

FEASIBILITY STUDY

FOR

DOWNTOWN RECONSTRUCTION, PHASE 3
PROJECT

CITY OF WACONIA, MN



DECEMBER 2024

PREPARED BY:
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December 10, 2024

City of Waconia
Attn: Shane Fineran
201 South Vine Street
Waconia, MN 55387

RE: Downtown Reconstruction, Phase 3 Project

Honorable Mayor and City Council Members:

Pursuant to your request we have prepared a Feasibility Study for project components to be included in the Downtown Reconstruction, Phase 3 Project. The project location and the various proposed project components include the following:

- Street and utility reconstruction of 1st Street from Maple Street to Olive Street, Olive Street from 1st Street to 2nd Street, and 2nd Street from City Hall to Elm Street consisting of the following items:
 - Complete street reconstruction
 - Storm sewer replacement/expansion & stormwater treatment
 - Sidewalk replacement/widening
 - Sanitary sewer replacement
 - Water system replacement/upsizing and addition of cathodic protection
 - Irrigation system expansion
- Reconstruction and utility improvements of 1 block of the alley east of Olive Street and north of 2nd Street.
- Reconstruction and paving of 2 blocks of alley east of Elm Street and north of Main Street.
- Parking lot improvement in the public and private parking areas south of 1st Street and west of Elm Street (across the alley from the proposed apartment building project).

This report includes maps and drawings indicating the proposed improvements and a proposed method of financing and funding. I am available to discuss this report and this proposed project at your convenience.

Respectfully Submitted,
Bolton & Menk, Inc.

Jake S. Saulsbury, P.E.

Cc: Jon Haukaas, Public Services Director

Enclosure

FEASIBILITY STUDY
FOR
DOWNTOWN RECONSTRUCTION, PHASE 3 PROJECT
CITY OF WACONIA, MINNESOTA

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.



Jake S. Saulsbury, P.E.

Date: December 10, 2024

Registration No. 42713

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SUMMARY & CONCLUSIONS

A. STUDY SCOPE

It is proposed that improvements to the infrastructure be constructed or reconstructed to provide the public with a sustainable system of roads, utilities, and pedestrian facilities to augment the City with good water quality, greater connectivity among residents, safer traveling for vehicles and pedestrians, and a healthier quality of life. This study investigates the feasibility of the proposed improvements, provides related project cost estimates, and recommends a proposed method for financing and funding the project. The location of these improvements is shown on Figure No. 1.1 in Appendix A and consists of the following project components:

1. Reconstruction of West 1st Street (from Maple Street to Olive Street), South Olive Street (from 1st Street to 2nd Street), 2nd Street (from dead end to Elm Street), alley from Olive Street to Elm Street, alley from Elm Street to Pine Street, alley from Pine Street to Spruce Street, and the parking lot in the southwest corner of Elm Street and First Street:
 - Removal and reconstruction of the entire 66-foot road right-of-way of 1st Street, Olive Street, and 2nd Street.
 - Reconstruction of 1st Street, Olive Street, and 2nd Street to the City's truck route section.
 - Reconstruction of the alleys from Olive Street to Elm Street, Elm Street to Pine Street, and Pine Street to Spruce Street.
 - Replacement of the sanitary sewer system, including service laterals.
 - Replacement and upsizing of the water system, including replacement of hydrants, gate valves, and services.
 - Expansion of irrigation system crossing 1st Street with distribution mains located along 1st Street and Olive Street
 - Replacement and expansion of the existing storm sewer system, including the addition of stormwater treatment.
 - Reconstruction of the existing sidewalks along 1st Street, Olive Street, and 2nd Street.

The City requested two alternatives to be reviewed for 1st Street between Vine Street and Olive Street. The contents of this Feasibility Study and the widths of the roadway, parking areas, and sidewalks contained herein reflect the City’s direction.

B. ESTIMATED COSTS, FUNDING, AND FINANCING

Estimated project costs for each of the project components are provided in Appendix A. The project costs are summarized as follows:

1.) Option A or B Street Reconstruction	\$5,035,600
2.) Parking Lot Reconstruction	\$314,600
3.) Utility Reconstruction	\$1,789,800
	Total Project Cost - \$7,140,000

The proposed method of financing for the Downtown Reconstruction, Phase 3 Project is through the sale of a combined bond consisting of a Chapter 429 General Obligation Bond, a Chapter 115 Sanitary Sewer Revenue Bond, and a Chapter 444 Water and Stormwater Revenue Bond. The Chapter 429 Bond would be used for the street/storm sewer reconstruction. The Chapter 115 Bond would be used for the sanitary sewer reconstruction. The Chapter 444 Bond would be used for the watermain reconstruction and miscellaneous drainage improvements. PIR Capital Improvement cash would be used for the sidewalk improvements. This proposed method will be discussed further with the Finance Director and the City’s Financial Consultant.

C. OVERALL FEASIBILITY AND COST EFFECTIVENESS

All improvements addressed within this report are feasible from a technical standpoint. This study addresses issues with failing or non-existent infrastructure including street pavement, storm sewer, watermain, sanitary sewer, irrigation, and sidewalk facilities. The improvements are necessary to provide safe and adequate infrastructure and represent cost effective solutions for doing so. Detailed cost estimates for all project components have been completed and are located in Appendix B.

SECTION 1 - INTRODUCTION

A. IMPETUS

The impetus for this report is a request from the City of Waconia to evaluate the feasibility of planned improvements for the upcoming year. Figure No. 1.1 in Appendix A shows the proposed project location for the Downtown Reconstruction, Phase 3 Project.

B. REPORT ORGANIZATION

To address the various projects in an orderly manner, this report is organized into three (3) sections, shown below:

- Section 1 - Introduction
- Section 2 - Street and Utility Reconstruction
- Section 3 - Financing / Funding

SECTION 2 - STREET AND UTILITY RECONSTRUCTION

A. STREET IMPROVEMENTS

Figure No. 2.1 indicates the two proposed street layout options for 1st Street between Vine Street and Olive Street and the proposed improvements on Olive Street and 2nd Street. The street improvements include removal of the existing road sections on each of the highlighted roads and rebuilding them to current city standards, including replacement of existing curb and gutter sections. Options the City requested to be reviewed are outlined below:

1. 1st Street (Maple Street to Vine Street)

The proposed street section for 1st Street from Maple Street to Vine Street consists of a 46-foot-wide street with curb and gutter. The proposed sidewalk on 1st Street between Maple Street and Vine Street would be 5-feet wide on the north side of the roadway and 10-feet on the south side. This street section would approximately match the existing sidewalk widths on 1st Street. Parking on 1st Street between Maple Street and Vine Street would remain parallel parking on both the north and south sides of the roadway. The parking stall count would remain approximately the same as existing on this block of 1st Street.

2. 1st Street (Vine Street to Olive Street) - Option A

The proposed street section for Option A consists of a 48-foot-wide street with curb and gutter, this street width would approximately match the existing roadway. Figure No. 2.1A shows the parallel parking layout on both the north and south sides of 1st Street. Option A would also keep the sidewalk widths approximately the same as existing at 6.5-feet on the north side and 11.5-feet on the south side. The pickup and drop off area in front of the movie theatre would be replaced at the same location with the same geometry.

3. 1st Street (Vine Street to Olive Street) - Option B

The proposed street section for Option B consists of a 48-foot-wide street with curb and gutter, this street width would approximately match the existing roadway. Figure No. 2.1B shows the change to 45-degree angled parking on the

north side of 1st Street and maintaining the parallel parking on the south. To change the north side of the street to 45-degree parking the sidewalk widths need to be adjusted to 8-feet wide on the north and 10-feet wide on the south side of the street. This change is needed to allow for vehicle bumpers to overhang the north curb while still maintaining minimum sidewalk widths for pedestrians. Changing the north side of this block to 45-degree parking would increase the parking stall count by approximately 5. This Option B layout would approximately match the section of 1st Street to the east where 60-degree angled parking exists along the northern side of the road. The 45-degree parking would result in a 3-foot offset in the street center line to the west and a 0-foot to 3-foot offset to the east depending on the future improvements on 1st Street.

4. Olive Street (1st Street to 2nd Street)

The proposed street section for Olive Street from 1st Street to 2nd Street consists of a 48-foot-wide street with curb and gutter. This results in a 4-foot narrowing of the roadway. Parking on both sides of the road would remain parallel parking. The sidewalk on both sides of Olive Street would be 9-feet which would increase the sidewalk width by approximately 2-feet on both sides. This proposed section would match the Downtown Reconstruction Phase 1 street section for Olive Street between 1st Street and Main Street.

5. 2nd Street (Olive Street to Elm Street)

The proposed street section for 2nd Street consists of a 42-foot-wide street with curb and gutter, which reduces the street width by approximately 2.5-feet. 2nd Street is proposed to have an 8-foot sidewalk on the north side of the street and a 6-foot sidewalk with a 4-foot boulevard on the south. The parking arrangement on 2nd Street would remain the same with parallel parking on both sides of the road. With this parking layout there would be 12-foot drive lanes. The properties on the north side of 2nd Street are being redeveloped into an apartment complex. The 8-foot-wide sidewalk adjacent to the building will match the downtown standard of a wider sidewalk with no grass boulevard.

6. 2nd Street (Olive Street to Dead End)

The proposed street section for 2nd Street between Olive Street and the dead end to the west consists of a 28-foot-wide street with curb and gutter, which narrows

the street by approximately 17-feet. This segment of 2nd Street acts as an access to the apartments and a loading area for the business at 132 Olive Street. The street width was reduced to a width that still accommodates large box trucks and large trucks with trailers. There will be no parking on this dead end segment of 2nd Street.

7. Alley Improvements

To comply with the Carver County Water Management Organization (CCWMO) stormwater requirements pertaining to sediment and total suspended solids for the Phase 2 Downtown Reconstruction, the City was required to pave the red rock portions of the alleys between Elm Street and Spruce Street shown on Figure No. 2.2. Approximately 170-feet of the alleys were already paved but in poor condition. It is proposed that the full length of the alleys be reconstructed to reduce future maintenance issues and future costs. The alleys are proposed to be 12-feet wide to reduce conflicts with utility poles, retaining walls, and driveway impacts. The alley between Olive Street and Elm Street will also be reconstructed due to utility improvements and impacts from the developer to construct the apartment building. The alleys will be constructed with a typical section of 2 lifts of bituminous pavement totaling 4.5-inches, an aggregate base depth of 9-inches, and geotextile fabric. As part of the Developer's Agreement, some of the costs associated with reconstructing the alley between Olive Street and Elm Street will be paid for by the developer. The total cost for the alley improvements were divided into a cost per linear foot to appropriately divide the costs between the City and the developer. The total estimated cost for the alley and the associated cost per linear foot can be found in Appendix A. The western 180 feet of the alley would need to be reconstructed under both projects if they were constructed independently resulting in a 50-50 cost share for this section. The eastern 150 feet of the alley between Olive Street and Elm Street only needs to be reconstructed due to apartment construction limits extending into the alley way and the large volume of construction traffic that will rapidly deteriorate the pavement; this results in a 100% developer cost for this section of the alley. The City will receive an estimated \$40,000 from the developer for the estimated developer impacts to the alley.

8. Offsite Parking Lot Improvements

With this project the City reviewed and evaluated the possibility of additional parking areas close to the downtown area. Figure No. 2.3 illustrates one of the potential locations near the intersection of Elm Street and 1st Street. This site would require coordination with the property owner and reserving some parking stalls for tenants. With the preliminary layout shown in Figure No 2.3 it would create a paved and striped lot with approximately 29 parking stalls in the downtown area. This parking lot design has dedicated space for vegetation and reduces the amount of paved surface. The parking lot would be constructed with a typical section of 2 lifts of bituminous pavement totaling 4.5-inches, an aggregate base depth of 9-inches, and geotextile fabric. The total estimated cost for the proposed offsite parking lot improvements is \$314,600 and is considered a non-assessable cost.

Construction of a standard truck route section includes three lifts of bituminous pavement (6.5”), aggregate base (12.0”), and select granular borrow (12.0”) underlain by geotextile fabric. The standard truck route street section will be constructed on top of a compacted subgrade and contain draintile behind the curb. The typical section for the City standard truck route section is shown on Figure No. 2.4. The results of the soils investigation indicate poor soils could be encountered on 1st Street from Maple Street to Olive Street and on Olive Street from 1st Street to 2nd Street. To provide a suitable subgrade, a layer of stabilizing aggregate will likely be needed in these areas. Additional materials above the standard street section are considered extra section items and are therefore not considered to be assessable. Street lighting improvements will take place on 1st Street, Olive Street, and 2nd Street and are a non-assessable cost. The style of fixtures and the layout of the lighting will approximately match the previous two phases of the Downtown Reconstruction project. Additionally, overhead power lines located along Olive Street are planned to be buried as part of the improvements.

The staging for construction will generally fall into two or three construction stages. The first stage of construction would consist of 1st Street between Maple Street and Olive Street. The second phase would be Olive Street from 1st Street to the alley. The third phase would include Olive Street from the alley to 2nd Street, 2nd Street from the dead end to Elm Street, and the alley between Olive Street and Elm Street. Phasing is subject to change

based on findings during final design and/or due to coordination with the proposed development of the apartment building project. Construction phasing may also need adjusting to provide adequate parking, pedestrian access, and business access available at all times. The stages will be continually changing as the work progresses from utilities to street construction and will be adjusted as necessary.

B. STORM SEWER IMPROVEMENTS

The existing storm sewer systems on 1st Street, Olive Street, and 2nd Street will be removed and reconstructed as shown on Figure No. 2.5. New storm sewer is proposed to be constructed in the alley between Olive Street and Elm Street to connect to the proposed stormwater treatment. A weir structure will be installed on Elm Street during the Phase 4 Reconstruction project to divert stormwater runoff on Elm Street into the proposed underground treatment. The Elm Street storm main will experience a decrease in pipe surcharging. The existing drainage patterns will primarily be maintained. Existing storm structures are anticipated to experience surcharging during 5-yr rainfall events.

Additional stormwater treatment will be required in order to meet the Carver County Watershed Management Organization's rules. Due to the limited amount of green space in the right-of-way, underground treatment options were evaluated. Property 24 on Figure No. 3.1 is being redeveloped and there is a partnership between the City and the developer to place the stormwater treatment under the proposed parking lot. See Figure No. 2.6 for stormwater treatment construction. The proposed underground treatment will be SC-740 Stormtech Chambers.

The proposed underground treatment will outlet into a new 24-inch storm pipe connecting down the alley into a catch basin on the west side of Olive Street. Refer to Figure No. 2.5 for structure locations. A weir will be installed in this catch basin to control storm flow. A proposed 18-inch storm sewer pipe will connect this catch basin south to the storm manhole on the northwest corner of the Olive Street and 2nd Street intersection. This proposed 18-inch pipe will allow excess stormwater to bypass the existing 12-inch catch basin outlet which runs behind the theatre to connect to the Vine Street storm main. All bypass stormwater is ultimately routed to the same Vine Street storm sewer manhole. These improvements will allow 10-yr rainfall events to pass without structure surcharging.

Future improvements behind the theatre should replace the existing 12-inch storm sewer pipe with a larger diameter pipe. Once this stretch of pipe is upsized to 24-inch it would allow for passage of a 100-yr rainfall event without structure surcharging.

As part of the development of the lots north of 2nd Street, the developer proposed storm sewer to connect to the existing system on Olive Street. Since the City will be placing the stormwater treatment under the parking lot of the apartment, storm sewer pipe is required to be installed to the existing system on Olive Street. The City will receive approximately \$67,000 for the storm sewer required for the development, and the City will be responsible for any additional structures and oversizing costs.

The total estimated cost for the proposed street and storm sewer reconstruction improvements is \$4,714,800. This amount includes the alley improvements and the offsite parking improvements. Of this amount \$550,100 is considered assessable. Itemized cost estimates are provided in Appendix B of this report. Financing and funding for the entire project is discussed in Section 3.

C. SIDEWALK IMPROVEMENTS

The proposed sidewalk reconstruction locations and alternates are also shown on Figure No. 2.1. The proposed sidewalk on the north and south sides of 1st Street between Maple Street and Vine Street will match the existing sidewalk at approximately 5-foot wide and 10-foot wide, respectively. 1st Street between Vine Street and Olive Street has two options. The first option is to match the existing sidewalk width on both sides of the roadway; 6.5-foot on the north and 11.5-foot on the south. The second option would be to have an 8-foot sidewalk on the north and a 10-foot sidewalk on the south side of the street. Option 2 would result in an increase of 1.5-foot on the north side and narrow the sidewalk width by approximately 1.5-foot on the south side. Olive Street sidewalk will be constructed to a width of 9-foot on both sides of the road which increases the width by approximately 2-foot. The sidewalk widths on 1st Street and Olive Street vary depending on building locations. The sidewalk on the north side of 2nd Street will be reconstructed to a width of 8-foot, this will widen the sidewalk by approximately 4-foot. Since the north side of 2nd Street is being redeveloped into an apartment complex the wider commercial sidewalk will be constructed adjacent to the building. The sidewalk on the south side of 2nd Street will be reconstructed to a width of 6-foot with a 4-foot boulevard, this results in an increase of 1-foot in width. All existing and proposed pedestrian ramps will be constructed to Americans with Disabilities Act (ADA) standards to provide adequate access to all users.

The total estimated cost of the sidewalk improvements is \$635,400 which is not considered an assessable cost. As part of the developer's agreement the developer will provide funds to the City for the sidewalk adjacent to the building on Olive Street and 2nd Street in the amount of \$65,600. The City will also receive an estimated \$41,500 from the developer for the sidewalk adjacent to the building on Elm Street which will be constructed with the Downtown Reconstruction Phase 4 project. An itemized cost is provided in Appendix B of this report. Financing and funding for the entire project is discussed in Section 3.

D. SANITARY SEWER IMPROVEMENTS

The sanitary sewer improvements consist of reconstruction of sewer main, manholes, and sewer services on 1st Street, Olive Street, 2nd Street, and the alley between Olive Street and Elm Street as shown on Figure No. 2.7. The sewer reconstruction consists of replacing the old and deteriorated, clay sewer system with an 8-inch PVC sewer main and with sewer services from the main to the property line. Sanitary manholes will be reconstructed, and new sewer will be stubbed out of the intersections and connected to the existing pipes east of the Olive Street and 1st Street intersection.

The total estimated cost for all of the sanitary sewer improvements is \$588,200. Of this amount, \$244,900 is considered assessable. Itemized cost estimates are provided in Appendix B. Financing and funding is discussed in Section 3.

E. WATERMAIN IMPROVEMENTS

Figure No. 2.8 indicates the proposed watermain improvements. The existing watermain consists of 6-inch main on 1st Street, Olive Street, and 2nd Street. The existing system is aging and is susceptible to breakages and leaks. Breakages and leaks result in high maintenance and repair costs, service disruptions, and saturation of the street subgrade. Therefore, the proposed improvements include removing and replacing the entire watermain system within the street right-of-way and upsizing to a 10-inch main on 1st Street and an 8-inch main on Olive Street and 2nd Street. Replacement includes the mainline, gate valves, hydrants, and services. The watermain reconstruction will stop short of the intersection of 2nd Street and Elm Street in order to not impact that intersection. The new watermain will be stubbed out to the east of the 1st Street and Olive Street intersection and connected to the existing pipes so the intersection will not need to be reconstructed again with future adjacent projects.

Water services along 1st Street and Olive Street will be constructed into the buildings that are adjacent to the road. This will involve connecting inside the buildings and extra work to bore through the foundation walls and make any necessary adjustments to interior connections. Curb stops will be constructed within the city right-of-way for future operation and maintenance needs as standard practice.

The proposed pipe material is polyvinyl chloride pipe (PVC). This pipe is more resistant to corrosion from the in-place clay soils. Previous geotechnical evaluations on adjacent projects included soil resistivity testing to determine how corrosive the in-place soils are. These tests resulted in resistivity values showing the in-place soil to be moderately corrosive. To protect the watermain against corrosion, the following steps will be taken during construction:

- All hydrants and gate valves will be manufactured and secured utilizing stainless steel bolts.
- All fittings will be coated with fusion bonded epoxy.
- All ductile iron pipe, fittings, valves, valve boxes, and hydrant risers will be wrapped in polyethylene encasement material and provided with cathodic protection.

Figure No. 2.9 indicates the proposed irrigation system improvements. The irrigation system improvements will include extending the 4-inch irrigation main across the intersection of 1st street and Olive Street and installing 1-inch mains along 1st Street and Olive Street. The 4-inch main will only be extended to the south side of 1st Street since this is the edge of the downtown service area. The 1-inch mains will be used to water plantings hanging from the light poles. The irrigation system is planned to be switched over to a stormwater reuse system when the stormwater treatment system is constructed. The irrigation system improvements are considered a non-assessable cost.

The total estimated cost for all of the watermain improvements is \$1,201,600. Of this amount, \$393,100 is considered assessable. Itemized cost estimates are provided in Appendix B. Financing and funding is discussed in Section 3.

SECTION 3 - FINANCING / FUNDING

A. FINANCING

The proposed method of financing for the Downtown Reconstruction, Phase 3 Project is through the sale of a combined bond consisting of a Chapter 429 General Obligation Bond, a Chapter 115 Sanitary Sewer Revenue Bond, and a Chapter 444 Water and Stormwater Revenue Bond. The Chapter 429 Bond would be used for the street/storm sewer reconstruction. The Chapter 115 Bond would be used for the sanitary sewer reconstruction. The Chapter 444 Bond would be used for the watermain reconstruction and miscellaneous drainage improvements. PIR Capital Improvement cash would be used for the sidewalk improvements.

It is recommended that the City discuss financing options in more detail with their Financial Consultant. Combining the financing of this project with other possible planned improvements or planned equipment purchases should also be evaluated and discussed.

The total estimated project cost is \$7,140,000. The detailed cost estimates for individual project components are located in Appendix B. The estimates consist of the estimated construction cost based on recent construction bid prices, a 10% allowance for contingencies, and a 30% allowance for bidding, surveying, engineering, property owner coordination, building inspections, construction staking, construction administration, and inspection costs.

B. FUNDING

The different funding sources proposed to be used to service the bond debt include the following:

- Special assessments
- New special debt levy
- Stormwater funds
- Sewer funds
- Water funds
- PIR funds

The City has funds available in the various fund accounts to service the debt. And if necessary, the City also has funds available in the general fund to service the debt.

The following sections provide a cost apportionment and funding source summary for the various project components.

C. STREET / STORM / SIDEWALK RECONSTRUCTION

The total project costs are apportioned as follows:

Item	Cost / FF	City Cost or Assessment	Recommended Funding Source
Sidewalk Construction Cost			
Sidewalk Construction Cost	\$635,400	City	PIR Funds
Total Project Cost:	\$635,400		
Street / Storm Reconstruction Costs			
Extra Section Depth / Width & Parking Lot	\$3,244,000	City	New Special Debt Levy
Street / Storm Reconstruction Cost	\$1,470,800		
Total Street / Storm Reconstruction Cost:	\$4,714,800		
Assessment Calculations			
Standard Street Section Cost	\$1,470,800		
City Contribution (50%)	\$735,400	City	New Special Debt Levy
Assessable Eligible Portion (50%)	\$735,400		
Total Front Footage	2,866.0		
Corner Lot Front Footage (Feet)	379.6		
Assessment Basis Front Footage (Feet)	2,486.3		
Assessable Cost Per Front Foot	\$295.78		
Non-Assessable Front Footage (Feet)	626.5		
Non-Assessable Cost	\$185,300	City	New Special Debt Levy
City Front Footage (Feet)	191.4		
City Front Footage Cost	\$56,600		
Assessment Front Footage (Feet)	1,859.8		
Total Assessed Amount	\$550,100	Assessment	Special Assessments
Total City Cost:	\$4,800,100		
Total Assessed Amount:	\$550,100		
Total Project Cost:	\$5,350,200		

D. SANITARY SEWER

The sanitary sewer proposed for reconstruction services commercial and residential properties. Commercial and multi-family properties are converted to equivalent residential units (ERUs) based on water usage. Three properties exceed the normal water usage for a typical single-family home. These properties and their ERU calculations are as follows:

Property Owner	Property Address	Annual Water Usage (gal)	Daily Water Usage (gal)	Daily Usage / ERU (gal)	*ERUs
JD RENTALS LLPA	125 1ST ST W	425,000	1,165	275	4.0
P & D WACONIA PROPERTIES LLC	119 OLIVE ST S	236,000	647	275	2.0
OLIVE & SECOND LLC	24 2ND ST W	2,812,000 **	7,704 **	275	28.0
	16 2ND ST W				
	8 2ND ST W				
	136 ELM ST S				

* ERUs are rounded down to the nearest 0.5 units

** Estimated usage based on total ERU calculation

On previous projects the portion of the sanitary sewer cost that was assessed consisted of 50 percent of the typical project sanitary sewer cost. Costs related to soil corrections, bypass pumping, and vibration monitoring are isolated as City costs and not included in the assessment calculations.

Also, the unique project area should be taken into account by including non-assessable units. To remain fair and equitable it is recommended to include 5 non-assessable units to account for the City/EDA owned parcels that are not served with sewer or water. Therefore, the project contains 55 sewer units, 50 of which are assessable.

Based on the information and recommendations above, the total project costs for the sanitary sewer component of the proposed project are apportioned as follows:

Item	Cost / Units	City Cost or Assessment	Recommended Funding Source
Total Sanitary Sewer Project Costs			
Typical Sanitary Sewer Project Cost	\$538,900		
City Contribution Cost	\$49,300	City	Sewer Fund
<i>Total Project Cost:</i>	<i>\$588,200</i>		
Assessment Calculations			
Assessment Eligible Portion	\$538,900		
City Contribution (50%)	\$269,500	City	Sewer Fund
Assessable Eligible Portion (50%)	\$269,400		
Sanitary Sewer Units	55.0		
Assessment Per Unit	\$4,898.18		
Assessable Units	50.0		
Non-Assessable Units	5.0		
Non-Assessable Cost	\$24,500	City	Sewer Fund
Total Assessed Amount	\$244,900	Assessment	Special Assessments
<i>Total City Cost:</i>	<i>\$343,300</i>		
<i>Total Assessed Amount:</i>	<i>\$244,900</i>		
<i>Total Project Cost:</i>	<i>\$588,200</i>		

E. WATERMAIN

The watermain proposed for reconstruction services commercial and residential properties. Same as with the sanitary sewer, commercial and multi-family properties are converted to equivalent residential units (ERUs) based on water usage. Three properties exceed the normal water usage for a typical single-family home. These properties and their ERU calculations are as follows:

Property Owner	Property Address	Annual Water Usage (gal)	Daily Water Usage (gal)	Daily Usage / ERU (gal)	*ERUs
JD RENTALS LLPA	125 1ST ST W	425,000	1,165	275	4.0
P & D WACONIA PROPERTIES LLC	119 OLIVE ST S	236,000	647	275	2.0
OLIVE & SECOND LLC	24 2ND ST W	2,812,000 **	7,704 **	275	28.0
	16 2ND ST W				
	8 2ND ST W				
	136 ELM ST S				

* ERUs are rounded down to the nearest 0.5 units

** Estimated usage based on total ERU calculation

On previous projects, the portion of the watermain cost that was assessed consisted of 50 percent of the standard water system cost. Costs related to soil corrections, vibration monitoring, boring, and cathodic protection are isolated as City costs and not included in the assessment calculations.

Similarly to the sanitary sewer methodology, 5 non-assessable units are recommended to be added to account for the unique project area. Therefore, the project contains 56 water units, 51 of which are assessable.

The total project costs for this component of the proposed project are apportioned as follows:

Item	Cost / Units	City Cost or Assessment	Recommended Funding Source
Total Watermain Project Costs			
City Contribution Cost	\$338,300	City	Water Fund
Standard Water System Costs	\$863,300		
Total Project Cost:	\$1,201,600		
Assessment Calculations			
Assessment Eligible Portion	\$863,300		
City Contribution (50%)	\$431,700	City	Water Fund
Assessable Eligible Portion (50%)	\$431,600		
Watermain Units	56.0		
Assessment Per Unit	\$7,707.14		
Assessable Units	51.0		
Non-Assessable Units	5.0		
Non-Assessable Cost	\$38,500	City	Water Fund
Total Assessed Amount	\$393,100	Assessment	Special Assessments
Total City Cost:	\$808,500		
Total Assessed Amount:	\$393,100		
Total Project Cost:	\$1,201,600		

F. OVERALL COST SUMMARY

In summary, a portion of the street and utility reconstruction work will be assessed to benefitting property owners and the remaining work is recommended to be paid by the City. The overall costs for all project components are summed as follows:

Item	Cost	Recommended Funding Source
Assessed Amount (Per Policy)	\$1,188,100	Special Assessments
Developer Cost Sharing	* \$214,100	Developer Costs
Street & Utility Reconstruction (City Cost)	\$5,737,800	Combined Bond Funds & PIR Capital Improvement Funds
Total Overall Project Cost:	\$7,140,000	

* This includes \$41,500 for the Elm Street sidewalk planned to be constructed with the Downtown Reconstruction, Phase 4 project.

G. ASSESSMENTS

The assessable portion of the street and utility reconstruction work is proposed to be assessed to the benefitting properties in accordance with current City policy as follows:

- Street Reconstruction - 50% Assessed on a Front Footage Basis of Standard City Residential Street
- Storm Sewer Reconstruction - 50% Assessed on a Front Footage Basis
- Sanitary Sewer Reconstruction - 50% Assessed on a Unit Basis
- Watermain Reconstruction - 50% Assessed on a Unit Basis

Some of the project components would not be assessed. These project components include the following:

- Extra Depth and Width of Street Reconstruction
- Parking Lot Reconstruction
- Sidewalk Reconstruction
- Stormwater Treatment
- Sanitary Sewer & Watermain Non-Standard Construction Items
- Irrigation

The current estimated assessable percentage of the street and utility reconstruction project is 16.6%. The minimum required assessable percentage for a Chapter 429 bond is 20.0%. Consistent with City policy and previous assessment projects, a benefit evaluation will be conducted to determine the special benefit amounts. The assessments will be capped at these amounts as determined by this benefit evaluation process. This process is anticipated to lower the assessments and reduce the assessable percentage of the project. Therefore, as discussed in the previous section, a combined bond approach is recommended in order to meet all statutory requirements.

The plans to redevelop the parcels on the north side of 2nd Street are in the final stages, and the City plans to assess the applicable lots at their “highest and best use” as is common practice for assessment and appraisal calculations. These lots include a redevelopment of single-family homes into multi-story apartment building along with two commercial properties. There is a significant difference in the sewer and water usage with this redevelopment. The estimated ERUs for the development property were derived from the water usage of existing apartment complexes within the City. Water usage data for the existing apartments was obtained and broken down into a per unit type ERU. The per unit type ERU was then applied to the proposed number of units of each type for the development. The ERUs for the restaurant area of the development were determined with the same methodology but only used water usage data from restaurants within the project area as comparison. This approach resulted in 23.0 ERU’s for the apartment building and 5.0 ERU’s for the commercial properties, for a total of 28.0 ERU’s.

A copy of the current City assessment policy is included in Appendix C of this report for reference. Located in Appendix A is an assessment area map (Figure 3.1). To follow is the preliminary assessment roll (Table 3.1) for the street and utility reconstruction project area and debt service and proposed funding sources (Tables 3.2).

