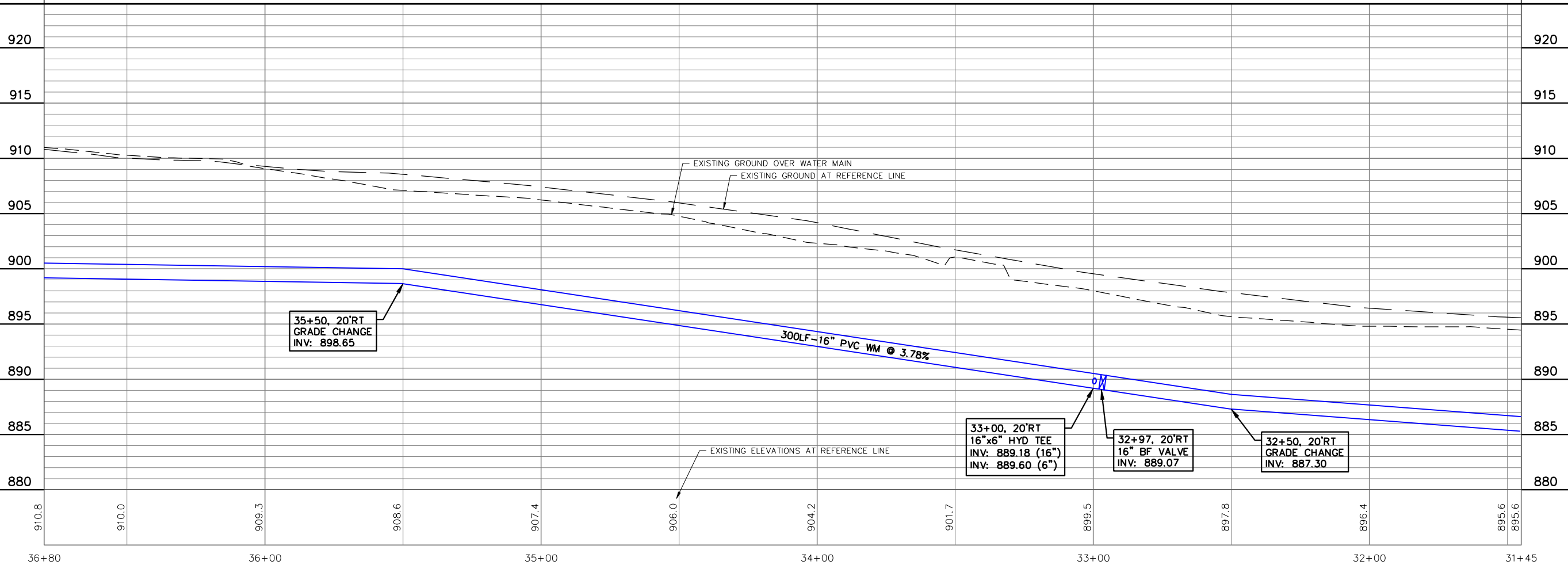
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 MARK & JOANN STEPHAN  
 N132 W21528 ROCKFIELD ROAD

TAX KEY NO. GTNV\_073993  
 MARK & JOANN STEPHAN  
 N132 W21528 ROCKFIELD ROAD



32+97, 20'RT  
 16" BF VALVE

33+00, 32'RT  
 HYDRANT ASSEMBLY  
 12LF - 6" HYD LEAD  
 16"x6" TEE  
 6" GV  
 6.5' BURY



35+50, 20'RT  
 GRADE CHANGE  
 INV: 898.65

33+00, 20'RT  
 16"x6" HYD TEE  
 INV: 889.18 (16")  
 INV: 889.60 (6")

32+97, 20'RT  
 16" BF VALVE  
 INV: 889.07

32+50, 20'RT  
 GRADE CHANGE  
 INV: 887.30

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 FAX 920-435-2250

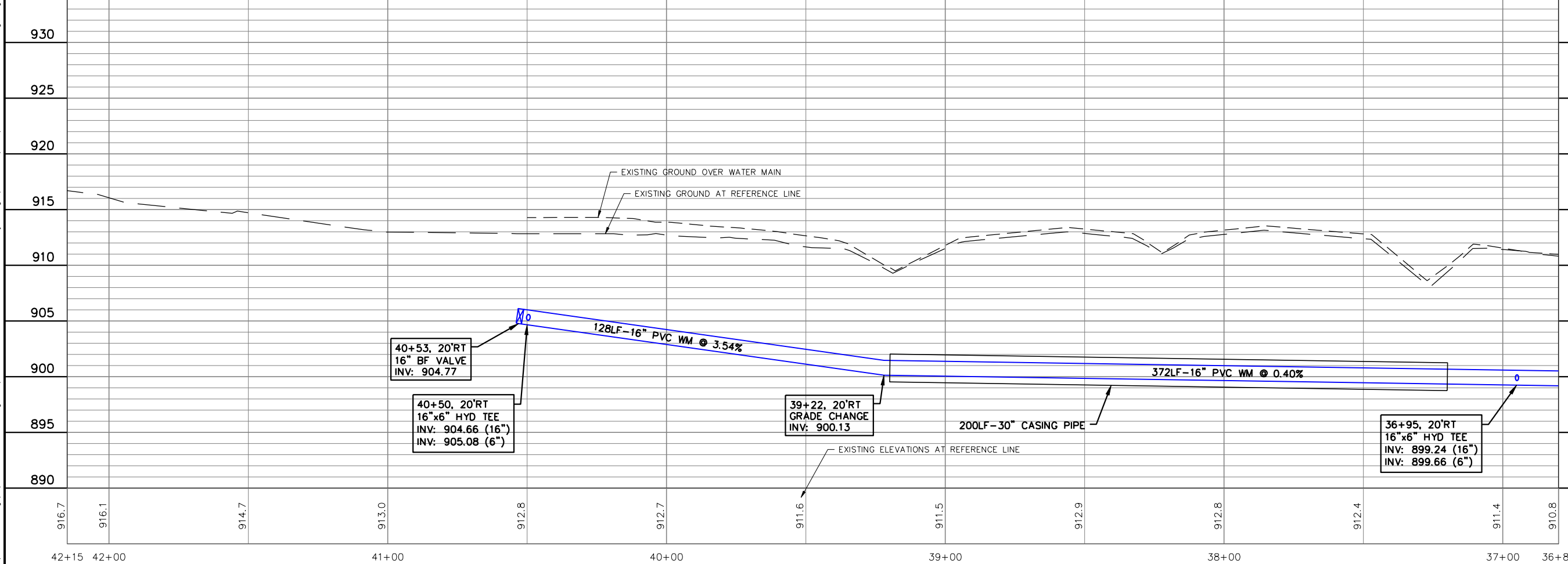
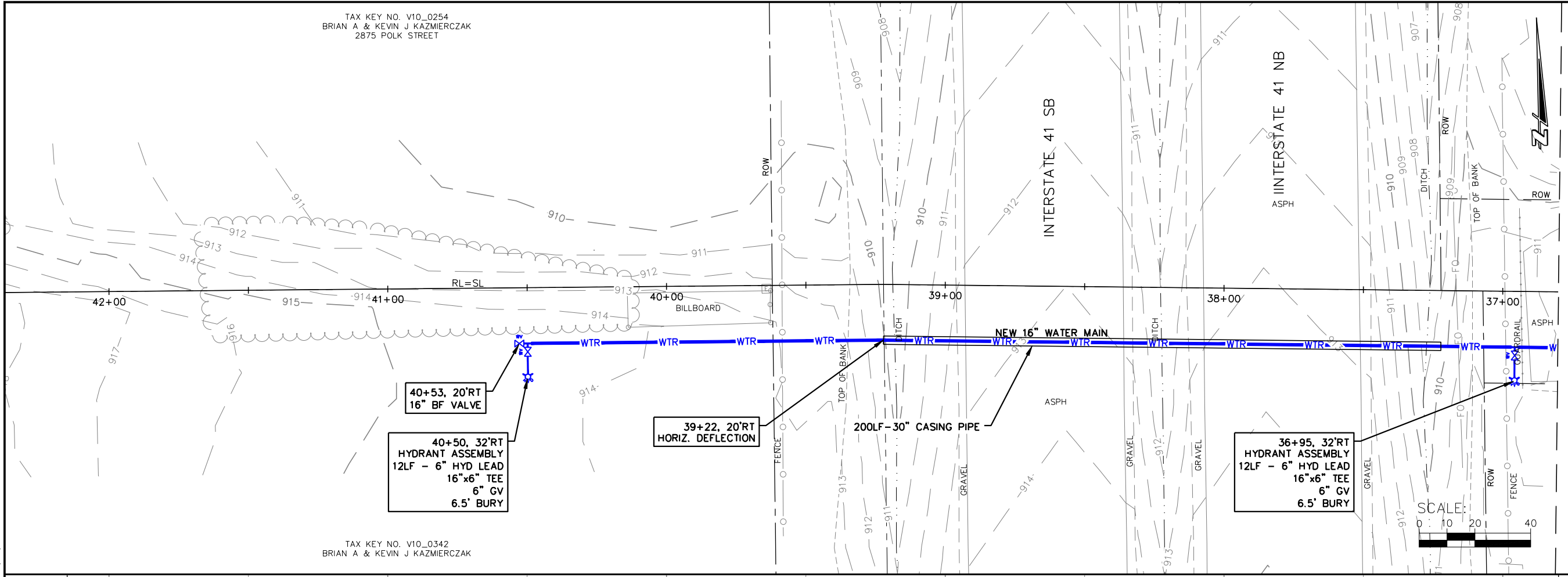
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 GERMANTOWN CONNECTION  
 WASHINGTON COUNTY, WISCONSIN  
 ROCKFIELD ROAD PLAN AND PROFILE

