BOLTON & MENK

Real People. Real Solutions.

Feasibility Report for

North Crailsheim Road Utility Extension

City of Worthington, MN

December 2017

BMI Project Number F18.114372

Submitted by:

Bolton & Menk, Inc.
150 South State Street, Suite 100
Fairmont, MN 56031
P: 507-238-4738
F: 507-238-4732

Certification

Feasibility Report

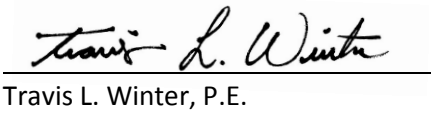
for

North Crailsheim Road Utility Extension

City of Worthington, MN
Worthington, MN
F18.114372

December 2017

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By: 

Travis L. Winter, P.E.
License No. 46649

Date: 12/28/17

Table of Contents

Tables

Appendix

I. INTRODUCTION AND BACKGROUND

The purpose of this report is to determine the feasibility of improving utility access along North Crailsheim Road north of Fox Farm Road for the development of the land parcels adjacent to North Crailsheim Road by extension of the municipal water distribution system and by extension of the municipal sanitary sewer collection system.

The following report summarizes the existing site conditions, needed infrastructure improvements and estimated costs for the proposed utility extensions along North Crailsheim Road. The improvement area includes the portion of North Crailsheim Road located north of Fox Farm Road and approximately 0.5 miles south of Oxford Street (CSAH 35). Figure A in Appendix B provides a project location map.

This report will address the infrastructure needed to provide service to an apartment housing development by MnWest Community & Technical College on the east side of North Crailsheim Road and a public school development for an Adult Learning Center & Gymnasium Facility (ALC) and ultimately a new high school directly across the street on the west side of North Crailsheim Road.

Council Resolution No. 2017-07-01 of July 10, 2017 authorized the preparation of this report. Worthington Public School, ISD 518 petitioned for these improvements needed for the development of their site.

II. PROJECT NEED

Utility service to both of the previously mentioned developments and for the future development of the entire school owned parcel requires the extension of the City owned utilities. The utility extension requested is for domestic water and sanitary sewer connection to the existing municipal utility infrastructure. Domestic water is proposed to be extended south along the west side of North Crailsheim Road with two options. The report includes two options for providing sanitary sewer service by extending an existing gravity line or construction of a new sub-district lift station. The alternatives discussed within this report account for the future widening of North Crailsheim Road with turn lanes and the addition of storm sewer to eliminate the ditch present on the west side of the road in the area of the ALC and high school sites.

III. EXISTING CONDITIONS

The existing corridor of North Crailsheim Road is for the most part undeveloped in the improvement area. North Crailsheim Road is currently a 40 feet wide bituminous street with curb & gutter along the east side with a 10 foot wide multi-use trail behind the curb. The existing land is primarily farmland along the west side of North Crailsheim Road, with a mix of farmland, acreages and park land on the east side.

In the southeast quadrant of the intersection of Fox Farm Road and North Crailsheim Road a lift station was built in 1979. The station was improved in 1991 with the addition of a 6” forcemain that travels northerly along the east side of North Crailsheim Road to a gravity sewer just south of Collegeway. The lift station was rehabilitated in 2013 with the replacement of the existing pumps, addition of a valve vault and a new control panel. Based on the 2013 plans the current lift station has a pump capacity of 320 gpm at 62 feet total dynamic head for each pump when operating singularly and 190 gpm at 73 feet total dynamic head for each pump when both pumps operate. Based on analysis of flow runtime meters from the lift station, the maximum daily flow is currently 211,200 gpd (147 gpm). An existing 10” gravity sewer extends westerly from the lift station along the south side of Fox Farm Road and could be used for a gravity connection into the existing system.

Existing watermains border the improvement area along North Crailsheim Road on the north and south. On the south end, a 1979 project constructed an 8" watermain line under the south edge of Fox Farm Road. On the north end, a 2009 project extended the 12" watermain from Collegeway to the south along the west side of North Crailsheim Road approximately 500 feet with a hydrant at the end. In October of 2017, City staff performed a flow test on the existing hydrant mentioned above with a measurement of 1,110 gpm.

IV. PROPOSED CONDITIONS

A. Sanitary Sewer System Alternatives

As identified previously, this report explores the options for providing sanitary sewer service to the MnWest housing development on the east side of North Crailsheim Road and development of the new ALC site with additional provisions for the future development of a new high school on the site south of the proposed ALC west of North Crailsheim Road.

Based on information found in the 2014 Worthington School District Enrollment Projections, the school (ISD 518) expects their enrollment to increase from 2,873 students in the 2014-2015 school year to approximately 3,800 in the 2024-2025 school year, of which 1,300 students would be in grades 9-12. Kevin Bohl of BKBM provided design flow information for the school site development. For the ALC site, BKBM estimated an average daily flow of 3,000 gpd (2.1 gpm) and peak flow of 12,000 gpd (8.3 gpm). For the future high school the design average daily flow is 22,000 gpd (15.3 gpm) and a peak flow of 88,000 gpd (61.1 gpm).

For the MnWest housing development, the developers are proposing to construct a 27 unit apartment building, with provisions for a future expansion to 54 units. Based on 54 units and an estimated average flow of 310 gpd/apartment, the design average daily flow is 17,000 gpd (11.8 gpm) with a peak flow of 68,000 gpd (47.2 gpm).

From the design flows estimated above, the alternatives considered need to accommodate an average daily flow of 42,000 gpd (29 gpm) and a peak flow of 168,000 gpd (117 gpm). Any additional flows added into the improvement area would require evaluation prior to connection into the system.

1. Sanitary Alternate 1 – Gravity Connection to Existing Lift Station

This option extends sanitary sewer from the existing sewer near the intersection of North Crailsheim Road and Fox Farm Road. In accordance with the City of Worthington sanitary sewer planning, the West-North District includes this improvement area and the existing lift station at the intersection of North Crailsheim Road and Fox Farm Road can serve the area. A gravity sewer main will extend northerly from the existing line at Fox Farm Road to the approximate location of the ALC site and crossing of North Crailsheim Road for MnWest. The crossing of North Crailsheim Road consists of an 8" sanitary sewer main with a manhole. Due to the depth of this utility, it is recommended to place the sewer main outside of the existing right-of-way within an easement. This report includes no costs for the easement. It is anticipated the easements will have minimal cost as the utility will serve the property that it is running through. The existing lift station will need upgrades to facilitate the increased proposed flow detailed above as the current pumps sizing appears consistent with the existing flow. The anticipated upgrades include new 20 HP pumps, precast cover/hatch replacement, discharge piping replacement and electrical service/control panel modification. Figure B in Appendix B provides a preliminary layout for this alternative.

2. Sanitary Alternate 2 – Sub-District Lift Station

   This option for sanitary sewer service includes the construction of a new sub-district lift station to serve the proposed developments. Preliminary design recommends the lift station to be built on the west side of North Crailsheim Road just to the north of the existing baseball field parking lot entrance. Trenchless construction of an 8" gravity sewer main to the east side of the street will provide service to the MnWest site. The lift station design provides capacity for the peak design flow shown above (117 gpm). A 4" forcemain would connect the new lift station to the existing 6" forcemain on the east side of North Crailsheim Road with a wye connection. The wyed connection requires several upgrades to the existing lift station at Fox Farm Road, including larger pumps and associated control panel work. Figure C in Appendix B shows the preliminary layout for this alternative.