**TABLE 3.1 - PRELIMINARY ASSESSMENT ROLL
DOWNTOWN RECONSTRUCTION, PHASE 3 PROJECT
12/10/2024**

PROP. NO.	P.I.D.	OWNER	PROPERTY ADDRESS	OWNER ADDRESS		F/F	*STREET ASSESSMENT	WATERMAIN UNITS	WATERMAIN ASSESSMENT	SANITARY SEWER UNITS	SANITARY SEWER ASSESSMENT	TOTAL ASSESSMENT	**ANNUAL ASSESSMENT PAYMENT
1	750502980	WACONIA SQUARE LLC	236 1ST ST W	7887 E BELLEVIEW AVE	1100 ENGLEWOOD, CO 80111	76.75	\$22,700.89	0.0	\$0.00	0.0	\$0.00	\$22,700.89	\$2,939.87
2	750503030	WACONIA CITY	217 MAIN ST W	201 VINE ST S	WACONIA, MN 55387	88.25	\$26,102.33	0.0	\$0.00	0.0	\$0.00	\$26,102.33	\$3,380.37
3	750502830	WACONIA CITY	NA	201 VINE ST S	WACONIA, MN 55387	15.17	\$4,486.94	0.0	\$0.00	0.0	\$0.00	\$4,486.94	\$581.08
4	750502820	PROMISE COMMUNITY CHURCH	138 1ST ST W	138 1ST ST W	WACONIA, MN 55387	134.66	\$39,829.34	1.0	\$7,707.14	1.0	\$4,898.18	\$52,434.67	\$6,790.53
5	750502800	WACONIA EDA	116 1ST ST W	201 VINE ST S	WACONIA, MN 55387-1337	110.00	\$32,535.48	0.0	\$0.00	0.0	\$0.00	\$32,535.48	\$4,213.49
6	750502790	WACONIA EDA	106 1ST ST W	201 VINE ST S	WACONIA, MN 55387-1337	22.00	\$6,507.10	0.0	\$0.00	0.0	\$0.00	\$6,507.10	\$842.70
7	750502780	JNIN LLC	100 1ST ST W	5930 BOULDER BRIDGE LN	SHOREWOOD, MN 55331	16.50	\$4,880.32	1.0	\$7,707.14	0.0	\$0.00	\$12,587.47	\$1,630.13
8	750501250	THE CUTTING EDGE SALON OF WACONIA	241 1ST ST W	241 1ST ST W	WACONIA, MN 55387	0.00	\$0.00	0.0	\$0.00	0.0	\$0.00	\$0.00	\$0.00
9	750501260	QVF PROPERTIES LLC	233 1ST ST W	12755 ISLAND VIEW CIR	ROGERS, MN 55374	55.00	\$16,267.74	1.0	\$7,707.14	1.0	\$4,898.18	\$28,873.07	\$3,739.19
10	750501270	S&C PROPERTIES LLC	225 1ST ST W	225 1ST ST W	WACONIA, MN 55387	67.50	\$19,964.95	1.0	\$7,707.14	1.0	\$4,898.18	\$32,570.28	\$4,218.00
11	750501291	SEGNER-PEITZ PROPERTIES LLC	209 1ST ST W	1933 SILVER ST	WACONIA, MN 55387-8613	97.50	\$28,838.27	1.0	\$7,707.14	1.0	\$4,898.18	\$41,443.59	\$5,367.13
12	750501300	STEP WEST LLC	201 1ST ST W	1941 CARDINAL LN STE A	FARIBAULT, MN 55021-4350	27.50	\$8,133.87	1.0	\$7,707.14	1.0	\$4,898.18	\$20,739.20	\$2,685.82
13	750501370	LIFT MANAGEMENT SERVICES LLP	141 1ST ST W	18258 MINNETONKA BLVD STE 205	WAYZATA, MN 55391	27.50	\$8,133.87	1.0	\$7,707.14	1.0	\$4,898.18	\$20,739.20	\$2,685.82
14	750501390	BERRY PROPERTIES LLC	137 1ST ST W	684 EXCELSIOR BLVD, SUITE 210	EXCELSIOR, MN 55331	22.81	\$6,746.68	1.0	\$7,707.14	1.0	\$4,898.18	\$19,352.00	\$2,506.17
15	750501380	PAVING INVESTMENTS LLC	133 1ST ST W	1124 SUGARBUSH LN	WACONIA, MN 55387	32.19	\$9,521.06	1.0	\$7,707.14	1.0	\$4,898.18	\$22,126.39	\$2,865.47
16	750501400	JD RENTALS LLPA	125 1ST ST W	300 W LAKE ST	WACONIA, MN 55387	51.00	\$15,084.63	4.0	\$30,828.57	4.0	\$19,592.73	\$65,505.93	\$8,483.32
17	750501420	SPIRIT MASTER FUNDING X LLC	101 1ST ST W	6632 TELEGRAPH RD # 193	BLOOMFIELD HILLS, MI 48301-301	163.00	\$48,211.67	1.0	\$7,707.14	1.0	\$4,898.18	\$60,816.99	\$7,876.08
18	750501520	GERALD A & JANE M EVESLAGE	41 1ST ST W	281 LAKEVIEW TERRACE BLVD	WACONIA, MN 55387	42.00	\$12,422.64	1.0	\$7,707.14	1.0	\$4,898.18	\$25,027.96	\$3,241.24
19	750501540	JDS LLC	115 OLIVE ST S	8820 ISLAND VIEW RD	WACONIA, MN 55387-9605	25.00	\$7,394.43	1.0	\$7,707.14	1.0	\$4,898.18	\$19,999.75	\$2,590.06
20	750501530	P & D WACONIA PROPERTIES LLC	119 OLIVE ST S	119 OLIVE ST	WACONIA, MN 55387-1421	75.00	\$22,183.28	2.0	\$15,414.29	2.0	\$9,796.36	\$47,393.93	\$6,137.73
21	750501340	OLIVE STREET PARTNERS LLC	132 OLIVE ST S	132 S OLIVE ST	WACONIA, MN 55387	133.50	\$39,486.24	1.0	\$7,707.14	1.0	\$4,898.18	\$52,091.57	\$6,746.10
22	754800010	WACONIA CITY	201 VINE ST S	201 VINE ST S	WACONIA, MN 55387	88.00	\$26,028.39	0.0	\$0.00	0.0	\$0.00	\$26,028.39	\$3,370.79
23	750501511	STEVEN J YETZER	125 OLIVE ST S	PO BOX 51	WACONIA, MN 55387	78.50	\$23,218.50	1.0	\$7,707.14	1.0	\$4,898.18	\$35,823.83	\$4,639.35
24	PENDING / 750501505	OLIVE AND SECOND LLC (INCLUDES PENDING SALES OF PROPERTIES OWNED BY STEVEN YETZER & CITY OF WACONIA)	24 2ND ST W	PO BOX 51	WACONIA, MN 55387	204.25	\$60,412.47	28.0	\$215,800.00	28.0	\$137,149.09	\$413,361.56	\$53,532.21
	PENDING / 750501480		16 2ND ST W	332 WEST 4TH STREET	WACONIA, MN 55387								
	PENDING / 750501460		8 2ND ST W	332 WEST 4TH STREET	WACONIA, MN 55387								
	PENDING / 750501450		136 ELM ST S	136 SOUTH ELM STREET	WACONIA, MN 55387								
25	750500580	JESSE AND JAMIE BERSTROM LIVING TRUST	41 2ND ST W	41 2ND ST W	WACONIA, MN 55387-1402	41.25	\$12,200.81	1.0	\$7,707.14	1.0	\$4,898.18	\$24,806.13	\$3,212.51
26	750500590	MICHAEL DEHN	25 2ND ST W	25 2ND ST W	WACONIA, MN 55387-1402	82.50	\$24,401.61	1.0	\$7,707.14	1.0	\$4,898.18	\$37,006.94	\$4,792.57
27	750500600	MARWAY PROPERTIES LLC	208 ELM ST S	17400 ERKIUM ST NW	RAMSEY, MN 55303	82.50	\$24,401.61	1.0	\$7,707.14	1.0	\$4,898.18	\$37,006.94	\$4,792.57
						1,859.83							

*Cost per FF = \$295.78 (Original Calculation)

**Based on a 5.00% Interest Rate and a 10 Year Term.

Totals:	\$550,095.13	51.0	\$393,064.29	50.0	\$244,909.09	\$1,188,068.51	\$153,860.31
TOTAL FRONT FOOTAGE:	2,866.00						
CORNER LOT CREDIT:	379.67						
ASSESSMENT BASIS FRONT FOOTAGE:	2,486.33						
NON-ASSESSABLE FRONT FOOTAGE:	626.50						
ASSESSMENT FRONT FOOTAGE:	1,859.83						

TABLE 3.2
DEBT SERVICE & PROPOSED FUNDING SOURCES
FOR
DOWNTOWN RECONSTRUCTION, PHASE 3 PROJECT
12/10/2024

PROPOSED PROJECTS	TOTALS				DEBT SERVICE / FUNDING SOURCE							RECOMMENDED FINANCING OPTION
	TOTAL PROJECT COST	TOTAL ASSESS. AMOUNT	TOTAL CITY COST	TOTAL ASSESS. %	TOTAL DEBT SERVICE	DEBT SVC ASSMT REVENUE	DEBT SVC GENERAL/PIR FUND	DEBT SVC STM WTR FUND	DEBT SVC SEWER FUND	DEBT SVC WATER FUND	TOTAL REVENUE	
STREET & UTILITY RECONSTRUCTION	\$7,140,175	\$1,188,069	\$5,952,105	16.6%	\$880,319	\$146,478	\$586,890	\$49,316	\$28,406	\$69,228	\$880,319	\$7,200,000
TOTALS:	\$7,140,175	\$1,188,069	\$5,952,105	16.6%	\$880,319	\$146,478	\$586,890	\$49,316	\$28,406	\$69,228	\$880,319	Combined Bond

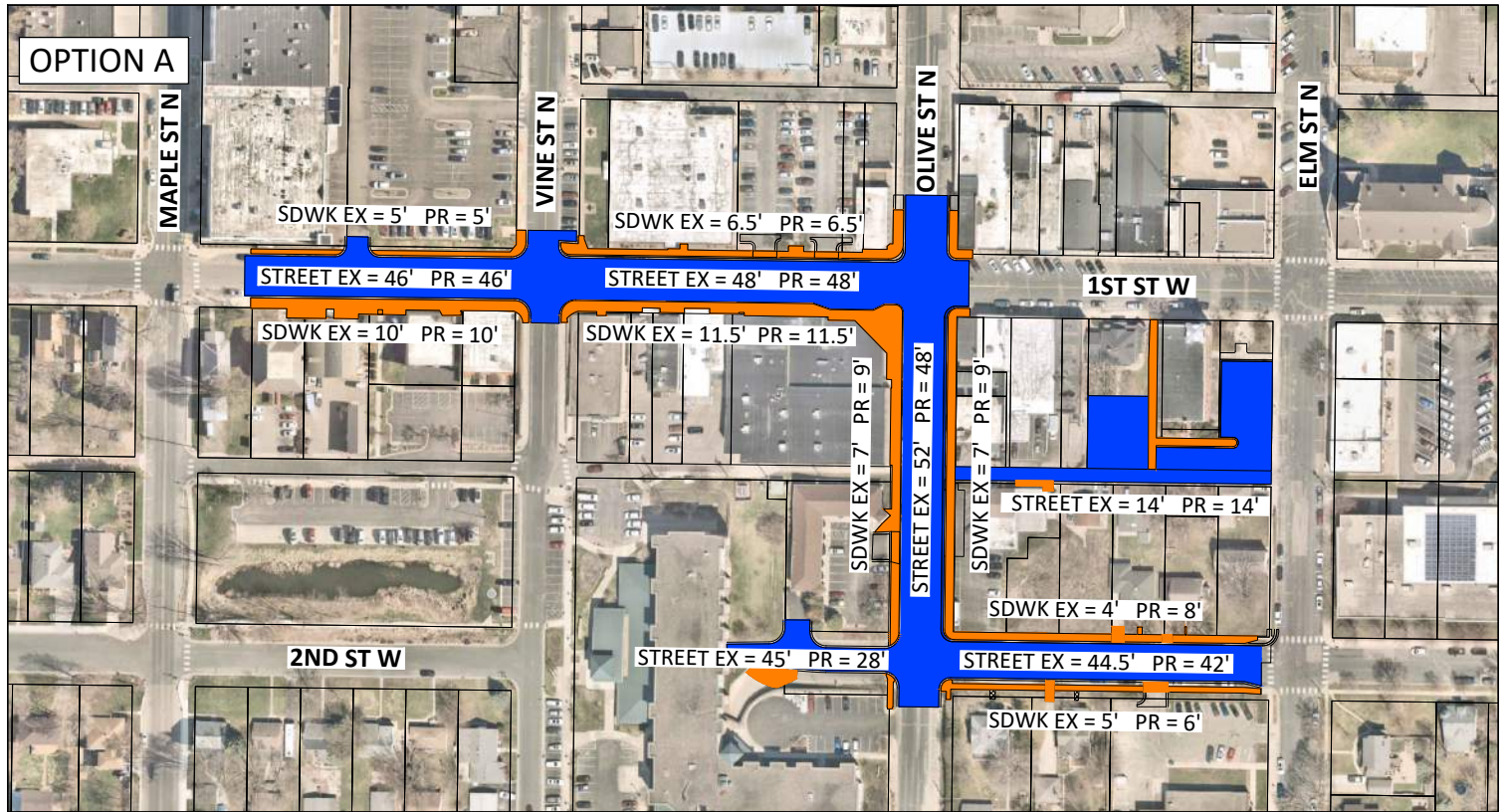
Notes:

- 1.) All Debt Service Projections are Based on a 10-Year Bond At 4.0%.
- 2.) Actual Assessment Revenue Debt Service Will Be Based On Interest Rate 1.0% Above Bonding Cost (=4.0% + 1.0% = 5.0%) With a 10-Year Term.
- 3.) Amounts Shown Do Not Include Any Grant Funds Which May Reduce the Required Payment Amounts.

APPENDIX A

FIGURES

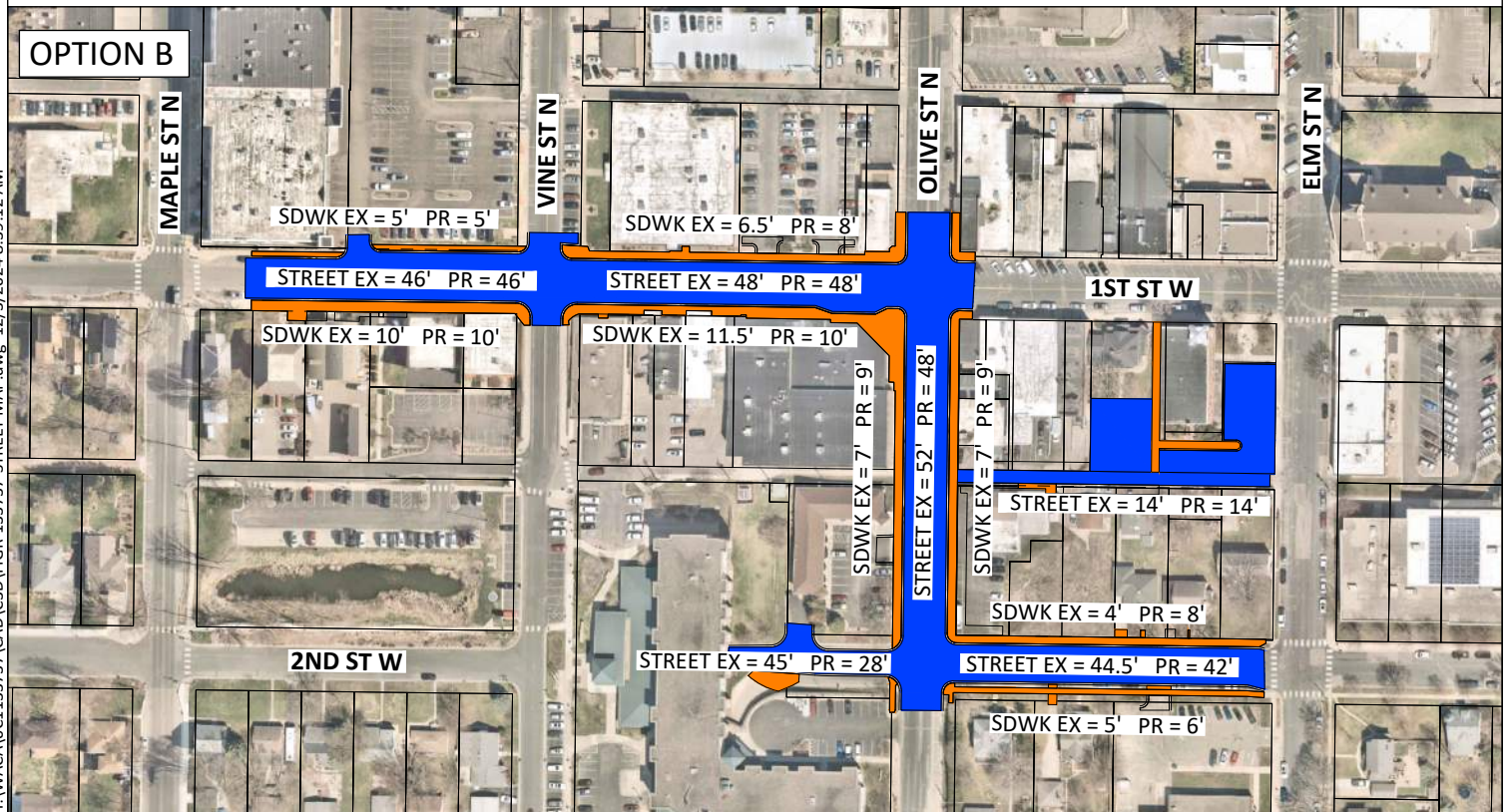


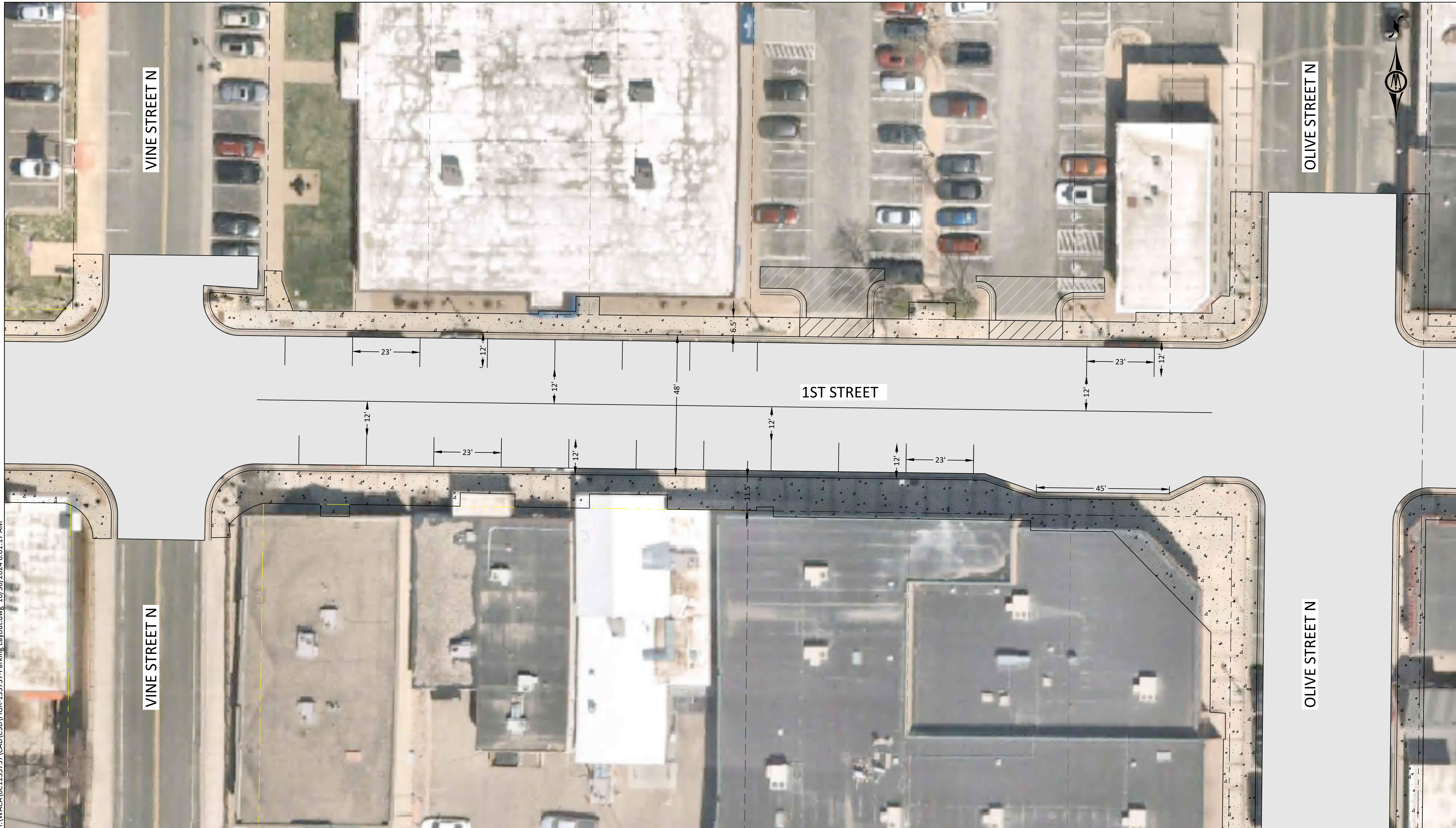
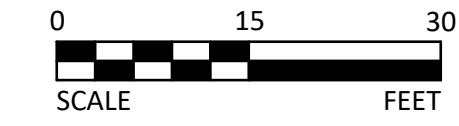


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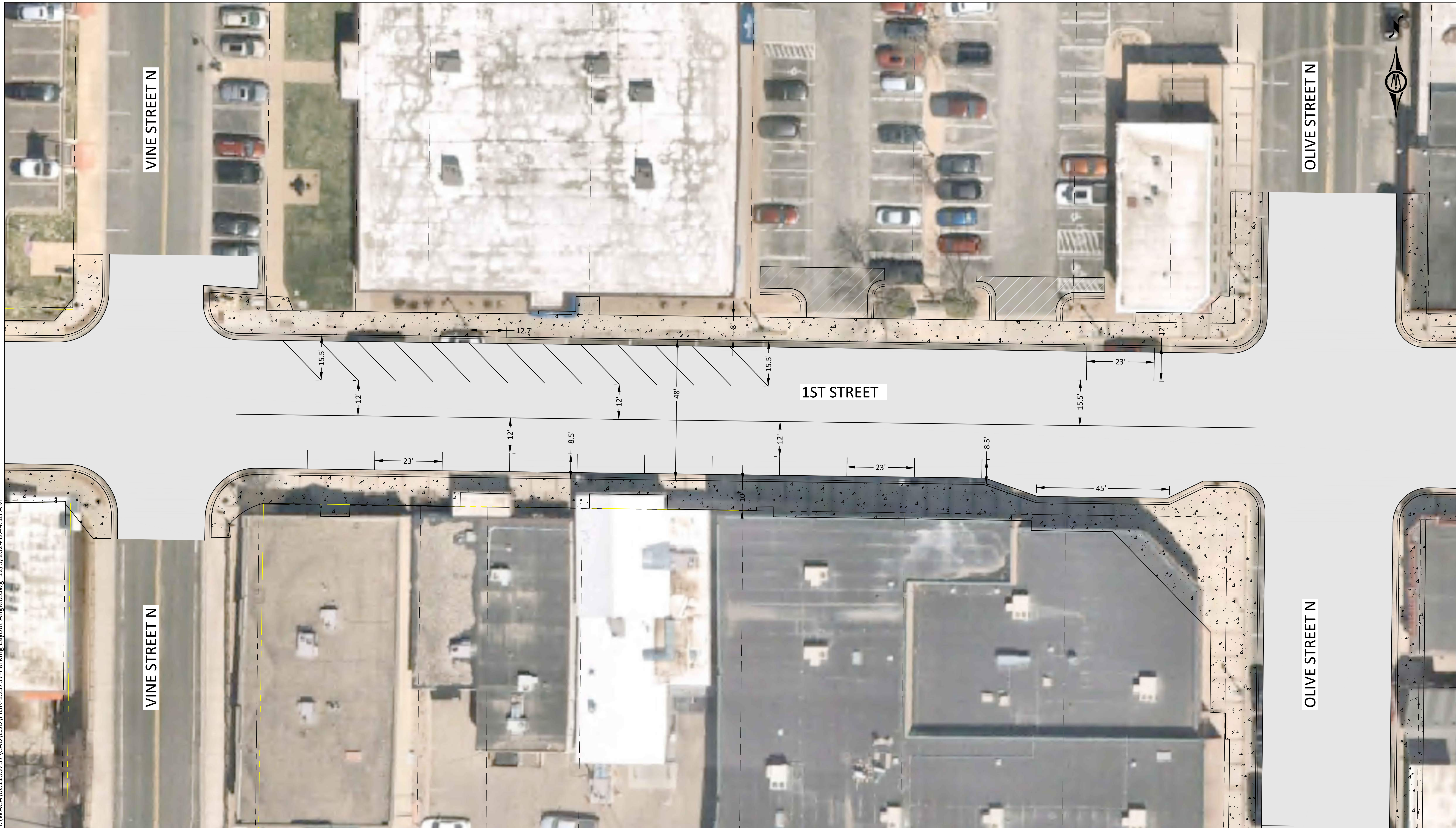
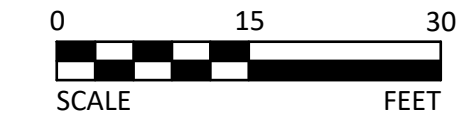
- █ PROPOSED STREET RECONSTRUCTION
- █ PROPOSED SIDEWALK RECONSTRUCTION

0 100 200
HORZ. SCALE FEET







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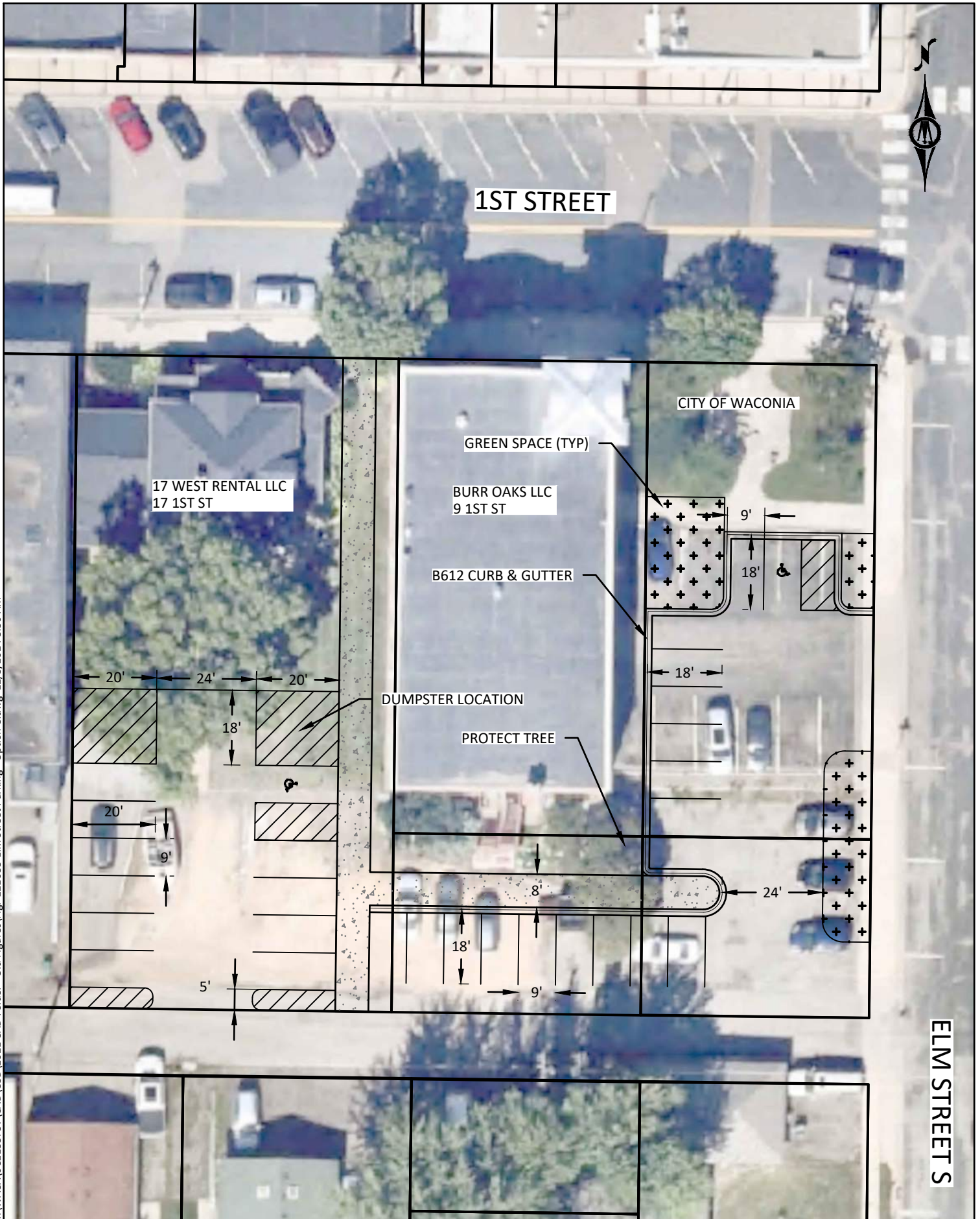
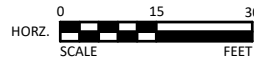
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-  PROPOSED STREET RECONSTRUCTION
-  PROPOSED SIDEWALK RECONSTRUCTION