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 BRIAN A. & KEVIN J. KAZMIERCZAK  
 2875 POLK STREET

TAX KEY NO. V10\_0342  
 BRIAN A. & KEVIN J. KAZMIERCZAK



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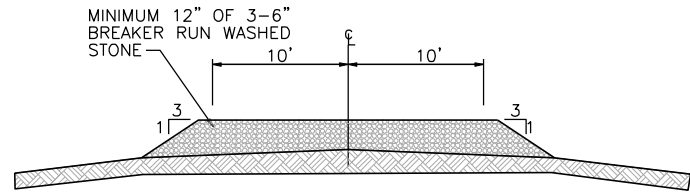
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 700 N. 1st St.  
 P.O. Box 227  
 FAX: 715-255-2727

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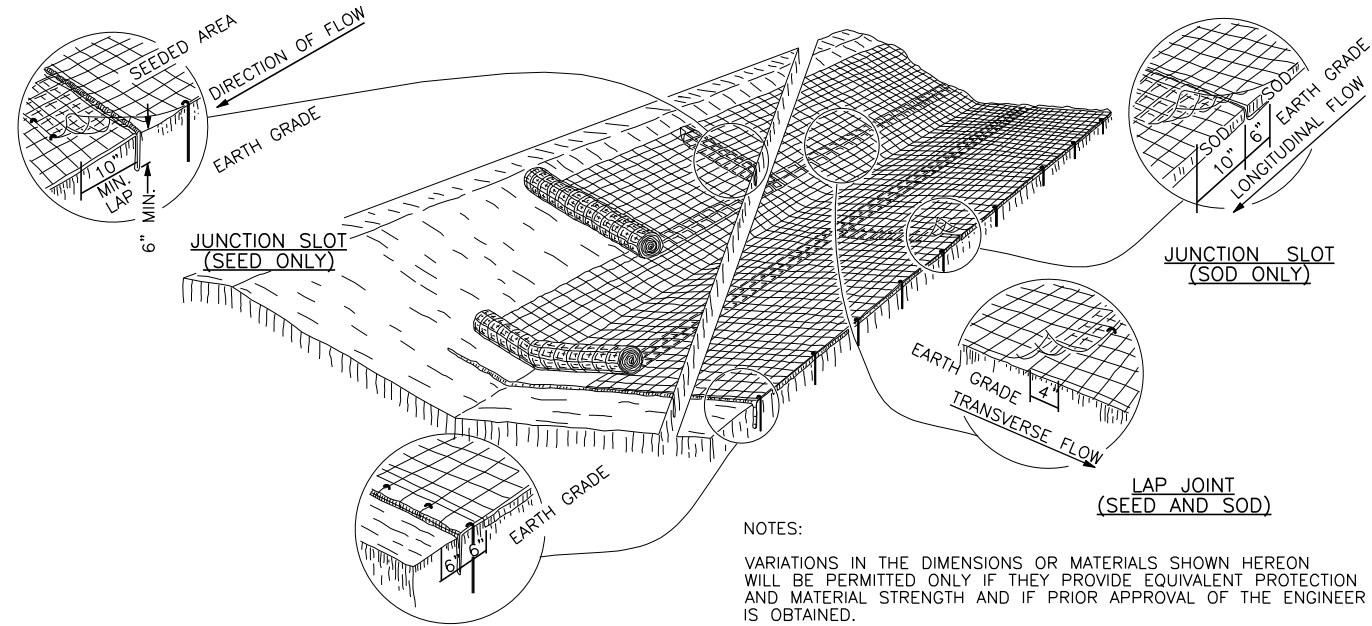
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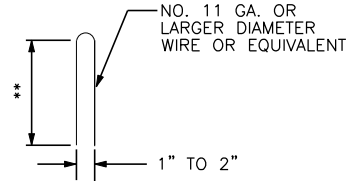
- NOTES:
1. TRACKING PAD TO BE A MINIMUM LENGTH OF 50'.
  2. REMOVE & REPLACE AGGREGATE WHEN VOIDS BECOME FILLED W/ SEDIMENT OR IF SURFACE OPENINGS BECOME PLUGGED SO THAT TRACKING AREA DOES NOT FUNCTION.
  3. REMOVE TRACKING PAD AND RESTORE AREA UPON COMPLETION OF THE PROJECT.