B. Domestic Water System Alternatives

Based on design information from BKBM, the fire protection flow needed for the proposed developments is 385 gpm for the ALC and 424 gpm for the future high school. No flows have been provided for the MnWest site. Based on the flow test previously identified, both of the water system alternatives addressed below anticipate no issues with providing the needed fire protection flow.

1. Watermain Alternate 1 – Looped Watermain Extension

   This option provides for the full extension of the existing 12" watermain along the west side of North Crailsheim Road from its current location, south, to connect to the existing 8" watermain running along Fox Farm Road, in accordance with the City's Watermain Master Plan. The total length of the extension contains approximately 3,120 feet of 12" watermain. Hydrants at the maximum spacing of 800 feet provide flushing and nominal fire protection. Connections for the proposed ALC and MnWest sites will be provided at locations identified by the project plans and any connection the future school would need to be added in the future. As seen in Figure B of Appendix B, the proposed watermain is shown along the west edge of North Crailsheim Road. Final design will determine exact location of the watermain with construction desired to be as close to the existing shoulder and a final burial depth on the watermain as close to 7 feet after filling the ditch in as practical.

2. Watermain Alternate 2 – Dead End Extension of Existing Watermain

   This option provides for the extension of the existing 12" watermain along the west side of North Crailsheim Road to serve the proposed ALC and the MnWest housing developments only. This option includes no closure of the master plan watermain loop or connections for the future high school. The extension includes just under 800 feet of 12" watermain. Figure C in Appendix B illustrates the preliminary layout for this alternative. The determination of the final design location matches the constraints along North Crailsheim Road as listed in Alternate 1.

V. PROJECT COST AND FINANCING

The tables below show the total project cost for the improvement alternatives discussed. The City's Assessment Ordinance outlines the distribution of assessable costs of each of the improvement types shown. Appendix A, at the end of the report, provides detailed cost estimates for each of the project alternatives with the total project cost and the lateral cost.

A. Sanitary Sewer System Alternatives

For the purposes of determining assessable project cost a distinction between the trunk line and lateral line construction costs must be determined. An 8" sanitary main at a depth of up to 10 feet provides the basis for the lateral cost determination.

1. Sanitary Alternate 1 – Gravity Connection to Existing Lift Station

   The total estimated cost of the sanitary sewer system work for Alternate 1 discussed above, including engineering and contingencies, is $481,270.

2. Sanitary Alternate 2 – Sub-District Lift Station

   The total estimated cost of the sanitary sewer system work for Alternate 2 discussed above, including engineering and contingencies, is $353,600.

Table 1 - Sanitary Sewer System Estimated Project Cost		
	Sanitary Alternate 1	Sanitary Alternate 2
Trunk Cost	$220,120	$268,200
Lateral Cost	$261,150	$85,400
Total	$481,270	$353,600

B. Domestic Water System Alternatives

For the purposes of determining assessable project cost a distinction between the trunk line and lateral line construction costs must be determined. An 8" watermain, excluding fire hydrants, provides the basis for the lateral cost determination.

1. Watermain Alternate 1 – Looped Watermain Extension

   The total estimated cost of the water system work for Alternate 1 discussed above, including engineering and contingencies, is $282,300.

2. Watermain Alternate 2 – Dead End Extension of Existing Watermain

   The total estimated cost of the water system work for Alternate 1 discussed above, including engineering and contingencies, is $77,750.

Table 2 – Domestic Water System Estimated Project Cost		
	Watermain Alternate 1	Watermain Alternate 2
Trunk Cost	$64,400	$23,600
Lateral Cost	$217,900	$54,150
Total	$282,300	$77,750

Due to the uncertainty of future development south of the proposed high school site and the ability of the dead end line to provide the needed fire protection flow to the school sites, Alternative 2 is the preferred alternative for the domestic water system improvements. As such, this report does not include any further detail for Alternative 1.

C. Special Assessments

Special assessments for wastewater collection and for water distribution projects are levied in two components, trunk assessments and lateral assessments. In general, lateral assessments are levied to properties along a project based on the cost that would be incurred in constructing a sewer or water main of the size and depth (applicable to sewer only) adequate for only providing service to abutting properties. Such lateral costs are based on the installation of an 8" main at up to 10 feet in depth (standard depth and size). The remaining costs would be defined as trunk costs or those additional costs associated with providing service to an area larger than that which abuts on the project. In the case of water distribution projects, the cost of installing hydrants is also defined as trunk costs. The estimated trunk and lateral costs of the proposed improvement are as defined above.

1. Lateral Assessments

Lateral assessments are based on the lateral costs as previously defined and the rate determining frontage or Residential Equivalent Connections (RECs) applicable to the project. The lateral costs divided by the rate determining units establishes the assessment rate. The amount of assessments is equal to the assessment rate multiplied by assessable units. Assessable units may be less than rate determining units when a portion or portions of the project abut property that is not benefitted by the project or is outside the corporate limits. Portions of the properties on the east side of North Crailsheim Road (side opposite of the location of the sewer and water mains) are not found to be benefitted nor proposed to be assessed at this time because it has been the recent practice of the City to not assess lateral benefit across highways such as North Crailsheim Road due to the physical barrier they tend to pose. The determination of lateral benefit on such a basis is consistent with previous projects having comparable circumstances such as the West-North Interceptor Phase V and VI projects (along South Crailsheim Road/ Olson Park), and Water Main Improvement 102 (water main on North Crailsheim south of Collegeway). The determination of benefit is also consistent with that proposed in the West Gateway Drive Sewer and Water Improvements. Only those properties having access to the mains without crossing North Crailsheim Road or will be connecting a water service (college housing) as shown on the figures in Appendix B are proposed to be immediately assessed lateral benefit. In regard to frontage at the points where the sewer main or proposed water service to the college housing are to be extended across North Crailsheim Road, each point of access would support two independent service connections and therefore the equivalent frontage of two REC's (108.9 feet each) would be assigned at each point of access. Such an assignment of property by a point of connection is also consistent with previous improvements such as those cited above. The properties located on the west side of North Crailsheim Road north of the school site are also not proposed to be assessed due to the wetland status and/or shape and configuration of the properties.

The selection of REC or frontage units tends to be based on the status of the abutting property. Frontage is generally used when assessments are to be levied to undeveloped property or properties that may be subdivided or rearranged. The use of frontage units yields a uniformly distributed rate which is beneficial in equitably reapportioning assessments at the time development or changes in property lines occurs. REC units are typically used where the number of individual connections or lots is able to be identified at the time the project is undertaken. In the case of this project it is proposed to utilize frontage units because all potential connections are not identifiable at this time.

As per past City practice, the rate determining frontage would be established on the basis of what would be potentially benefitted frontages if not for the separation created by county highways, being outside city limits or being undevelopable. The determination of lateral rates on such a basis is consistent with previous projects having comparable circumstances. The lateral assessment rate will therefore be equal to the lateral costs

divided by the frontage that would abut each side of the length of the sanitary sewer or water main extension.