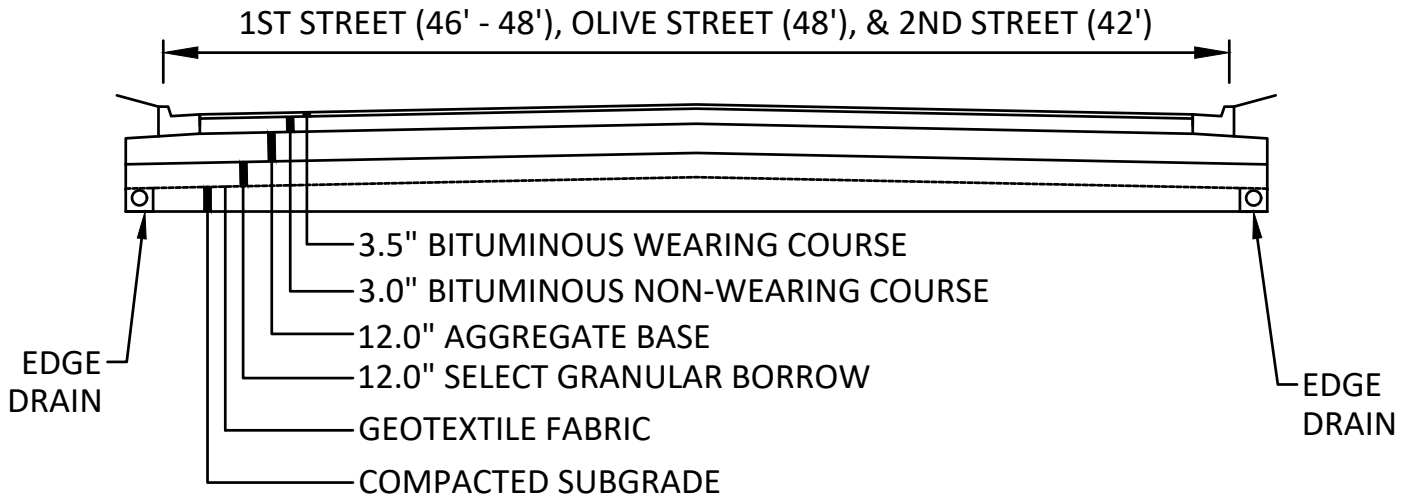


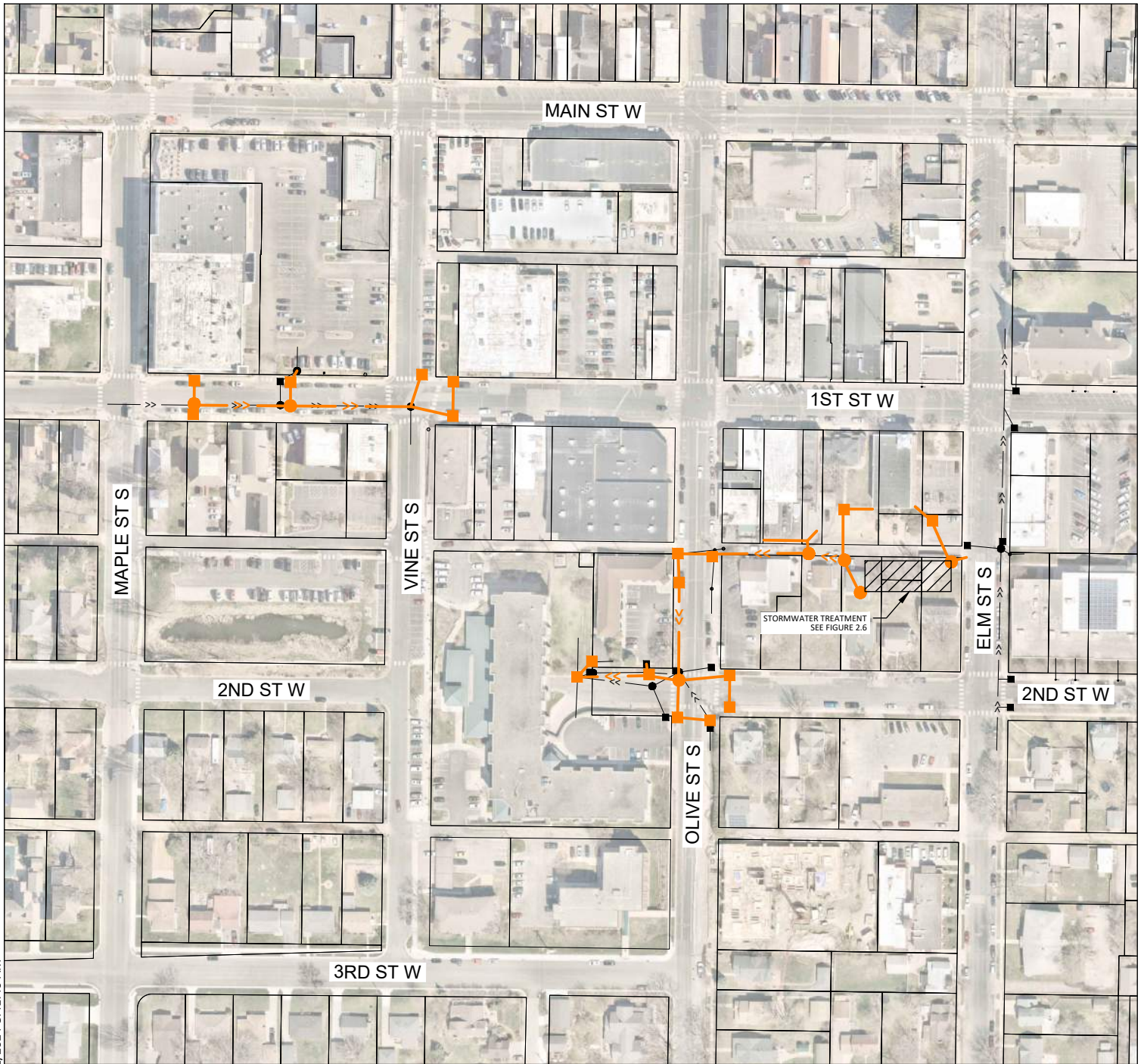


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ELM STREETS S

STREET SECTION (TRUCK SECTION)
NOT TO SCALE

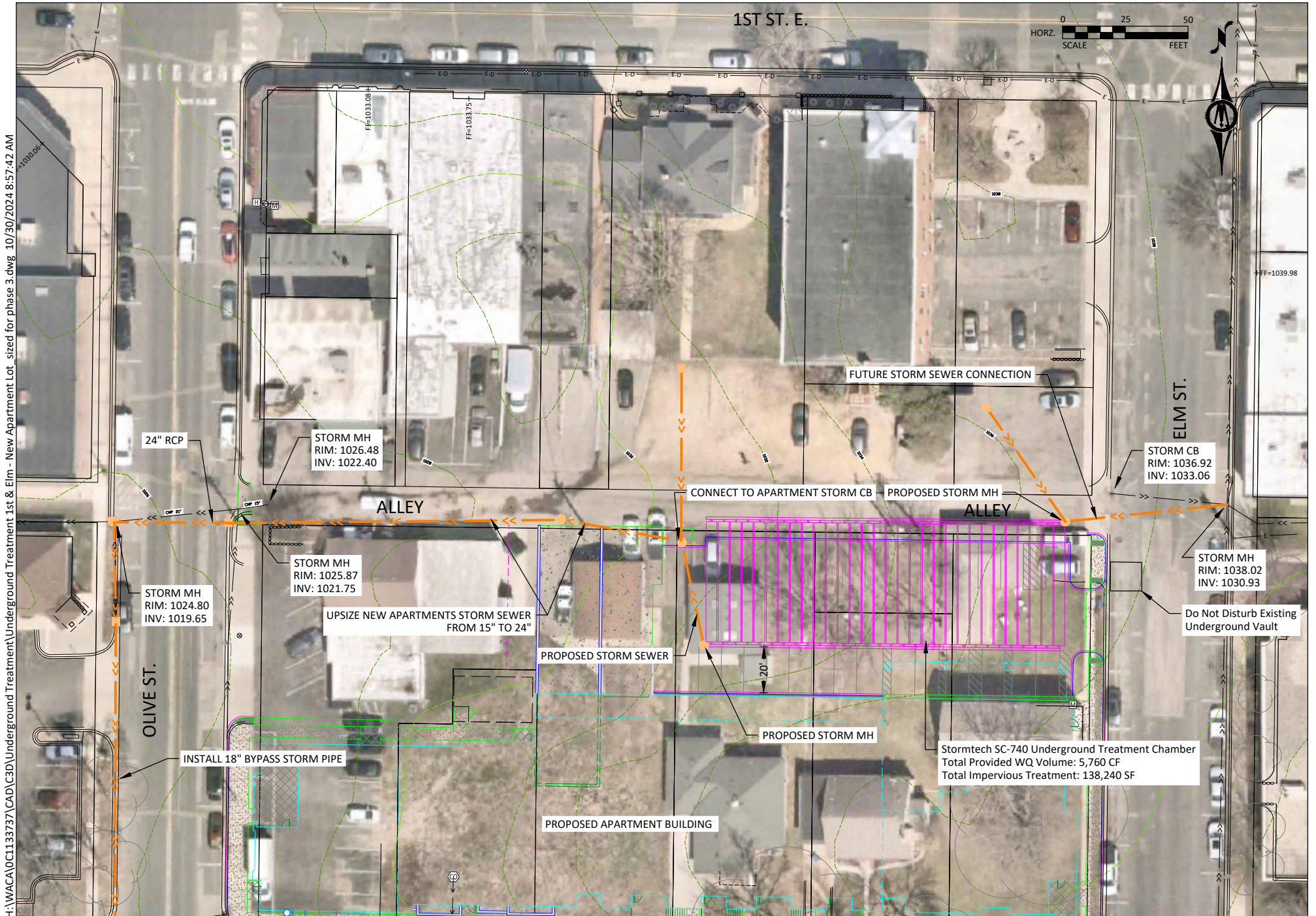


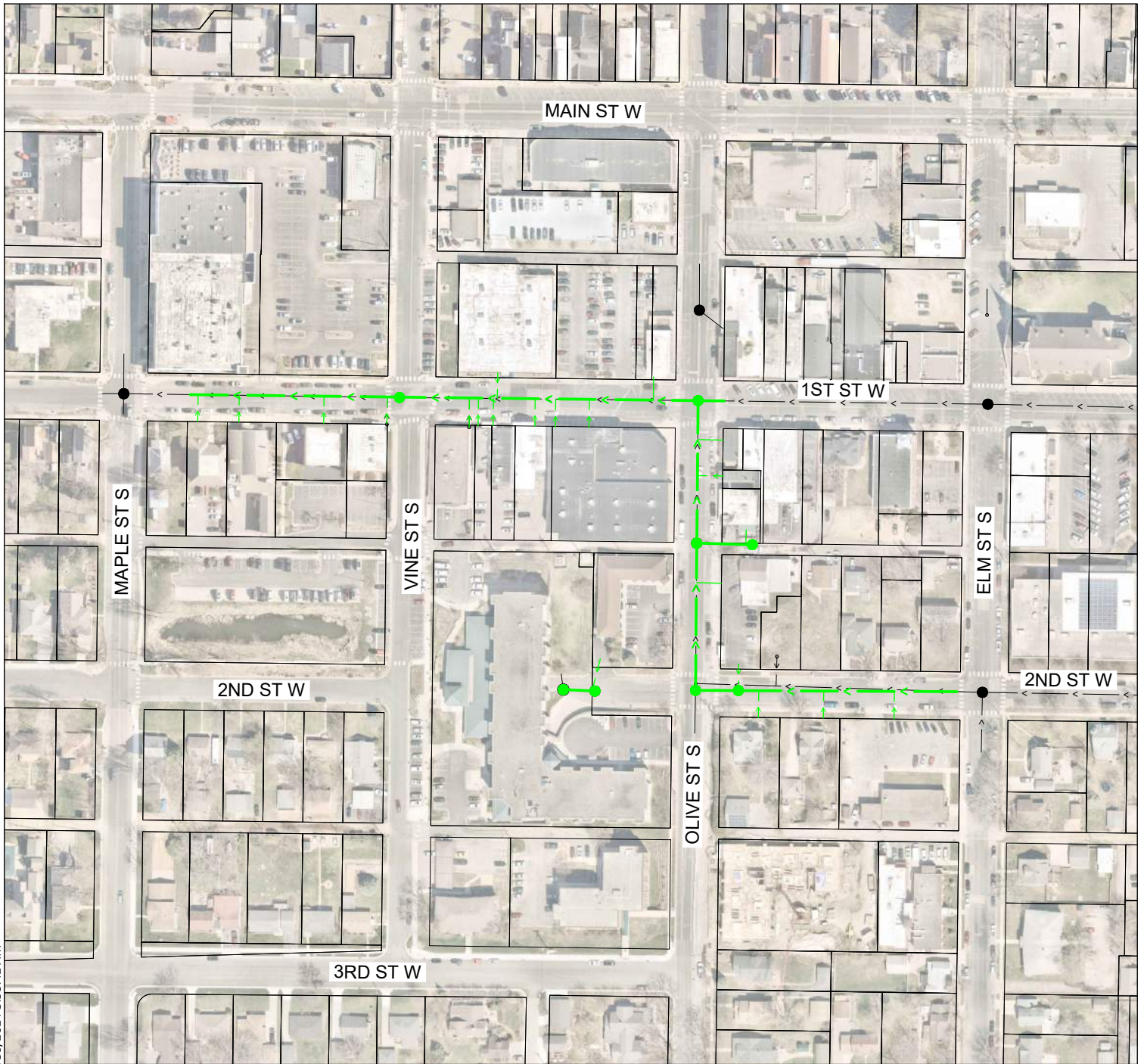


LEGEND

- << — << — EXISTING STORM SEWER
- << — << — CONSTRUCT STORM SEWER
- CONSTRUCT MANHOLE
- □ CONSTRUCT CATCH BASIN

HORIZ. SCALE FEET

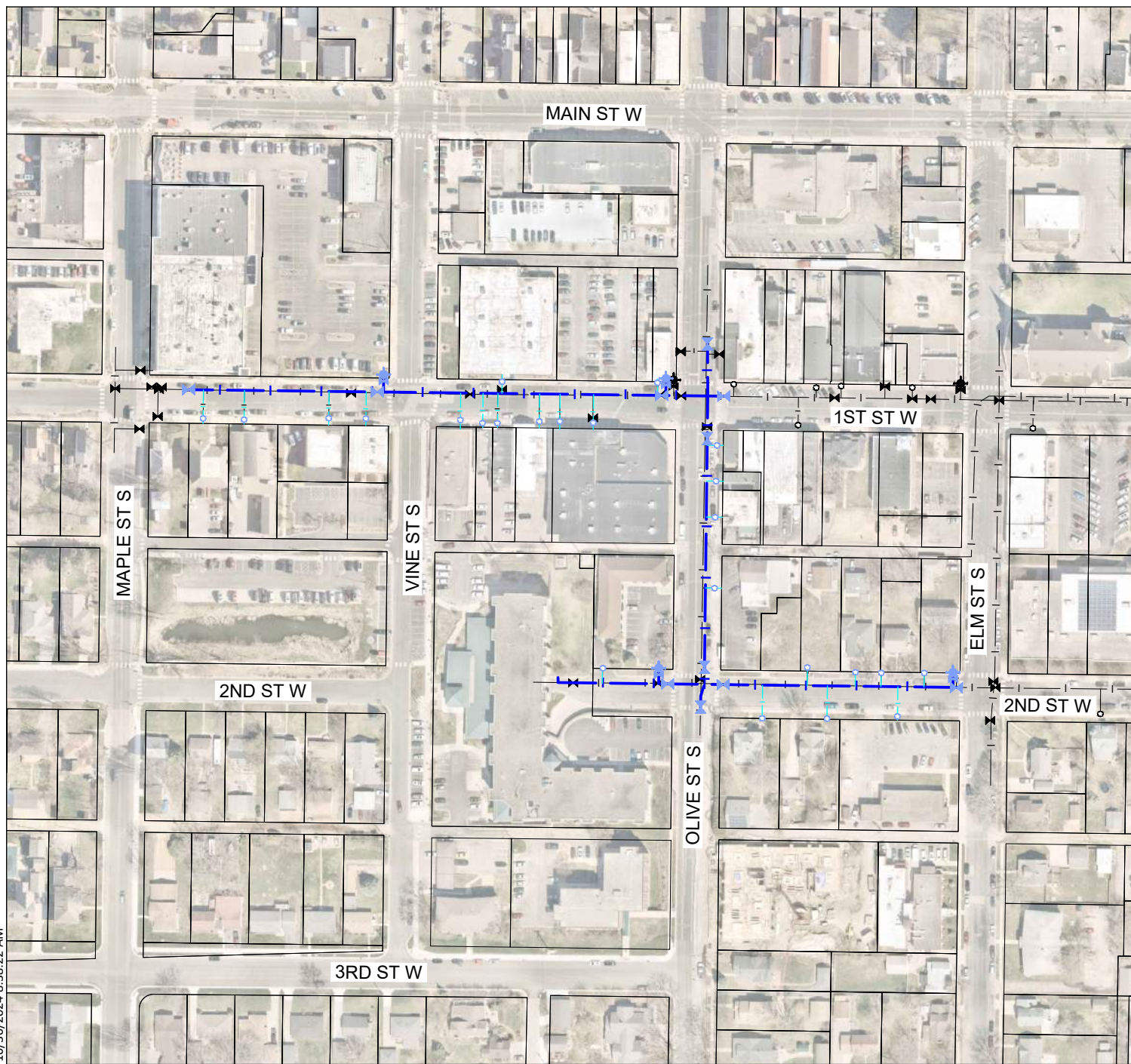




LEGEND

- EXISTING SANITARY SEWER
- REPLACE SANITARY SEWER
- REPLACE SANITARY SEWER SERVICE
- REPLACE MANHOLE

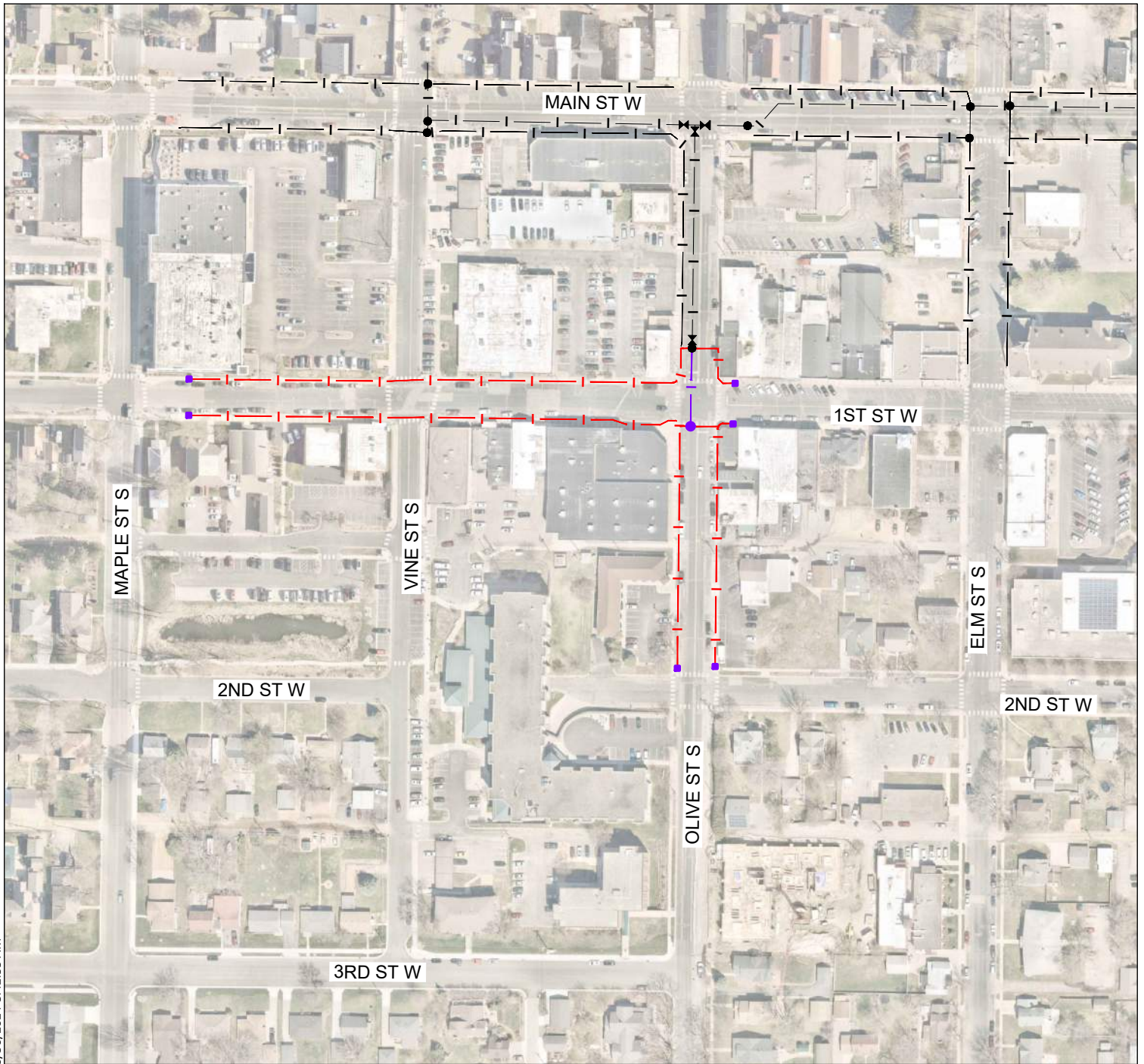
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HORZ. SCALE FEET




LEGEND


	EXISTING WATERMAIN
	REPLACE WATERMAIN
	REPLACE WATER SERVICE
	HYDRANTS AND VALVES

HORZ. SCALE 0 100 200 FEET

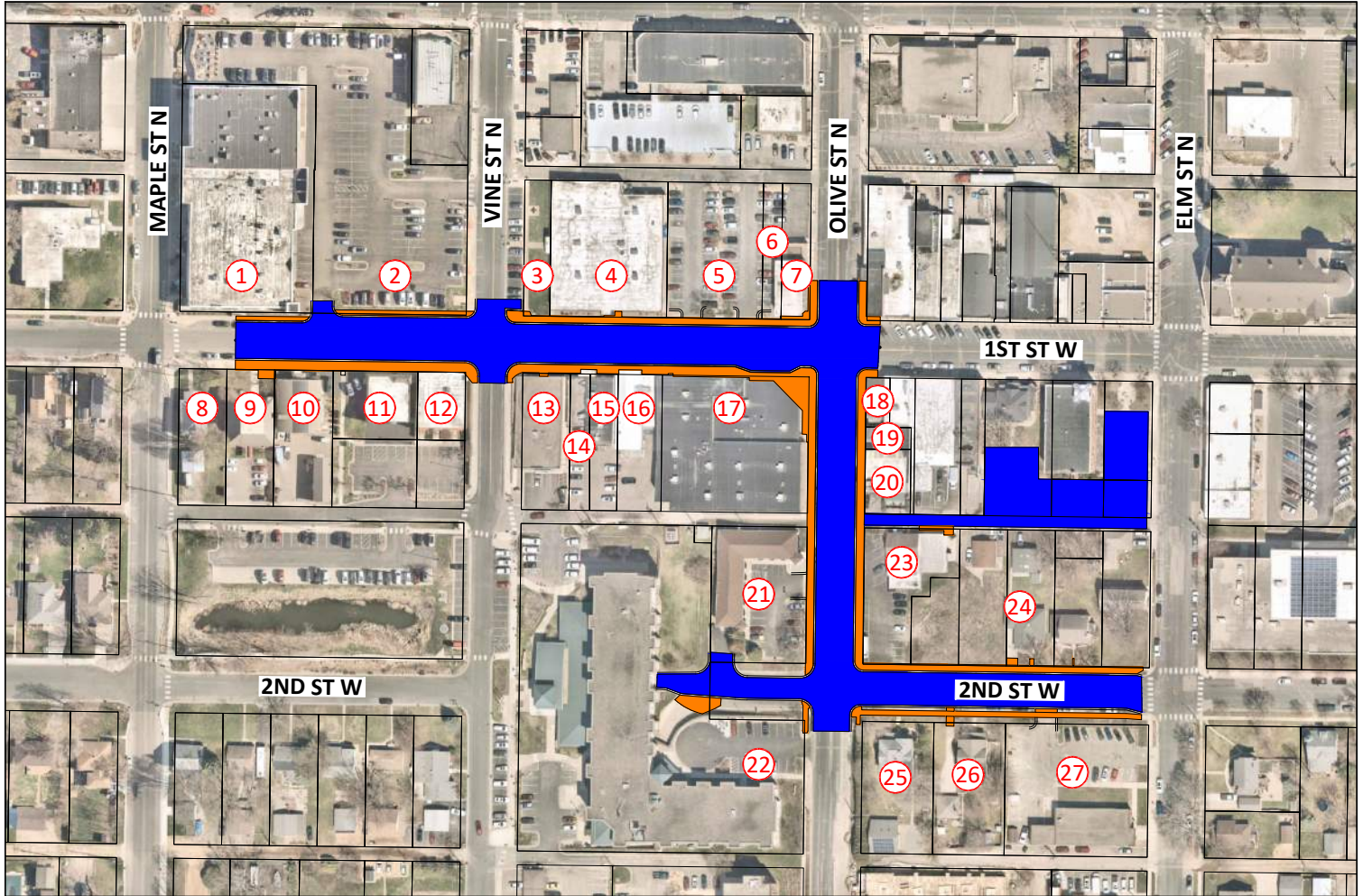


LEGEND	
	EXISTING IRRIGATION SYSTEM
	4" IRRIGATION MAIN
	1" IRRIGATION PIPE
	ACCESS MANHOLE
	BLOWOFF IN CONCRETE MANHOLE

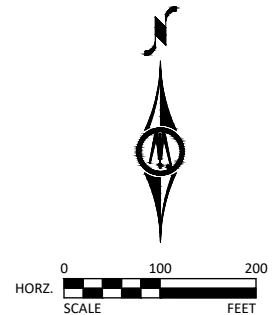




HORZ. SCALE FEET



PROP. NO.	P.I.D.	OWNER	PROPERTY ADDRESS
1	750502980	WACONIA SQUARE LLC	236 1ST ST W
2	750503030	WACONIA CITY	217 MAIN ST W
3	750502830	WACONIA CITY	NA
4	750502820	PROMISE COMMUNITY CHURCH	138 1ST ST W
5	750502800	WACONIA EDA	116 1ST ST W
6	750502790	WACONIA EDA	106 1ST ST W
7	750502780	JNIN LLC	100 1ST ST W
8	750501250	THE CUTTING EDGE SALON OF WACONIA LLC	241 1ST ST W
9	750501260	QVF PROPERTIES LLC	233 1ST ST W
10	750501270	S&C PROPERTIES LLC	225 1ST ST W
11	750501291	SEGNER-PEITZ PROPERTIES LLC	209 1ST ST W
12	750501300	STEP WEST LLC	201 1ST ST W
13	750501370	LIFT MANAGEMENT SERVICES LLP	141 1ST ST W
14	750501390	BERRY PROPERTIES LLC	137 1ST ST W
15	750501380	PAVING INVESTMENTS LLC	133 1ST ST W
16	750501400	JD RENTALS LLPA	125 1ST ST W
17	750501420	SPIRIT MASTER FUNDING X LLC	101 1ST ST W
18	750501520	GERALD A & JANE M EVESLAGE	41 1ST ST W
19	750501540	JDS LLC	115 OLIVE ST S
20	750501530	P & D WACONIA PROPERTIES LLC	119 OLIVE ST S
21	750501340	OLIVE STREET PARTNERS LLC	132 OLIVE ST S
22	754800010	WACONIA CITY	201 VINE ST S
23	750501511	STEVEN J YETZER	125 OLIVE ST S
24	PENDING (750501505)	OLIVE AND SECOND LLC (INCLUDES PENDING SALES OF PROPERTIES OWNED BY STEVEN YETZER & CITY OF WACONIA)	24 2ND ST W
	PENDING (750501480)		16 2ND ST W
	PENDING (750501460)		8 2ND ST W
	PENDING (750501450)		136 ELM ST S
25	750500580	JESSE AND JAMIE BERSTROM LIVING TRUST	41 2ND ST W
26	750500590	MICHAEL DEHN	25 2ND ST W
27	750500600	MARWAY PROPERTIES LLC	208 ELM ST S



APPENDIX B

ITEMIZED COST ESTIMATES

**ESTIMATED PROJECT COST
FOR
Downtown Reconstruction Phase 3
12/10/2024**

STREET RECONSTRUCTION (ASSESSABLE)

ITEM NO.	BID ITEM	UNIT	EST QTY	UNIT PRICE	TOTAL
1	MOBILIZATION	LUMP SUM	1	\$49,000.00	\$49,000.00
2	REMOVE CONCRETE CURB & GUTTER	LIN FT	3,428	\$6.25	\$21,425.00
3	REMOVE BITUMINOUS PAVEMENT	SQ YD	9,090	\$4.00	\$36,360.00
4	REMOVE CONCRETE DRIVEWAY	SQ FT	3,101	\$3.25	\$10,078.25
5	REMOVE BITUMINOUS DRIVEWAY	SQ FT	6,744	\$2.00	\$13,488.00
6	REMOVE PAVER DRIVEWAY	SQ FT	110	\$5.00	\$550.00
7	REMOVE DRAINAGE STRUCTURE	EACH	21	\$600.00	\$12,600.00
8	REMOVE DRAINAGE PIPE	LIN FT	1,177	\$16.00	\$18,832.00
9	COMMON EXCAVATION (EV)	CU YD	5,107	\$26.00	\$132,782.00
10	GEOTEXTILE FABRIC	SQ YD	7,504	\$2.50	\$18,760.00
11	AGGREGATE BASE CLASS 5 (CV) - 8" DEPTH	TON	3,245	\$31.00	\$100,595.00
12	CONCRETE CURB & GUTTER (B618)	LIN FT	3,641	\$25.00	\$91,025.00
13	BITUMINOUS NON-WEAR COURSE - 3.0" DEPTH	TON	1,069	\$85.00	\$90,865.00
14	BITUMINOUS WEAR COURSE - 1.5" DEPTH	TON	535	\$99.00	\$52,965.00
15	3" BITUMINOUS DRIVEWAY	SQ FT	6,774	\$6.25	\$42,337.50
16	6" CONCRETE DRIVEWAY	SQ FT	4,110	\$15.00	\$61,650.00
17	CONSTRUCT DRAINAGE STRUC. DES 2'X3'	EACH	7	\$2,000.00	\$14,000.00
18	CONSTRUCT DRAINAGE STRUC. DES 4020-48	EACH	4	\$7,000.00	\$28,000.00
19	CONSTRUCT DRAINAGE STRUC. DES 4022-48	EACH	9	\$7,000.00	\$63,000.00
20	15" RC PIPE SEWER DES 3006 CL V	LIN FT	781	\$82.00	\$64,042.00
21	18" RC PIPE SEWER DES 3006 CL V	LIN FT	334	\$88.00	\$29,392.00
22	21" RC PIPE SEWER DES 3006 CL V	LIN FT	140	\$90.00	\$12,600.00
23	24" RC PIPE SEWER DES 3006 CL V	LIN FT	172	\$92.00	\$15,824.00
24	CASTING ASSEMBLY (STORM)	EACH	20	\$1,100.00	\$22,000.00
25	ADJUST CASTING (STORM)	EACH	2	\$680.00	\$1,360.00
26	CONNECT TO EXISTING STORM SEWER	EACH	7	\$2,000.00	\$14,000.00
27	LANDSCAPING	ALLOWANCE	1	\$10,000.00	\$10,000.00
28	IRRIGATION & DOG FENCE REPAIR	ALLOWANCE	1	\$1,000.00	\$1,000.00

	<i>SUBTOTAL:</i>	\$1,028,530.75
	<i>CONTINGENCIES (10%):</i>	\$102,853.08
	<i>ESTIMATED CONSTRUCTION COST:</i>	\$1,131,383.83
	<i>ADMINISTRATION, ENGINEERING, SURVEYING, INSPECTION (30%):</i>	\$339,415.15
	<i>TOTAL ESTIMATED PROJECT COST:</i>	<i>\$1,470,798.97</i>

**ESTIMATED PROJECT COST
FOR
Downtown Reconstruction Phase 3
12/10/2024**

STREET RECONSTRUCTION (EXTRA SECTION - NON-ASSESSABLE)

ITEM NO.	BID ITEM	UNIT	EST QTY	UNIT PRICE	TOTAL
1	MOBILIZATION	LUMP SUM	1	\$98,000.00	\$98,000.00
2	TRAFFIC CONTROL	LUMP SUM	1	\$50,000.00	\$50,000.00
3	CLEAR & GRUB TREE	EACH	12	\$1,300.00	\$15,600.00
4	REMOVE CONCRETE STAIRS	SQ FT	168	\$12.00	\$2,016.00
5	REMOVE BITUMINOUS PAVEMENT	SQ YD	539	\$4.00	\$2,156.00
6	REMOVE BITUMINOUS DRIVEWAY	SQ FT	4,379	\$2.00	\$8,758.00
7	REMOVE SIGN	EACH	35	\$350.00	\$12,250.00
8	COMMON EXCAVATION (EV)	CU YD	5,284	\$26.00	\$137,384.00
9	SUBGRADE EXCAVATION (EV)	CU YD	4,269	\$26.00	\$110,994.00
10	GEOTEXTILE FABRIC	SQ YD	4,092	\$2.50	\$10,230.00
11	AGGREGATE BASE CLASS 5 (CV) - 12" DEPTH	TON	1,678	\$31.00	\$52,018.00
12	AGGREGATE BASE CLASS 5 (CV) - 9" DEPTH	TON	870	\$31.00	\$26,970.00
13	AGGREGATE BASE CLASS 5 (CV) - 4" DEPTH	TON	1,619	\$31.00	\$50,189.00
14	STABILIZING AGGREGATE (CV)	CU YD	4,269	\$31.00	\$132,339.00
15	SELECT GRANULAR BORROW (CV) - 12" DEPTH	CU YD	3,575	\$31.00	\$110,825.00
16	BITUMINOUS NON-WEAR COURSE - 3.0" DEPTH	TON	849	\$85.00	\$72,165.00
17	BITUMINOUS WEAR COURSE - 1.5" DEPTH	TON	127	\$99.00	\$12,573.00
18	BITUMINOUS WEAR COURSE - 2.0" DEPTH	TON	716	\$99.00	\$70,884.00
19	BITUMINOUS WEAR COURSE - 3.5" DEPTH	TON	503	\$99.00	\$49,797.00
20	PAVER SIDEWALK	SQ FT	105	\$25.00	\$2,625.00
21	3" BITUMINOUS DRIVEWAY	SQ FT	4,379	\$6.25	\$27,365.63
22	4" SOLID DOUBLE YELLOW LINE	LIN FT	649	\$1.50	\$973.35
23	4" SOLID LINE WHITE	LIN FT	1,000	\$1.25	\$1,250.00
24	PAVEMENT MARKINGS	EACH	3	\$275.00	\$825.00
25	CONCRETE STAIRS	SQ FT	254	\$75.00	\$19,012.50
26	SUMP PUMP SERVICE CONNECTION	EACH	7	\$315.00	\$2,205.00
27	CONSTRUCT DRAINAGE STRUC. DES 4020-48	EACH	3	\$7,000.00	\$21,000.00
28	CONSTRUCT WEIR STRUCTURE	EACH	1	\$12,000.00	\$12,000.00
29	24" RC PIPE SEWER DES 3006 CL V	LIN FT	210	\$92.00	\$19,320.00
30	CASTING ASSEMBLY (STORM)	EACH	3	\$1,100.00	\$3,300.00
31	STORMWATER TREATMENT	LUMP SUM	1	\$325,000.00	\$325,000.00
32	4" PERFORATED EDGE DRAIN	LIN FT	3,537	\$20.00	\$70,740.00
33	4" HDPE DRAIN TILE CLEANOUT	EACH	12	\$300.00	\$3,600.00
34	6" PVC DRAINTILE	LIN FT	300	\$23.00	\$6,900.00
35	CONNECT TO EXISTING DRAINTILE	EACH	6	\$1,300.00	\$7,800.00
36	ROCK CONSTRUCTION ENTRANCE	EACH	3	\$2,000.00	\$6,000.00
37	SOD TYPE LAWN	SQ YD	2,303	\$14.00	\$32,235.00
38	TOPSOIL BORROW (LV)	CU YD	330	\$45.00	\$14,852.25
39	FURNISH & INSTALL SIGN	EACH	35	\$475.00	\$16,625.00
40	2 1/2" CALIPER DECIDUOUS TREE	EACH	12	\$900.00	\$10,800.00
41	BUSINESS SIGNAGE	ALLOWANCE	1	\$15,000.00	\$15,000.00
42	REPAIR EXTERIOR BUILDING FAÇADE	ALLOWANCE	1	\$20,000.00	\$20,000.00
43	STREET LIGHTING & WAYFINDING SIGNAGE	LUMP SUM	1	\$300,000.00	\$300,000.00
44	BURY OVERHEAD POWER	LUMP SUM	1	\$50,000.00	\$50,000.00
45	BURY ELECTRIC SERVICE	EACH	4	\$5,000.00	\$20,000.00
46	CONSTRUCTION TRAILER MOBILIZATION & SETUP	LUMP SUM	1	\$4,000.00	\$4,000.00
47	LANDSCAPING	ALLOWANCE	1	\$10,000.00	\$10,000.00

SUBTOTAL: \$2,048,576.73
 CONTINGENCIES (10%): \$204,857.67
 ESTIMATED CONSTRUCTION COST: \$2,253,434.40
 ADMINISTRATION, ENGINEERING, SURVEYING, INSPECTION (30%): \$676,030.32
TOTAL ESTIMATED PROJECT COST: \$2,929,464.72

**ESTIMATED PROJECT COST
FOR
Downtown Reconstruction Phase 3
12/10/2024**

PARKING LOT RECONSTRUCTION (NON-ASSESSABLE)