**TYPICAL TRACKING PAD**



- NOTES:
- VARIATIONS IN THE DIMENSIONS OR MATERIALS SHOWN HEREON WILL BE PERMITTED ONLY IF THEY PROVIDE EQUIVALENT PROTECTION AND MATERIAL STRENGTH AND IF PRIOR APPROVAL OF THE ENGINEER IS OBTAINED.
- DO NOT PLACE LAP JOINTS AT THE BOTTOM OF V-SHAPED DITCHES.
- JUNCTION SLOTS ON ADJACENT STRIPS OF MATTING WILL BE STAGGERED A MINIMUM OF 4 FEET APART
- IMPRESS ALL EDGES OF THE EROSION MAT INTO THE SOIL.

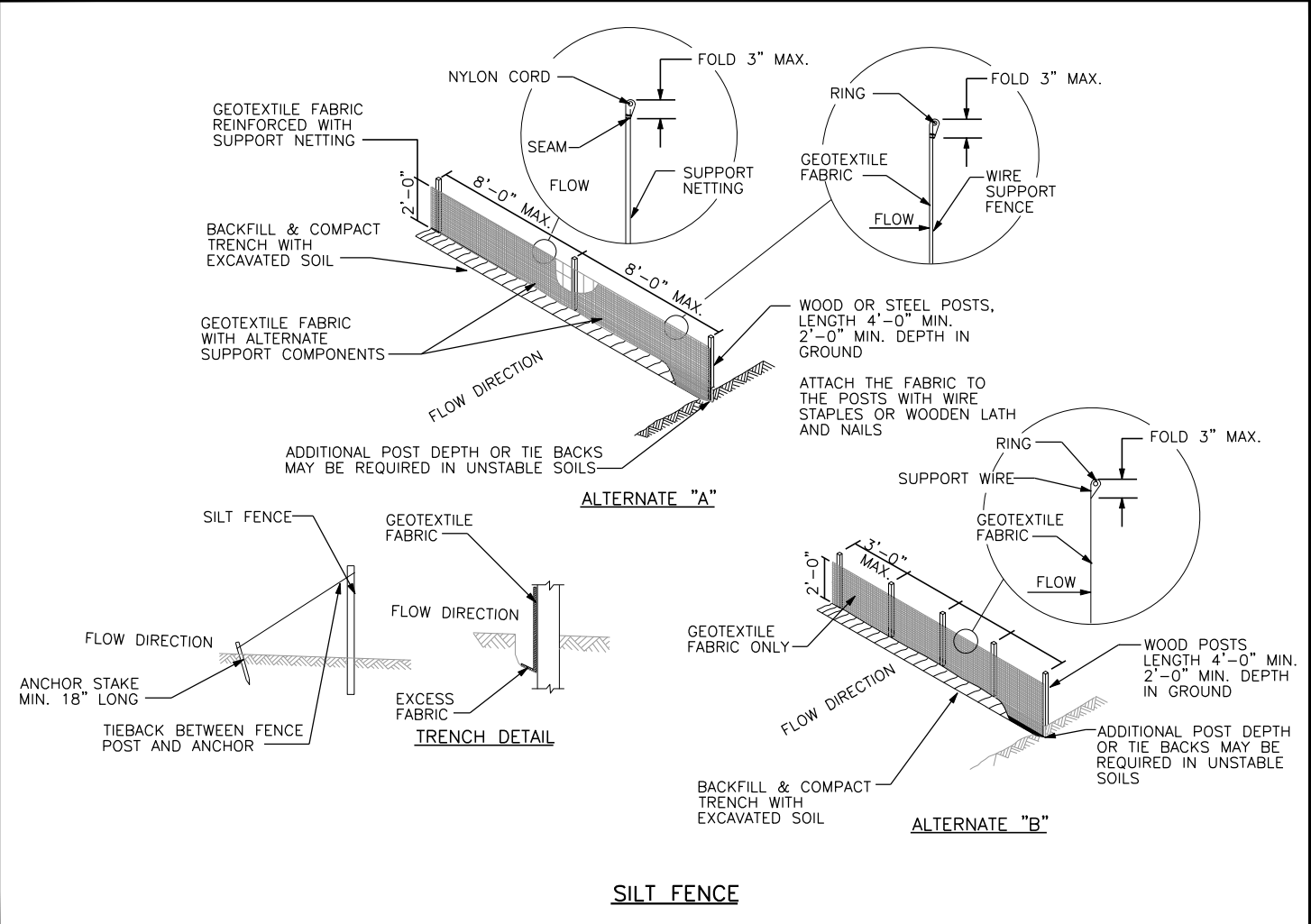
**ANCHOR SLOT AT BEGINNING AND END OF EROSION MAT (SEED AND SOD)**



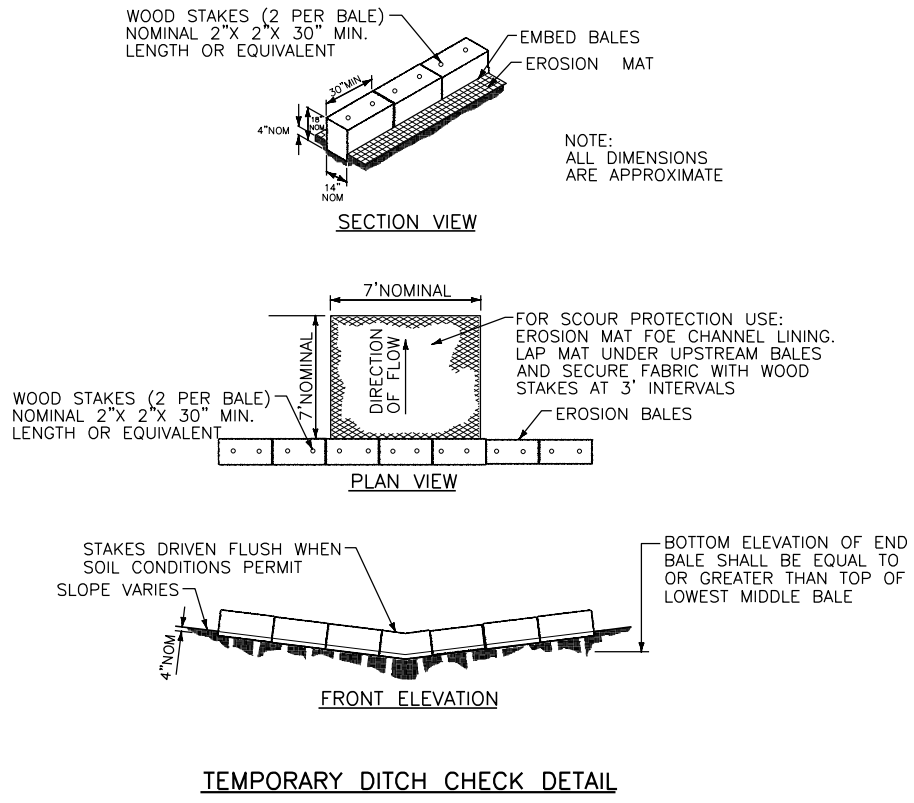
- \*\* 6" MIN. FOR FIRM SOILS  
12" MIN. FOR LOOSE SOILS  
8" MIN. WHERE BOTH SOD AND MATS ARE USED
- DETAIL OF TYPICAL STAPLE**

**EROSION MAT**

- EROSION MAT OVER SOD**
- ONLY JUTE FABRIC WILL BE PERMITTED OVER SOD
- WOOD STAKES FOR SOD MAY BE OMITTED IF THE EXISTING SLOPE AND SOIL CONDITIONS SO WARRANT.
- THE WIDTH OF THE EROSION MAT SHALL EQUAL THE SOD WIDTH.
- SOD STRIPS MAY BE PLACED EITHER LONGITUDINALLY OR TRANSVERSELY TO THE FLOW LINE OF THE DITCH.
- EROSION MAT OVER SEEDING**
- JUNCTION OR ANCHOR SLOTS WILL BE AT MINIMUM INTERVALS OF 100 FEET ON GRADES UP TO AND INCLUDING 3 PERCENT, AND 50 FEET ON GRADES EXCEEDING 3 PERCENT.