Table 3 – Sanitary Sewer Lateral Assessment Rates			
	Lateral Costs	Rate Determining Units	Lateral Rate
Sanitary Alternate 1	$261,150	5,279.7	$49.463
Sanitary Alternate 2	$85,400	891.0	$95.847 ($63.858)[1]
Watermain Alternate 2	$217,900	6,026.4	$36.158

[1] Due To the unusually high assessments that would result from strict use of the City's Assessment Ordinance, it is believed that the calculated lateral assessment rate for Sanitary Sewer Alternate 2 as shown above would exceed the benefit derived from the project as defined by the intent of Minnesota Statutes. It is therefore recommended that the lateral assessment be based on the current value of the previous calculated sewer lateral assessment rates used in similar situations, which is estimated to be $63.858 per foot at the time the project is undertaken. Final lateral assessments will be determined at the time of project financing or on calculated rates, whichever is less.

Properties that are not proposed to be assessed lateral benefit at this time will be subject to additional assessments in the future if connections (lateral or service) are made to the mains installed in the proposed improvement. This would be the case whether a service is extended under North Crailsheim Road, the wetland area is developed (wetland replacement required), or properties are annexed and subsequently utilize a main crossing of North Crailsheim Road.

2. Trunk Assessments

   Trunk assessments are levied on the basis of area benefitted by a water extension and the current trunk assessment rate which is independent of a particular project's cost. The trunk rate is defined by ordinance and originates from a July 1975 determination of estimated costs for all trunk improvements needed at that time and the total area to be served by those improvements. An adjustment using a construction cost index maintains current value of the trunk rate. A trunk fund receives all trunk assessments and is utilized to retire those debt costs attributable to trunk project costs. The trunk fund may receive more or less assessments than trunk costs for each project undertaken. As with lateral assessments, only the areas shown on the figures in Appendix B are proposed to be immediately subject to trunk sanitary sewer or water assessments as a result of the proposed improvements.

   Similar to lateral assessments, properties or portions of properties that are not proposed to be assessed trunk benefit at this time will be subject to additional assessments in the future if the mains installed in the proposed improvement are utilized in one manner or the other. Additional trunk assessments are also levied as additional property is developed. In other words, as property is incorporated into a development that property will be subject to additional trunk assessments if not assessed at this time.

3. Estimated Assessments

   Estimated assessments, trunk fund obligations, and “City Share” costs of the project are as follows:

Table 4 – Sanitary Sewer Assessments – Alternate No. 1			
	Lateral	Trunk	Total
Assessments	$142,497.96	$111,820.05	$254,318.01
Trunk Funds		$108,299.95	$108,299.95
City Share	$118,652.04		$118,652.04
Total	$261,150.00	$220,120.00	$481,270.00

Table 5 – Sanitary Sewer Assessments – Alternate No. 2			
	Lateral	Trunk	Total
Assessments	$41,654.63	$71,673.47	$113,328.10
Trunk Funds		$196,526.53	$196,526.53
City Share	$43,745.37		$43.745.37
Total	$85,400.00	$268,200.00	$353,600.00

Table 6 – Watermain Assessments – Alternate No. 2			
	Lateral	Trunk	Total
Assessments	$24,559.27	$44,918.87	$69,478.14
Trunk Funds(due to[1])		($21,318.87)	($21,318.87)
City Share	$29,590.73		$29,590.73
Total	$54,150.00	$23,600.00	$77,750.00

[1]Due to trunk fund for prior improvements

D. Sanitary Sewer System Alternatives Life Cycle Cost

Table 7 provides a present worth cost analysis of the proposed sanitary sewer alternatives based on the present value of the total life cycle (assumed at 40 years) cost. The present worth cost analysis uses the Real Federal Discount Rate from Appendix C of OMB Circular A-94 (30 year interest rate=1.5% November 2015 Revision).

Table 7 – Sanitary Sewer Life Cycle Cost Analysis Summary		
	Alternate 1	Alternate 2
Total Capital Costs	$481,270	$353,600
Useful Life of Improvements, Years	40	40
Real Federal Discount Rate	1.5%	1.5%
Total Annual Operating Costs	$3,000	$11,300
20-Year Uniform Series Present Value Factor	29.9160	29.9160
Present Value of Annual Operating Costs	$89,748	$338,051
Life Cycle Cost	**$571,018**	**$691,651**

PIR bonding can provide initial financing for the proposed project. Until the receipt of bond proceeds, the City may need to temporarily use 401 Construction Fund reserves. Revenues from special assessments levied as a result of the project along with the annual special tax levy required to recover the City share of the project would be utilized for bond repayment.

VI. CONCLUSION

The life cycle cost analysis presented above delivers the recommended alternative for extension of the sanitary sewer system as Alternative 1. As discussed in the project cost section above, Alternative 2 is the recommended alternative for extension of the domestic water system.

From an engineering standpoint, this project, as proposed, is feasible, cost effective and necessary for the development of the properties adjacent to North Crailsheim Road in the City of Worthington. The requesting competitive bids for the project best accomplishes the proposed construction of sanitary sewer and watermain described in this report. It is recommended that the work be done under one contract in order to complete the work in an orderly and efficient manner.

The preliminary estimated costs presented herein, have been prepared based on current, average bidding prices and are subject to variation due to construction timing, contractor workloads, etc. The cost estimates include the estimated cost of engineering and contract administration, but do not include the cost of any fiscal fees related to project financing.

Appendix A: Preliminary Cost Estimates

PRELIMINARY ESTIMATE

CRAILSHEIM ROAD UTILITY EXTENSION
SANITARY ALTERNATE 1 - GRAVITY EXTENSION
WORTHINGTON, MINNESOTA
BMI PROJECT NO.: F18.114372
DATE December 27, 2017

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	SANITARY QUANT	SANITARY TOTAL
1	MOBILIZATION	LS	$22,000.00	1.0	$ 22,000.00
2	TRAFFIC CONTROL	LS	$9,000.00	1.0	$ 9,000.00
3	BITUMINOUS PAVEMENT REMOVAL	SY	$10.00	90.0	$ 900.00
4	BITUMINOUS PAVEMENT PATCH	SY	$70.00	90.0	$ 6,300.00
5	CORE & BOOT EXISTING MANHOLE	EA	$1,000.00	1.0	$ 1,000.00
6	8" PVC SANITARY SEWER PIPE	LF	$30.00	1,020.0	$ 30,600.00
7	10" PVC SANITARY SEWER PIPE	LF	$50.00	1,720.0	$ 86,000.00
8	8" PVC SANITARY SEWER PIPE, IN CASING	LF	$35.00	130.0	$ 4,550.00
9	24" STEEL CASING, JACK & AUGER	LF	$210.00	120.0	$ 25,200.00
10	SANITARY SEWER MANHOLE	LF	$400.00	153.0	$ 61,200.00
11	OUTSIDE DROP	LF	$200.00	10.1	$ 2,020.00
12	CASTING ASSEMBLY	EA	$1,500.00	10.0	$ 15,000.00
13	LIFT STATION UPGRADES	LS	$75,000.00	1.0	$ 75,000.00
14	TURF ESTABLISHMENT	ACRE	$2,500.00	3.0	$ 7,500.00
15	EROSION CONTROL	LS	$9,000.00	1.0	$ 9,000.00
16	UNCLASSIFIED MISCELLANEOUS CONSTRUCTION	LS	$16,000.00	1.0	$ 16,000.00
			Subtotal:		**$ 371,270.00**
			Contingencies (10%):		**$ 37,000.00**
			Preliminary Estimated Construction Costs:		**$ 408,270.00**
			Estimated Engineering & Administration (18%):		**$ 73,000.00**
			Preliminary Estimated Project Cost:		**$ 481,270.00**