ITEM NO.	BID ITEM	UNIT	EST QTY	UNIT PRICE	TOTAL
1	MOBILIZATION	LUMP SUM	1	\$7,000.00	\$7,000.00
2	TRAFFIC CONTROL	LUMP SUM	1	\$1,500.00	\$1,500.00
3	ROCK CONSTRUCTION ENTRANCE	EACH	1	\$2,000.00	\$2,000.00
4	REMOVE CONCRETE CURB & GUTTER	LIN FT	123	\$6.25	\$768.75
5	CLEAR & GRUB TREE	EACH	4	\$1,300.00	\$5,200.00
6	REMOVE BITUMINOUS PAVEMENT	SQ YD	947	\$4.00	\$3,788.00
7	REMOVE CONCRETE DRIVEWAY/WALK	SQ FT	1,927	\$3.25	\$6,262.75
8	COMMON EXCAVATION (EV)	CU YD	867	\$26.00	\$22,542.00
9	SUBGRADE EXCAVATION (EV)	CU YD	73	\$26.00	\$1,898.00
10	GEOTEXTILE FABRIC	SQ YD	1,721	\$2.50	\$4,302.50
11	AGGREGATE BASE CLASS 5 (CV) - 9" DEPTH	TON	877	\$31.00	\$27,187.00
12	STABILIZING AGGREGATE (CV)	CU YD	73	\$31.00	\$2,263.00
13	BITUMINOUS NON-WEAR COURSE - 3.0" DEPTH	TON	253	\$85.00	\$21,505.00
14	BITUMINOUS WEAR COURSE - 1.5" DEPTH	TON	127	\$99.00	\$12,573.00
15	CONSTRUCT DRAINAGE STRUC. DES G	EACH	1	\$2,500.00	\$2,500.00
16	CONSTRUCT DRAINAGE STRUC. DES 2'X3'	EACH	1	\$3,750.00	\$3,750.00
17	15" RC PIPE SEWER DES 3006 CL V	LIN FT	150	\$82.00	\$12,300.00
18	CASTING ASSEMBLY (STORM)	EACH	3	\$1,100.00	\$3,300.00
19	CONNECT TO EXISTING ROOF DRAIN	EACH	2	\$1,000.00	\$2,000.00
20	STORM DRAIN INLET PROTECTION	EACH	8	\$150.00	\$1,200.00
21	BIOROLL	LIN FT	475	\$3.50	\$1,662.50
22	4" CONCRETE WALK (w/ AGG. CL 5 BASE)	SQ FT	3,101	\$9.25	\$28,684.25
23	PEDESTRIAN RAMP	EACH	3	\$3,500.00	\$10,500.00
24	6" CONCRETE DRIVEWAY	SQ FT	163	\$15.00	\$2,445.00
25	4" SOLID LINE WHITE	LIN FT	3,589	\$1.25	\$4,486.25
26	PAVEMENT MARKINGS	EACH	3	\$275.00	\$825.00
27	SOD TYPE LAWN	SQ YD	128	\$14.00	\$1,792.00
28	TOPSOIL BORROW (LV)	CU YD	17	\$45.00	\$765.00
29	LANDSCAPING	ALLOWANCE	1	\$20,000.00	\$20,000.00
30	REPAIR EXTERIOR BUILDING FAÇADE	ALLOWANCE	1	\$5,000.00	\$5,000.00

	SUBTOTAL:	\$220,000.00
	CONTINGENCIES (10%):	\$22,000.00
	ESTIMATED CONSTRUCTION COST:	\$242,000.00
ADMINISTRATION, ENGINEERING, SURVEYING, INSPECTION (30%):		\$72,600.00
	TOTAL ESTIMATED PROJECT COST:	\$314,600.00

**ESTIMATED PROJECT COST
FOR
Downtown Reconstruction Phase 3
12/10/2024**

SIDEWALK (NON-ASSESSABLE)

ITEM NO.	BID ITEM	UNIT	EST QTY	UNIT PRICE	TOTAL
1	REMOVE CONCRETE WALK	SQ FT	24,431	\$2.25	\$54,969.75
2	REMOVE RAILING	LIN FT	37	\$15.00	\$551.25
3	4" CONCRETE WALK (w/ AGG. CL 5 BASE)	SQ FT	31,023	\$9.25	\$286,962.75
4	BUSINESS ENTRANCE MODIFICATIONS	ALLOWANCE	1	\$7,500.00	\$7,500.00
5	PEDESTRIAN RAMP	EACH	20	\$3,500.00	\$70,000.00
6	CONSTRUCT RETAINING WALL	SQ FT	320	\$55.00	\$17,600.00
7	METAL RAILING	LIN FT	32	\$75.00	\$2,362.50
8	CROSSWALK EXPOXY	SQ FT	1,474	\$3.00	\$4,422.00

	SUBTOTAL:	\$444,368.25
	<i>CONTINGENCIES (10%):</i>	<i>\$44,436.83</i>
	<i>ESTIMATED CONSTRUCTION COST:</i>	<i>\$488,805.08</i>
	<i>ADMINISTRATION, ENGINEERING, SURVEYING, INSPECTION (30%):</i>	<i>\$146,641.52</i>
	TOTAL ESTIMATED PROJECT COST:	\$635,446.60

**ESTIMATED PROJECT COST
FOR
Downtown Reconstruction Phase 3
12/10/2024**

SANITARY SEWER RECONSTRUCTION (ASSESSABLE)

ITEM NO.	BID ITEM	UNIT	EST QTY	UNIT PRICE	TOTAL
1	MOBILIZATION	LUMP SUM	1	\$18,000.00	\$18,000.00
2	REMOVE SANITARY MANHOLE	EACH	7	\$800.00	\$5,600.00
3	REMOVE SANITARY PIPE	LIN FT	1,874	\$11.00	\$20,614.00
4	REMOVE SANITARY SERVICE PIPE	LIN FT	945	\$5.00	\$4,725.00
5	EXTERNAL CHIMNEY SEAL	EACH	8	\$400.00	\$3,200.00
6	8" PVC PIPE SEWER SDR 35	LIN FT	1,684	\$82.00	\$138,088.00
7	6" PVC PIPE SEWER SERVICE SDR 26	LIN FT	1,010	\$50.00	\$50,500.00
8	8" X 6" SERVICE WYE	EACH	21	\$625.00	\$13,125.00
9	CONSTRUCT SANITARY MANHOLE	EACH	8	\$8,250.00	\$66,000.00
10	CONSTRUCT MANHOLE GREASE TRAP	EACH	1	\$9,500.00	\$9,500.00
11	CASTING ASSEMBLY (SANITARY)	EACH	8	\$1,100.00	\$8,800.00
12	CONNECT TO EXISTING SANITARY SEWER PIPE	EACH	4	\$4,200.00	\$16,800.00
13	CONNECT TO EXISTING SANITARY SERVICE	EACH	25	\$875.00	\$21,875.00

<i>SUBTOTAL:</i>	<i>\$376,827.00</i>
<i>CONTINGENCIES (10%)</i>	<i>\$37,682.70</i>
<i>ESTIMATED CONSTRUCTION COST:</i>	<i>\$414,509.70</i>
<i>ADMINISTRATION, ENGINEERING, SURVEYING, INSPECTION (30%):</i>	<i>\$124,352.91</i>
<i>TOTAL ESTIMATED PROJECT COST:</i>	<i>\$538,862.61</i>

**ESTIMATED PROJECT COST
FOR
Downtown Reconstruction Phase 3
12/10/2024**

SANITARY SEWER RECONSTRUCTION (NON-ASSESSABLE)

ITEM NO.	BID ITEM	UNIT	EST QTY	UNIT PRICE	TOTAL
1	MOBILIZATION	LUMP SUM	1	\$2,000.00	\$2,000.00
2	BYPASS PUMPING	LUMP SUM	1	\$15,000.00	\$15,000.00
3	VIBRATION MONITORING	LUMP SUM	1	\$17,500.00	\$17,500.00

	<i>SUBTOTAL:</i>	<i>\$34,500.00</i>
	<i>CONTINGENCIES (10%):</i>	<i>\$3,450.00</i>
	<i>ESTIMATED CONSTRUCTION COST:</i>	<i>\$37,950.00</i>
<i>ADMINISTRATION, ENGINEERING, SURVEYING, INSPECTION (30%):</i>		<i>\$11,385.00</i>
	<i>TOTAL ESTIMATED PROJECT COST:</i>	<i>\$49,335.00</i>

**ESTIMATED PROJECT COST
FOR
Downtown Reconstruction Phase 3
12/10/2024**

WATERMAIN RECONSTRUCTION (ASSESSABLE)

ITEM NO.	BID ITEM	UNIT	EST QTY	UNIT PRICE	TOTAL
1	MOBILIZATION	LUMP SUM	1	\$29,000.00	\$29,000.00
2	REMOVE WATERMAIN	LIN FT	1,955	\$7.00	\$13,685.00
3	REMOVE WATERMAIN SERVICE	LIN FT	934	\$3.00	\$2,802.00
4	REMOVE GATE VALVE & BOX	EACH	14	\$325.00	\$4,550.00
5	REMOVE HYDRANT	EACH	4	\$500.00	\$2,000.00
6	6" DIP WATERMAIN	LIN FT	256	\$88.00	\$22,528.00
7	8" PVC WATERMAIN	LIN FT	1,177	\$79.00	\$92,983.00
8	10" PVC WATERMAIN	LIN FT	788	\$95.00	\$74,860.00
9	3 LB ANODE	EACH	8	\$150.00	\$1,200.00
10	9 LB ANODE	EACH	10	\$250.00	\$2,500.00
11	WATERMAIN FITTINGS	POUND	2,888	\$16.00	\$46,208.00
12	6" GATE VALVE & BOX	EACH	8	\$3,000.00	\$24,000.00
13	8" GATE VALVE & BOX	EACH	8	\$4,500.00	\$36,000.00
14	10" GATE VALVE & BOX	EACH	4	\$5,500.00	\$22,000.00
15	1" CORPORATION STOP	EACH	24	\$900.00	\$21,600.00
16	1" SERVICE PIPE (OPEN CUT)	LIN FT	536	\$46.00	\$24,656.00
17	1" SERVICE PIPE (PULLED)	LIN FT	660	\$100.00	\$66,000.00
18	HYDRANT	EACH	4	\$8,500.00	\$34,000.00
19	WATER SERVICE CASTING ASSEMBLY	EACH	24	\$450.00	\$10,800.00
20	TRACER WIRE ACCESS BOX	EACH	1	\$300.00	\$300.00
21	TEMPORARY WATER SYSTEM	LUMP SUM	1	\$30,000.00	\$30,000.00
22	CONNECT TO EXISTING WATER SERVICE	EACH	24	\$750.00	\$18,000.00
23	CONNECT TO EXISTING WATERMAIN	EACH	6	\$4,000.00	\$24,000.00

<i>SUBTOTAL:</i>	<i>\$603,672.00</i>
<i>CONTINGENCIES (10%):</i>	<i>\$60,367.20</i>
<i>ESTIMATED CONSTRUCTION COST:</i>	<i>\$664,039.20</i>
<i>ADMINISTRATION, ENGINEERING, SURVEYING, INSPECTION (30%):</i>	<i>\$199,211.76</i>
<i>TOTAL ESTIMATED PROJECT COST:</i>	<i>\$863,250.96</i>

**ESTIMATED PROJECT COST
FOR
Downtown Reconstruction Phase 3
12/10/2024**

WATERMAIN RECONSTRUCTION (NON-ASSESSABLE)

ITEM NO.	BID ITEM	UNIT	EST QTY	UNIT PRICE	TOTAL
1	MOBILIZATION	LUMP SUM	1	\$12,000.00	\$12,000.00
2	BORE FOUNDATION WALL/REMOVE & REPLACE FLOOR	EACH	14	\$1,300.00	\$18,200.00
3	RESET WATER METER & ADJUST PIPING	EACH	14	\$1,500.00	\$21,000.00
4	MOVE ELECTRICAL GROUND FROM WATER SERVICE	EACH	14	\$500.00	\$7,000.00
5	HAND EXCAVATION TO CONNECT WATER SERVICE (IN CRAWL SPACE)	EACH	14	\$750.00	\$10,500.00
6	CATHODIC PROTECTION TEST STATION	EACH	1	\$2,000.00	\$2,000.00
7	VIBRATION MONITORING	LUMP SUM	1	\$17,500.00	\$17,500.00
8	4" CONDUIT FOR IRRIGATION MAIN	LIN FT	2,304	\$12.00	\$27,648.00
9	1" IRRIGATION MAIN HDD	LIN FT	2,304	\$12.00	\$27,648.00
10	4" IRRIGATION MAIN HDD	LIN FT	116	\$28.00	\$3,248.00
11	CONNECT TO EXISTING IRRIGATION MAIN	EACH	1	\$750.00	\$750.00
12	IRRIGATION ACCESS MANHOLE CASTING	EACH	1	\$1,300.00	\$1,300.00
13	IRRIGATION BLOWOFF STRUCTURE CASTING	EACH	6	\$1,250.00	\$7,500.00
14	IRRIG. CONNECTOR IN PRECAST CONC. HANDHOLE	EACH	12	\$1,800.00	\$21,600.00
15	DUCTILE IRON FITTINGS (IRRIGATION)	LUMP SUM	1	\$5,500.00	\$5,500.00
16	BLOWOFF IN PRECAST CONCRETE HANDHOLE (60")	EACH	6	\$7,500.00	\$45,000.00
17	ACCESS MANHOLE (60")	EACH	1	\$8,200.00	\$8,200.00

SUBTOTAL: \$236,594.00
 CONTINGENCIES (10%): \$23,659.40
 ESTIMATED CONSTRUCTION COST: \$260,253.40
 ADMINISTRATION, ENGINEERING, SURVEYING, INSPECTION (30%): \$78,076.02
TOTAL ESTIMATED PROJECT COST: \$338,329.42

**ESTIMATED PROJECT COST
FOR
Downtown Reconstruction Phase 3
12/10/2024**

STORM SEWER IN ALLEY - DEVELOPER COSTS MINUS OVERSIZING

ITEM NO.	BID ITEM	UNIT	EST QTY	UNIT PRICE	TOTAL
1	CONSTRUCT DRAINAGE STRUC. DES 4020-48	EACH	3	\$8,000.00	\$24,000.00
2	24" RC PIPE SEWER DES 3006 CL V	LIN FT	272	\$92.00	\$25,024.00
3	CASTING ASSEMBLY (STORM)	EACH	3	\$1,100.00	\$3,300.00
4	CONNECT TO EXISTING STORM SEWER	EACH	1	\$2,000.00	\$2,000.00

SUBTOTAL: \$54,324.00
 CONTINGENCIES (10%): \$5,432.40
 ESTIMATED CONSTRUCTION COST: \$59,756.40
 ADMINISTRATION, ENGINEERING, SURVEYING, INSPECTION (30%): \$17,926.92
TOTAL ESTIMATED PROJECT COST: \$77,683.32

TOTAL ESTIMATED STORM SEWER OVERSIZING COSTS: \$10,719.96

TOTAL ESTIMATED DEVELOPER COST: \$66,963.36

**ESTIMATED PROJECT COST
FOR
Downtown Reconstruction Phase 3
12/10/2024**

ALLEY COST ESTIMATE

ITEM NO.	BID ITEM	UNIT	EST QTY	UNIT PRICE	TOTAL
1	COMMON EXCAVATION (EV)	CU YD	257	\$26.00	\$6,682.00
2	SUBGRADE EXCAVATION (EV)	CU YD	20	\$26.00	\$520.00
3	GEOTEXTILE FABRIC	SQ YD	579	\$2.50	\$1,447.50
4	AGGREGATE BASE CLASS 5 (CV) - 9" DEPTH	TON	287	\$31.00	\$8,897.00
5	STABILIZING AGGREGATE (CV)	CU YD	20	\$31.00	\$620.00
6	BITUMINOUS NON-WEAR COURSE - 3.0" DEPTH	TON	91	\$85.00	\$7,735.00
7	BITUMINOUS WEAR COURSE - 1.5" DEPTH	TON	47	\$99.00	\$4,653.00
8	3" BITUMINOUS DRIVEWAY	SQ FT	1,578	\$5.00	\$7,890.00

SUBTOTAL:	\$38,444.50
CONTINGENCIES (10%):	\$3,844.45
ESTIMATED CONSTRUCTION COST:	\$42,288.95
ADMINISTRATION, ENGINEERING, SURVEYING, INSPECTION (30%):	\$12,686.69
TOTAL ESTIMATED PROJECT COST:	\$54,975.64
TOTAL COST PER LINEAR FOOT	<u>\$166.59</u>

**ESTIMATED PROJECT COST
FOR
Downtown Reconstruction Phase 3
12/10/2024**

SIDEWALK (DEVELOPER COST SHARING - OLIVE STREET & 2ND STREET)

ITEM NO.	BID ITEM	UNIT	EST QTY	UNIT PRICE	TOTAL
1	REMOVE CONCRETE WALK	SQ FT	2,252	\$2.25	\$5,067.00
2	4" CONCRETE WALK (w/ AGG. CL 5 BASE)	SQ FT	3,652	\$9.25	\$33,781.00
3	PEDESTRIAN RAMP	EACH	2	\$3,500.00	\$7,000.00

	<i>SUBTOTAL:</i>	\$45,848.00
	<i>CONTINGENCIES (10%):</i>	\$4,584.80
	<i>ESTIMATED CONSTRUCTION COST:</i>	\$50,432.80
	<i>ADMINISTRATION, ENGINEERING, SURVEYING, INSPECTION (30%):</i>	\$15,129.84
	<i>TOTAL ESTIMATED PROJECT COST:</i>	<i>\$65,562.64</i>

**ESTIMATED PROJECT COST
FOR
Downtown Reconstruction Phase 3
12/10/2024**

SIDEWALK (DEVELOPER COST SHARING - ELM STREET)

ITEM NO.	BID ITEM	UNIT	EST QTY	UNIT PRICE	TOTAL
1	REMOVE CONCRETE WALK	SQ FT	1,065	\$2.25	\$2,395.58
2	4" CONCRETE WALK (w/ AGG. CL 5 BASE)	SQ FT	1,369	\$9.25	\$12,658.63
3	PEDESTRIAN RAMP	EACH	4	\$3,500.00	\$14,000.00

	<i>SUBTOTAL:</i>	\$29,054.20
	<i>CONTINGENCIES (10%):</i>	\$2,905.42
	<i>ESTIMATED CONSTRUCTION COST:</i>	\$31,959.62
	<i>ADMINISTRATION, ENGINEERING, SURVEYING, INSPECTION (30%):</i>	\$9,587.89
	<i>TOTAL ESTIMATED PROJECT COST:</i>	<i>\$41,547.51</i>

APPENDIX C

CITY ASSESSMENT POLICY

**Section Extracted from City of Waconia Financial Policy & Guidelines
Last Amended June 19, 2017**

Special Assessments

The financing for reconstruction projects is through the sale of General Obligation 429 Improvement Bonds. Minnesota State Statute requires a minimum assessed percentage of 20% for projects financed with 429 bonds.

With each reconstruction project, a feasibility study is completed and approved by the City Council. Once a draft of the feasibility study is complete, City staff will share the information with a qualified appraiser to determine the special benefit to each property in the reconstruction area. The City Council will use this appraisal information as a basis for finalizing the special assessments due by property owners for reconstruction projects.

Assessment Policy Summary:

- The portion of the project costs assessed to the abutting property owner shall be based on a linear front footage basis of the parcel or unit basis.
- The City pays 50% of the total project cost of a standard local street section and 100% of the cost of extra width and extra depth above the city standard local street section.
- Storm sewer costs are to be included in the total project cost of a city standard local street, assessed 50% (and City pays 50%), in accordance with the Street Assessment Policy.
- All or some of the following improvements may be incorporated in a reconstruction project. Costs for these improvements will be included in the overall project cost, with a contribution from the City: storm water ponding, street lights, relocation of overhead power lines, street signs, sidewalks and trails, and boulevard trees.
- Corner lots and parcels with multiple frontages shall be assessed 50% of the front footage on each side.
- A minimum assessment shall be levied to parcels identified within the project area having neither direct primary nor non-primary access to affected streets. The assessment shall be equal to 75% of the typical front footage identified within the project area. Parcels abutting county roads are exempt from this provision.
- Assessments will not be levied for seal coat and overlay operations.
- Assessments may be pre-paid to the City by benefiting properties
- Assessments will be billed to the benefiting property owner by the City; typically over a ten (10) year period, at an interest rate of one percent (1%) over the bond interest rate. Other terms of the assessment receivable may be available to the benefiting property owners.
 - For any project, where all the benefiting property owner(s) are governmental entities (school district, county, state, etc.), the City will assess the benefiting property owner(s) the actual bond interest rate, typically over a ten (10) year period.
- In the case where a benefiting property owner is delinquent in their assessment payment, assessments may be certified to real estate taxes over a ten (10) year period, at an interest rate one percent (1%) over the bond interest rate.
- Partial pre-payments for assessments exceeding \$100,000.00 may be accepted by the City.

Infrastructure Improvement Cost Breakdown & Methodology

Improvement	Type of Construction	Method
Curb & Gutter	New Development	100% of the cost assessed to abutting property owner on linear front footage OR unit basis.
	Reconstruction (Complete)	The portion of the project costs assessed to the abutting property owner shall be based on a linear front footage basis of the parcel.
	Reconstruction (Spot repair)	100% of cost to be included in overall cost of project prior to assessment apportionment in accordance with policy.
Local Street	New Development	100% of the cost assessed to abutting property owner on linear front footage OR per unit basis.
	Reconstruction	50% of the cost to be assessed to abutting property owner on linear front footage OR per unit basis. 50% of the cost to be paid by City.
	Maintenance (Seat coat & overlay)	100% Paid with City funds.
Collector Street as defined by the City's Transportation Plan	New Development	100% of the construction cost of a city standard local street assessed to abutting property owner based on linear front footage OR per unit basis.
	Reconstruction	The portion of the project costs assessed to the abutting property owner shall be based on a linear front footage OR per unit basis. City pays 50% of the cost of the construction of city standard local street and 100% of the cost of construction above a city standard local street.
	Maintenance (Seat coat & overlay)	100% Paid with City funds.
Intersection	New Development	100% of the cost to be included as part of street project and apportioned according to appropriate street construction category.
	Reconstruction	100% of cost to be included in overall cost of project prior to assessment apportionment in accordance with policy.
Multiple Fronted Parcels - Corner Lot - Double Fronted Lot - Large Parcels - Etc.	Reconstruction	Front footage to be used in assessment methods described herein shall be calculated as follows: - 50% of the front footage on all sides of the parcel. 50% of the cost to be paid with City funds.

Table continues on next page

Improvement	Type of Construction	Method
Parcels with no driveway access to primary and non-primary streets.	Reconstruction	A minimum assessment shall be levied to parcels identified within the project area having no direct driveway access to neither primary nor non-primary streets, i.e. alley access. The assessment shall be equal to 75% of the typical front footage identified within the project area. Parcels abutting county roads are exempt from this provision.
Alley	New Development	100% of the cost assessed to abutting property owner on linear front footage OR per unit basis.
	Reconstruction	50% of the cost to be assessed to abutting property owner on linear front footage OR per unit basis. 50% of the cost to be paid with City funds.
Sanitary Sewer Trunk/Lateral	New Development	100% of the cost assessed to benefited area on unit basis.
	Reconstruction	50% of the cost assessed to benefited area on unit basis. 50% of the cost to be paid with City funds.
	Maintenance	100% of the cost to be paid with City funds.
Sanitary Sewer Service	New Development	100% of cost assessed to property owner.
	Reconstruction (Including main)	50% of the cost assessed to benefited area on a unit basis. 50% of the cost to be paid with City funds.
	Reconstruction (Stand alone service replacement)	100% of cost assessed to property owner.
Sanitary Sewer Oversizing	New Development	100% paid with City funds. (Materials cost above 8-inch pipe plus 20% for handling and installation.)
	Reconstruction	100% paid with City funds. (Materials cost above 8-inch pipe plus 20% for handling and installation.)
Lift Station	New Development	100% of the cost assessed to benefited area on a per unit basis.
Water Trunk/Lateral	New Development	100% of the cost assessed to benefited area on unit basis.
	Reconstruction	50% of the cost assessed to benefited area on unit basis. 50% of cost to be paid with City funds.
	Maintenance	100% of the cost to be paid with City funds.
Water Service	New Development	100% of cost assessed to property owner.
	Reconstruction (Including main)	50% of the cost assessed to benefited area on a unit basis. 50% of the cost to be paid with City funds.
	Reconstruction (Stand alone service replacement)	100% of cost assessed to property owner.
Water Oversizing	New Development	100% paid with City funds. (Materials cost above 8-inch pipe plus 20% for handling and installation.)
	Reconstruction	100% paid with City funds. (Materials cost above 8-inch pipe plus 20% for handling and installation.)
Storm Sewer Trunk/Lateral	New Development	100% of the cost assessed to benefited area on unit basis.
	Reconstruction	50% of the cost to be assessed to abutting property owner on linear front footage OR per unit basis. 50% of the cost to be paid with City funds.
	Maintenance	100% of the cost to be paid with City funds.
Storm Water Ponding	New Development	100% assessed to development.
	Reconstruction	Cost to be included in overall cost of project prior to assessment apportionment in accordance with policy. City makes contribution to the project.
	Maintenance	100% of the cost to be paid with City funds.

Table continues on next page

Improvement	Type of Construction	Method
Overhead Power Lines	Relocation	Cost to be included in overall cost of project prior to assessment apportionment in accordance with policy. City makes contribution to the project.
Street Lights	New Development	100% of material and installation cost on a unit basis paid by developer.
	Reconstruction	Cost to be included in overall cost of project prior to assessment apportionment in accordance with policy. City makes contribution to the project.
	Maintenance	100% of the cost to be paid with City funds.
Street Signs	New Development	100% of material and installation cost on a unit basis paid by developer.
	Reconstruction	Cost to be included in overall cost of project prior to assessment apportionment in accordance with policy. City makes contribution to the project.
	Maintenance	100% of the cost to be paid with City funds.
Sidewalks & Trails	New Development	100% of cost assessed on a unit basis to development.
	Reconstruction	Cost to be included in overall cost of project prior to assessment apportionment in accordance with policy. City makes contribution to the project.
	Maintenance	100% of the cost to be paid with City funds.
Boulevard Trees	New Development	100% of cost paid by developer.
	Reconstruction	Cost to be included in overall cost of project prior to assessment apportionment in accordance with policy. City makes contribution to the project.
	Maintenance	100% of the cost to be paid with City funds.

Deferred Special Assessments

Hardship Assessment Deferral for Senior Citizens, People with Disabilities, or Members of the National Guard or other Reserves Ordered to Active Military Service.

Pursuant to the authority for deferring special assessments as provided in Minnesota State Statute Section 435.193 through 435.195, the City Council may, in its discretion, defer the payment of special assessments for any homestead property owned by a person 65 years of age or older, one retired by virtue of a permanent and total disability, or a member of the National Guard or other reserves ordered to active military service for whom it would be a hardship to make the payments.

Eligibility

Any person 65 years of age or older, permanently and totally disabled (as determined by the Social Security Administrator), or a member of the National Guard or other reserve ordered to active military service may request deferment of special assessments levied against real property for public improvements if the following conditions are met.

1. Ownership. The applicant must be the fee simple owner of the property or must be a contract vendee for fee simple ownership. An applicant must provide either a recorded deed or contract for deed with the application to establish a qualified ownership interest as required here.
2. Homestead. The property must be the applicant’s principal place of domicile and classified on the City’s and County’s real estate tax rolls as the applicant’s homestead.

3. Income. The income threshold for eligibility of those applicants 65 years of age and older or disabled be established by the most recent U.S. Census Bureau Poverty Threshold compilations. Income eligibility would be determined by the submittal of the most recent federal tax filing form.

Interest on Deferred Assessment

Interest on the deferred assessment shall be forgiven until December 31st of the year before the first installment is payable.

Deferment Period

The deferment shall be granted for as long a period of time as the hardship exists and the conditions aforementioned have been met. However, it shall be the duty of the applicant to notify the City Administrator of any change in status that would affect eligibility or deferment.

The entire amount of deferred special assessments shall be due within sixty (60) days after loss of eligibility by the applicant. If the special assessment is not paid within the sixty (60) days, the City Administrator shall add thereto interest at a per annum interest rate of one percent (1%) above the bond interest rate and the total amount of principal and interest shall be certified to the County Auditor for collection with taxes the following year. Should the applicant demonstrate to the satisfaction of the City Council that full repayment of the deferred special assessment would cause the applicant particular undue financial hardship, the Council may order that the applicant pay within sixty (60) days a sum equal to the number of installments of deferred special assessments outstanding and unpaid to date, including principal and interest, with the balance thereafter paid according to the terms and conditions of the original special assessments.

Termination of Deferral Status

The option to defer the payment of special assessment shall terminate and all amounts accumulated plus applicable interest shall become due upon the occurrence of any one of the following events:

1. Sale of Property. The subject is sold, transferred, or subdivided in whole or in part.
2. Death of Owner. The death of the fee owner qualified for deferral status unless a surviving joint tenant, tenant in common, or contract vendee is eligible for the deferral benefit provided hereunder.
3. Nonhomestead Property. The subject property loses its homestead status for any reason.
4. No Hardship. The City Council determines that there would be no hardship to require an immediate or partial payment of the deferred special assessment.

Filing for Federal Status/Fee

An eligible applicant must file an application not later than thirty (30) days after the assessment is adopted by the City Council.

All deferral applications must be made on forms approved by the City and submitted to the City Administrator. The applicant will be charged an administrative filing fee, based on the current fee schedule.

Nothing herein shall be construed to prohibit the determination of hardship on the basis of exceptional and unusual circumstances not covered by the above noted requirements where the determination is made in a nondiscriminatory manner and does not give the applicant an unreasonable preference or advantage over other applicants.

Deferred Assessment Procedures

- Deferred Assessment Application form is provided to applicant/property owner by the City Administrator's Office.
- Applicant fills out the application form and provides the relevant information to document qualification for deferred assessment. Applicant then returns form to City Administrator's Office.
- City Administrator forwards the application to the Finance Director for review of qualifications. Finance Director makes recommendation to City Council to approve or deny the application.
- An approved application may be forwarded to the Carver County Recorder's office for recording and to the Carver County Taxpayer Services Division.
- The deferral information is entered into the City's property records data base.
- At such time the property no longer qualifies for the deferred assessment (upon a transfer of the property, loss of homestead status, or death, no hardship as determined by the Council), the County Auditor/Recorder's office will notify the City of the termination of the deferral status, and direct the party to the City Administrator's office to pay balance on the outstanding deferred assessment amount.



CITY OF WACONIA
APPLICATION AND AUTHORIZATION FOR DEFERRED PAYMENT ON
SPECIAL ASSESSMENTS FOR SENIOR CITIZEN/PERMANENTLY DISABLED HOMESTEAD/
NATIONAL GUARD OR OTHER RESERVES ORDERED TO ACTIVE MILITARY SERVICE
MINNESOTA STATUTES 435.193 TO 435.195

STATE OF MINNESOTA)
)
 COUNTY OF CARVER)

Date: _____, 20__

To: City Clerk, City of Waconia, Minnesota
 201 South Vine Street
 Waconia, MN 55387

I, the undersigned, declare under penalties of perjury:

1. That I reside at _____
 - a. That I am not less than 65 years of age and that the date of my birth is _____
 - b. That I am permanently and totally disabled as is used for social security purposes, which aid is at least 90 percent of the total income of such disabled person from all sources. YES _____ NO _____
 - c. That I am a member of the National Guard or other reserves ordered to active military service
2. That I am the owner of the property legally described as _____
3. That my interest in the ownership of the above property was acquired on _____ and is as follows:
 1. Sole ownership YES _____ NO _____
 2. Joint tenancy, held with _____
 3. Other undivided interest (Specify) _____
4. That the total gross annual household income does not exceed \$ _____ (Established by the most recent U.S. Census Bureau Poverty Threshold compilation.)

A COPY OF YOUR MOST CURRENT MINNESOTA HOMEOWNER PROPERTY TAX REFUND RETURN FORM #MIPR MUST ACCOMPANY THIS APPLICATION IF APPLICABLE.

Kinds of Income Received	Husband	Wife	Other Family Members
Salaries & Wages	\$	\$	\$
Social Security			
Veteran's Benefits			
Other Retirement			
Money from Rents			
Unemployment Insurance			
Workmen's Compensation			
Disability Benefits			
Stock Dividends/Interest			
All Other			

10/2/2008

7. That my social security number is _____ Spouse _____
8. That on January 2, 20____ or December 1, 20____ I owned and occupied the above property as my homestead and such occupancy began on _____.
9. That the payments for improvements on the special assessments duly adopted by the City of Waconia as of _____ which have been allocated against the subject property would create undue personal hardship on my behalf and I respectfully request that payment be delayed and that such payments be so deferred for the years 20____ to 20_____.

Owner Signature

Owner Signature

=====

I, _____, City Clerk of the City of Waconia, Carver County, State of Minnesota, do hereby certify that the application of _____, above named, has been duly reviewed and that in accordance with the minutes of official record was duly
 _____ **APPROVED** _____ **DENIED** as of _____, 20_____.

That in accordance with approval granted, that the payment for special assessments on the applicant's subject property in the amount of \$_____ for the year (s) _____ should be so deferred with interest at the annual rate of $\frac{1}{2}\%$, until such time as it is deemed the applicant no longer qualifies or the property loses its eligibility.