**SILT FENCE**



**TEMPORARY DITCH CHECK DETAIL**

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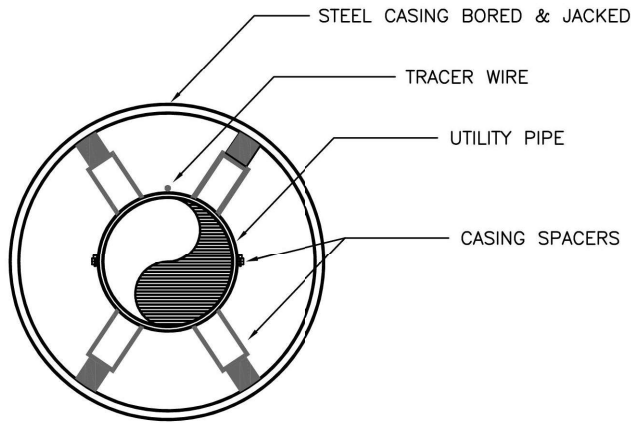
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STEEL CASING PIPE SHALL MEET THE REQUIREMENTS AS DESCRIBED IN THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN SECTION 6.2.3 AND DRAWING FILE NO. 19.

THE PIPE SHALL BE SUPPORTED AND BRACED USING CASING SPACERS AS MANUFACTURED BY ADVANCE PRODUCTS & SYSTEMS OR EQUAL, AS APPROVED BY THE ENGINEER.

A TRACER WIRE SHALL BE INSTALLED AS PER THE VILLAGE SPECIFICATIONS.

EACH END OF THE CASING SHALL RECEIVE A 12" CONCRETE OR BRICK MORTARED BULKHEAD.

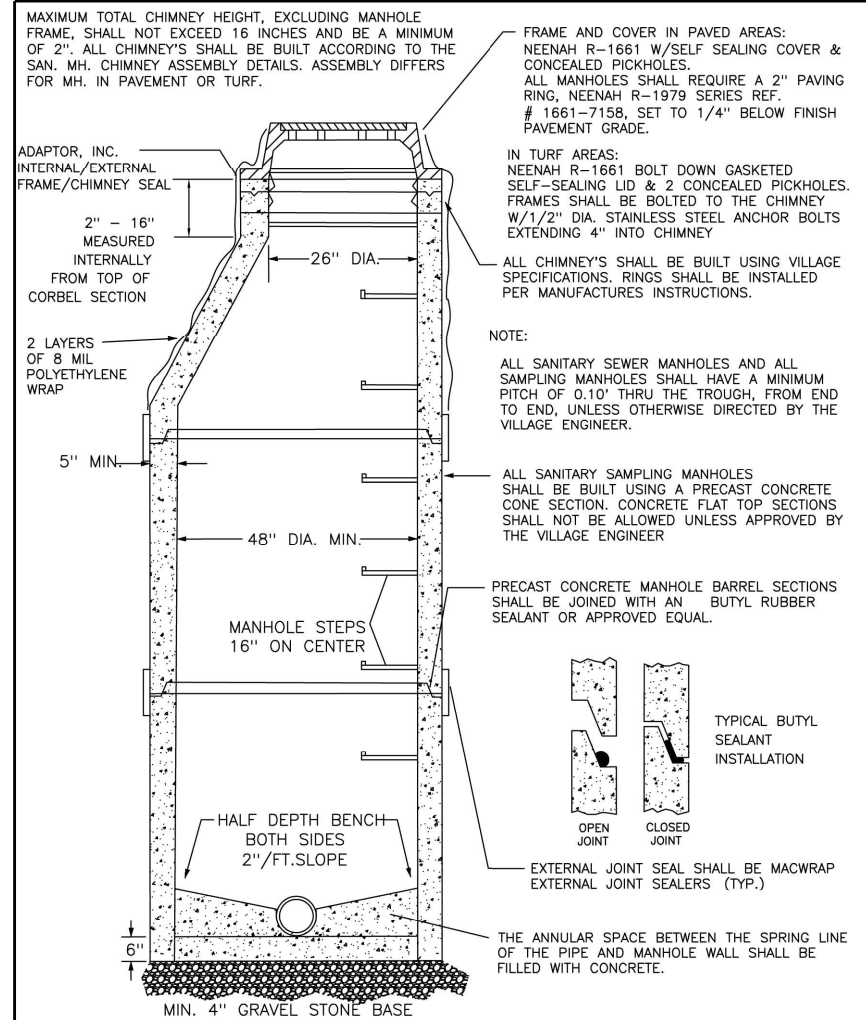
NEW UTILITY PIPE TO BE CENTERED IN THE CASING PIPE.

REV. 10/10/2018 RCB



BORING OR JACKING CASING PIPE WITH CASING SPACERS

NOT TO SCALE



MAXIMUM TOTAL CHIMNEY HEIGHT, EXCLUDING MANHOLE FRAME, SHALL NOT EXCEED 16 INCHES AND BE A MINIMUM OF 2". ALL CHIMNEYS SHALL BE BUILT ACCORDING TO THE SAN. MH. CHIMNEY ASSEMBLY DETAILS. ASSEMBLY DIFFERS FOR MH. IN PAVEMENT OR TURF.

FRAME AND COVER IN PAVED AREAS: NEENAH R-1661 W/SELF SEALING COVER & CONCEALED PICKHOLES. ALL MANHOLES SHALL REQUIRE A 2" PAVING RING, NEENAH R-1979 SERIES REF. # 1661-7158, SET TO 1/4" BELOW FINISH PAVEMENT GRADE.

IN TURF AREAS: NEENAH R-1661 BOLT DOWN GASKETED SELF-SEALING LID & 2 CONCEALED PICKHOLES. FRAMES SHALL BE BOLTED TO THE CHIMNEY W/1/2" DIA. STAINLESS STEEL ANCHOR BOLTS EXTENDING 4" INTO CHIMNEY.

ALL CHIMNEYS SHALL BE BUILT USING VILLAGE SPECIFICATIONS. RINGS SHALL BE INSTALLED PER MANUFACTURERS INSTRUCTIONS.