PRELIMINARY ESTIMATE

CRAILSHEIM ROAD UTILITY EXTENSION
SANITARY ALTERNATE 2 - SUB-DISTRICT LIFT STATION
WORTHINGTON, MINNESOTA
BMI PROJECT NO.: F18.114372
DATE December 27, 2017

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	SANITARY	
				QUANT	TOTAL
1	MOBILIZATION	LS	$16,000.00	1.0	$ 16,000.00
2	TRAFFIC CONTROL	LS	$7,000.00	1.0	$ 7,000.00
3	CONNECTION TO EXISTING FORCEMAIN	EA	$1,000.00	1.0	$ 1,000.00
4	6" SANITARY FORCEMAIN	LF	$25.00	130.0	$ 3,250.00
5	8" PVC SANITARY SEWER PIPE	LF	$30.00	390.0	$ 11,700.00
6	8" PVC SANITARY SEWER PIPE, IN CASING	LF	$35.00	130.0	$ 4,550.00
7	24" STEEL CASING, JACK & AUGER	LF	$210.00	120.0	$ 25,200.00
8	SANITARY SEWER MANHOLE	LF	$400.00	26.0	$ 10,400.00
9	CASTING ASSEMBLY	EA	$1,500.00	2.0	$ 3,000.00
10	LIFT STATION	LS	$170,000.00	1.0	$ 170,000.00
11	TURF ESTABLISHMENT	ACRE	$2,500.00	1.0	$ 2,500.00
12	EROSION CONTROL	LS	$7,000.00	1.0	$ 7,000.00
13	UNCLASSIFIED MISCELLANEOUS CONSTRUCTION	LS	$11,000.00	1.0	$ 11,000.00
			Subtotal:		**$ 272,600.00**
			Contingencies (10%):		**$ 27,000.00**
			Preliminary Estimated Construction Costs:		**$ 299,600.00**
			Estimated Engineering & Administration (18%):		**$ 54,000.00**
			Preliminary Estimated Project Cost:		**$ 353,600.00**

PRELIMINARY ESTIMATE

CRAILSHEIM ROAD UTILITY EXTENSION
WATERMAIN ALTERNATE 1 - LOOPED CONNECTION
WORTHINGTON, MINNESOTA
BMI PROJECT NO.: F18.114372
DATE December 27, 2017

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	WATERMAIN QUANT	WATERMAIN TOTAL
1	MOBILIZATION	LS	$13,000.00	1.0	$ 13,000.00
2	TRAFFIC CONTROL	LS	$6,000.00	1.0	$ 6,000.00
3	BITUMINOUS PAVEMENT REMOVAL	SY	$10.00	90.0	$ 900.00
4	BITUMINOUS PAVEMENT PATCH	SY	$70.00	90.0	$ 6,300.00
5	6" PVC WATERMAIN	LF	$40.00	30.0	$ 1,200.00
6	12" PVC WATERMAIN	LF	$40.00	3,120.0	$ 124,800.00
7	6" GATE VALVE & BOX	EA	$2,200.00	3.0	$ 6,600.00
8	12" GATE VALVE & BOX	EA	$3,500.00	5.0	$ 17,500.00
9	HYDRANT	EA	$3,500.00	3.0	$ 10,500.00
10	FITTINGS	LBS	$10.00	800.0	$ 8,000.00
11	TURF ESTABLISHMENT	ACRE	$2,500.00	3.0	$ 7,500.00
12	EROSION CONTROL	LS	$6,000.00	1.0	$ 6,000.00
13	UNCLASSIFIED MISCELLANEOUS CONSTRUCTION	LS	$9,000.00	1.0	$ 9,000.00
			Subtotal:		**$ 217,300.00**
			Contingencies (10%):		**$ 22,000.00**
			Preliminary Estimated Construction Costs:		**$ 239,300.00**
			Estimated Engineering & Administration (18%):		**$ 43,000.00**
			Preliminary Estimated Project Cost:		**$ 282,300.00**

PRELIMINARY ESTIMATE

CRAILSHEIM ROAD UTILITY EXTENSION
WATERMAIN ALTERNATE 2 - DEAD END EXTENSION
WORTHINGTON, MINNESOTA
BMI PROJECT NO.: F18.114372
DATE December 27, 2017

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	WATERMAIN QUANT	WATERMAIN TOTAL
1	MOBILIZATION	LS	$4,000.00	1.0	$ 4,000.00
2	TRAFFIC CONTROL	LS	$2,000.00	1.0	$ 2,000.00
3	6" PVC WATERMAIN	LF	$40.00	15.0	$ 600.00
4	12" PVC WATERMAIN	LF	$40.00	780.0	$ 31,200.00
5	6" GATE VALVE & BOX	EA	$2,200.00	1.0	$ 2,200.00
6	12" GATE VALVE & BOX	EA	$3,500.00	2.0	$ 7,000.00
7	HYDRANT	EA	$3,500.00	1.0	$ 3,500.00
8	FITTINGS	LBS	$10.00	300.0	$ 3,000.00
9	TURF ESTABLISHMENT	ACRE	$2,500.00	0.5	$ 1,250.00
10	EROSION CONTROL	LS	$2,000.00	1.0	$ 2,000.00
11	UNCLASSIFIED MISCELLANEOUS CONSTRUCTION	LS	$3,000.00	1.0	$ 3,000.00
			Subtotal:		**$ 59,750.00**
			Contingencies (10%):		**$ 6,000.00**
			Preliminary Estimated Construction Costs:		**$ 65,750.00**
			Estimated Engineering & Administration (18%):		**$ 12,000.00**
			Preliminary Estimated Project Cost:		**$ 77,750.00**

PRELIMINARY ESTIMATE

CRAILSHEIM ROAD UTILITY EXTENSION
SANITARY ALTERNATE 1 - GRAVITY EXTENSION - LATERAL SEWER COSTS
WORTHINGTON, MINNESOTA
BMI PROJECT NO.: F18.114372
DATE December 27, 2017