Dated _____ 20_____

City Clerk

APPENDIX D

GEOTECHNICAL REPORT

July 23, 2024

Project Number: 21-0538

Mr. Colton Lee, P.E.
Bolton & Menk, Inc
2638 Shadow Lane, Suite 200
Chaska, MN 55318

RE: Geotechnical Exploration Report, City of Waconia Downtown Reconstruction Phase 3 and 4, Waconia, Minnesota

Dear Mr. Lee:

We have completed the geotechnical exploration report for the City of Waconia Downtown Reconstruction Phase 3 and 4 project. Very briefly; we advanced 9 soil borings along the various roadways to characterize subsurface soil and groundwater conditions. Below the pavement section the soil borings generally encountered varying thicknesses of Fill and/or buried topsoil underlain predominantly by clayey glacial till soils that extended to the termination depths of the borings. Portions of the Fill and the buried topsoil were organic in composition and are poor quality soils for utility and pavement support.

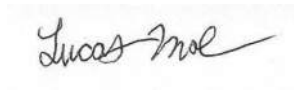
Groundwater was not encountered in the borings while drilling and sampling or after removing the augers from the boreholes. We generally do not anticipate groundwater will be encountered during utility installation and/or pavement construction.

Specific details regarding our procedures, results and recommendations follow in the attached geotechnical exploration report.

Thank you for the opportunity to assist you on this project. If you have any questions or need additional information, please contact Paul Gionfriddo at 612-729-2959.

Sincerely,

Haugo GeoTechnical Services



Lucas Mol
Project Manager



Paul Gionfriddo, P.E.
Senior Engineer

GEOTECHNICAL EXPLORATION REPORT

PROJECT:

City of Waconia
Downtown Reconstruction Phase 3 and 4
Waconia, Minnesota

PREPARED FOR:

Bolton & Menk, Inc
2638 Shadow Lane, Suite 200
Chaska, MN 55318

PREPARED BY:

Haugo GeoTechnical Services LLC
2825 Cedar Avenue South
Minneapolis, Minnesota 55407

Haugo GeoTechnical Services Project: 24-0344

July 23, 2024

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.



Paul Gionfriddo, P.E.
Senior Engineer
License Number: 23093



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1.0 INTRODUCTION

1.1 Project Description

Bolton & Menk, Inc. is preparing design and construction documents for the City of Waconia Downtown Reconstruction Phase 3 (2025) and 4 (2026) projects

To aid in their design, Bolton & Menk, Inc. solicited bids to complete a geotechnical exploration for the projects. Haugo GeoTechnical Services, LLC (HGTS), the successful bidder was retained to advance 9 soil borings along the streets slated for improvements to characterize subsurface soil and groundwater conditions.

1.2 Purpose

The purpose of this geotechnical exploration was to characterize subsurface soil and groundwater conditions and provide recommendations for utility and street construction or reconstruction.

1.3 Site Description

Nine (9) soil borings were completed for the project and were taken along downtown business and residential streets. Each street consisted of a 2-lane bituminous paved surface. The streets slated for reconstruction and the soil boring locations are shown on the Revised Soil Boring Map that was prepared and provided by Bolton and Menk. These streets are summarized in Table 1.

Table 1. Downtown Street Reconstruction

Phase 3 - 2025	
Street	Between Streets
1 st Street W	Maple Street S to Olive Street S
Olive Street S	1 st Street W to 2 nd Street W
2 nd Street W	Library to Elm Street S
Phase 4 - 2026	
1 st Street W	Olive Street S to Spruce Street S
Elm Street S	1 st Street W to 2 nd Street W
Pine Street S	1 st Street W to 2 nd Street W
2 nd Street W	Elm Street S to Pine Street S

1.4 Scope of Services

Our services were performed in accordance with the HGTS proposal 21-0538 dated May 27, 2021. Our scope of services was performed under the terms of our General Conditions and limited to the following tasks:

- Calling the Gopher State One Call system to locate existing underground public utilities.
- Completing one (1) standard penetration soil borings extending to a nominal depth of 10 feet.
- Completing six (6) standard penetration soil borings extending to a nominal depth of 20 feet.

- Completing two (2) standard penetration soil borings extending to a nominal depth of 25 feet.
- Sealing the borings in accordance with MDH Regulations, including bituminous patching.
- Obtaining GPS coordinates and ground surface elevations at the soil boring locations. Elevations were subsequently provided by Bolton & Menk.
- Visually classifying samples recovered from the soil borings.
- Performing up to ten moisture content tests and ten P-200 content tests on selected samples.
- Preparing soil boring logs describing the soil types/classifications, N-Value determinations and results of water level measurements.
- Preparing an engineering report summarizing soil and groundwater conditions and providing recommendations for utility and roadway construction.

1.5 Documents Provided

We were provided with a map titled; "Downtown Reconstruction - Soil Boring Map" that was prepared by Bolton & Menk and dated April 2024. The map showed the streets and proposed boring locations superimposed onto an aerial photograph of the area. The locations of soil borings completed for previous street improvement projects near this project were also shown on the map.

The April 2024 Soil Boring Map showed the locations of 10 borings. The number of borings was reduced to 9 and we were subsequently provided a Revised Soil Boring Map that was dated May 2024.

Soil borings were completed in this general area of the city in 2013, 2014, 2020 and 2021 by HGTS and by American Engineering Testing (AET). Log of boring sheets and sketches showing the locations of those boring are included in the Appendix for informational purposes.

1.6 Locations and Elevations

The boring locations were selected and staked in the field by Bolton & Menk. The approximate locations of the soil borings are shown on Revised Soil Boring Map provided by Bolton and Menk.

Ground surface elevations at the boring locations were provided by Bolton & Menk.

2.0 FIELD PROCEDURES

The Standard Penetration Test (SPT) borings were advanced on June 6, 2024 by HGTS with a rotary drilling rig, using continuous flight augers to advance the boreholes. Representative samples were obtained from the borings, using the split-barrel sampling procedures in general accordance with ASTM Specification D-1586. In the split-barrel sampling procedure, a 2-inch O.D. split-barrel spoon is driven into the ground with a 140-pound hammer falling 30 inches. The number of blows required to drive the sampling spoon the last 12 inches of an 18-inch penetration is recorded as the standard penetration resistance value, or "N" value. The results of the standard penetration tests are indicated on the boring log. The samples were sealed in containers and provided to the HGTS office for testing and soil classification.

A field log of each boring was prepared by the HGTS drill crew. The logs contained visual classifications of the soil materials encountered during drilling, as well as the driller's interpretation of the subsurface conditions between samples and water observation notes. The final boring logs included with this report represent an interpretation of the field logs and include modifications based on visual/manual method observation of the samples.

The soil boring logs, general terminology for soil description and identification, and classification of soils for engineering purposes are also included in the appendix. The soil boring logs identify and describe the materials encountered, the relative density or consistency based on the Standard Penetration resistance (N-value, "blows per foot") and groundwater observations.

The strata changes were inferred from the changes in the samples and auger cuttings. The depths shown as changes between strata are only approximate. The changes are likely transitions, variations can occur beyond the location of the boring.

3.0 RESULTS

3.1 Soil Conditions

The soil borings generally encountered 4 main stratigraphic units that included; 1) a pavement section, 2) Fill, 3) buried topsoil, and 4) native glacial till. A brief description of each stratigraphic unit is described below.

Pavement Section Each of the soil borings encountered a pavement section at the surface that consisted of varying thicknesses of bituminous pavement over varying thickness of aggregate base. The bituminous thickness ranged from about 2 ¼ to 7 inches thick with the aggregate base ranging from about 1 to 12 inches thick. The pavement section at boring SB-5 consisted of about 5 inches of bituminous over an approximate 2-inch layer of aggregate over an approximate 2-inch layer bituminous. The pavement section thickness at the boring locations is summarized in Table 2.

Table 2. Summary of Existing Roadway Section

Boring Number	Approximate Bituminous Thickness (inches)	Approximate Aggregate Base Thickness (inches)	Subgrade Soil Type (ASTM)
Phase 3 (2025)			
SB-1	7	8	Buried Topsoil
SB-2	6	6	Buried Topsoil
SB-6	6	12	Buried Topsoil
SB-7	2 ¼	1 ¾	Sandy Lean Clay (CL)
Phase 4 (2026)			
SB-3	6 ½	6	Buried Topsoil & Fill
SB-4	6 ½	1 ¼	Sandy Silt (ML)
SB-5	5	2 & 2" bituminous	Sandy Lean Clay (CL)
SB-8	5	< 1	Sandy Lean Clay (CL)
SB-9	6	< 1	Fill (CL)

Buried Topsoil Soil borings SB-1, SB-2, SB-3 and SB-6 encountered buried topsoil below the pavement section. The buried topsoil was composed of sandy lean clay that was black to dark grey in color. Organic content tests of the buried topsoil indicated that it was slightly organic with organic contents ranging from about 3 ½ to 4 ½ percent. The buried topsoil extended to depth ranging from about 2 to 4 ½ feet below the pavement surface.

Fill Soil borings SB-3 and SB-9 encountered Fill below the pavement section of the buried topsoil. The Fill was composed of sandy lean clay that extended to depths ranging from about 2 to 4 ½ feet below the pavement surface. The Fill varied from brown to greyish brown to black in color.

The penetration resistance values (N-Values), shown as blows per foot (bpf) on the boring logs, within the clayey Fill soils was 5 bpf. Indicating the Fill had a rather soft consistency.

Glacial Till Below the pavements section, Fill, or buried topsoil the borings encountered glacial till deposits that were composed predominantly of sandy lean clay that extended to the termination depths of the borings.

The exceptions were soil borings SB-4 and SB-5. Soil boring SB-4 encountered sandy silt below the pavement that extend to a depth of about 4 ½ feet. Both boring SB-4 and SB-5 encountered relatively thin layer of sand (poorly graded sand with silt) at about 7 and 9 ½ feet, respectively. The sand layer was estimated to be less than a foot thick at boring SB-4 and was estimated to be about 2 feet thick at boring SB-5.

The N-Values within the native clayey glacial till soils ranged from 3 to 17 bpf. These values indicate the clayey glacial till had a soft to very stiff consistency but was mostly medium to rather stiff. N-Values within the sandy silt poorly graded sand with silt ranged from 9 to 32 bpf, indicating a loose to dense relative density.

3.2 Groundwater

Groundwater was not encountered in the soil borings while drilling and sampling or after removing the augers from the boreholes. Groundwater appears to be below the depths explored by our borings.

Water levels were measured on the dates as noted on the boring logs and the period of water level observations was relatively short. Given the cohesive nature of the soils encountered, it is possible that insufficient time was available for groundwater to seep into the borings and rise to its hydrostatic level. Groundwater monitoring wells or piezometers would be required to more accurately determine water levels. Seasonal and annual fluctuations in the groundwater levels should be expected.

3.3 Laboratory Testing

Laboratory moisture content, organic content, and grain size analyses (gradations) were performed on selected samples recovered from the soil borings. Table 3 summarizes the results of the laboratory moisture content and organic content tests along with the P-200 portion of the grain size analyses. These results are also shown on the boring logs adjacent to the sample tested. The full grain size analyses are included in the Appendix.

Table 3. Summary of Laboratory Analysis

Boring Number	Sample	Depth (feet)	Moisture Content (%)*	P-200 Content (%) *	Organic Content (%) *
SB-1	AU-43	Agg Base	-	9	-
SB-1	SS-44	2 ½	27	-	3 ½
SB-1	SS-46	7 ½	20 ½	-	-
SB-2	AU-51	Agg Base	-	10 ½	-
SB-2	SS-52	2 ½	22	-	-
SB-2	SS-55	10	19	-	-
SB-3	AU-35	Agg Base	-	5	-
SB-3	SS-36	2 ½	25	-	-
SB-3	SS-38	7 ½	19 ½	-	-
SB-4	SS-28	2 ½	16	-	-
SB-4	SS-31	10	20 ½	-	-
SB-5	SS-65	2 ½	15 ½	-	-
SB-5	SS-68	10	7	-	-
SB-6	AU-59	Agg Base	-	11	-
SB-6	SS-60	2 ½	20	-	4 ½
SB-6	SS-61	5	19	-	-
SB-7	SS-21	5	30 ½	-	-
SB-7	SS-23	10	19 ½	-	-
SB-8	SS-11	2 ½	22 ½	-	-
SB-8	SS-13	7 ½	19	-	-
SB-9	SS-4	7 ½	19	-	-
SB-9	SS-7	15	19 ½	-	-

*Moisture content, P-200 and organic content tests were rounded to the nearest ½ percent.

3.4 OSHA Soil Classification

The soils encountered in the borings at the anticipated excavation depths consisted predominantly of sandy lean clay with lesser amounts of sandy silt and poorly graded sand with silt corresponding to the ASTM Classifications of CL, ML, and SP-SM, respectively. The clayey soils (CL) will generally be Type B soils under Department of Labor Occupational Safety and Health Administration (OSHA) guidelines. The sandier soils (ML and SP-SM) will generally be a Type C soil under OSHA guidelines.

An OSHA-approved qualified person should review the soil classification in the field. Excavations must comply with the requirements of OSHA 29 CFR, Part 1926, Subpart P, "Excavations and Trenches." This document states excavation safety is the responsibility of the contractor. The project specifications should reference these OSHA requirements.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 Proposed Construction

We understand that street improvements will include removing and replacing underground watermain, storm sewer and sanitary sewer utilities and reconstructing the roadways.

Based on correspondence with Bolton & Menk we understand that the watermain and sanitary sewer will consist of non-corrosive pipe materials and the storm sewer will likely be reinforced concrete pipe. Sanitary sewer and watermain invert depths are anticipated to range from about 7 to 18 feet below the ground surface. Pipe burial depths for the storm sewer are anticipated to be within about 5 feet of the ground surface. We anticipate that site grading will consist of earthwork necessary for utility installations and roadway reconstruction and we do not anticipate any significant changes in the roadway alignment or roadway grades. Cuts or fills involving permanent grade change, if any, are assumed to be less than 2 feet.

Changes in the nature, design, or location of all or parts of this project may occur. If the proposed grades differ by more than 2 feet from the assumed values or if the design or location of the proposed improvements change, we should be informed. Additional analyses and revised recommendations may be necessary.

4.2 Discussion

General

The laboratory moisture contents of the clayey subgrade soils ranged from about 15 ½ to 30 ½ percent with most of the moisture contents between about 19 and 25 percent. These values indicate the soils were likely above their assumed optimum soil moisture content. Soil that will be reused as fill or backfill will likely require some drying to meet the recommended compaction levels. Summer months are typically more favorable for drying wet soils.

Buried Topsoil

Buried topsoil was encountered in borings SB-1, SB-2, SB-3 and SB-6. Laboratory tests indicated the buried topsoil was slightly organic. Organic soils or soils contain organic materials are generally compressible and are poor quality soils for utility and/or pavement support. We anticipate that these materials will be excavated incidental to utility installation and further anticipate that it will be desired to reuse the excavated materials to the greatest extent possible but given the organic nature of the materials we recommend they be replaced with suitable non-organic mineral soils.

Glacial Till

The sandy lean clay glacial till encountered in the borings, in our opinion, are suitable for roadway and pipe support. However, portions of the clay had a soft consistency and are not suitable for pipe support. Soft clays may need to be removed and replaced with suitable pipe bedding materials or excavated, dried and recompacted.

We anticipate that it will be desired to reuse the clayey soils as fill and backfill to the greatest extent possible. As noted above the clayey were likely above their assumed optimum soil moisture content. Soil that will be reused as fill or backfill will likely require some drying to meet the recommended compaction levels. Soils that cannot be dried and recompacted may need to be replaced with suitable compacted engineered fill.

Sandy silt (ML) was encountered in boring SB-4 that extended to about 4 ½ feet below the ground surface. The sandy silt is a moisture sensitive material and can easily become disturbed and loose strength due to construction activities, especially in the presence of excess moisture. These soils can also be difficult to compact. Silty soils that cannot be compacted to project requirements may need to be removed and replaced with suitable compacted engineered fill.

Groundwater Groundwater was not encountered in the soil borings while drilling and sampling or after removing the augers from the boreholes. We do not anticipate groundwater will be encountered during construction and do not anticipate that dewatering will be required.

4.3 Utility and Pavement Subgrade Preparation

Excavations We recommend that all pavements, organic soils, buried topsoil, Fill, and any soft or otherwise unsuitable soil materials, if encountered, be removed from below the proposed utilities, pavement and oversize areas. Table 4 summarizes the anticipated excavation depths to remove the pavements and buried topsoil. Excavation depths for pipe installation will likely be deeper. We anticipate that the utilities will be supported on the native glacial till soils which in our opinion are suitable for pipe support.

Table 4. Anticipated Excavation Depths

Boring Number	Measured Surface Elevation (feet)	Anticipated Excavation Depth (feet)*	Anticipated Excavation Elevation (feet)*	Anticipated Groundwater Elevation (feet)*
Phase 3 (2025)				
SB-1	1015.7	4 ½	1011	NE
SB-2	1024.6	2	1022 ½	NE
SB-6	1027.3	4 ½	1023	NE
SB-7	1028.9	½	1028 ½	NE
Phase 4 (2026)				
SB-3	1036.7	2	1034 ½	NE
SB-4	1043.5	½	1043	NE
SB-5	1049.5	1	1048 ½	NE
SB-8	1044.1	½	1043 ½	NE
SB-9	1045.9	2	1044	NE

* = Excavation elevations were rounded to nearest ½ foot. NE - Not Encountered

Oversizing In areas where the excavations extend below the proposed pavement or utility elevations, the excavation requires oversizing. We recommend the perimeter of the excavation be extended a foot outside the proposed footprint for every foot below finish grade (1H:1V oversizing). The purpose of the oversizing is to provide lateral support of the pavement or utility.

Backfilling We recommend bedding material be thoroughly compacted around the pipes. We recommend that engineered fill placed to establish pavement grades be compacted to a minimum of 95 percent of its standard Proctor density (ASTM D 698), the exception being within 3 feet of the proposed pavement subgrade, where 100 percent of standard Proctor density is required. In landscaped areas we recommend a minimum compaction of 90 percent.

Granular fill classified as SP or SP-SM should be placed within 65 percent to 105 percent of its optimum moisture content as determined by the standard Proctor. Other fill soils should be placed within 3 percentage points above and 1 percentage point below its optimum moisture content as determined by the standard Proctor. All fill should be placed in thin lifts and be compacted with a large self-propelled vibratory compactor operating in vibratory mode.

We anticipate that the soil removed for utility construction will be re-used as fill and backfill to the greatest extent possible. However, we do not recommend reusing the buried topsoil or other organic soils or other soils that are black in color as fill or backfill.

It is our opinion that glacial till soils excavated for utility installation are generally suitable for re-use as fill and backfill provided it is free of topsoil, organic soils or other unsuitable materials.

Moisture contents of the on-site soil materials ranged from about 15 ½ to 30 ½ percent with most of the moisture contents between 19 and 25 percent. These values indicate the soils were likely above their assumed optimum soil moisture content. Soil that will be reused as fill or backfill will likely require some drying to meet the recommended compaction levels. Summer months are typically more favorable for drying wet soils.

Additional backfill, if needed, to attain pavement subgrade elevation can consist of any mineral soil provided it is free of organic material or other deleterious materials.

Dewatering Groundwater was not encountered in the soil borings while drilling and sampling or after removing the augers from the boreholes. We do not anticipate groundwater will be encountered during construction and do not anticipate that dewatering will be required.

4.4 Pavement Recommendations

We anticipate the pavements will be designed in accordance with City of Waconia standard plates.

We were not provided any information regarding traffic volumes, such as Average Annual Daily Traffic (AADT) or vehicle distribution. Since the streets are generally located near “downtown” Waconia we anticipate that the streets will be used a variety of vehicles including; automobiles, light trucks, school buses, garbage trucks and delivery vans (FEDEX, UPS etc.). 1st Street, Olive Street and Elm Street are truck routs and may see some larger delivery vehicles. Based on the assumed traffic types we estimate the roadways will be subjected to Equivalent Single Axle Loads (ESAL’s) ranging from about 50,000 to 75,000 over a 20-year design life. This does not account for any future growth.

We recommend the subgrade soil be backfilled and compacted as described in Section 4.3 above.

Prior to placing the aggregate base (Class 5) we recommend the subgrade be test rolled with a loaded tandem truck to identify soft, weak, loose or unstable areas that may require additional subcuts.

R-Values Laboratory tests to determine the soils Hveem Stabilometer R-Value (R-Value) was beyond the scope of this project. Based on the soil borings we anticipate we anticipate the pavement subgrade will consist of sandy lean clay meeting the ASTM classification CL. Information provided in the State of Minnesota Department of Transportation, Geotechnical & Pavement Manual, Part II, indicates that R-Values for sandy lean clay materials meeting the ASTM Classification CL can range from 6 to 18. Since the borings were spaced fairly far apart and to account for potential variations in subgrade soil conditions it is our opinion that an R-Value of 12 can be used for pavement design.

Pavement Section We understand that the pavements will be constructed to meet City of Waconia standard street sections. These city standard street sections are presented below. However, we understand that the City of Waconia and/or Bolton & Menk may evaluate alternate pavement section thicknesses and select an appropriate pavement section. Alternate pavement sections can be provided if requested.

Residential Street We recommend the pavement section consist of a minimum of 4 ½ inches of bituminous (2 inches of wear course and 2 ½ inches of base course) underlain by a minimum of 8 inches of aggregate base and a minimum of 12 inches of select granular subbase. We recommend placing a layer of geotextile separator fabric between the subgrade soils and select granular subbase. We recommend installing along with drain tile. Drain tile should be routed to the storm sewer system or other suitable disposal area.

Truck Routes We recommend the pavement section consist of a minimum of 6 ½ inches of bituminous underlain by a minimum of 12 inches of aggregate base and a minimum of 12 inches of select granular subbase. We recommend placing a layer of geotextile separator fabric between the subgrade soils and select granular subbase. We recommend installing along with drain tile. Drain tile should be routed to the storm sewer system or other suitable disposal area.

Geotextile Materials Geotextile fabric should meet MN/DOT Specification 3733. Based on 2020 MN/DOT specifications we recommend a Category 2, Type 9 geotextile, or equivalent.

Pavement Materials We recommend that the bituminous wear and base courses meet the requirement of Mn/DOT specification 2360. We recommend compacting the SPNW bituminous pavements to at least 93% of the maximum theoretical density and compacting SPWE bituminous pavements to at least 92% of the maximum theoretical density.

We recommend aggregate base meeting Mn/DOT specification 3138 for Class 5 aggregate base. We recommend the aggregate base be compacted to 100 percent of its maximum standard Proctor dry density.

The new pavement areas will likely include concrete curb and gutter. We recommend specifying concrete that has a minimum 28-day compressive strength of 3,900 psi. We recommend specifying 5 to 8 percent entrained air for exposed concrete to provide resistance to freeze-thaw deterioration. We recommend slump, air content and compressive strength tests of Portland cement concrete.

5.0 CONSTRUCTION CONSIDERATIONS

5.1 Excavation

The soils encountered in the borings at the anticipated excavation depths consisted predominantly of sandy lean clay with lesser amounts of sandy silt and poorly graded sand with silt corresponding to the ASTM Classifications of CL, ML, and SP-SM, respectively. The clayey soils (CL) will generally be Type B soils under Department of Labor Occupational Safety and Health Administration (OSHA) guidelines. The sandier soils (ML and SP-SM) will generally be a Type C soil under OSHA guidelines.

Temporary excavations in Type B soils should be constructed at a minimum of 1 foot horizontal to every 1-foot vertical within excavations. Temporary excavations in Type C soils should be constructed at a minimum of 1 ½ foot horizontal to every 1-foot vertical within excavations. Slopes constructed in this manner may still exhibit surface sloughing. If site constraints do not allow the construction of slopes with these dimensions, temporary shoring may be required.

5.2 Observations

A geotechnical engineer or qualified engineering technician should observe the excavation subgrade to evaluate if the subgrade soils are similar to those encountered in the borings and adequate to support the proposed construction.

5.3 Backfill and Fills

Site soils that will be excavated and reused as backfill and fill appear to be above their assumed optimum moisture content. We anticipate it may be necessary to moisture condition (dry) portions of these soils to achieve the recommended compaction. We recommend that fill and backfill be placed in lifts not exceeding 4 to 12 inches, depending on the size of the compactor and materials used.

5.4 Testing

We recommend density tests of backfill and fills placed during utility and pavement construction. Samples of the proposed materials should be submitted to our laboratory prior to placement for evaluation of their suitability and to determine their optimum moisture content and maximum dry density (Standard Proctor).

5.5 Winter Construction

If site grading and construction is anticipated to proceed during cold weather, all snow and ice should be removed from cut and fill areas prior to additional grading and placement of fill. No fill should be placed on frozen soil and no frozen soil should be used as fill or backfill.

Concrete delivered to the site should meet the temperature requirements of ASTM and/or ACI. Concrete should not be placed on frozen soil. Concrete should be protected from freezing until the necessary strength is obtained.

6.0 PROCEDURES

6.1 Soil Classification

The drill crew chief visually and manually classified the soils encountered in the borings in general accordance with ASTM D 2488, "Description and Identification of Soils (Visual-Manual Procedure)". Soil terminology notes are included in the Appendix. The samples were returned to our laboratory for review of the field classification by a geotechnical engineer. Samples will be retained for a period of 30 days.

6.2 Groundwater Observations

Immediately after taking the final samples in the bottom of the borings, the hole was checked for the presence of groundwater. Again, at the end of the drilling day, the borings were re-checked for the presence of groundwater with the levels and time delay being noted on the boring logs.

7.0 GENERAL

7.1 Subsurface Variations

The analyses and recommendations presented in this report are based on data obtained from a limited number of soil borings. Variations can occur away from the borings, the nature of which may not become apparent until additional exploration work is completed or construction is conducted. A reevaluation of the recommendations in this report should be made after performing on-site observations during construction to note the characteristics of any variations. The variations may result in additional excavation costs and it is suggested that a contingency be provided for this purpose.

It is recommended that we be retained to perform the observation and testing program during construction to evaluate whether the design is as expected, if any design changes have affected the validity of our recommendations, and if our recommendations have been correctly interpreted and implemented in the designs, specifications and construction methods. This will allow correlation of the soil conditions encountered during construction to the soil borings and will provide continuity of professional responsibility.

7.2 Review of Design

This report is based on the design of the proposed structures as related to us for preparation of this report. It is recommended that we be retained to review the geotechnical aspects of the design and specifications. With the review we will evaluate whether any changes have affected the validity of the recommendations and whether our recommendations have been correctly interpreted and implemented in the design and specifications.

7.3 Groundwater Fluctuations

We made water level measurements in the borings at the times and under the conditions stated on the boring logs. The data was interpreted in the text of this report. The period of observation was relatively short and fluctuations in the groundwater level may occur due to rainfall, flooding, irrigation, spring thaw, drainage, and other seasonal and annual factors not evident at the time the observations were made. Design drawings and specifications and construction planning should recognize the possibility of fluctuations.

7.4 Use of Report

This report is for the exclusive use of Bolton & Menk and their design team to use to design the proposed structures and prepare construction documents. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report. The data, analysis and recommendations may not be appropriate for other structures or purposes. We recommend that parties contemplating other structures or purposes contact us.

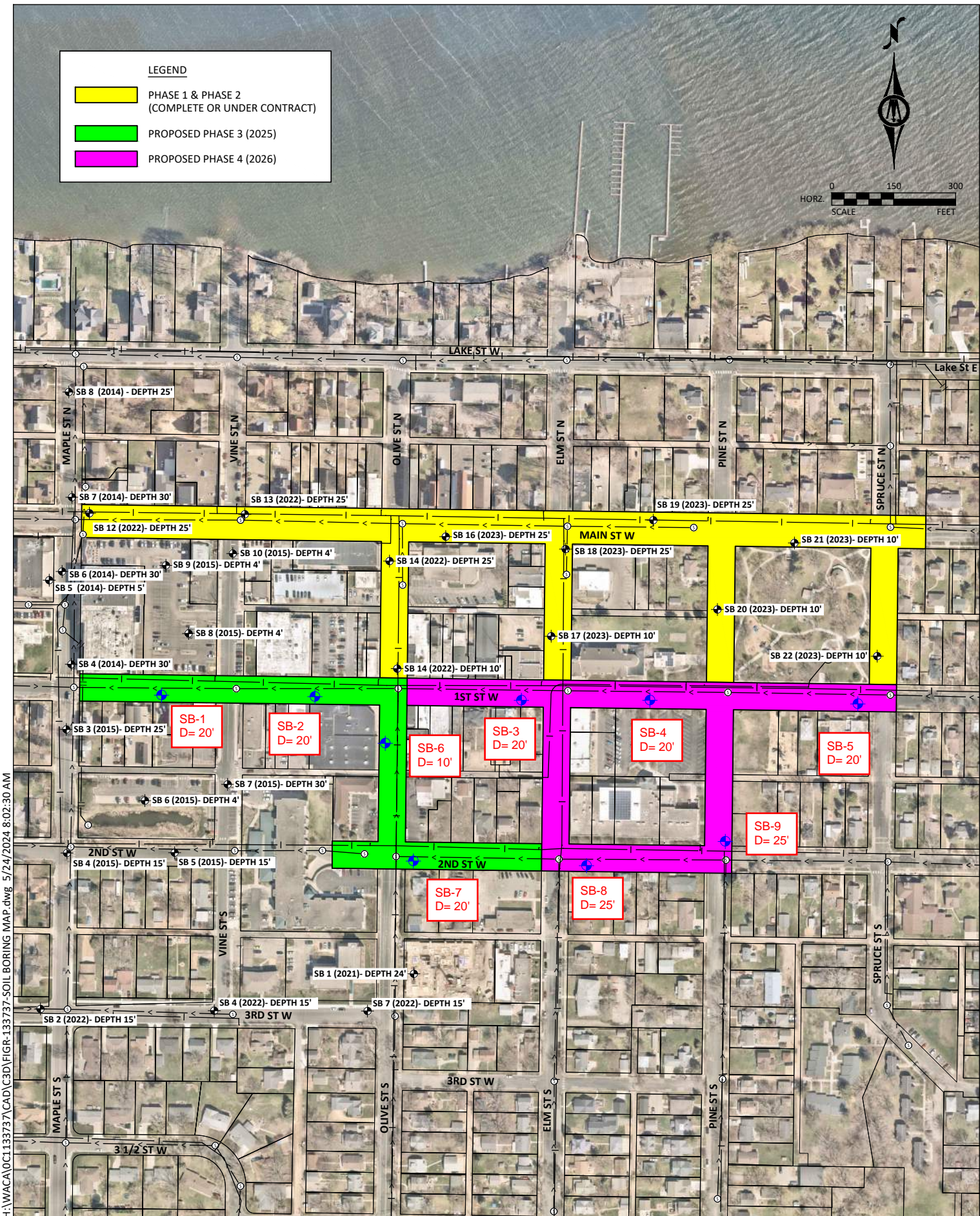
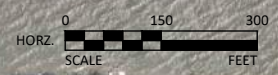
7.5 Level of Care

Haugo GeoTechnical Services, LLC has used the degree of skill and care ordinarily exercised under similar circumstance by members of the profession currently practicing in this locality. No warranty expressed or implied is made.

APPENDIX

LEGEND

- PHASE 1 & PHASE 2
(COMPLETE OR UNDER CONTRACT)
- PROPOSED PHASE 3 (2025)
- PROPOSED PHASE 4 (2026)



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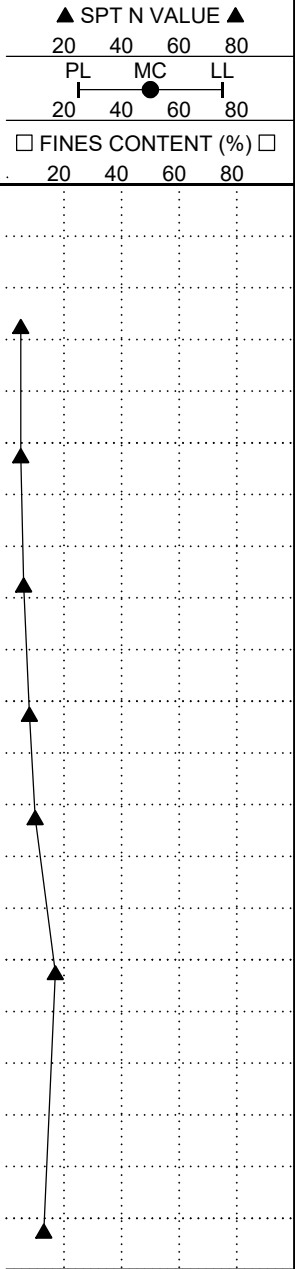
BORING NUMBER SB-1

CLIENT City of Waconia
PROJECT NUMBER 24-0344
DATE STARTED 6/6/24 **COMPLETED** 6/6/24
DRILLING CONTRACTOR HGTS- 45
DRILLING METHOD Hollow Stem Auger/Split Spoon
LOGGED BY NC/MS **CHECKED BY** PG
NOTES _____

PROJECT NAME Downtown Reconstruction Phase 3 & 4
PROJECT LOCATION Waconia, MN
GROUND ELEVATION 1015.7 ft **HOLE SIZE** 3 1/4 inches
GROUND WATER LEVELS:
AT TIME OF DRILLING --- Not Encountered
AT END OF DRILLING --- Not Encountered
AFTER DRILLING --- Not Encountered

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Moisture Content (%)	▲ SPT N VALUE ▲		
							20	40	60
0		Approximately 7 Inches of Bituminous							
		Approximately 8 Inches of Aggregate	AU 43						
		Sandy Lean Clay, black to dark grey, moist to wet (Buried Topsoil)	SS 44		1-3-2 (5)	27			
		Organic Content= 3.5%							
5		(CL) Sandy Lean Clay, trace Gravel, brown, moist to wet, rather soft to very stiff (Glacial Till)	SS 45		1-2-3 (5)				
			SS 46		2-2-4 (6)	20.5			
			SS 47		3-3-5 (8)				
			SS 48		2-4-6 (10)				
			SS 49		3-6-11 (17)				
20			SS 50		4-5-8 (13)				



Bottom of borehole at 21.0 feet.