NOTE:  
ALL SANITARY SEWER MANHOLES AND ALL SAMPLING MANHOLES SHALL HAVE A MINIMUM PITCH OF 0.10' THRU THE TROUGH, FROM END TO END, UNLESS OTHERWISE DIRECTED BY THE VILLAGE ENGINEER.

ALL SANITARY SAMPLING MANHOLES SHALL BE BUILT USING A PRECAST CONCRETE CONE SECTION. CONCRETE FLAT TOP SECTIONS SHALL NOT BE ALLOWED UNLESS APPROVED BY THE VILLAGE ENGINEER.

PRECAST CONCRETE MANHOLE BARREL SECTIONS SHALL BE JOINED WITH AN BUTYL RUBBER SEALANT OR APPROVED EQUAL.

TYPICAL BUTYL SEALANT INSTALLATION

OPEN JOINT CLOSED JOINT

EXTERNAL JOINT SEAL SHALL BE MACWRAP EXTERNAL JOINT SEALERS (TYP.)

THE ANNULAR SPACE BETWEEN THE SPRING LINE OF THE PIPE AND MANHOLE WALL SHALL BE FILLED WITH CONCRETE.

MIN. 4" GRAVEL STONE BASE

6" MIN.

5" MIN.

2" - 16" MEASURED INTERNALLY FROM TOP OF CORBEL SECTION

ADAPTOR, INC. INTERNAL/EXTERNAL FRAME/CHIMNEY SEAL

2 LAYERS OF 8 MIL POLYETHYLENE WRAP

26" DIA.

48" DIA. MIN.

MANHOLE STEPS 16" ON CENTER

HALF DEPTH BENCH BOTH SIDES 2"/FT.SLOPE

6"

SPRAY EPOXY COATINGS MH EXTERIOR: 2 COATS (BLACK) OF AMERON INTERNATIONAL, AMERCOAT 78 HB AT 8-10 MILS EA. MH INTERIOR: 2 COATS (WHITE) OF PERMITE PCS-9043 TYPE II PERMOX PIPE GLAZE AT 20 MILS EA. COATINGS SHALL BE APPLIED BY SUPPLIERS AT THE PLANT.