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	SANITARY QUANT	SANITARY TOTAL
1	MOBILIZATION	LS	$11,000.00	1.0	$ 11,000.00
2	TRAFFIC CONTROL	LS	$5,000.00	1.0	$ 5,000.00
3	BITUMINOUS PAVEMENT REMOVAL	SY	$10.00	90.0	$ 900.00
4	BITUMINOUS PAVEMENT PATCH	SY	$70.00	90.0	$ 6,300.00
5	CORE & BOOT EXISTING MANHOLE	EA	$1,000.00	1.0	$ 1,000.00
6	8" PVC SANITARY SEWER PIPE	LF	$30.00	2,740.0	$ 82,200.00
7	8" PVC SANITARY SEWER PIPE, TRENCHLESS	LF	$35.00	130.0	$ 4,550.00
8	24" STEEL CASING, JACK & AUGER	LF	$210.00	120.0	$ 25,200.00
9	SANITARY SEWER MANHOLE	LF	$320.00	100.0	$ 32,000.00
10	CASTING ASSEMBLY	EA	$1,500.00	10.0	$ 15,000.00
11	TURF ESTABLISHMENT	ACRE	$2,500.00	2.0	$ 5,000.00
12	EROSION CONTROL	LS	$5,000.00	1.0	$ 5,000.00
13	UNCLASSIFIED MISCELLANEOUS CONSTRUCTION	LS	$8,000.00	1.0	$ 8,000.00
			Subtotal:		**$ 201,150.00**
			Contingencies (10%):		**$ 20,000.00**
			Preliminary Estimated Construction Costs:		**$ 221,150.00**
			Estimated Engineering & Administration (18%):		**$ 40,000.00**
			Preliminary Estimated Lateral Cost:		**$ 261,150.00**

PRELIMINARY ESTIMATE

CRAILSHEIM ROAD UTILITY EXTENSION
SANITARY ALTERNATE 2 - SUB-DISTRICT LIFT STATION - LATERAL SEWER COSTS
WORTHINGTON, MINNESOTA
BMI PROJECT NO.: F18.114372
DATE December 27, 2017

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	SANITARY QUANT	SANITARY TOTAL
1	MOBILIZATION	LS	$4,000.00	1.0	$ 4,000.00
2	TRAFFIC CONTROL	LS	$2,000.00	1.0	$ 2,000.00
3	CONCRETE SIDEWALK REMOVAL	SY	$5.00	20.0	$ 100.00
4	CONCRETE SIDEWALK	SY	$60.00	20.0	$ 1,200.00
5	CORE & BOOT EXISTING MANHOLE	EA	$1,000.00	1.0	$ 1,000.00
6	8" PVC SANITARY SEWER PIPE	LF	$30.00	390.0	$ 11,700.00
7	8" PVC SANITARY SEWER PIPE, TRENCHLESS	LF	$35.00	130.0	$ 4,550.00
8	24" STEEL CASING, JACK & AUGER	LF	$210.00	120.0	$ 25,200.00
9	SANITARY SEWER MANHOLE	LF	$320.00	20.0	$ 6,400.00
10	CASTING ASSEMBLY	EA	$1,500.00	2.0	$ 3,000.00
11	TURF ESTABLISHMENT	ACRE	$2,500.00	0.5	$ 1,250.00
12	EROSION CONTROL	LS	$2,000.00	1.0	$ 2,000.00
13	UNCLASSIFIED MISCELLANEOUS CONSTRUCTION	LS	$3,000.00	1.0	$ 3,000.00
			Subtotal:		**$ 65,400.00**
			Contingencies (10%):		**$ 7,000.00**
			Preliminary Estimated Construction Costs:		**$ 72,400.00**
			Estimated Engineering & Administration (18%):		**$ 13,000.00**
			Preliminary Estimated Lateral Cost:		**$ 85,400.00**

PRELIMINARY ESTIMATE

CRAILSHEIM ROAD UTILITY EXTENSION
WATERMAIN ALTERNATE 1 - LOOPED CONNECTION - LATERAL WATER COSTS
WORTHINGTON, MINNESOTA
BMI PROJECT NO.: F18.114372
DATE December 27, 2017

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	WATERMAIN QUANT	WATERMAIN TOTAL
1	MOBILIZATION	LS	$9,000.00	1.0	$ 9,000.00
2	TRAFFIC CONTROL	LS	$4,000.00	1.0	$ 4,000.00
3	BITUMINOUS PAVEMENT REMOVAL	SY	$10.00	90.0	$ 900.00
4	BITUMINOUS PAVEMENT PATCH	SY	$70.00	90.0	$ 6,300.00
5	8" PVC WATERMAIN	LF	$35.00	3,120.0	$ 109,200.00
6	8" GATE VALVE & BOX	EA	$2,700.00	5.0	$ 13,500.00
7	FITTINGS	LBS	$10.00	400.0	$ 4,000.00
8	TURF ESTABLISHMENT	ACRE	$2,500.00	4.0	$ 10,000.00
9	EROSION CONTROL	LS	$4,000.00	1.0	$ 4,000.00
10	UNCLASSIFIED MISCELLANEOUS CONSTRUCTION	LS	$7,000.00	1.0	$ 7,000.00
			Subtotal:		**$ 167,900.00**
			Contingencies (10%):		**$ 17,000.00**
			Preliminary Estimated Construction Costs:		**$ 184,900.00**
			Estimated Engineering & Administration (18%):		**$ 33,000.00**
			Preliminary Estimated Lateral Cost:		**$ 217,900.00**

PRELIMINARY ESTIMATE

CRAILSHEIM ROAD UTILITY EXTENSION
WATERMAIN ALTERNATE 2 - DEAD END EXTENSION - LATERAL WATER COSTS
WORTHINGTON, MINNESOTA
BMI PROJECT NO.: F18.114372
DATE December 27, 2017

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	WATERMAIN QUANT	WATERMAIN TOTAL
1	MOBILIZATION	LS	$3,000.00	1.0	$ 3,000.00
2	TRAFFIC CONTROL	LS	$1,000.00	1.0	$ 1,000.00
3	8" PVC WATERMAIN	LF	$35.00	780.0	$ 27,300.00
4	8" GATE VALVE & BOX	EA	$2,700.00	2.0	$ 5,400.00
5	FITTINGS	LBS	$10.00	120.0	$ 1,200.00
6	TURF ESTABLISHMENT	ACRE	$2,500.00	0.5	$ 1,250.00
7	EROSION CONTROL	LS	$1,000.00	1.0	$ 1,000.00
8	UNCLASSIFIED MISCELLANEOUS CONSTRUCTION	LS	$2,000.00	1.0	$ 2,000.00
			Subtotal:		**$ 42,150.00**
			Contingencies (10%):		**$ 4,000.00**
			Preliminary Estimated Construction Costs:		**$ 46,150.00**
			Estimated Engineering & Administration (18%):		**$ 8,000.00**
			Preliminary Estimated Lateral Cost:		**$ 54,150.00**

Appendix B: Figures

CRAILSHEIM ROAD UTILITY EXTENSION

CITY OF WORTHINGTON, MN

LOCATION MAP

FIGURE A - DECEMBER 2017

H:\WGTN\F18114372\CAD\C3D\Preliminary\MISC-114372-Project Location Map.dwg 12/28/2017 12:03:27 PM