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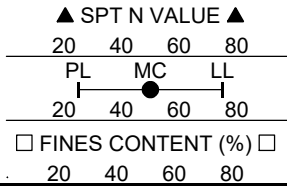
BORING NUMBER SB-2

CLIENT City of Waconia
PROJECT NUMBER 24-0344
DATE STARTED 6/6/24 **COMPLETED** 6/6/24
DRILLING CONTRACTOR HGTS- 45
DRILLING METHOD Hollow Stem Auger/Split Spoon
LOGGED BY NC/MS **CHECKED BY** PG
NOTES _____

PROJECT NAME Downtown Reconstruction Phase 3 & 4
PROJECT LOCATION Waconia, MN
GROUND ELEVATION 1024.6 ft **HOLE SIZE** 3 1/4 inches
GROUND WATER LEVELS:
AT TIME OF DRILLING --- Not Encountered
AT END OF DRILLING --- Not Encountered
AFTER DRILLING --- Not Encountered

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Moisture Content (%)	▲ SPT N VALUE ▲		
							20	40	60
0		Approximately 6 Inches of Bituminous							
		Approximately 6 Inches of Aggregate Base P-200= 10.3%	AU 51						
		Sandy Lean Clay, black, moist (Buried Topsoil)							
		(CL) Sandy Lean Clay, trace Gravel, brown, moist to wet, medium to stiff (Glacial Till)	SS 52		2-3-4 (7)	22			
5			SS 53		2-7-6 (13)				
			SS 54		4-5-6 (11)				
10			SS 55		4-4-6 (10)	19			
			SS 56		2-4-6 (10)				
15			SS 57		4-5-7 (12)				
20			SS 58		4-7-8 (15)				



Bottom of borehole at 21.0 feet.



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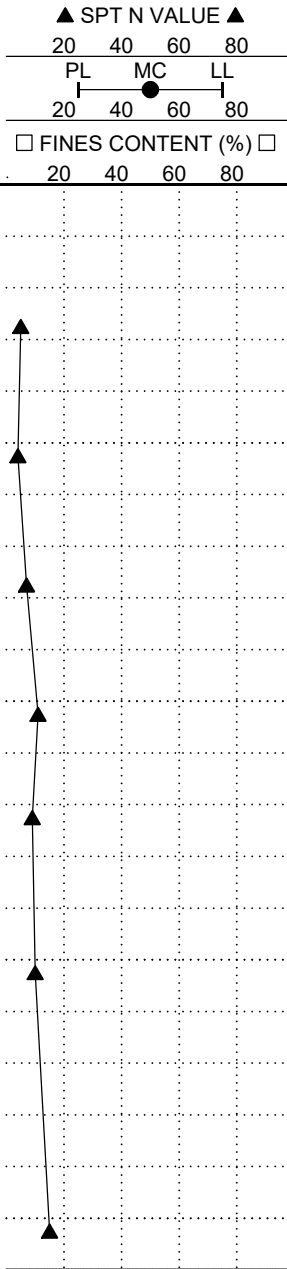
BORING NUMBER SB-3

CLIENT City of Waconia
PROJECT NUMBER 24-0344
DATE STARTED 6/6/24 **COMPLETED** 6/6/24
DRILLING CONTRACTOR HGTS- 45
DRILLING METHOD Hollow Stem Auger/Split Spoon
LOGGED BY NC/MS **CHECKED BY** PG
NOTES _____

PROJECT NAME Downtown Reconstruction Phase 3 & 4
PROJECT LOCATION Waconia, MN
GROUND ELEVATION 1036.7 ft **HOLE SIZE** 3 1/4 inches
GROUND WATER LEVELS:
AT TIME OF DRILLING --- Not Encountered
AT END OF DRILLING --- Not Encountered
AFTER DRILLING --- Not Encountered

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Moisture Content (%)	▲ SPT N VALUE ▲		
							20	40	60
0									
0 - 0.5		Approximately 6.5 Inches of Bituminous	AU 35						
0.5 - 1.0		Approximately 6 Inches of Aggregate Base P-200=4.9%							
1.0 - 1.5		Sandy Lean Clay, trace Gravel, black, moist (Fill/Buried Topsoil)	SS 36		2-2-3 (5)	25			
1.5 - 5.0		Sandy Lean Clay, trace Gravel, brown, moist to wet, rather soft to stiff (Fill)							
5.0 - 19.5		(CL) Sandy Lean Clay, trace Gravel, brown, moist to wet, rather soft to stiff (Glacial Till)	SS 37		2-2-2 (4)				
			SS 38		2-3-4 (7)	19.5			
			SS 39		3-5-6 (11)				
			SS 40		2-4-5 (9)				
			SS 41		3-4-6 (10)				
20.0 - 21.0		(CL) Sandy Lean Clay, trace Gravel, grey, moist to wet, stiff (Glacial Till)	SS 42		4-6-9 (15)				



Bottom of borehole at 21.0 feet.



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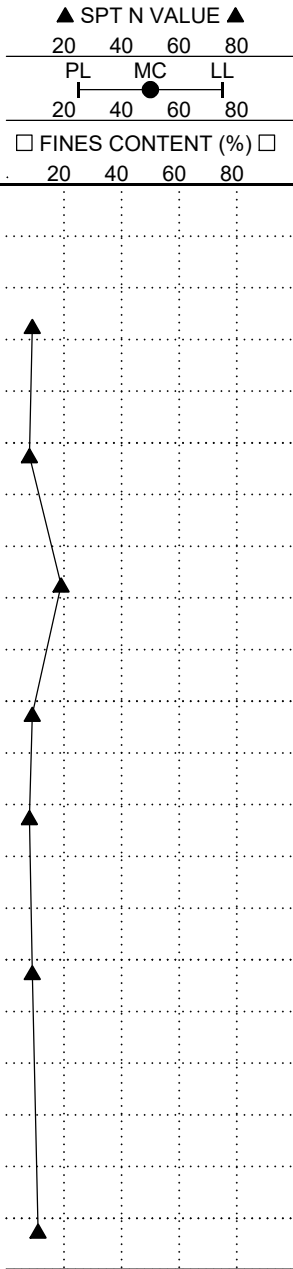
BORING NUMBER SB-4

CLIENT City of Waconia
PROJECT NUMBER 24-0344
DATE STARTED 6/6/24 **COMPLETED** 6/6/24
DRILLING CONTRACTOR HGTS- 45
DRILLING METHOD Hollow Stem Auger/Split Spoon
LOGGED BY NC/MS **CHECKED BY** PG
NOTES _____

PROJECT NAME Downtown Reconstruction Phase 3 & 4
PROJECT LOCATION Waconia, MN
GROUND ELEVATION 1043.5 ft **HOLE SIZE** 3 1/4 inches
GROUND WATER LEVELS:
AT TIME OF DRILLING --- Not Encountered
AT END OF DRILLING --- Not Encountered
AFTER DRILLING --- Not Encountered

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Moisture Content (%)	▲ SPT N VALUE ▲		
							20	40	60
0		Approximately 6.5 Inches of Bituminous							
		Approximately 1.25 Inches of Bituminous (ML) Sandy Silt, brown, moist, loose (Glacial Till)	AU 27						
			SS 28		2-3-6 (9)	16			
5		(CL) Sandy Lean Clay, trace Gravel, brown, moist to wet, medium (Glacial Till)	SS 29		2-3-5 (8)				
		(SP-SM) Poorly Graded Sand with Silt, fine to medium grained, trace Gravel, brown, moist, medium dense (Glacial Till)	SS 30		6-10-9 (19)				
		(CL) Sandy Lean Clay, trace Gravel, brown, moist to wet, medium to rather stiff (Glacial Till)	SS 31		2-4-5 (9)	20.5			
10			SS 32		2-3-5 (8)				
15			SS 33		2-3-6 (9)				
20			SS 34		3-4-7 (11)				



Bottom of borehole at 21.0 feet.



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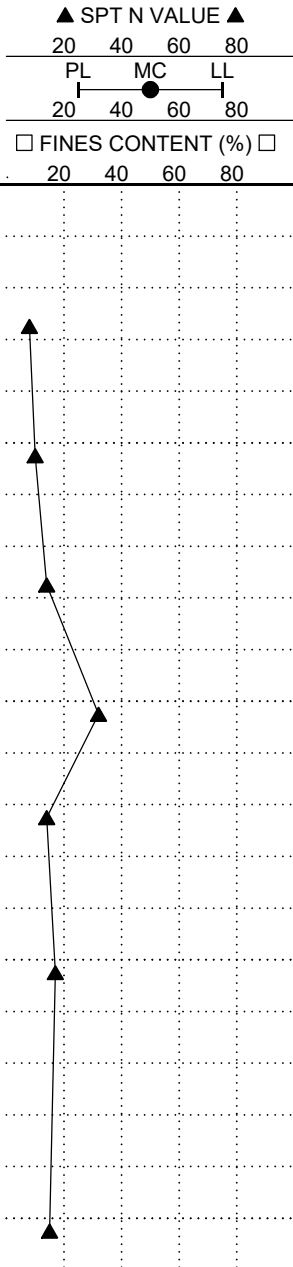
BORING NUMBER SB-5

CLIENT City of Waconia
PROJECT NUMBER 24-0344
DATE STARTED 6/6/24 **COMPLETED** 6/6/24
DRILLING CONTRACTOR HGTS- 45
DRILLING METHOD Hollow Stem Auger/Split Spoon
LOGGED BY NC/MS **CHECKED BY** PG
NOTES _____

PROJECT NAME Downtown Reconstruction Phase 3 & 4
PROJECT LOCATION Waconia, MN
GROUND ELEVATION 1049.5 ft **HOLE SIZE** 3 1/4 inches
GROUND WATER LEVELS:
AT TIME OF DRILLING --- Not Encountered
AT END OF DRILLING --- Not Encountered
AFTER DRILLING --- Not Encountered

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Moisture Content (%)	▲ SPT N VALUE ▲		
							20	40	60
0		Approximately 5 Inches of Bituminous Approximately 2 Inches of Aggregate Base Approximately 2 Inches of Bituminous (CL) Sandy Lean Clay, trace Gravel, brown, moist to wet, medium to stiff (Glacial Till)	AU 64						
5			SS 65		4-4-4 (8)	15.5			
			SS 66		3-4-6 (10)				
			SS 67		3-5-9 (14)				
10		(SP-SM) Poorly Graded Sand with Silt, fine to coarse grained, with Gravel, brown, moist, dense (Glacial Till)	SS 68		3-14-18 (32)	7			
		(CL) Sandy Lean Clay, trace Gravel, brown, moist to wet, stiff to very stiff (Glacial Till)	SS 69		4-5-9 (14)				
15			SS 70		3-7-10 (17)				
20			SS 71		4-6-9 (15)				



Bottom of borehole at 21.0 feet.



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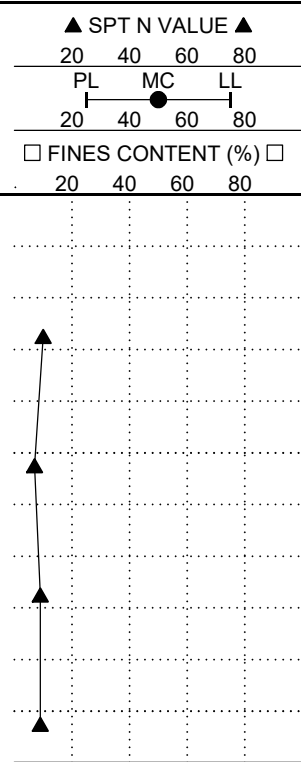
BORING NUMBER SB-6

CLIENT City of Waconia
PROJECT NUMBER 24-0344
DATE STARTED 6/6/24 **COMPLETED** 6/6/24
DRILLING CONTRACTOR HGTS- 45
DRILLING METHOD Hollow Stem Auger/Split Spoon
LOGGED BY NC/MS **CHECKED BY** PG
NOTES _____

PROJECT NAME Downtown Reconstruction Phase 3 & 4
PROJECT LOCATION Waconia, MN
GROUND ELEVATION 1027.3 ft **HOLE SIZE** 3 1/4 inches
GROUND WATER LEVELS:
AT TIME OF DRILLING --- Not Encountered
AT END OF DRILLING --- Not Encountered
AFTER DRILLING --- Not Encountered

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Moisture Content (%)	▲ SPT N VALUE ▲		
							20	40	60
0		Approximately 6 Inches of Bituminous							
		Approximately 12 Inches of Aggregate Base P-200= 10.9%	AU 59						
		Sandy Lean Clay, black to dark grey, moist (Buried Topsoil)							
		Organic Content= 4.5%	SS 60		6-4-6 (10)	20			
5		(CL) Sandy Lean Clay, dark brown, moist to wet, medium (Glacial Till)	SS 61		2-3-4 (7)	19			
		(CL) Sandy Lean Clay, trace Gravel, brown, moist to wet, rather stiff (Glacial Till)	SS 62		2-4-5 (9)				
10			SS 63		4-4-5 (9)				



Bottom of borehole at 11.0 feet.



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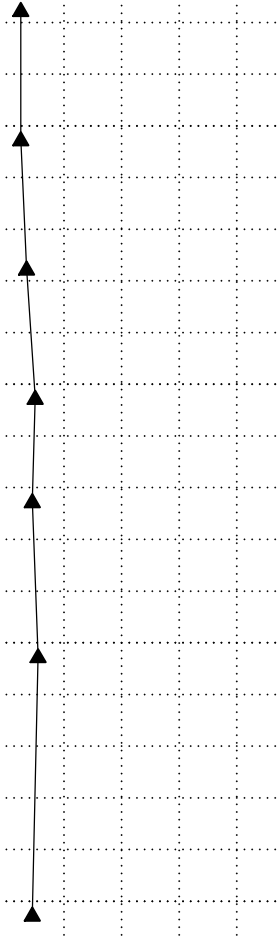
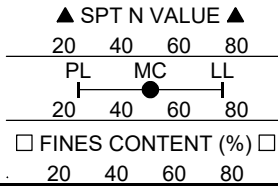
BORING NUMBER SB-7

CLIENT City of Waconia
PROJECT NUMBER 24-0344
DATE STARTED 6/5/24 **COMPLETED** 6/5/24
DRILLING CONTRACTOR HGTS- 45
DRILLING METHOD Hollow Stem Auger/Split Spoon
LOGGED BY NC/MS **CHECKED BY** PG
NOTES _____

PROJECT NAME Downtown Reconstruction Phase 3 & 4
PROJECT LOCATION Waconia, MN
GROUND ELEVATION 1028.9 ft **HOLE SIZE** 3 1/4 inches
GROUND WATER LEVELS:
AT TIME OF DRILLING --- Not Encountered
AT END OF DRILLING --- Not Encountered
AFTER DRILLING --- Not Encountered

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 7/23/24 11:32 - C:\USERS\ALICE HAUGO\HGTS DROPBOX\LAB HAUGO\HAUGO GEOTECHNICAL SERVICES\GINT PROJECT BACKUP\PROJECTS\24-0344 BORING LOG DRAFT.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	Moisture Content (%)	▲ SPT N VALUE ▲		
							20	40	60
0		Approximately 2.25 Inches of Bituminous Approximately 1.75 Inches of Aggregate Base (CL) Lean Clay, brown and light grey, moist to wet, rather soft (Glacial Till)	AU 19						
5		(CL) Sandy Lean Clay, trace Gravel, brown, moist to wet, medium to rather stiff (Glacial Till)	SS 20		2-2-3 (5)	30.5			
			SS 21		3-2-3 (5)				
10		(CL) Sandy Lean Clay, trace Gravel, brown, moist to wet, medium to rather stiff (Glacial Till)	SS 22		2-3-4 (7)	19.5			
			SS 23		3-4-6 (10)				
			SS 24		4-4-5 (9)				
15		(CL) Sandy Lean Clay, trace Gravel, grey, moist to wet, rather stiff (Glacial Till)	SS 25		4-4-7 (11)				
20			SS 26		1-4-5 (9)				



Bottom of borehole at 21.0 feet.



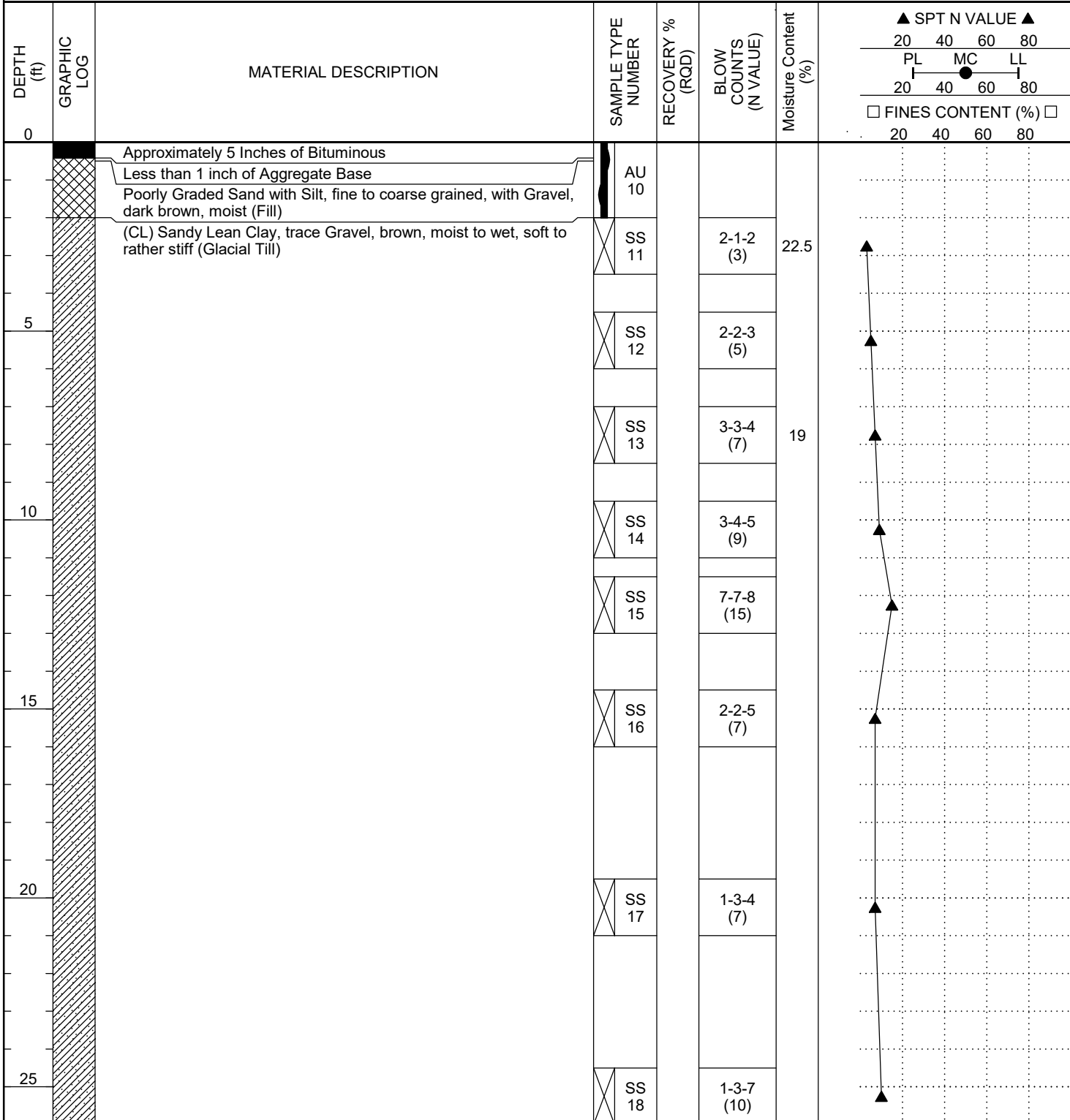
Haugo GeoTechnical Services
 2825 Cedar Ave South
 Minneapolis, MN, 55407
 Telephone: 612-729-2959
 Fax: 763-445-2238

BORING NUMBER SB-8

CLIENT City of Waconia
PROJECT NUMBER 24-0344
DATE STARTED 6/5/24 **COMPLETED** 6/5/24
DRILLING CONTRACTOR HGTS- 45
DRILLING METHOD Hollow Stem Auger/Split Spoon
LOGGED BY NC/MS **CHECKED BY** PG
NOTES _____

PROJECT NAME Downtown Reconstruction Phase 3 & 4
PROJECT LOCATION Waconia, MN
GROUND ELEVATION 1044.1 ft **HOLE SIZE** 3 1/4 inches
GROUND WATER LEVELS:
AT TIME OF DRILLING --- Not Encountered
AT END OF DRILLING --- Not Encountered
AFTER DRILLING --- Not Encountered

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 7/23/24 11:32 - C:\USERS\ALICE HAUGO\HGTS DROPBOX\LAB HAUGO\HAUGO GEOTECHNICAL SERVICES\GINT PROJECT BACKUP\PROJECTS\24-0344 BORING LOG DRAFT.GPJ



Bottom of borehole at 26.0 feet.



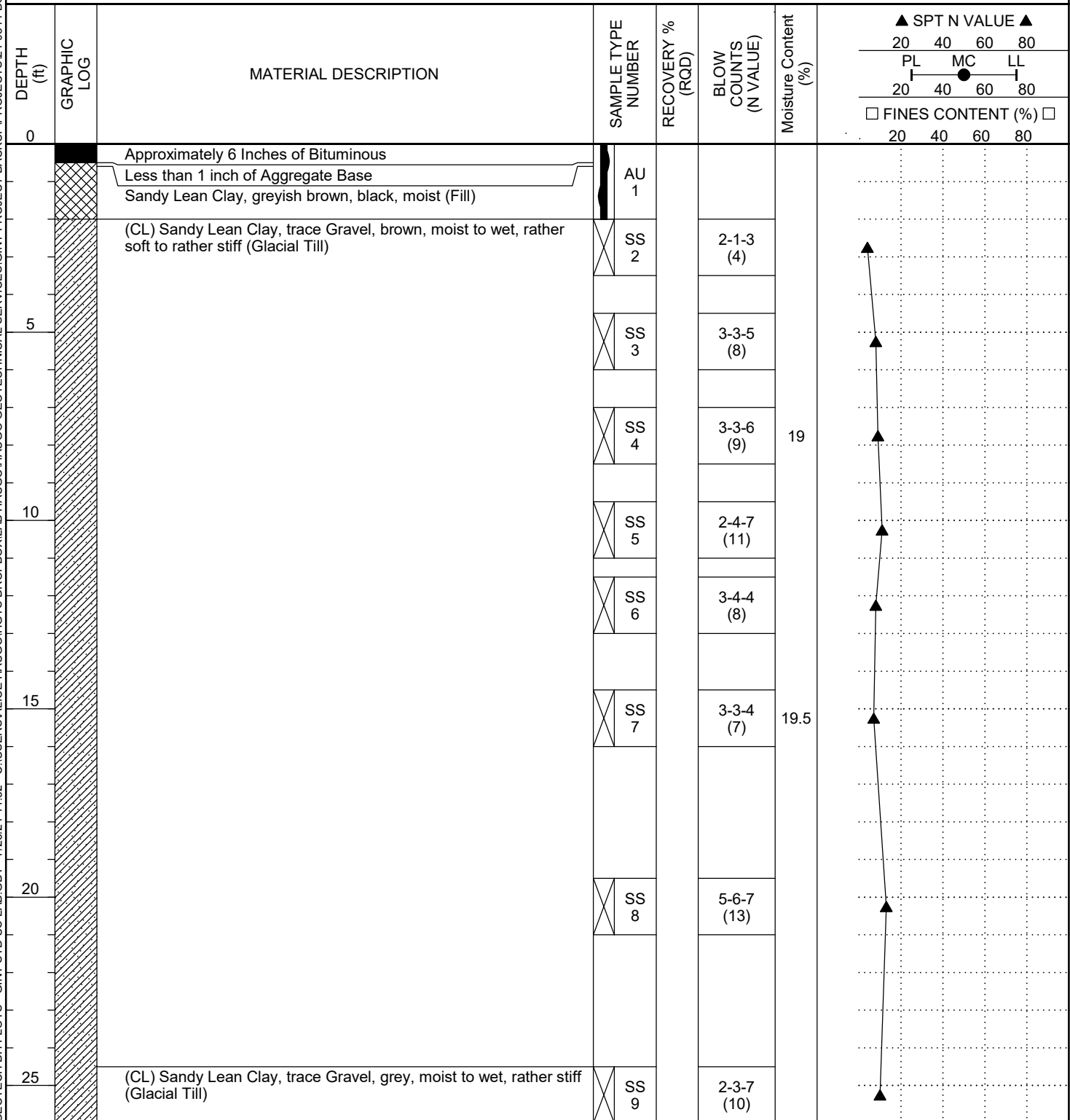
Haugo GeoTechnical Services
 2825 Cedar Ave South
 Minneapolis, MN, 55407
 Telephone: 612-729-2959
 Fax: 763-445-2238

BORING NUMBER SB-9

CLIENT City of Waconia
PROJECT NUMBER 24-0344
DATE STARTED 6/5/24 **COMPLETED** 6/5/24
DRILLING CONTRACTOR HGTS- 45
DRILLING METHOD Hollow Stem Auger/Split Spoon
LOGGED BY NC/MS **CHECKED BY** PG
NOTES _____

PROJECT NAME Downtown Reconstruction Phase 3 & 4
PROJECT LOCATION Waconia, MN
GROUND ELEVATION 1045.9 ft **HOLE SIZE** 3 1/4 inches
GROUND WATER LEVELS:
AT TIME OF DRILLING --- Not Encountered
AT END OF DRILLING --- Not Encountered
AFTER DRILLING --- Not Encountered

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 7/23/24 11:32 - C:\USERS\ALICE HAUGO\HGTS DROPBOX\LAB HAUGO\HAUGO GEOTECHNICAL SERVICES\GINT PROJECT BACKUP\PROJECTS\24-0344 BORING LOG DRAFT.GPJ



Bottom of borehole at 26.0 feet.



Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^a				Soils Classification		
				Group Symbol	Group Name ^b	
Coarse-grained Soils more than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels 5% or less fines ^e	$C_u \geq 4$ and $1 \leq C_c \leq 3$ ^c	GW	Well-graded gravel ^d	
		Gravels with Fines More than 12% fines ^e	$C_u < 4$ and/or $1 > C_c > 3$ ^c	GP	Poorly graded gravel ^d	
		Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands 5% or less fines ⁱ	$C_u \geq 6$ and $1 \leq C_c \leq 3$ ^c	SW	Well-graded sand ^h
			Sands with Fines More than 12% ⁱ	$C_u < 6$ and/or $1 > C_c > 3$ ^c	SP	Poorly graded sand ^h
	Fine-grained Soils 50% or more passed the No. 200 sieve	Silts and Clays Liquid limit less than 50	Inorganic	PI > 7 and plots on or above "A" line ^j	CL	Lean clay ^{k, i, m}
			Organic	Liquid limit - oven dried < 0.75 Liquid limit - not dried	OL	Organic silt ^{k, i, m, n}
		Silts and clays Liquid limit 50 or more	Inorganic	PI plots on or above "A" line	CH	Fat clay ^{k, i, m}
			Organic	Liquid limit - oven dried < 0.75 Liquid limit - not dried	OH	Organic clay ^{k, i, m, p}
Highly Organic Soils	Primarily organic matter, dark in color and organic odor			PT	Peat	

Particle Size Identification

Boulders over 12"
 Cobbles 3" to 12"
 Gravel
 Coarse 3/4" to 3"
 Fine No. 4 to 3/4"
 Sand
 Coarse No. 4 to No. 10
 Medium No. 10 to No. 40
 Fine No. 40 to No. 200
 Silt $< \text{No. } 200, \text{PI} < 4$ or below "A" line
 Clay $< \text{No. } 200, \text{PI} \geq 4$ and on or above "A" line

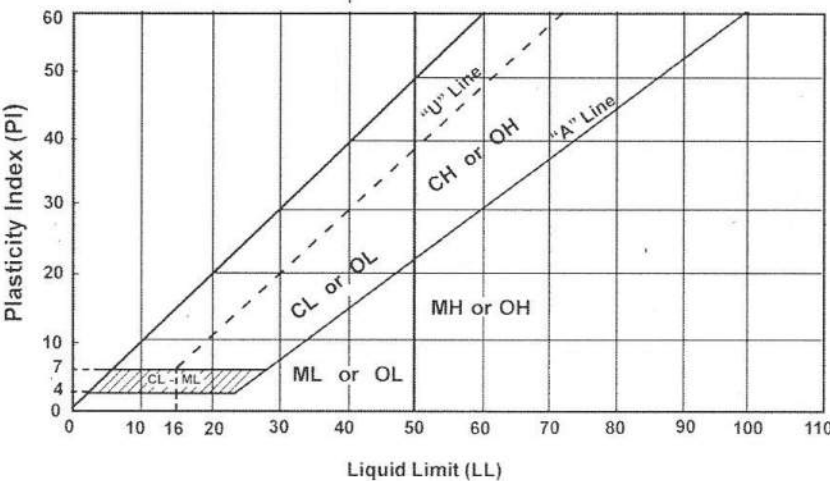
Relative Density of Cohesionless Soils

Very loose 0 to 4 BPF
 Loose 5 to 10 BPF
 Medium dense 11 to 30 BPF
 Dense 31 to 50 BPF
 Very dense over 50 BPF

Consistency of Cohesive Soils

Very soft 0 to 1 BPF
 Soft 2 to 3 BPF
 Rather soft 4 to 5 BPF
 Medium 6 to 8 BPF
 Rather stiff 9 to 12 BPF
 Stiff 13 to 16 BPF
 Very stiff 17 to 30 BPF
 Hard over 30 BPF

- a. Based on the material passing the 3-in (75mm) sieve.
- b. If field sample contained cobbles or boulders, or both, add "with cobbles or boulders or both" to group name.
- c. $C_u = D_{60} / D_{10}$, $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
- d. If soil contains $\geq 15\%$ sand, add "with sand" to group name.
- e. Gravels with 5 to 12% fines require dual symbols:
 GW-GM well-graded gravel with silt
 GW-GC well-graded gravel with clay
 GP-GM poorly graded gravel with silt
 GP-GC poorly graded gravel with clay
- f. If fines classify as CL-ML, use dual symbol GC-GM or SC-SM.
- g. If fines are organic, add "with organic fines" to group name.
- h. If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.
- i. Sands with 5 to 12% fines require dual symbols:
 SW-SM well-graded sand with silt
 SW-SC well-graded sand with clay
 SP-SM poorly graded sand with silt
 SP-SC poorly graded sand with clay
- j. If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.
- k. If soil contains 10 to 29% plus No. 200, add "with sand" or "with gravel" whichever is predominant.
- l. If soil contains $\geq 30\%$ plus No. 200, predominantly sand, add "sandy" to group name.
- m. If soil contains $\geq 30\%$ plus No. 200 predominantly gravel, add "gravelly" to group name.
- n. $\text{PI} \geq 4$ and plots on or above "A" line.
- o. $\text{PI} < 4$ or plots below "A" line.
- p. PI plots on or above "A" line.
- q. PI plots below "A" line.



Laboratory Tests

DD	Dry density, pcf	OC	Organic content, %
WD	Wet density, pcf	S	Percent of saturation, %
MC	Natural moisture content, %	SG	Specific gravity
LL	Liquid limit, %	C	Cohesion, psf
PL	Plastic limit, %	ϕ	Angle of internal friction
PI	Plasticity index, %	qu	Unconfined compressive strength, psf
P200	% passing 200 sieve	qp	Pocket penetrometer strength, tsf

Drilling Notes

Standard penetration test borings were advanced by 3 1/4" or 6 1/4" ID hollow-stem augers unless noted otherwise. Jetting water was used to clean out auger prior to sampling only where indicated on logs. Standard penetration test borings are designated by the prefix "ST" (Split Tube). All samples were taken with the standard 2" OD split-tube sampler, except where noted.

Power auger borings were advanced by 4" or 6" diameter continuous-flight, solid-stem augers. Soil classifications and strata depths were inferred from disturbed samples augered to the surface and are, therefore, somewhat approximate. Power auger borings are designated by the prefix "B."