REVISED DATE: 10/11/2019 FJR



STANDARD SANITARY MANHOLE & SAMPLING MANHOLE DETAIL

NOT TO SCALE

VILLAGE OF RICHFIELD  
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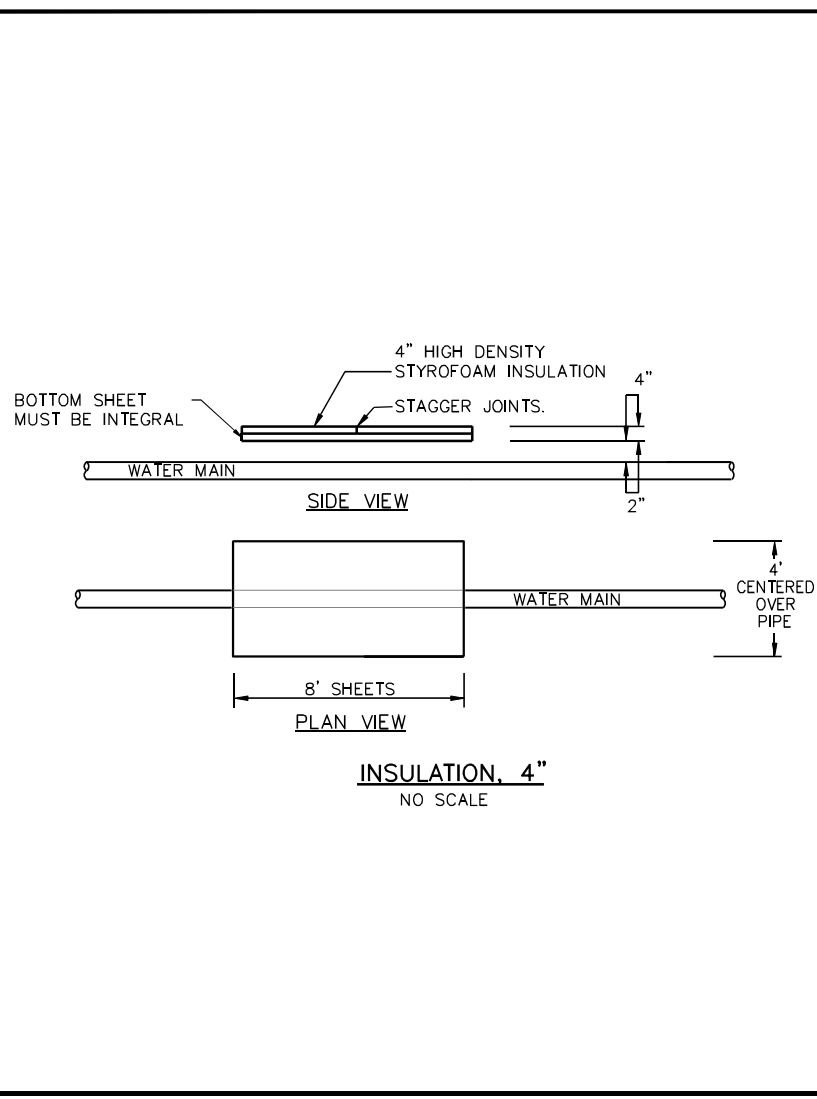
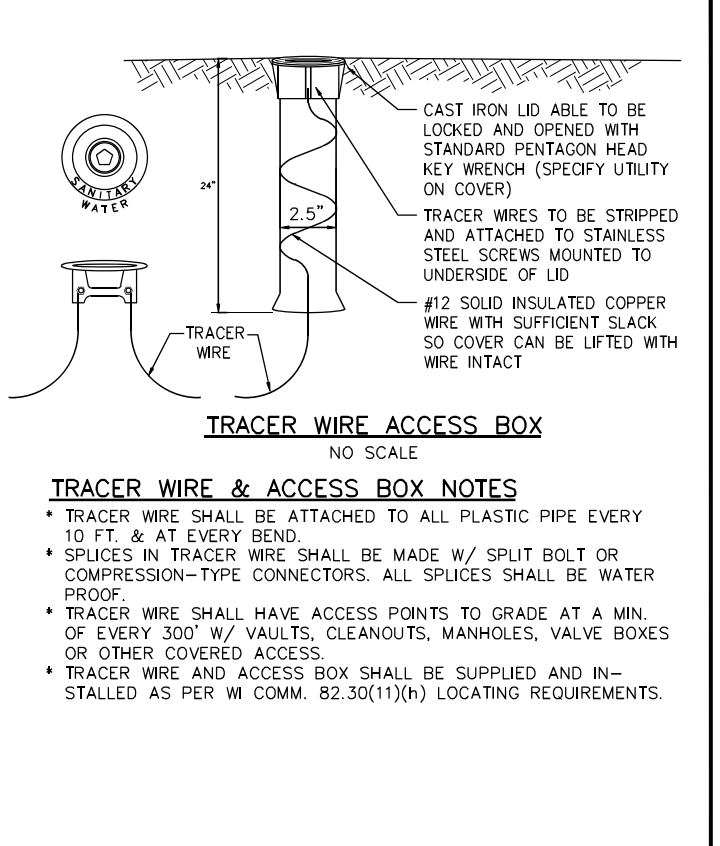
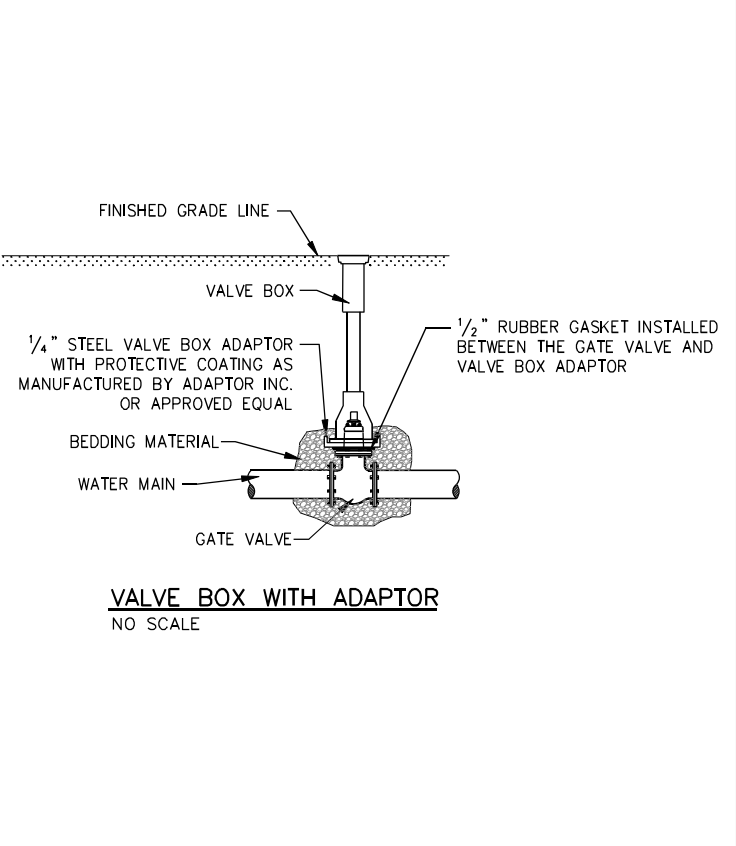
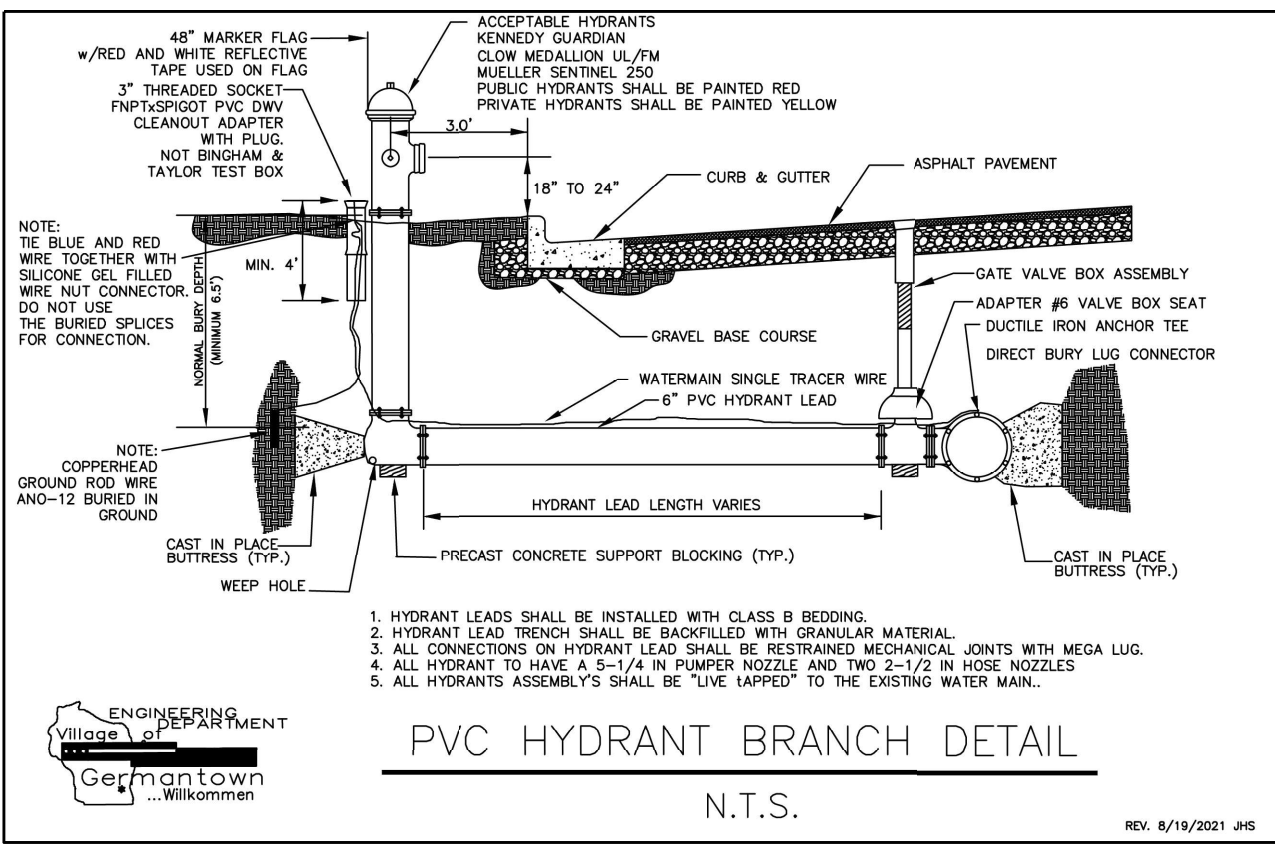
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Appendix M – Germantown Connection Sewer & Water Extension Opinion of Probably Cost