City of Worthington

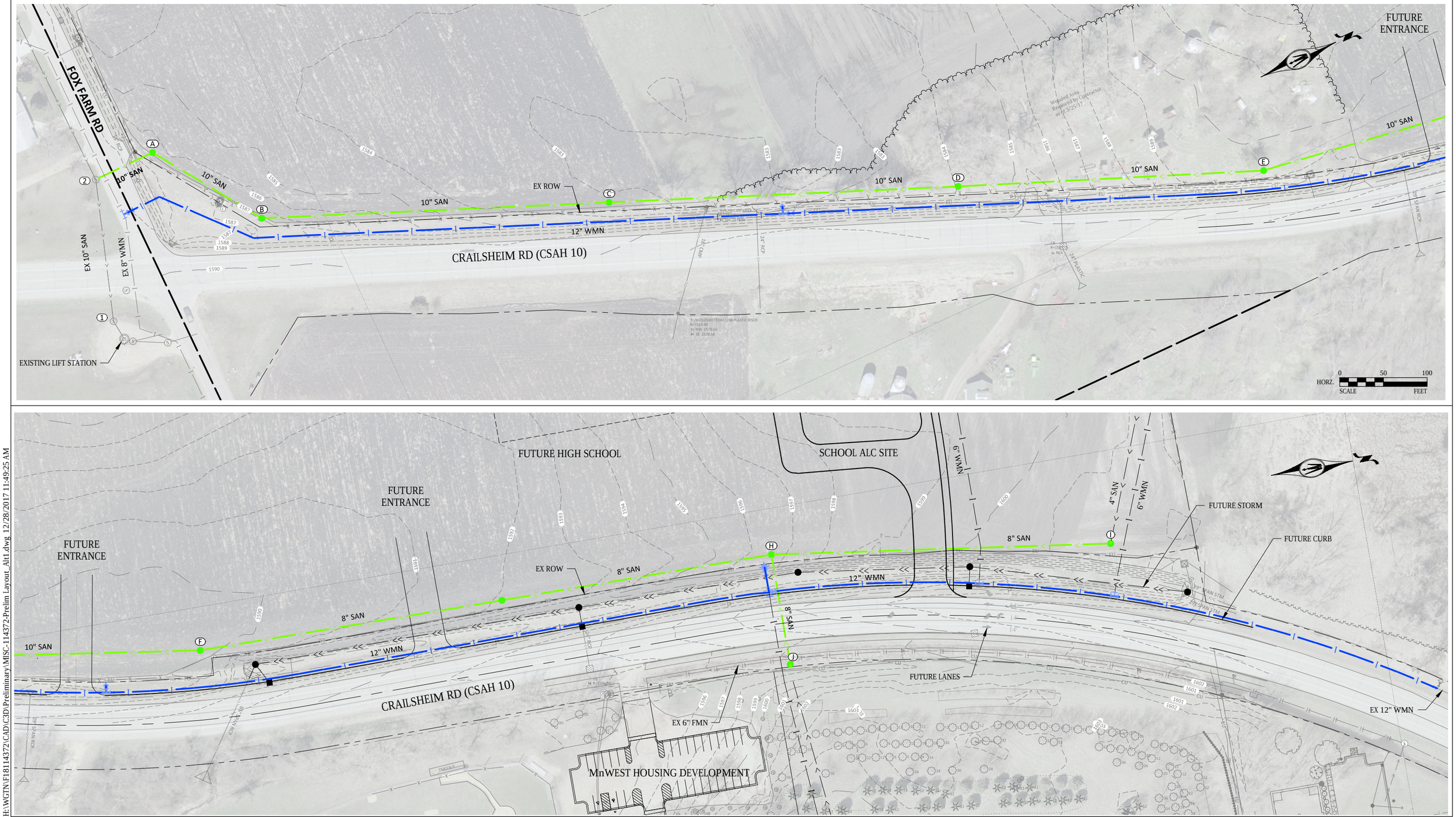
CRAILSHEIM ROAD UTILITY EXTENSION

CITY OF WORTHINGTON, MN

ALTERNATE 1 - CONNECTION TO EXISTING LIFT STATION

FIGURE B - DECEMBER 2017

BOLTON & MENK



H:\WGTN\F1811\4372\CAD\C3D\Preliminary\MISC-114372-Prelim Layout_Alt1.dwg 12/28/2017 11:49:25 AM