Hand auger borings were advanced manually with a 1 1/2" or 3 1/4" diameter auger and were limited to the depth from which the auger could be manually withdrawn. Hand auger borings are indicated by the prefix "H."

BPF: Numbers indicate blows per foot recorded in standard penetration test, also known as "N" value. The sampler was set 6" into undisturbed soil below the hollow-stem auger. Driving resistances were then counted for second and third 6" increments and added to get BPF. Where they differed significantly, they are reported in the following form: 2/12 for the second and third 6" increments, respectively.

WH: WH indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

WR: WR indicates the sampler penetrated soil under weight of rods alone; hammer weight and driving not required.

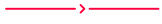
TW indicates thin-walled (undisturbed) tube sample.

Note: All tests were run in general accordance with applicable ASTM standards.

LEGEND



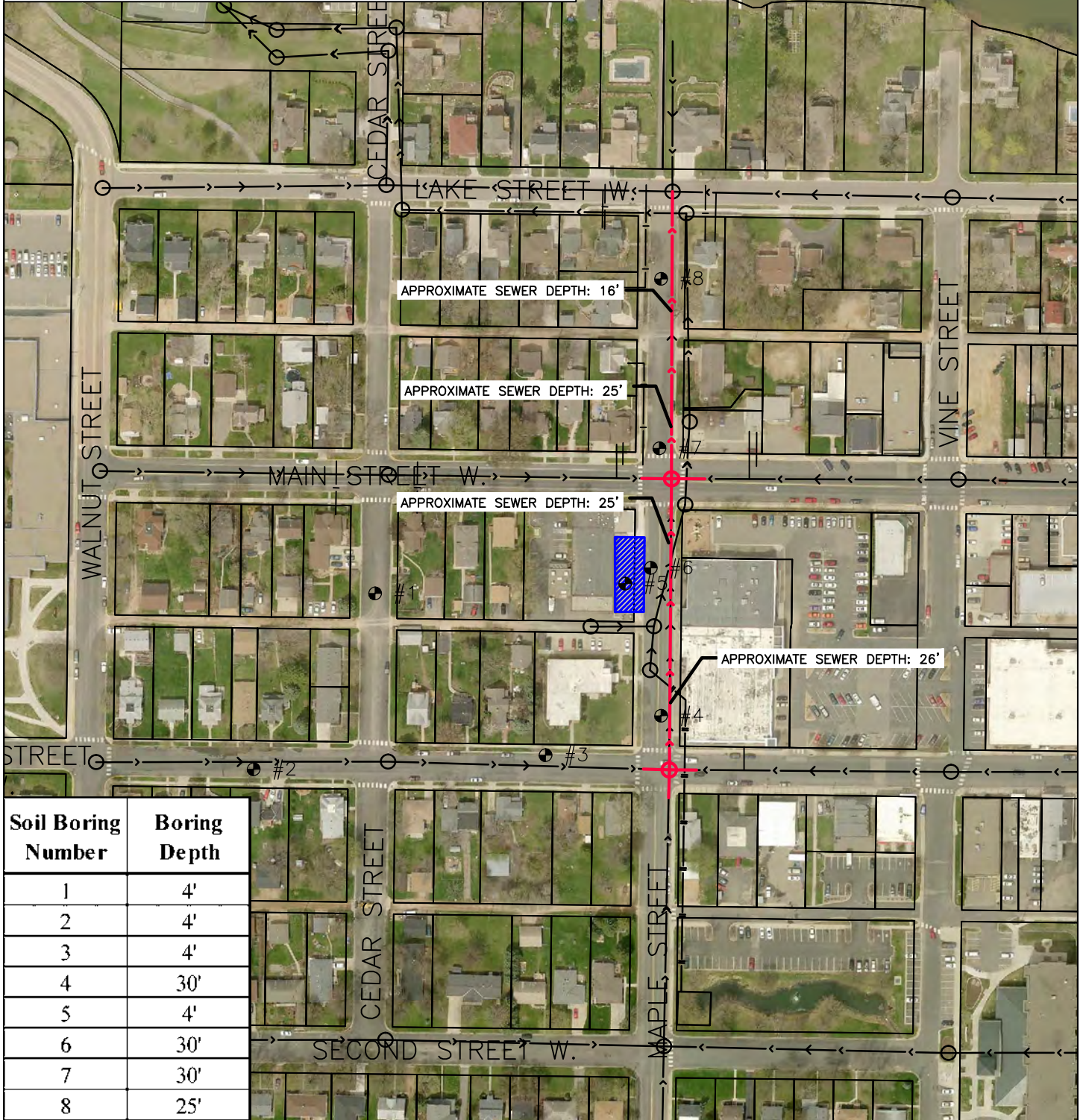
APPROXIMATE SOIL BORING LOCATION



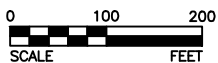
REPLACE SANITARY SEWER MAIN



REPLACE FIRE STATION APRON



Soil Boring Number	Boring Depth
1	4'
2	4'
3	4'
4	30'
5	4'
6	30'
7	30'
8	25'



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 RAMSEY, MN MAPLEWOOD, MN BRAINERD, MN AMES, IA

CITY OF WACONIA, MINNESOTA
 2014 INFRASTRUCTURE IMPROVEMENTS
 SOIL BORING LOCATIONS

10/28/2013

FIGURE NO. 1



SUBSURFACE BORING LOG

AET JOB NO: 22-02671

LOG OF BORING NO. B-4 (p. 1 of 2)

PROJECT: 2014 Infrastructure Improvements; Waconia, MN

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS										
							WC	DEN	LL	PL	R						
1	4.5" Bituminous pavement	FILL		F													
	FILL, mostly gravelly silty sand, brown, frozen (A-1-b)		50/4	F	SS	8	18										
2	FILL, mostly sandy lean clay, a little gravel, ash/cinders, pieces of concrete, glass, ceramic, wood and bituminous, dark brown and gray, frozen to 3', a lens of gravelly sand at 4.5' to 6' (A-6)		18	F	SS	16	21										
3																	
4																	
5				9	M	SS	5	14									
6																	
7																	
8				3	M	SS	6	22									900
9																	
10				4	M	SS	10	27									
11																	
12																	
13				4	M	SS	6	24									
14																	
15				16			SS	16	27								
16																	
17			FILL, mostly lean clay with sand, a little gravel, brown, dark brown and light brown	5	W	SS	16	28									
18																	
19			FILL, mostly gravelly sandy lean clay, pieces of wood, dark brown and gray														
20		4		W	SS	5	31										
21																	

AET CORP 22-02671.GPJ AET-CPT-WELL.GDT 1/13/14

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
0-29½'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
		12/30/13	12:00	18.5	17.0	18.3		15.9	
		12/30/13	12:10	18.5	17.0	18.3		15.7	
BORING COMPLETED:	12/30/13	12/30/13	12:30	31.0	29.5	31.0		27.7	
DR: SS	LG: MF	Rig: 1C							



SUBSURFACE BORING LOG

AET JOB NO: **22-02671**

LOG OF BORING NO. **B-4 (p. 2 of 2)**

PROJECT: **2014 Infrastructure Improvements; Waconia, MN**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS						
							WC	DEN	LL	PL	R		
23	FILL, mostly gravelly sandy lean clay, pieces of wood, dark brown and gray <i>(continued)</i>	FILL <i>(continued)</i>											
24	SANDY LEAN CLAY, a little gravel, gray, very stiff (CL) (A-6)	TILL											
25			27	M	SS	16	17						
26													
27													
28													
29													
30			18	M	SS	18	17						
31	END OF BORING												



SUBSURFACE BORING LOG

AET JOB NO: 22-02671

LOG OF BORING NO. B-5 (p. 1 of 1)

PROJECT: 2014 Infrastructure Improvements; Waconia, MN

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
1	6.5" Concrete pavement	FILL	50/4	F	SS	12	23					
	FILL, mostly silty sand, a little gravel and clayey sand, brown, frozen to 18" (A-2-4)											
2	FILL, mostly sandy lean clay, a little gravel, geotextile around 2', dark brown and brown (A-6)											
3	FILL, mostly silty sand, a little gravel and lean clay, brown (A-2-4)											
4	END OF BORING											

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
0-26"	FA	12/20/13	12:48	4.0	2.0	4.0			None
BORING COMPLETED: 12/20/13									
DR: TK LG: SHS Rig: 85C									

AET CORP 22-02671.GPJ AET-CPT-WELL_GDT 1/13/14



SUBSURFACE BORING LOG

AET JOB NO: 22-02671 LOG OF BORING NO. B-6 (p. 1 of 2)
 PROJECT: 2014 Infrastructure Improvements; Waconia, MN

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS								
							WC	DEN	LL	PL	R				
1	6.5" Bituminous pavement	FILL													
1	FILL, mostly gravelly silty sand, brown, frozen (A-1-b)						14								
2	FILL, mostly clayey sand, a little gravel, dark brown, frozen to 18" (A-2-6)														
3			14	F	SS	12	14								
4															
5	FILL, mostly sandy lean clay, a little gravel and silty sand, ash/cinders, brown and dark brown (A-6)														
6			13	M	SS	12	14								
7															
8			7	M	SS	10	13								2700
9															
10			14	M	SS	12	27								
11															
12															
13			8	M	SS	14	23								
14															
15	FILL, mostly sandy lean clay, a little gravel, gray, dark brown and brown (A-6)														
16		8	M	SS	12	20									
17															
18	SANDY LEAN CLAY, a little gravel, gray mottled, firm, laminations of silty sand (CL) (A-6)	TILL													
19															
20			6	M	SS	14	23								
21															

AET CORP 22-02671.GPJ AET+CPT+WELL.GDT 3/11/14

DEPTH: DRILLING METHOD		WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-29½'	3.25" HSA	12/20/13	1:51	31.0	29.5	30.5		27.0	
BORING COMPLETED: 12/20/13									
DR: TK LG: SHS Rig: 85C									



SUBSURFACE BORING LOG

AET JOB NO: 22-02671

LOG OF BORING NO. B-6 (p. 2 of 2)

PROJECT: 2014 Infrastructure Improvements; Waconia, MN

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS							
							WC	DEN	LL	PL	R			
23	SANDY LEAN CLAY, a little gravel, gray mottled, firm, laminations of silty sand (CL) (A-6) <i>(continued)</i>	TILL <i>(continued)</i>												
24														
25			7	M	SS	16	25							
26														
27														
28	SANDY LEAN CLAY, a little gravel, gray, stiff (CL) (A-6)													
29														
30			14	M	SS	14	19							
31	END OF BORING													

AET_CORP 22-02671.GPJ AET+CPT+WELL.GDT 3/11/14



SUBSURFACE BORING LOG

AET JOB NO: **22-02671**

LOG OF BORING NO. **B-7 (p. 1 of 2)**

PROJECT: **2014 Infrastructure Improvements; Waconia, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS													
							WC	DEN	LL	PL	%-#200									
1	5" Bituminous pavement	FILL		F																
	FILL, mostly silty sand, a little gravel, dark brown (A-2-4)			70	F/M	SS	18													
2	FILL, mostly lean clay with sand, a little gravel, brown and dark brown, frozen to 2.5' (A-6)			7	M	SS	10	24												
3																				
4	FILL, mostly sandy lean clay, a little gravel and lean clay, dark brown and brown (A-6)																			
5				6	M	SS	6	13												
6																				
7				6	M	SS	6	18												
8																				
9	LEAN CLAY, black, firm (CL) (A-6) (possible fill)	TOPSOIL OR FILL																		
10				8	M	SS	6	27												
11																				
12	SANDY LEAN CLAY, a little gravel, brown, a little light brown, very stiff, laminations of lean clay (CL) (A-6)	TILL																		
13				15	M	SS	14	17												
14	SANDY LEAN CLAY, a little gravel, brown, a little dark brown and light gray, very stiff, laminations of sandy silt and silt (CL) (A-6)																			
15				29	M	SS	18	17												
16																				
17																				
18	SANDY LEAN CLAY, a little gravel, possible cobbles around 20' and 22', gray, very stiff (CL) (A-6)																			
19																				
20																				
21			17	M	SS	16	17													

AET CORP 22-02671 GPJ AET-CPT+WELL.GDT 1/13/14

DEPTH: DRILLING METHOD		WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
0-29½'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
		12/26/13	12:15	21.0	19.5	19.3		19.0	
		12/26/13	12:25	21.0	19.5	19.3		18.7	
BORING COMPLETED: 12/26/13		12/26/13	12:40	31.0	29.5	29.8		29.1	
DR: SS	LG: CD/MF	Fig: 1C							



SUBSURFACE BORING LOG

AET JOB NO: 22-02671

LOG OF BORING NO. B-7 (p. 2 of 2)

PROJECT: 2014 Infrastructure Improvements; Waconia, MN

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
23	CLAYEY SAND, a little gravel, gray, very stiff, laminations of silty sand (SC) (A-6)	TILL (continued)										
24												
25			16	M	SS	18	18					
26												
27												
28												
29												
30			18	M	SS	18	16					
31	END OF BORING											



SUBSURFACE BORING LOG

AET JOB NO: **22-02671**

LOG OF BORING NO. **B-8 (p. 1 of 2)**

PROJECT: **2014 Infrastructure Improvements; Waconia, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS								
							WC	DEN	LL	PL	%-#200				
1	2" Bituminous pavement	FILL													
1	FILL, mostly silty sand, a little gravel, brown, frozen (A-2-4)		50/5	F	SS	3	.12								
2	FILL, mostly clayey sand, a little gravel, brown and dark brown, frozen (A-6)														
3	SANDY LEAN CLAY, a little gravel, brown, a little gray and light brown, frozen to 2.5', laminations of sandy silt and silt (CL) (A-6)	TILL	14	F/M	SS	14	18								
4	SANDY LEAN CLAY, a little gravel, brown and brownish gray mottled to brown, stiff to very stiff, a lens of gravelly silty sand around 13' (CL) (A-6)		15	M	SS	16	17								
5															
6															
7															
8			18	M	SS	18	18								
9															
10															
11															
12															
13			26	M	SS	18	20								
14	SANDY LEAN CLAY, a little gravel, brown, a little dark brown, very stiff (CL) (A-6)		28	M	SS	18	15								
15															
16															
17															
18	SANDY LEAN CLAY, a little gravel, brown, hard (CL) (A-6)														
19															
20			42	M	SS	2	16								
21															

AET CORP 22-02671.GPJ AET-CPT-WELL.GDT 1/13/14

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-24½'	3.25" HSA	12/26/13	1:50	26.0	24.5	24.1		23.0	
		12/26/13	1:55	26.0	24.5	24.1		22.5	
BORING COMPLETED: 12/26/13									
DR: SS LG: CD/MRlg: 1C									



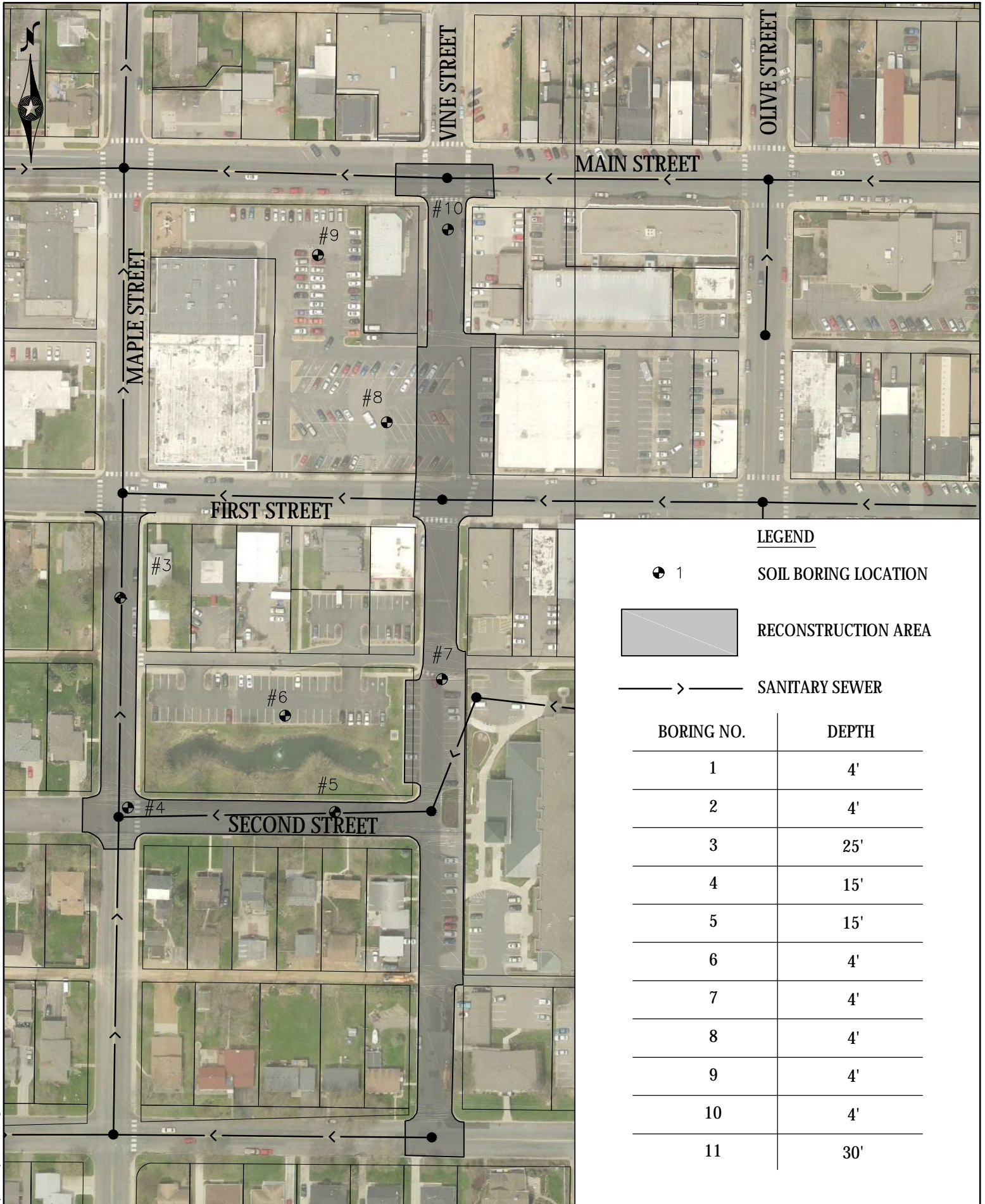
SUBSURFACE BORING LOG

AET JOB NO: 22-02671



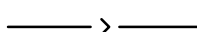
LOG OF BORING NO. B-8 (p. 2 of 2)

PROJECT: 2014 Infrastructure Improvements; Waconia, MN

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
23	SANDY LEAN CLAY, a little gravel, brown, hard (CL) (A-6) (continued)	TILL (continued)		▼							
24	SANDY LEAN CLAY, a little gravel, brownish gray, very stiff, laminations of sandy silt (CL) (A-6)										
25			28	M	SS	16	17				
26	END OF BORING										



LEGEND

-  1 SOIL BORING LOCATION
-  RECONSTRUCTION AREA
-  SANITARY SEWER

BORING NO.	DEPTH
1	4'
2	4'
3	25'
4	15'
5	15'
6	4'
7	4'
8	4'
9	4'
10	4'
11	30'



BOLTON & MENK, INC.
 Consulting Engineers & Surveyors
 MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN BURNSVILLE, MN
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CITY OF WACONIA, MINNESOTA
 2015 INFRASTRUCTURE IMPROVEMENTS
 SOIL BORING LOCATIONS

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 H:\WACONIA\2108448-2\Drawings\2108448-2.dwg 7/18/14 9:25 am



SUBSURFACE BORING LOG

AET JOB NO: **20-12298**

LOG OF BORING NO. **SB-3 (p. 1 of 2)**

PROJECT: **2015 Infrastructure Improvements; Waconia, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS														
							WC	DEN	LL	PL	%-#200										
1	7" Bituminous pavement	FILL			SU																
1	FILL, mostly sandy lean clay, a little gravel, brown and gray mottled, stiff (A-6)		12	M	SS	7	19														
2	SANDY LEAN CLAY, a little gravel, brown and gray mottled, firm, laminations of silt (CL) (A-6)	WEATHERED TILL	7	M	SS	20	19														
3																					
4																					
5	SANDY LEAN CLAY, a little gravel, brown and gray mottled to gray and brown mottled, stiff to very stiff, laminations of sandy silt (CL) (A-6)	TILL	13	M	SS	16	19														
6																					
7																					
8																					
9																					
10																					
11																					
12																					
13																					
14																					
15																					
16																					
17																					
18	SANDY LEAN CLAY, a little gravel, gray, very stiff, laminations of sand (CL) (A-6)		13	M	SS	18	20														
19																					
20																					
21																					

AET_CORP 20-12298.GPJ AET+CPT+WELL.GDT 8/28/14

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
0-24½'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
		8/18/14	11:05	26.0	24.5	24.5		None	
BORING COMPLETED: 8/18/14									
DR: SG LG: SB Rig: 91C									





SUBSURFACE BORING LOG

AET JOB NO: **20-12298**

LOG OF BORING NO. **SB-3 (p. 2 of 2)**

PROJECT: **2015 Infrastructure Improvements; Waconia, MN**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS							
							WC	DEN	LL	PL	%-#200			
23	SANDY LEAN CLAY, a little gravel, gray, very stiff, laminations of sand (CL) (A-6) <i>(continued)</i>													
24														
25														
26	END OF BORING													

AET_CORP_20-12298.GPJ AET+CPT+WELL.GDT 8/28/14



SUBSURFACE BORING LOG

AET JOB NO: **20-12298**

LOG OF BORING NO. **SB-4 (p. 1 of 1)**

PROJECT: **2015 Infrastructure Improvements; Waconia, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS							
							WC	DEN	LL	PL	ohm-cm			
1	12.5" Bituminous pavement	FILL		M	SU									
2	FILL, mostly lean clay, black and gray (A-7-6)		14	M	SS	8	21							
3	FILL, mostly clayey sand, a little gravel, gray, a little black (A-6)		9	M	SS	10	15							
4														
5	FILL, mostly organic clay, a little sand (A-8)		10	M	SS	8	42							
6														
7	FILL, mostly organic clay, a little sandy lean clay, black, a little gray (A-8)													
8			4	M	SS	4	30							1100
9														
10	SANDY LEAN CLAY, a little gravel, brown and gray mottled, firm (CL) (A-6)		TILL	7	M	SS	14	41	22					
11														
12	CLAYEY SAND, a little gravel, gray, soft to firm (CL) (A-6)	4		M	SS	16	22							
13														
14														
15				6	M	SS	17	19						
16	END OF BORING													

AET_CORP 20-12298.GPJ AET+CPT+WELL.GDT 8/28/14

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
0-14½'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
		8/18/14	12:00	16.0	14.5	14.5		None	
BORING COMPLETED: 8/18/14									
DR: SG LG: SB Rig: 91C									



SUBSURFACE BORING LOG

AET JOB NO: **20-12298**

LOG OF BORING NO. **SB-5 (p. 1 of 2)**

PROJECT: **2015 Infrastructure Improvements; Waconia, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS													
							WC	DEN	LL	PL	%#200									
1	6" Bituminous pavement	FILL																		
	18" Crushed limestone, light brown (A-1-b)			13	M		10													
2	FILL, mostly lean clay with sand, a little sand, black and gray (A-6)			7	M		2	28												
3																				
4																				
5	ORGANIC CLAY, black, soft to very soft (OH) (A-8)	SWAMP DEPOSIT	2	W/M		6	140													
6																				
7																				
8				1½	M		18	140												
9	ORGANIC CLAY, trace shells and roots, black, very soft (OH) (A-8)																			
10			WH	M		16	95													
11																				
12																				
13			WH	M		18	164													
14	ORGANIC CLAY, trace shells and roots, black, a little brown and light gray, very soft, lenses and laminations of hemic peat (OH) (A-8)																			
15			WH	M		18	197													
16																				
17	ORGANIC CLAY, trace roots, brown, very soft (OH) (A-8)																			
18			WH	M		10	240													
19	CLAYEY SAND, a little gravel, gray, very soft to firm (SC) (A-6)	TILL																		
20				WH	W		16	22												
21																				

AET_CORP 20-12298.GPJ AET+CPT+WELL.GDT 8/28/14

DEPTH: 0-24'	DRILLING METHOD: 3.25" HSA	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
		8/18/14	1:10	26.0	24.5	24.5		None	
BORING COMPLETED: 8/18/14									
DR: SG	LG: SB	Rig: 91C							



SUBSURFACE BORING LOG

AET JOB NO: 20-12298

LOG OF BORING NO. SB-5 (p. 2 of 2)

PROJECT: 2015 Infrastructure Improvements; Waconia, MN

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
23	CLAYEY SAND, a little gravel, gray, very soft to firm (SC) (A-6) <i>(continued)</i>	TILL <i>(continued)</i>					24					
24												
25			6	M	SS	18	21					
26	END OF BORING											

AET_CORP_20-12298.GPJ AET+CPT+WELL.GDT 8/28/14



SUBSURFACE BORING LOG

AET JOB NO: **20-12298**

LOG OF BORING NO. **SB-6 (p. 1 of 1)**

PROJECT: **2015 Infrastructure Improvements; Waconia, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
1	3.75" Bituminous pavement	FILL	25	M	SU	16						
	10.25" Crushed limestone base, light brown (A-1-b)											
2	FILL, mostly sand with silt, a little gravel, geotextile at 14", brown (A-1-b)											
3	FILL, mostly sandy lean clay, gray and black (A-6)	SWAMP DEPOSIT	5	M	SS	5	21					55
4	ORGANIC CLAY, black, soft (OH) (A-8)											
5												
6	ORGANIC CLAY, trace shells and roots, dark brown to black, soft to firm (OH) (A-8)											
7		TILL	2	M	SS	16	107					
8												
9	CLAYEY SAND, gray, firm (SC) (A-6)											
10	END OF BORING											

AET_CORP 20-12298.GPJ AET+CPT+WELL.GDT 8/28/14

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
0-8'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
		8/18/14	1:50	10.0	8.0	8.0		None	
BORING COMPLETED: 8/18/14									
DR: SG LG: SB Rig: 91C									



SUBSURFACE BORING LOG

AET JOB NO: **20-12298**

LOG OF BORING NO. **SB-7 (p. 1 of 1)**

PROJECT: **2015 Infrastructure Improvements; Waconia, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	6" Bituminous pavement	FILL	33	M	SU	16					
	FILL, mostly silty sand with gravel, light brown (A-2-4)										
2	FILL, mostly sand with silt, a little gravel, light brown (A-3)	SWAMP DEPOSIT	9	M	SS	18	35				
3	ORGANIC CLAY, black, stiff (OH) (A-8)										
4	SANDY LEAN CLAY, a little gravel, brown and gray mottled, soft to firm, laminations of sandy silt (CL) (A-6)	TILL	4	M	SS	2	26				
5											
6		TILL	7	M	SS	15	23				
7											
8		TILL	7	M	SS	15	23				
9											
10	CLAYEY SAND, a little gravel, gray and brown mottled, firm, laminations of sand (SC) (A-6)	TILL	7	M	SS	18	22				
11	END OF BORING										

AET_CORP 20-12298.GPJ AET-CPT+WELL.GDT 8/28/14

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
0-9½'	3.25" HSA	8/18/14	9:05	11.0	9.5	9.5			None
BORING COMPLETED: 8/19/14									
DR: SG LG: SB Rig: 91C									



SUBSURFACE BORING LOG

AET JOB NO: **20-12298**

LOG OF BORING NO. **SB-8 (p. 1 of 1)**

PROJECT: **2015 Infrastructure Improvements; Waconia, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%#200	
1	3" Bituminous pavement	FILL	6	M	SU SU	14	25					
	8" Crushed limestone base, light brown (A-1-b)											
2	FILL, mostly sand with silt, a little gravel, brown (A-3)	FINE ALLUVIUM TILL	6	M	SS	17	21					
3	LEAN CLAY, slightly organic, black, firm (CL) (A-7-6)											
4	SANDY LEAN CLAY, brown, a little gray mottled, firm (CL) (A-6)											
4	END OF BORING											

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-2'	3.25" HSA	8/19/14	9:19	4.0	2.0	4.0		None	
BORING COMPLETED: 8/19/14									
DR: SG LG: SB Rig: 91C									

AET_CORP 20-12298.GPJ AET+CPT+WELL.GDT 8/28/14



SUBSURFACE BORING LOG

AET JOB NO: **20-12298**

LOG OF BORING NO. **SB-9 (p. 1 of 1)**

PROJECT: **2015 Infrastructure Improvements; Waconia, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
1	3" Bituminous pavement 5" Crushed limestone base, light brown (A-1-b) FILL, mostly sandy lean clay, gray (A-6)	FILL	9	M	SU SU SS	8	19					
2	SANDY LEAN CLAY, a little gravel, brown and gray mottled, firm, laminations of sandy silt (CL) (A-6)	TILL	9	M	SS	22	18					
3												
4	END OF BORING											

AET_CORP 20-12298.GPJ AET+CPT+WELL.GDT 8/28/14

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-2'	3.25" HSA	8/19/14	9:34	4.0	2.0	4.0		None	
BORING COMPLETED: 8/19/14									
DR: SG LG: SB Rig: 91C									



SUBSURFACE BORING LOG

AET JOB NO: **20-12298**

LOG OF BORING NO. **SB-10 (p. 1 of 1)**

PROJECT: **2015 Infrastructure Improvements; Waconia, MN**

DEPTH IN FEET	SURFACE ELEVATION: _____ MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
1	2" Bituminous pavement 14" Crushed limestone base, light brown (A-1-b)	FILL	16	M	SU SU SS	11	15					
2	FILL, mostly sandy lean clay with gravel, brown and gray	TILL OR FILL										
3	CLAYEY SAND, a little gravel, brown, stiff, lenses of sand with silt (SC) (A-6) (possible fill)			13	M	SS	17	15				
4	END OF BORING											

AET_CORP_20-12298.GPJ_AET+OPT+WELL.GDT_8/28/14

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-2'	3.25" HSA	8/19/14	9:55	4.0	2.0	4.0		None	
BORING COMPLETED: 8/19/14									
DR: SG LG: SB Rig: 91C									



Project: Waconia Apartments
Waconia, Minnesota

AET Report No.:
P-0006217

Subject: Approximate Soil Boring Locations

Date: 11/8/2021

Scale: Shown

Prepared By: AS

Checked By: JS

Figure 1



SUBSURFACE BORING LOG

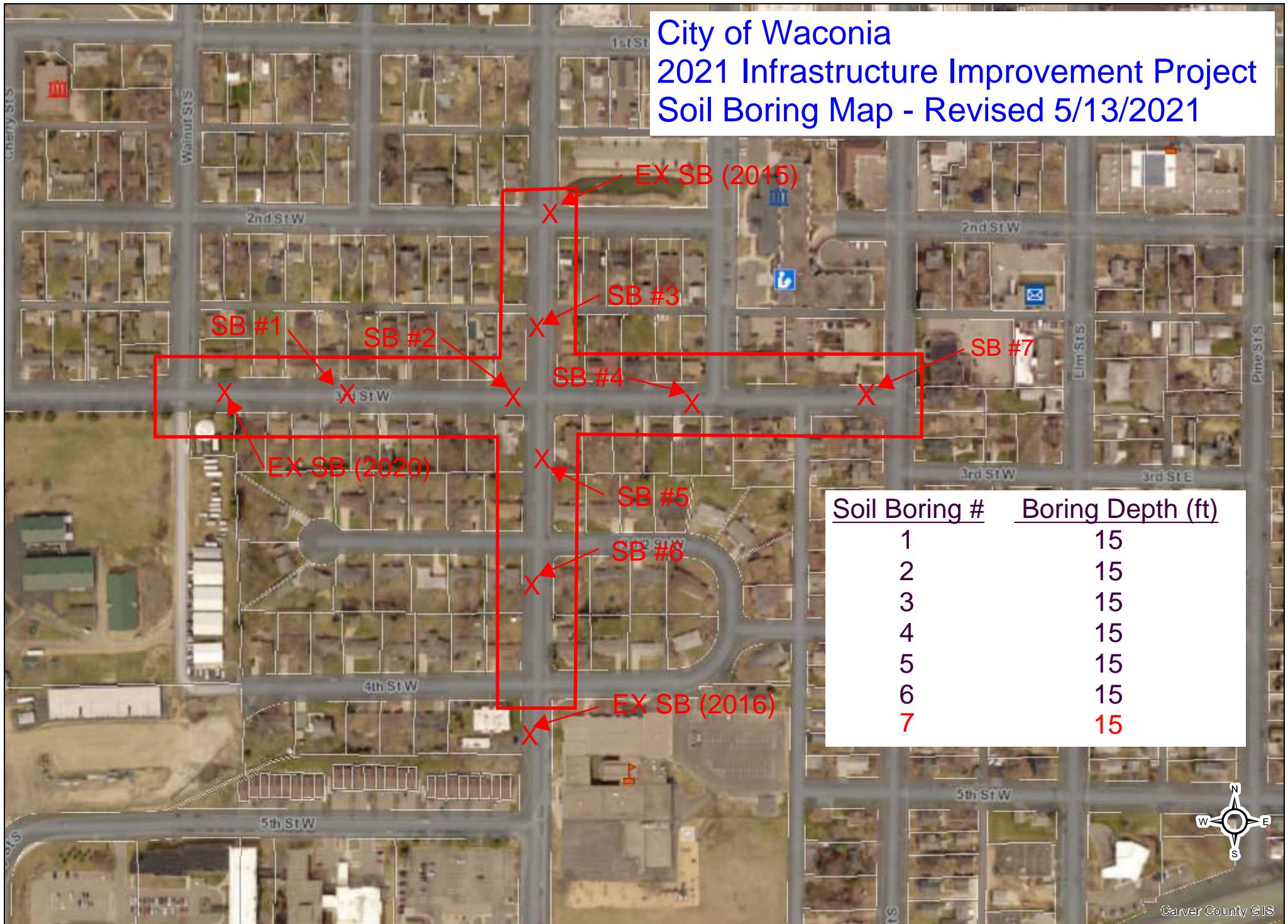
AET JOB NO: P-0006217 LOG OF BORING NO. B-1 (p. 1 of 1)
 PROJECT: Waconia Apartment Complex; Waconia, MN
 SURFACE ELEVATION: 1040.4 LATITUDE: 44.84753 LONGITUDE: -93.7875

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
1	FILL, mostly clayey sand with organic fines, a little gravel, black (topsoil)	FILL	4	M	SS	10	18					
2	FILL, mostly gravelly sand with silt, brown											
3			15	M	SS	11						
4												
5	FILL, mixture of gravelly sand with silt and clayey sand, brown		14	M	SS	10						
6												
7	FILL, mostly gravelly sand with silt, brown		10	M	SS	7						
8												
9												
10												
11												
12	SAND WITH SILT WITH GRAVEL, medium grained, dark brown, waterbearing, loose to medium dense (SP-SM)	COARSE ALLUVIUM										
13			10	W	SS	15						
14												
15			13	W	SS	13					12	
16												
17												
18												
19												
20												
21												
22												
23												
24												
END OF BORING												

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-23'	3.25" HSA	10/21/21	12:43	14.0	12.0	15.0		12.5	
		10/21/21	12:59	24.5	23.0	24.0		12.9	
BORING COMPLETED: 10/21/21									
DR: GH LG: JJ Rig: 91C									

AET CORP W-LAT-LONG P-0006217.GPJ AET+CPT+WELL.GDT 11/15/21

City of Waconia 2021 Infrastructure Improvement Project Soil Boring Map - Revised 5/13/2021



Soil Boring #	Boring Depth (ft)
1	15
2	15
3	15
4	15
5	15
6	15
7	15



Carver County GIS

This map was created using Carver County's Geographic Information Systems (GIS), it is a compilation of information and data from various City, County, State, and Federal offices. This map is not a surveyed or legally recorded map and is intended to be used as a reference. Carver County is not responsible for any inaccuracies contained herein.

Map Date: 4/28/2021



Haugo GeoTechnical Services
 2825 Cedar Ave South
 Minneapolis, MN 55407
 Telephone: 612-729-2959
 Fax: 763-445-2238

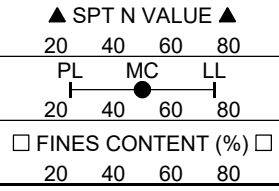
BORING NUMBER SB-2

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 8/12/21 16:22 - C:\USERS\HGTS\3DROPPBOX\HGTS\HAUGO GEOTECHNICAL SERVICES\GINT PROJECT BACKUP\PROJECTS\21-0538 2022 WACONIA INFRASTRUCTURE IMPROVEMENTS.GPJ

CLIENT Bolton & Menk
PROJECT NUMBER 21-0538
DATE STARTED 6/29/21 **COMPLETED** 6/29/21
DRILLING CONTRACTOR HGTS - 120
DRILLING METHOD Hollow Stem Auger/Split Spoon
LOGGED BY GD **CHECKED BY** PG
NOTES _____

PROJECT NAME 2022 Waconia Infrastructure Improvements
PROJECT LOCATION Waconia, MN
GROUND ELEVATION 1011.5 ft **HOLE SIZE** 3 1/4 inches
GROUND WATER LEVELS:
AT TIME OF DRILLING --- Not Encountered
AT END OF DRILLING ---
AFTER DRILLING --- Not Encountered

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	MOISTURE CONT. (%)	NOTES	▲ SPT N VALUE ▲			
								20	40	60	80
0.0		Approximately 3 Inches of Bituminous Asphalt									
		Approximately 4 Inches of Aggregate Base									
2.5		(SC) Clayey Sand, fine to medium grained, trace Gravel, brown, medium. (Glacial Till)	AU 29								
		P-200 = 43.5	SS 30		3-3-3 (6)	18.5					
5.0			SS 31		2-3-3 (6)						
7.5		(CL) Sandy Lean Clay, trace Gravel, wet, soft to rather stiff. (Glacial Till)	SS 32		1-2-2 (4)	22					
10.0			SS 33		3-5-6 (11)						
12.5		(CL) Sandy Lean Clay, trace Gravel, gray, wet, rather stiff. (Glacial Till)	SS 34		3-5-7 (12)						
			SS 35		6-6-6 (12)						



Bottom of borehole at 14.5 feet.



Haugo GeoTechnical Services
 2825 Cedar Ave South
 Minneapolis, MN 55407
 Telephone: 612-729-2959
 Fax: 763-445-2238

BORING NUMBER SB-4

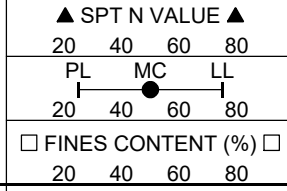
GEOTECH BH PLOTS - GINT STD US LAB.GDT - 8/12/21 16:22 - C:\USERS\HGTS\3\DROPBOX\3\GINT\HAUGO GEOTECHNICAL SERVICES\GINT PROJECT BACKUP\PROJECTS\21-0538 2022 WACONIA INFRASTRUCTURE IMPROVEMENTS.GPJ

CLIENT Bolton & Menk
PROJECT NUMBER 21-0538
DATE STARTED 6/29/21 **COMPLETED** 6/29/21
DRILLING CONTRACTOR HGTS - 120
DRILLING METHOD Hollow Stem Auger/Split Spoon
LOGGED BY GD **CHECKED BY** PG
NOTES _____

PROJECT NAME 2022 Waconia Infrastructure Improvements
PROJECT LOCATION Waconia, MN
GROUND ELEVATION 1010.2 ft **HOLE SIZE** 3 1/4 inches
GROUND WATER LEVELS:
AT TIME OF DRILLING --- Not Encountered
AT END OF DRILLING ---
AFTER DRILLING --- Not Encountered

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	MOISTURE CONT. (%)	NOTES	▲ SPT N VALUE ▲		
								20	40	60
0.0		Approximately 3 Inches of Bituminous Asphalt Approximately 4 Inches of Aggregate Base P-200 = 7% Sandy Lean Clay, gray and black, wet. (Fill)	AU 36			4				
2.5		Organic Content = 4%	SS 37		2-2-3 (5)	20.5				
5.0		Sandy Lean Clay, black, wet. (Fill) Organic Content = 10.5%	SS 38		3-3-4 (7)	35				
7.5		(CL) Sandy Lean Clay, trace Gravel, brown, wet, medium to rather stiff. (Glacial Till)	SS 39		2-2-5 (7)					
10.0			SS 40		3-5-7 (12)					
12.5			SS 41		4-5-6 (11)					
		(CL) Sandy Lean Clay, trace Gravel, gray, wet, rather stiff. (Glacial Till)	SS 42		4-4-8 (12)					

Bottom of borehole at 14.5 feet.





Haugo GeoTechnical Services
 2825 Cedar Ave South
 Minneapolis, MN 55407
 Telephone: 612-729-2959
 Fax: 763-445-2238

BORING NUMBER SB-7

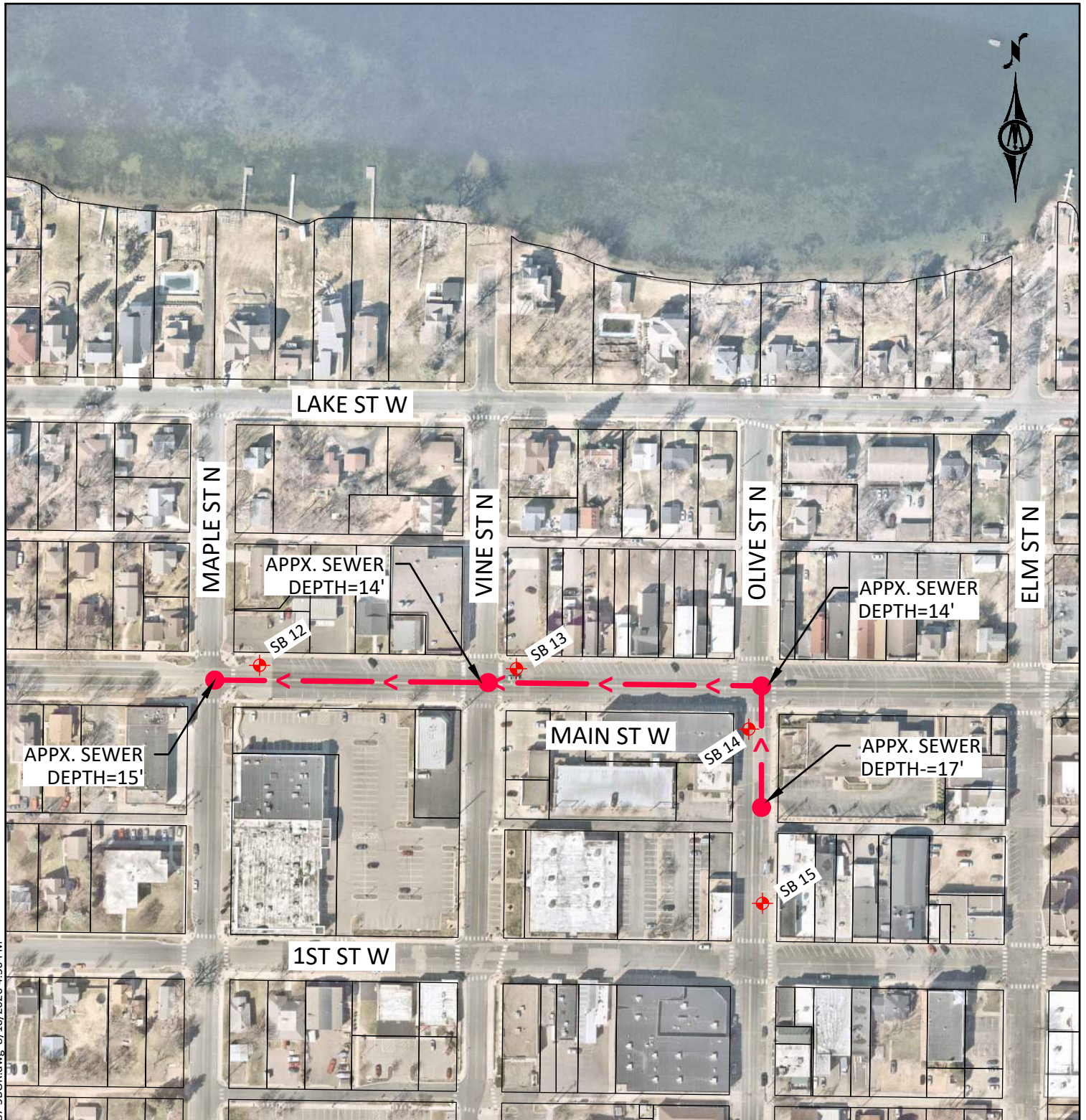
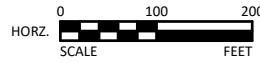
GEOTECH BH PLOTS - GINT STD US LAB.GDT - 8/12/21 16:22 - C:\USERS\HGTS\3\DROPBOX\PROJECT BACKUP\PROJECTS\21-0538 2022 WACONIA INFRASTRUCTURE IMPROVEMENTS.GPJ

CLIENT Bolton & Menk
PROJECT NUMBER 21-0538
DATE STARTED 6/29/21 **COMPLETED** 6/29/21
DRILLING CONTRACTOR HGTS - 120
DRILLING METHOD Hollow Stem Auger/Split Spoon
LOGGED BY GD **CHECKED BY** PG
NOTES _____

PROJECT NAME 2022 Waconia Infrastructure Improvements
PROJECT LOCATION Waconia, MN
GROUND ELEVATION 1032.9 ft **HOLE SIZE** 3 1/4 inches
GROUND WATER LEVELS:
 ∇ **AT TIME OF DRILLING** 12.50 ft / Elev 1020.40 ft
AT END OF DRILLING ---
AFTER DRILLING --- Not Encountered

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	MOISTURE CONT. (%)	NOTES	▲ SPT N VALUE ▲			
								20	40	60	80
0.0		Approximately 3 Inches of Bituminous Asphalt									
		Approximately 4 Inches of Aggregate Base									
		(CL-ML) Silty Clay, brown, moist, medium (Glacial Till)	AU 43								
2.5		P-200 = 64.5%	SS 44		3-4-4 (8)	23.5					
5.0		(ML) Sandy Silt, fine grained, brown and gray, moist, loose. (Glacial Till)	SS 45		3-4-5 (9)						
7.5			SS 46		3-4-3 (7)	30					
10.0		(SM) Silty Sand, fine to medium grained, brown, waterbearing, loose to medium dense. (Glacial Till)	SS 47		4-5-6 (11)						
12.5	∇		SS 48		2-4-6 (10)						
		(ML) Sandy Silty, fine grained, brown, waterbearing, loose. (Glacial Till)	SS 49		1-2-3 (5)						

Bottom of borehole at 14.5 feet.



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LEGEND

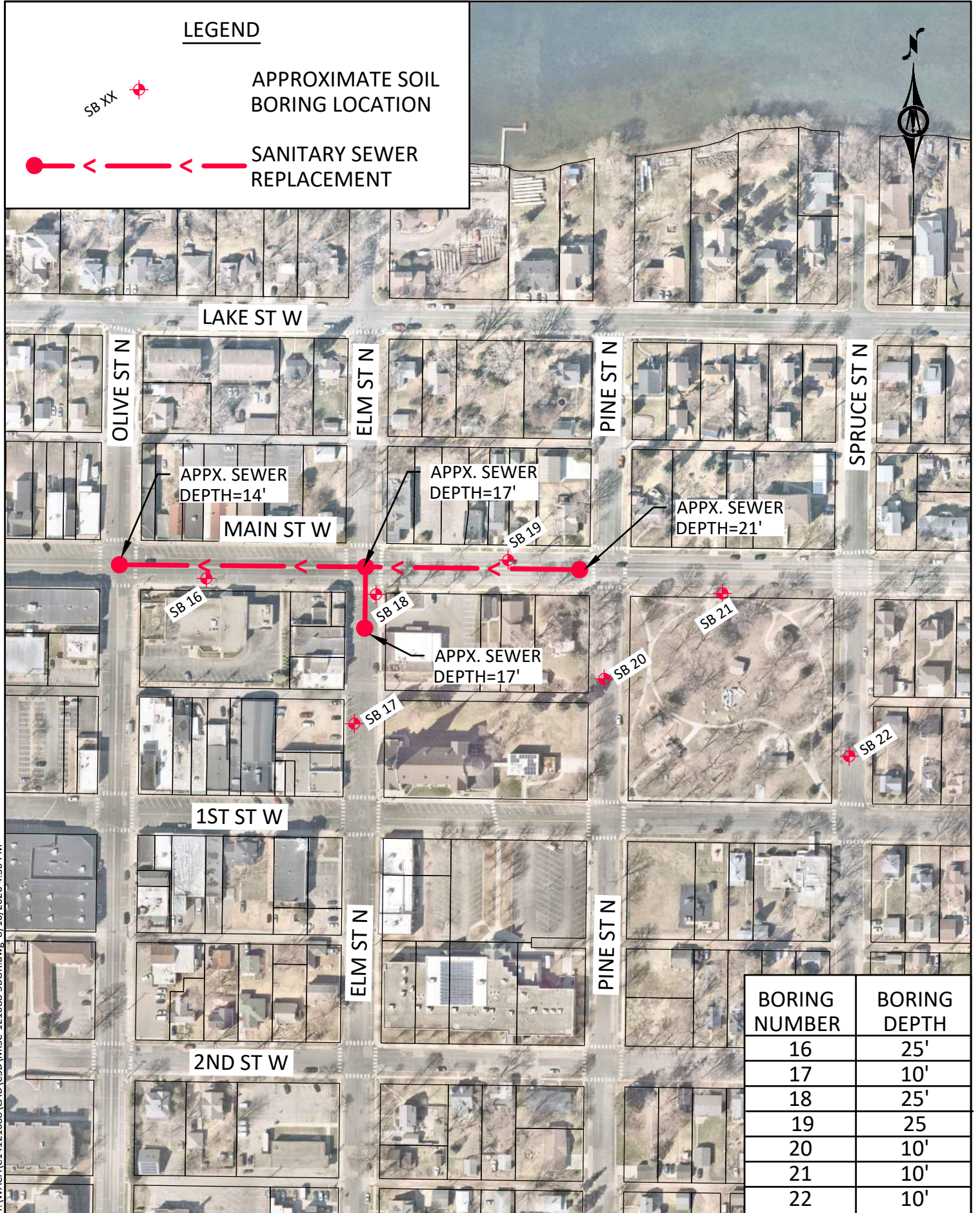
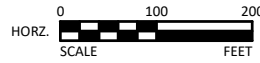


APPROXIMATE SOIL BORING LOCATION



SANITARY SEWER REPLACEMENT

BORING NUMBER	BORING DEPTH
12	25'
13	25'
14	25'
15	10'



LEGEND

SB xx

APPROXIMATE SOIL BORING LOCATION

SANITARY SEWER REPLACEMENT

SANITARY SEWER REPLACEMENT

APPX. SEWER DEPTH=14'

APPX. SEWER DEPTH=17'

APPX. SEWER DEPTH=21'

APPX. SEWER DEPTH=17'

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BORING NUMBER	BORING DEPTH
16	25'
17	10'
18	25'
19	25
20	10'
21	10'
22	10'



SUBSURFACE BORING LOG

AET No: 20-23155 Log of Boring No. B-12 (p. 1 of 1)
 Project: 2022 and 2023 Infrastructure Improvement Projects; Waconia, MN

DEPTH IN FEET	Surface Elevation <u>1011.5</u> MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS							
							WC	DEN	LL	PL	%-#200			
1	7½" Bituminous pavement	FILL												
2	FILL, mostly silty sand with gravel, pieces of concrete, geotextile, brown, A-1-b		75	M		3								
3	FILL, mostly silty sand with gravel, a little clayey sand and gravel, pieces of bituminous pavement, brown, A-1-b		28	M		22								
4														
5	FILL, mostly sandy lean clay, a little gravel, brown and dark brown, A-6		11	M		18	24							
6														
7														
8				2	M		4	23						
9														
10				5	M		10	21						
11														
12	ORGANIC CLAY, black, firm, A-8 (OL/OH)		SWAMP DEPOSIT											
13		8		M		12	26							
14														
15	SANDY LEAN CLAY, slightly organic, dark brown, grayish brown, firm, A-6 (CL)	FINE ALLUVIUM												
16			7	M		22	24							
17														
18	SANDY LEAN CLAY, a little gravel, brown and gray mottled, a little light gray, stiff, laminations of silt, A-6 (CL)	TILL												
19			14	M		15	14							
20	CLAYEY SAND, a little gravel, brown and a little dark brown, very stiff, laminations of sandy silt, A-6 (SC)													
21			22	M		13	18							
22	CLAYEY SAND, a little gravel, brown, very stiff, laminations of silty sand, A-6 (SC)													
23			24	M		17	20							
24	END OF BORING													

AET_CORP_20-23155.GPJ_AET+CPT+WELL_20181012_JG.GDT_12/15/20

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-22½'	3.25" HSA	10/6/20	11:40	24.0	22.5	23.9		None	
		10/6/20	11:50	24.0	22.5	23.9		None	
BORING COMPLETED: 10/6/20									
DR: DS LG: SB Rig: 1C									



SUBSURFACE BORING LOG

AET No: 20-23155

Log of Boring No. B-13 (p. 1 of 1)

Project: 2022 and 2023 Infrastructure Improvement Projects; Waconia, MN

DEPTH IN FEET	Surface Elevation <u>1012.3</u> MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS						
							WC	DEN	LL	PL	%-#200		
1	6½" Bituminous pavement	FILL	18	M		SU							
2	8½" FILL, crushed limestone, light brown A-1-b												
3	FILL, mostly silty sand, a little clayey sand and gravel, brown, A-2-4												
4													
5	FILL, mostly gravelly sand with silt, brown, A-1-b												
6		FINE ALLUVIUM	6	M		SS	18	29					
7	SANDY LEAN CLAY, brown, a little gray, firm, laminations of sand and silt, A-6 (CL)												
8													
9		TILL	5	M		SS	24	18					
10	SANDY LEAN CLAY, a little gravel, brown, firm, laminations of silty sand, A-6 (CL)												
11													
12													
13	SANDY LEAN CLAY, a little gravel, gray, very stiff to stiff, A-6 (CL)		19	M		SS	24	17					
14													
15													
16													
17													
18													
19	CLAYEY SAND, a little gravel, gray, a little brown, hard, laminations of silty sand, A-6 (SC)		47	M		SS	18	15					
20													
21													
22	CLAYEY SAND, a little gravel, gray, a little light gray, hard, laminations of sand (SC)		54	M		SS	6	15					
23													
24	END OF BORING												

AET_CORP 20-23155.GPJ AET+CPT+WELL 2018/10/12 JG.GDT 12/15/20

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
0-22½'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
		10/6/20	10:10	24.0	22.5	23.8		None	
		10/6/20	10:20	24.0	22.5	23.8		None	
BORING COMPLETED: 10/6/20									
DR: DS LG: SB Rig: 1C									



SUBSURFACE BORING LOG

AET No: 20-23155 Log of Boring No. B-14 (p. 1 of 1)
 Project: 2022 and 2023 Infrastructure Improvement Projects; Waconia, MN

DEPTH IN FEET	Surface Elevation <u>1017.4</u> MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS							
							WC	DEN	LL	PL	%-#200			
1	6¾" Bituminous pavement	FILL												
1	FILL, mostly silty sand with gravel, brown, A-1-b		11	M		15	11							
2	FILL, mostly clayey sand, a little silty sand and gravel, brown, A-6		7	M		7	11							
3														
4														
5														
6														
7	FILL, mostly sandy lean clay, a little gravel, brown, A-6	TILL	1	M		12	22							
8														
9														
10	SANDY LEAN CLAY, a little gravel, brown to brown and dark brown mottled, firm to very stiff, A-6 (CL)		7	M		18	19							
11														
12														
13				18			22	18						
14														
15	SANDY LEAN CLAY, a little gravel, grayish brown, stiff to very stiff, A-6 (CL)		15	M		18	19							
16														
17														
18														
19														
20			18	M		18	21							
21														
22														
23														
24	END OF BORING													

AET_CORP_20-23155.GPJ_AET+CPT+WELL_20181012_JG.GDT_12/15/20

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
0-22½'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
		10/6/20	1:10	24.0	22.5	24.0		19.6	
		10/6/20	1:30	24.0	22.5	23.9		13.7	
BORING COMPLETED: 10/6/20									
DR: DS LG: SB Rig: 1C									



SUBSURFACE BORING LOG

AET No: 20-23155 Log of Boring No. B-15 (p. 1 of 1)
 Project: 2022 and 2023 Infrastructure Improvement Projects; Waconia, MN

DEPTH IN FEET	Surface Elevation <u>1025.6</u> MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	6½" Bituminous pavement	FILL	16	M	SU	14					
2	FILL, mostly silty sand with gravel, pieces of bituminous pavement at 3', brown and black, A-1-b										
3											
4											
5	FILL, mostly sandy lean clay, a little silty sand and gravel (apparent boulder at 5'), brown, a little light tan, A-6	55/6	M	SS	6	17					
6											
7	SANDY LEAN CLAY, a little gravel, grayish brown and brown mottled, a little light gray, stiff, laminations of silt and sandy silt, stiff, A-6 (CL)	TILL	12	M	SS	24	20				
8											
9	END OF BORING										

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-7½'	3.25" HSA	10/6/20	1:50	9.5	7.5	9.4		None	
BORING COMPLETED: 10/6/20									
DR: DS LG: SB Rig: 1C									

AET_CORP_20-23155.GPJ_AET+CPT+WELL_20181012_JG.GDT 1/29/21



SUBSURFACE BORING LOG

AET No: 20-23155 Log of Boring No. B-16 (p. 1 of 1)
 Project: 2022 and 2023 Infrastructure Improvement Projects; Waconia, MN

DEPTH IN FEET	Surface Elevation <u>1019.7</u> MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS							
							WC	DEN	LL	PL	%-#200			
1	5¾" Bituminous pavement	FILL												
2	FILL, mostly silty sand, a little gravel, brown, A-2-4		27	M		17								
3	FILL, mostly clayey sand, a little silty sand, gravel and bituminous pavement, brown, A-6		17	M		18	15							
4														
5	SANDY LEAN CLAY, a little gravel, brown, a little gray mottled to brown, stiff to very stiff, A-6 (CL)	TILL	11	M		22	19							
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23	CLAYEY SAND, a little gravel, brown, hard, lens of silty sand, A-6 (SC)		39	M/W		18	16							
24	END OF BORING													

DEPTH: 0-22½'	DRILLING METHOD: 3.25" HSA	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
		10/7/20	9:40	24.0	22.5	24.0			23.0
		10/7/20	9:50	24.0	22.5	24.0			21.4
BORING COMPLETED: 10/7/20									
DR: DS LG: SB Rig: 1C									

AET_CORP_20-23155.GPJ AET+CPT+WELL_20181012_JG.GDT 1/29/21



SUBSURFACE BORING LOG

AET No: 20-23155 Log of Boring No. B-17 (p. 1 of 1)
 Project: 2022 and 2023 Infrastructure Improvement Projects; Waconia, MN

DEPTH IN FEET	Surface Elevation <u>1039.3</u> MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS							
							WC	DEN	LL	PL	%-#200			
1	4 3/4" Bituminous pavement	FILL			SU									
1	FILL, mixture of crushed limestone and silty sand, brown, A-1-b		9	M	SS	10	21							
2	FILL, mostly clayey sand, a little gravel, brown, A-6	TILL												
3	CLAYEY SAND, a little gravel, brown, stiff, A-6 (SC)		10	M	SS	16	20							
4														
5														
6														
7														
8														
9			12	M	SS	24	20							
END OF BORING														

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-7 1/2'	3.25" HSA	10/7/20	2:05	9.5	7.5	9.5		None	
BORING COMPLETED: 10/7/20									
DR: DS LG: SB Rig: 1C									

AET_CORP_20-23155.GPJ_AET+CPT+WELL_20181012_JG.GDT 12/15/20



SUBSURFACE BORING LOG

AET No: 20-23155 Log of Boring No. B-18 (p. 1 of 1)
 Project: 2022 and 2023 Infrastructure Improvement Projects; Waconia, MN

DEPTH IN FEET	Surface Elevation <u>1032.1</u> MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS							
							WC	DEN	LL	PL	%-#200			
1	5½" Bituminous pavement	FILL												
	FILL, mostly gravelly silty sand, brown, A-1-b		28	M		15								
2	FILL, mostly gravelly clayey sand, brown, A-2-6													
3			6	M		19	12							
4														
5	FILL, mostly clayey sand, a little gravel, brown, A-6													
6			6	M		8	18							
7	SANDY LEAN CLAY, a little gravel, brown, firm to very stiff, A-6 (CL)	TILL												
8			7	M		20	18							
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
	END OF BORING													

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
0-23'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
		10/7/20	11:30	24.5	23.0	24.3			None
		10/7/20	11:40	24.5	23.0	24.3			None
BORING COMPLETED: 10/7/20									
DR: DS LG: SB Rig: 1C									

AET_CORP 20-23155.GPJ AET+CPT+WELL_20181012_JG.GDT 12/15/20



SUBSURFACE BORING LOG

AET No: 20-23155 Log of Boring No. B-19 (p. 1 of 1)
 Project: 2022 and 2023 Infrastructure Improvement Projects; Waconia, MN

DEPTH IN FEET	Surface Elevation <u>1039.6</u> MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS											
							WC	DEN	LL	PL	%-#200							
1	7 1/4" Bituminous pavement	FILL																
2	FILL, mostly silty sand, a little gravel, brown, A-2-4		19	M		15												
3	FILL, mixture of clayey sand and silty sand with cinders, a little gravel, brown and dark brown. A-2-4 and A-6		11	M		19	15											
4																		
5	SANDY LEAN CLAY, a little gravel, brown to brown with a little gray mottled, stiff, A-6 (CL)	TILL				13	18											
6																		
7																		
8										14	M		20	20				
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		
END OF BORING																		

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
0-23'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
		10/7/20	1:10	24.5	23.0	24.0			None
		10/7/20	1:20	24.5	23.0	24.0			None
BORING COMPLETED: 10/7/20									
DR: DS LG: SB Rig: 1C									

AET_CORP_20-23155.GPJ_AET+CPT+WELL_20181012_JG.GDT 12/15/20



SUBSURFACE BORING LOG

AET No: 20-23155 Log of Boring No. B-20 (p. 1 of 1)
 Project: 2022 and 2023 Infrastructure Improvement Projects; Waconia, MN

DEPTH IN FEET	Surface Elevation <u>1047.1</u> MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	2½" Bituminous pavement	FILL			SU		7				
2	FILL, mixture of clayey sand and silty sand, a little gravel, dark brown, A-2-6	TOPSOIL OR FILL	2	M	SS	6	28				
3	LEAN CLAY with sand, slightly organic, dark grayish brown, A-6 (possible fill) (CL)	TILL	12	M	SS	10	22				
4	SANDY LEAN CLAY, a little gravel, brown, stiff, A-6 (CL)										
5	SANDY LEAN CLAY, a little gravel, brown, a little gray and light brown, stiff, laminations of sandy silt, A-6 (CL)		11	M	SS	20	22				
6											
7											
8	LEAN CLAY, brown, a little gray, stiff, laminations of silt, A-6 (CL)	FINE ALLUVIUM	11	M	SS	24	33				
9	END OF BORING										

DEPTH: 0-7½'	DRILLING METHOD: 3.25" HSA	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
		10/8/20	10:50	9.5	7.5	9.5			None
BORING COMPLETED: 10/8/20									
DR: DS LG: SB Rig: 1C									

AET_CORP_20-23155.GPJ_AET+CPT+WELL_20181012_JG.GDT 12/15/20



SUBSURFACE BORING LOG

AET No: 20-23155 Log of Boring No. B-21 (p. 1 of 1)
 Project: 2022 and 2023 Infrastructure Improvement Projects; Waconia, MN

DEPTH IN FEET	Surface Elevation <u>1043.2</u> MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
1	5" Bituminous pavement	FILL	25	M	SU	17	23					
	FILL, mostly silty sand, a little gravel, brown, A-2-4				SS							
2	FILL, mostly silty sand with gravel, pieces of bituminous, dark brown, A-1-b				SS							
3		TILL	11	M	SS	19	22					
4	SANDY LEAN CLAY, a little gravel, brown, stiff, A-6 (CL)											
5	SANDY LEAN CLAY, a little gravel, brown, a little light brown, stiff, laminations of sandy silt, A-6 (CL)											
6												
7												
8	SANDY LEAN CLAY, a little gravel, brown mottled, very stiff, A-6 (CL)		18	M	SS	18	19					
9												
END OF BORING												

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-7½'	3.25" HSA	10/8/20	9:35	9.5	7.5	9.5		None	
BORING COMPLETED: 10/8/20									
DR: DS LG: SB Rig: 1C									

AET_CORP_20-23155.GPJ_AET+CPT+WELL_20181012_JG.GDT 12/15/20



SUBSURFACE BORING LOG

AET No: 20-23155

Log of Boring No. B-22 (p. 1 of 1)

Project: 2022 and 2023 Infrastructure Improvement Projects; Waconia, MN

DEPTH IN FEET	Surface Elevation <u>1047.8</u> MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS							
							WC	DEN	LL	PL	%-#200			
1	2 1/4" Bituminous pavement	FILL			SU									
1	FILL, mostly silty sand with gravel, brown, A-1-b		15	M	SS	17	26							
2	FILL, mixutre of lean clay, slightly organic, and silty sand, a little gravel, pieces of bituminous, dark brown and black, A-6	FINE ALLUVIUM												
3			17	M	SS	14	30							
4	LEAN CLAY, brown, a little gray, very stiff, A-7-6													
5	SILTY SAND, a little gravel, brown, medium dense, laminations of clayey sand, A-2-4 (SM)	TILL												
6			11	M	SS	20	10							
7	SANDY LEAN CLAY, a little gravel, brown and gray mottled, a little light brown, stiff to very stiff, laminations of sandy silt and silty sand, A-6 (CL)													
8														
9			23	M	SS	22	19							
END OF BORING														

AET_CORP_20-23155.GPJ_AET+CPT+WELL_20181012_JG.GDT 12/15/20

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-7 1/2'	3.25" HSA	10/8/20	10:20	9.5	7.5	9.5		None	
BORING COMPLETED: 10/8/20									
DR: DS LG: SB Rig: 1C									