# OPINION OF PROBABLE PROJECT COST

Community Infrastructure • Architecture • Environmental Services

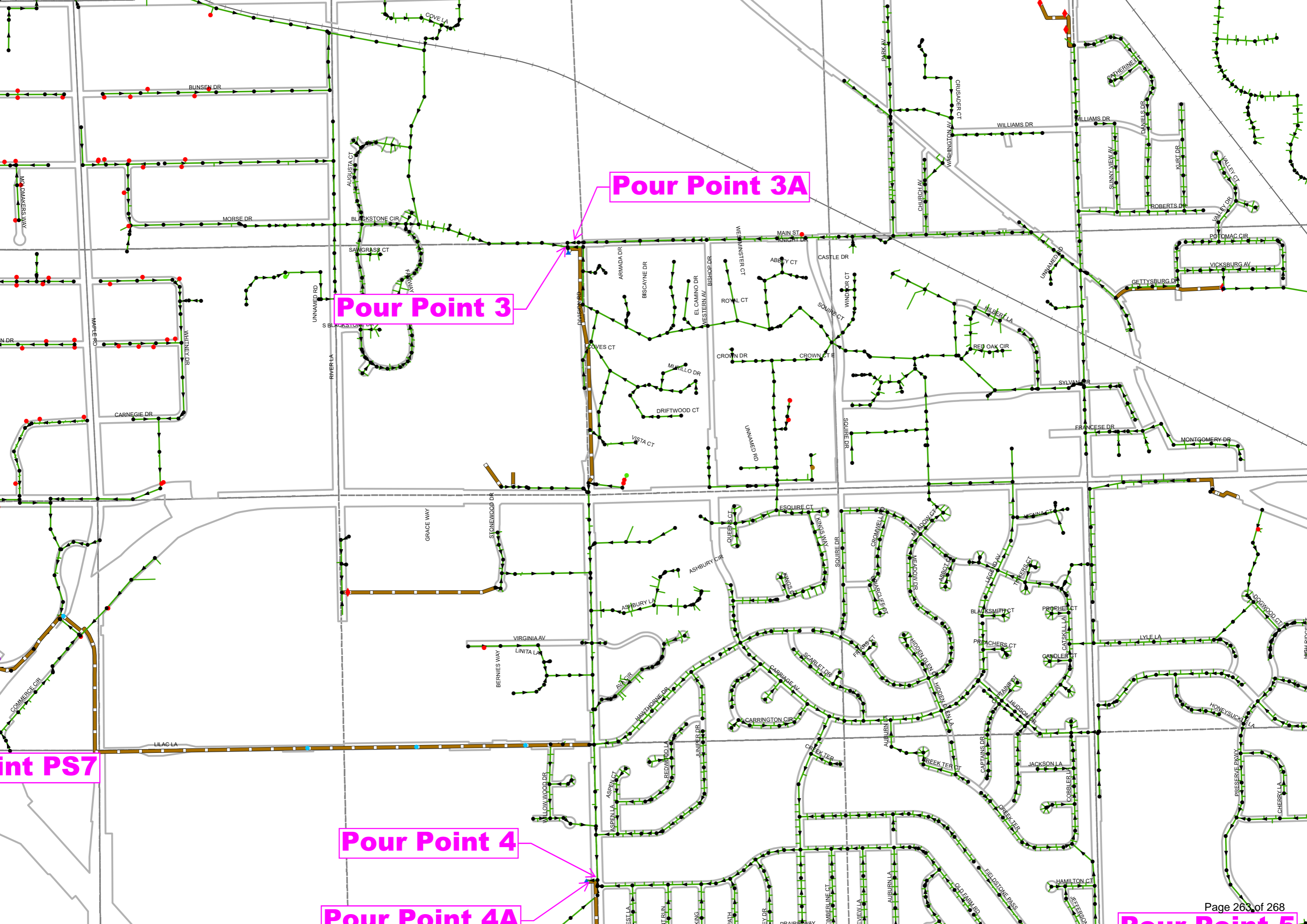
Client	Village of Richfield
Project	Germantown Sanitary and Water Connections
Prepared By	M. Stephan / B. Greisch

Project No.	R5771-0017
Date	9/27/2023
Revised Date	

Item	Unit	Qty	Unit Price	Cost
<b><u>Sanitary Sewer</u></b>				
Connection to Existing MH @ Freistadt	EA	1	\$20,000.00	\$20,000.00
12-inch PVC Sanitary Sewer	LF	7390	\$500.00	\$3,695,000.00
6-inch Force Main - Open Cut or Directional Drilled	LF	4000	\$200.00	\$800,000.00
Sanitary Sewer Manholes (25 Unit)	VF	435	\$600.00	\$261,000.00
Rock Excavation (Sanitary Sewer)	CY	1900	\$140.00	\$266,000.00
18-inch Steel Casing under RR	LF	120	\$900.00	\$108,000.00
Air Release / Air Vacuum Valve and Vault	EA	2	\$12,000.00	\$24,000.00
6-inch Plug Valve	EA	4	\$3,000.00	\$12,000.00
<b><u>Watermain - South</u></b>				
16-inch PVC Water Main - open cut	LF	7300	\$200.00	\$1,460,000.00
16-inch Water Main - Directional Drilled along RR and Under I-41	LF	1550	\$200.00	\$310,000.00
12-inch Water Main - Directional Drilled along RR and Richfield Parkway	LF	2560	\$180.00	\$460,800.00
Hydrant Assembly	EA	29	\$12,000.00	\$348,000.00
16-inch Butterfly Valve	EA	14	\$10,000.00	\$140,000.00
12-inch Gate Valve	EA	3	\$7,000.00	\$21,000.00
24-inch Steel Casing under RR	LF	120	\$1,250.00	\$150,000.00
<b><u>Watermain - From Rockfield Rd.</u></b>				
16-inch PVC Water Main - open cut	LF	2620	\$200.00	\$524,000.00
16-inch Water Main - Directional Drilled	LF	300	\$200.00	\$60,000.00
Hydrant Assembly	EA	9	\$12,000.00	\$108,000.00
16-inch Butterfly Valve	EA	4	\$10,000.00	\$40,000.00
30-inch Steel Casing under I-41	LF	200	\$1,500.00	\$300,000.00
<b><u>Street</u></b>				
Reconstruct Freistadt Road	LF	1400	\$250.00	\$350,000.00
Tracking Pads	EA	4	\$2,500.00	\$10,000.00
Silt Fence	LF	15000	\$2.50	\$37,500.00
Traffic Control	LS	1	\$20,000.00	\$20,000.00

Subtotal Construction	\$9,525,300
Contingency	\$800,700
Engineering and Administration	\$1,500,000
<b>TOTAL PROJECT COST</b>	<b>\$11,826,000</b>

Appendix N – Sanitary System Map with Flow Analysis Points



Pour Point 3A

Pour Point 3

Pour Point 4

Pour Point 4A

Point PS7

Pour Point 5

Appendix O – Conceptual Sanitary Sewer System Extension & Expansion – Northeast Area

"Country Aire" Basin  
 - Future SSSA Tributary to 24" interceptor  
 - Probable Pump Station "CA" required  
 - Approx. 2,100 LF 4" FM to existing 10" sewer in Country Aire Dr

Potential PS "CA" location

**Border of Expanded Future SSSA**

"Wrenwood" Basin  
 - Future SSSA tributary to Wrenwood LS, Partial  
 - Sewered in existing SSSA  
 - Gravity to existing sewers & WW Pump Station  
 - Approx. 2,300 LF 12" trunk sewer

**Node WW.4**  
 FG +/- 865.0  
 12" IE = 853.0  
 D = 12.0'

**Node WW.3**  
 FG +/- 866.0  
 12" IE = 851.6  
 D = 14.4'

**Node WW.2**  
 FG +/- 870.0  
 12" IE = 850.0  
 D = 20.0'

**Node WW.1**  
 FG +/- 876.0  
 12" IE = 847.7  
 D = 28.3'

**Conn. to Existing**  
 FG +/- 876.5  
 12" IE = 847.2  
 D = 29.3'

**Wrenwood Pump Station**

Country Aire Dr.