City of Worthington

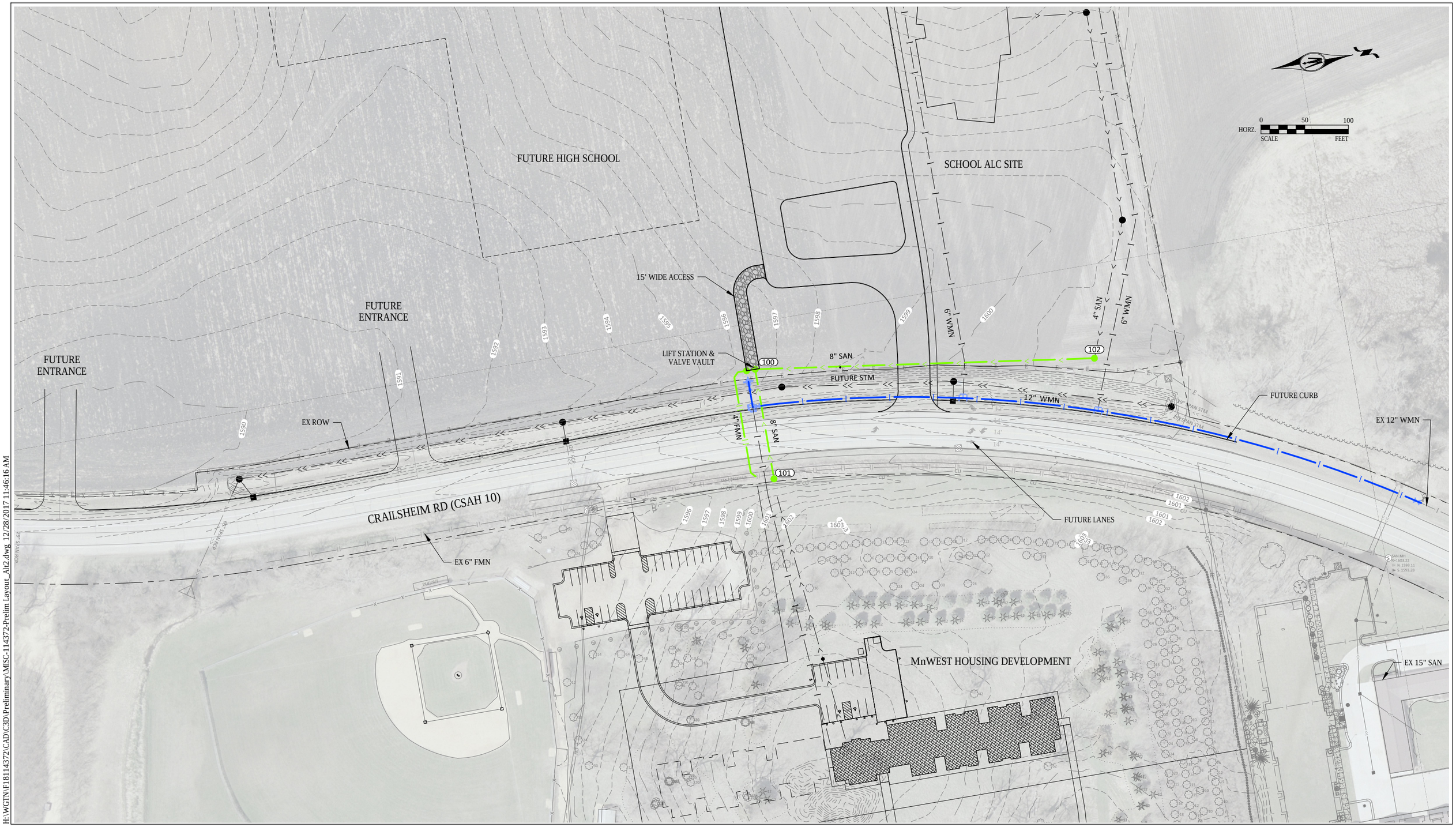
CRAILSHEIM ROAD UTILITY EXTENSION

CITY OF WORTHINGTON, MN

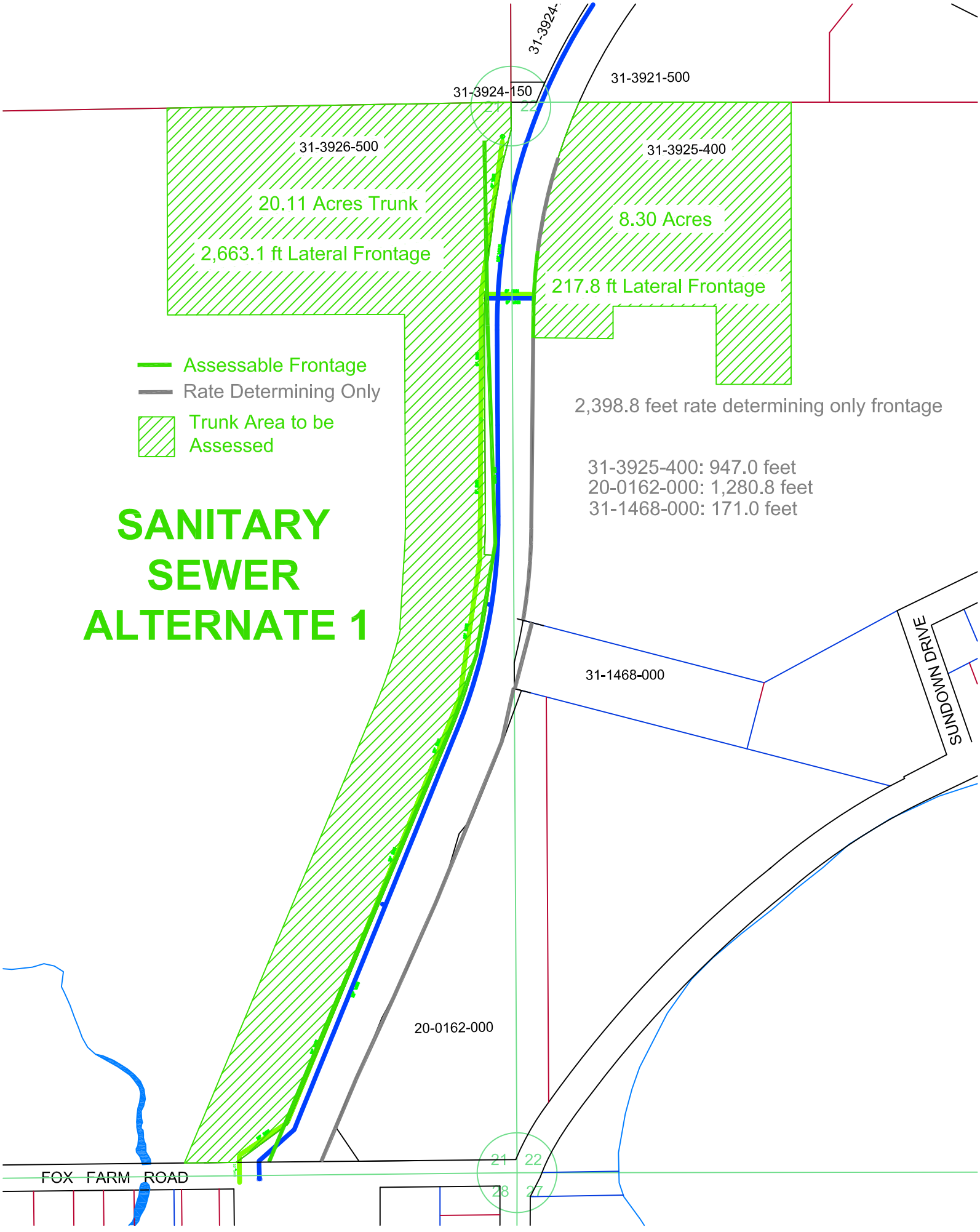
ALTERNATE 2 - SUBDISTRICT LIFT STATION

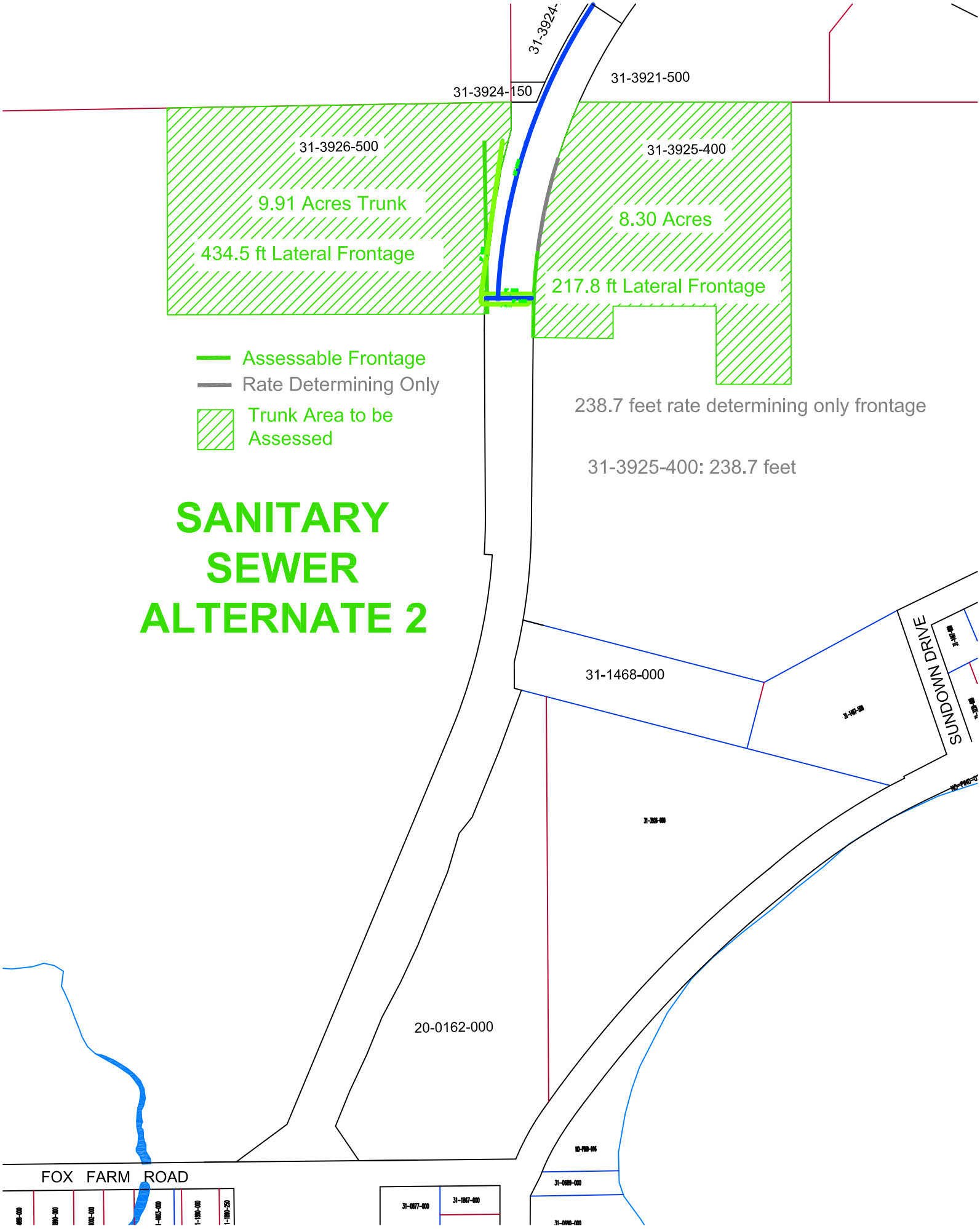
FIGURE C - DECEMBER 2017

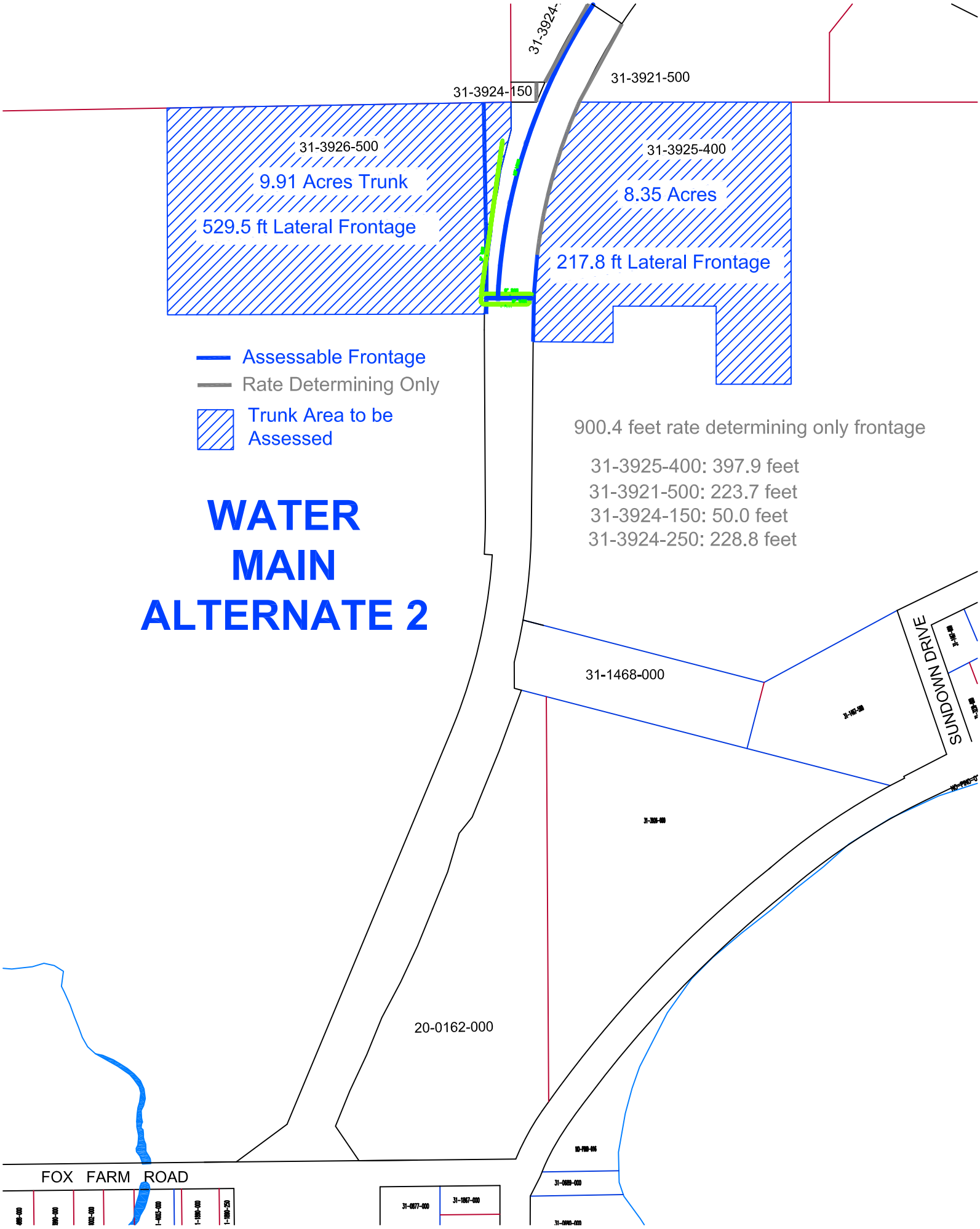
BOLTON & MENK



H:\WGTN\P18114372\CAD\C3D\Preliminary\MISC-114372-Prelim Layout_Alt2.dwg 12/28/2017 11:46:16 AM


31-3924-
31-3924-150
31-3921-500
31-3926-500
20.11 Acres Trunk
2,663.1 ft Lateral Frontage
31-3925-400
8.30 Acres
217.8 ft Lateral Frontage
Assessable Frontage
Rate Determining Only
Trunk Area to be Assessed
2,398.8 feet rate determining only frontage
31-3925-400: 947.0 feet
20-0162-000: 1,280.8 feet
31-1468-000: 171.0 feet
SANITARY SEWER ALTERNATE 1
31-1468-000
SUNDOWN DRIVE
20-0162-000
FOX FARM ROAD
21
22
28
27


31-3924-
31-3924-150
31-3921-500
31-3926-500
9.91 Acres Trunk
434.5 ft Lateral Frontage
31-3925-400
8.30 Acres
217.8 ft Lateral Frontage
Assessable Frontage
Rate Determining Only
Trunk Area to be Assessed
238.7 feet rate determining only frontage
31-3925-400: 238.7 feet
SANITARY SEWER ALTERNATE 2
31-1468-000
SUNDOWN DRIVE
20-0162-000
FOX FARM ROAD


31-3924-
31-3924-150
31-3921-500
31-3926-500
9.91 Acres Trunk
529.5 ft Lateral Frontage
31-3925-400
8.35 Acres
217.8 ft Lateral Frontage
Assessable Frontage
Rate Determining Only
Trunk Area to be Assessed
900.4 feet rate determining only frontage
31-3925-400: 397.9 feet
31-3921-500: 223.7 feet
31-3924-150: 50.0 feet
31-3924-250: 228.8 feet
WATER MAIN ALTERNATE 2
31-1468-000
SUNDOWN DRIVE
20-0162-000
FOX FARM ROAD