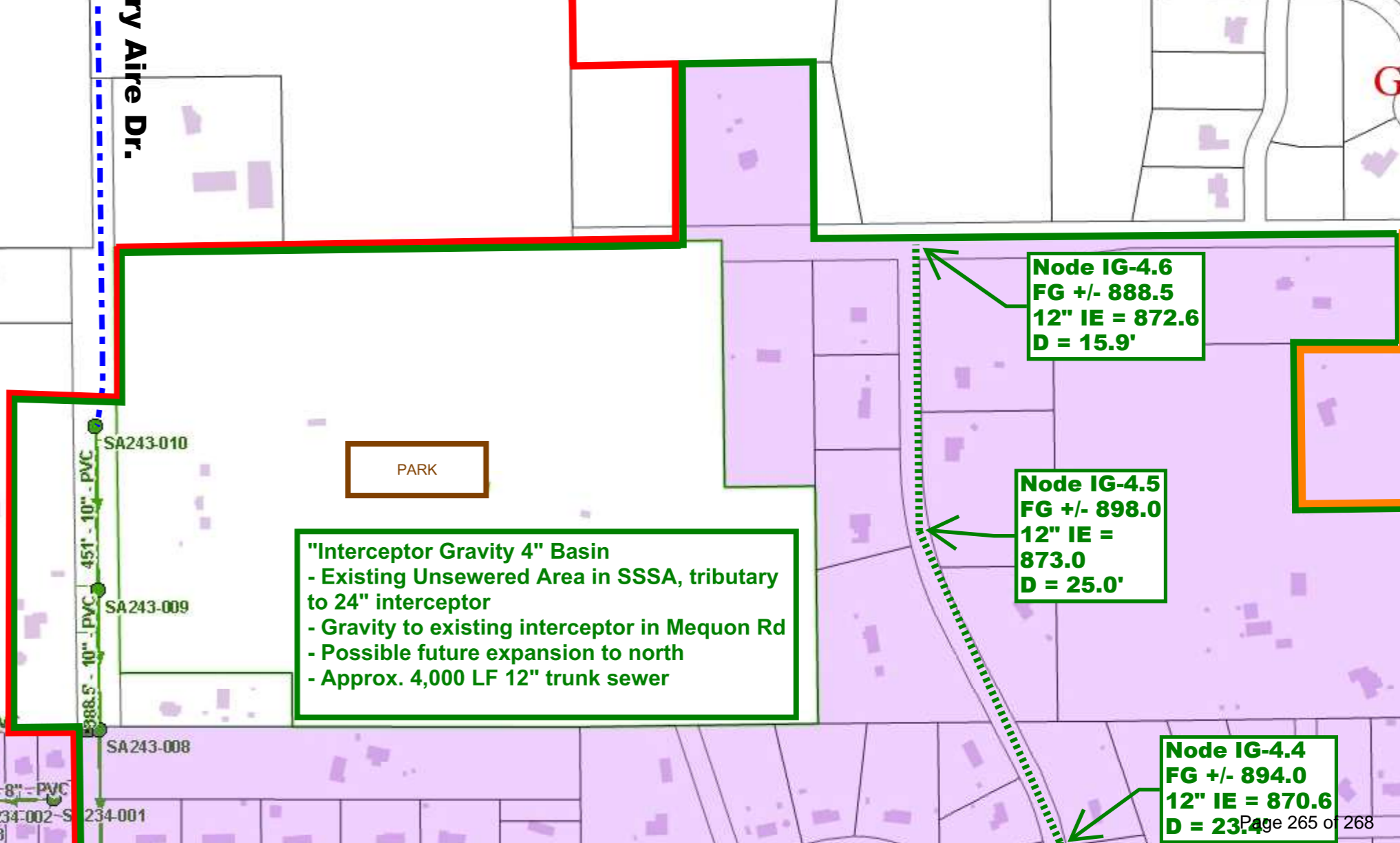
PARK

"Interceptor Gravity 4" Basin  
 - Existing Unsewered Area in SSSA, tributary  
 - to 24" interceptor  
 - Gravity to existing interceptor in Mequon Rd  
 - Possible future expansion to north  
 - Approx. 4,000 LF 12" trunk sewer

**Node IG-4.6**  
 FG +/- 888.5  
 12" IE = 872.6  
 D = 15.9'

**Node IG-4.5**  
 FG +/- 898.0  
 12" IE = 873.0  
 D = 25.0'

**Node IG-4.4**  
 FG +/- 894.0  
 12" IE = 870.6  
 D = 23.4'



Appendix P – Conceptual Sanitary Sewer System Extension & Expansion – Northwest Area

**"Gateway North" Basin**

- Future SSSA Tributary to Main Street PS, Partial unsewered in existing SSSA
- New PS constructed in undeveloped area
- Approx. 6,500 LF 12" gravity sewer to new PS
- Approx. 1,600 LF 6" FM to new 12" sewer in Rockfield Rd.
- Approx. 1,400 LF 12" gravity sewer in Rockfield Rd. to existing 12" sewer in Gateway X-ing

**Rockfield Rd**

**"Gateway Central" Basin**

**Germantown**

**Goldendale Rd**

**"Gateway East" Basin**

- Future SSSA Tributary to Main Street PS
- New gravity sewers to existing 18" sewer in Goldendale Rd.
- Approx. 1,300 LF of 15" gravity sewer
- Approx. 8,700 LF of 12" gravity sewer

**NODE GW-E.9A**  
 FG +/- 952.0  
 12" IE = 920.2  
 D = 31.8'

**NODE GW-E.6**  
 FG +/- 960.0  
 12" IE = 934.6  
 D = 25.4'

**NODE GW-E.8A**  
 FG +/- 935.0  
 12" IE = 911.9  
 D = 23.1'

**NODE GW-E.7A**  
 FG +/- 936.0  
 12" IE = 907.6  
 D = 28.4'

**NODE GW-E.5**  
 FG +/- 945.0  
 12" IE = 923.4  
 D = 21.6'

**NODE GW-E.6A**  
 FG +/- 925.0  
 12" IE = 904.3  
 D = 20.7'

**Holy Hill Rd**

**NODE GW-E.4**  
 FG +/- 940.0  
 12" IE = 919.3  
 D = 20.7'

**NODE GW-E.5A**  
 FG +/- 926.5  
 12" IE = 903.9  
 D = 22.6'

**NODE GW-E.4A**  
 FG +/- 918.0

**BUSINESS OF THE UTILITY ADVISORY COMMITTEE**

MEETING DATE: August 15, 2024

PLACEMENT: Presentation

ITEM TITLE: Director Updates

SUBMITTED BY: Matthew Mortwedt, Public Works Director

SUMMARY EXPLANATION:

Brief presentation on upcoming utility related matters:

- Forthcoming water rate increase per PSC Rate Case 2210-WR-106.
- Sewer rate increase, as passed by the Village Board.
- Construction update

ATTACHMENT:

STAFF RECOMMENDATION:

None

ACTION BY Committee: