



Preliminary Engineering Report

2022 Street & Utility Improvements

City of Hopkins

City Project No. 2021-010

BMI Project No. 0T1.124643

Submitted by:

Bolton & Menk, Inc.
12224 Nicollet Avenue
Burnsville, MN 55337
P: 952-890-0509
F: 952-890-8065



BOLTON & MENK

Certification

Preliminary Engineering Report


For

2022 Street & Utility Improvements

City of Hopkins
Hopkins, MN
City Project 2021-010
BMI OT1.124643

September 2021

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

By: 

Nicholas J. Amatuccio, P.E.
License No. 53639

Date: 09/10/21

Table of Contents

I.	Executive Summary	1
A.	Background Information.....	1
B.	Proposed Improvements	1
C.	Estimated Costs & Proposed Funding	2
II.	Project Introduction.....	3
III.	Background	4
IV.	Existing Conditions.....	4
A.	Streets.....	4
B.	Storm Sewer	6
C.	Sanitary Sewer	7
D.	Watermain.....	8
V.	Proposed Improvements	Error! Bookmark not defined.
A.	Streets.....	8
B.	Storm Sewer	13
C.	Sanitary Sewer	14
D.	Watermain.....	16
E.	Pedestrian & Bicycle Facilities	18
F.	Driveways	18
G.	Lawn Sprinkler Systems	18
H.	Street Signing & Striping.....	18
I.	Turf & Landscaping Restoration	18
J.	Boulevard Trees.....	19
VI.	Neighborhood Meetings.....	20
VII.	Estimated Costs	22
VIII.	Special Assessments	23
IX.	Right-Of-Way/Easements/Permits	24
X.	Project Schedule	24
XI.	Feasibility & Recommendation.....	24

Tables

Table ES-1: Preliminary Estimated Cost of 2022 Proposed Improvements	2
Table 1: Summary of Existing Corridor Conditions	6
Table 2: Summary of Geotechnical Evaluation	6
Table 3: Resident Questionnaire Response Summary.....	20
Table 4: Preliminary Estimated Cost of 2022 Proposed Improvements	22

Appendix

Appendix A: Preliminary Cost Estimates

Appendix B: Figures

Appendix C: Preliminary Assessment Roll

Appendix D: Resident Questionnaires & Neighborhood Meetings

Appendix E: Geotechnical Evaluation

I. Executive Summary

A. BACKGROUND INFORMATION

The Hopkins City Council ordered preparation of this Preliminary Engineering Report at its May 18, 2021 meeting. In general, the goal of the project is to preserve the investments Hopkins has made in its infrastructure with proper upkeep through the City's Pavement Management Program. The preliminary design report has been completed to identify the appropriate improvements needed as well as the associated project costs and preliminary estimated assessments.

B. PROPOSED IMPROVEMENTS

This report examines potential street and utility construction along various streets in the City of Hopkins. These areas are depicted in Figure 1 of Appendix B. The proposed improvements are described in the body of this report and are graphically illustrated in Appendix B. In brief, the proposed improvements consist of:

- Full reconstruction of the street section along 7th Ave S, between Mainstreet and 2nd St S, with replacement of concrete curb and gutter and concrete sidewalk, and replacement/rehabilitation of watermain, sanitary sewer, and storm sewer utilities.
- Reclamation and resurfacing of the street section along 6th Ave S, between Mainstreet and 2nd St S, with spot replacement of concrete curb and gutter and concrete sidewalk as needed.
- Mill and overlay of 2nd Ave S from 5th St S to Nine Mile Cove, and 7th St S from 2nd Ave S to TH 169.
- Sanitary sewer lining in areas designated by City Staff as needing repairs.
- Spot sidewalk replacements in a zone of the city designated by City Staff.
- Depending on budget and bid results, maintenance may also occur on the following streets:
 - Reclamation and resurfacing of 10th Ave N, between Mainstreet and 1st St N.
 - Mill and overlay of 1st St N, between 14th Ave N and 10th Ave N.
 - Reclamation and resurfacing of 1st St N, between 10th Ave N and 8th Ave N.

All of these improvements would be constructed in one construction season in 2022. While this report covers several areas of potential improvements, it will focus on 6th Ave S and 7th Ave S as being the central project location and the most impactful to residents, with special assessments involved for 7th Ave S properties.

2022 STREET & UTILITY IMPROVEMENTS

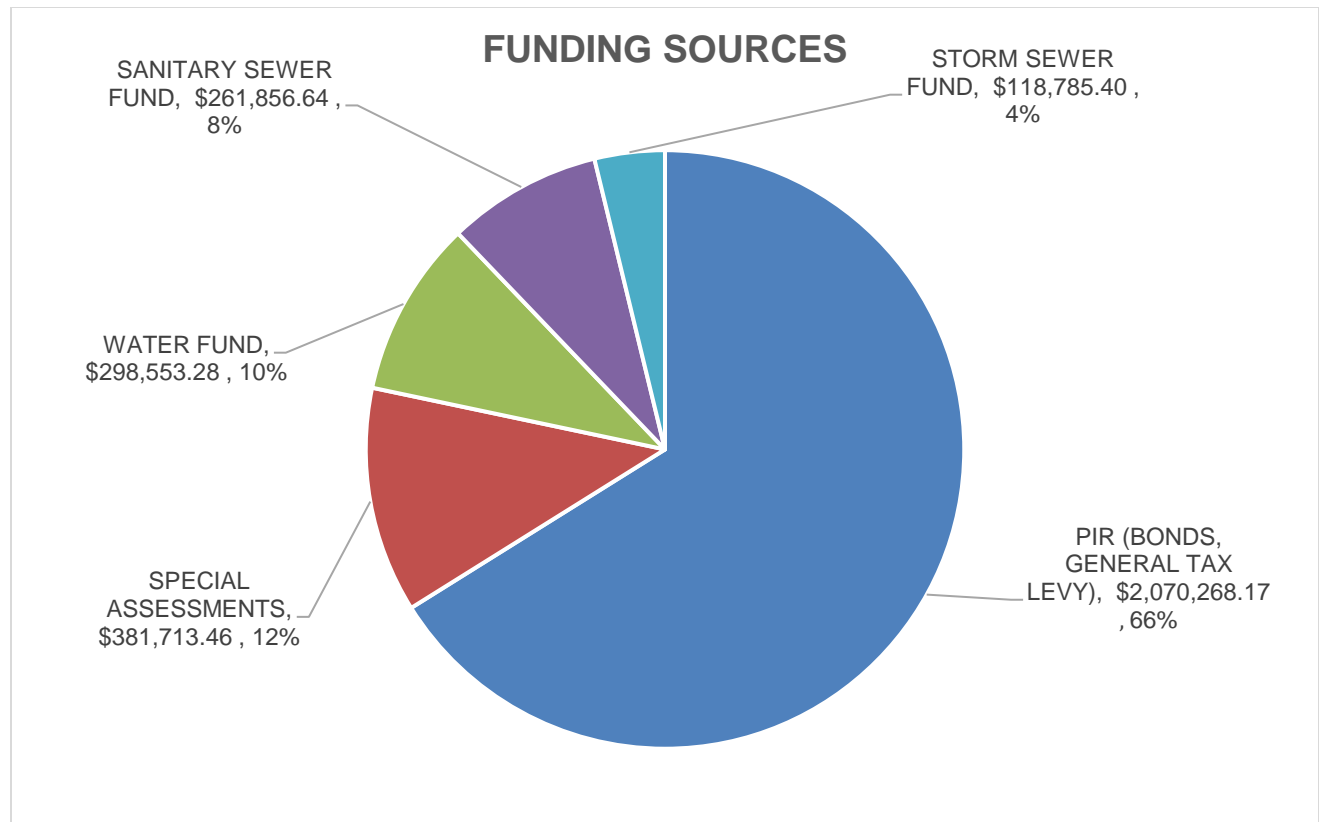
C. ESTIMATED COSTS & PROPOSED FUNDING

Cost estimates have been prepared for addressing the varying needs of all areas reviewed. Detailed cost estimates are provided in Appendix A and summarized below in Table ES-1.

Table ES-1: Preliminary Estimated Cost of 2022 Proposed Improvements	
Street (7 th Ave S)	\$732,000
Street (6 th Ave S)	\$180,000
Sanitary Sewer	\$188,000
Watermain	\$215,000
Storm Sewer	\$85,000
Mill & Overlay (2 nd Ave S)	\$292,000
Miscellaneous (CIPP Sanitary Lining & Spot Concrete)	\$99,000
Contingencies (15%)	\$269,000
Engineering & Administration (21%)	\$433,000
Total Estimated Project Costs	\$2,493,000
Add Alternates Total Est. Proj. Costs (10 th Ave N & 1 st St N)*	\$638,000
Potential Total Estimated Project Costs with Add Alternates*	\$3,131,000

*Add Alternates are areas of the project involving street maintenance that will be bid with the rest of the project, but the City will have the option to either move forward with the work or remove the work from the project depending on budget constraints and bid results. We are anticipating that at least part of the Add Alternate work will be included in the 2022 street improvements.

The project is proposed to be funded with general obligation bonds, utility funds, and assessments to individual properties. The chart below illustrates proposed funding sources inclusive of contingencies, engineering, and administration. \$638,000 of the PIR funds is for the Add Alternates and may not be included as part of the project based on bid results and at the discretion of the City.



II. Project Introduction

This report examines the proposed street and utility improvements including storm sewer replacement, water main replacement, sanitary sewer replacement, and street reconstruction of 7th Street S, between Mainstreet and 2nd St S, as shown on Figure 1 in Appendix B.

This report also examines the following related improvements which are proposed to be constructed in the same project, but without involvement of special assessments:

- Reclamation and resurfacing of the street section along 6th Ave S, between Mainstreet and 2nd St S, with spot replacement of concrete curb and gutter and concrete sidewalk as needed.
- Mill and overlay of 2nd Ave S from 5th St S to Nine Mile Cove, and 7th St S from 2nd Ave S to TH 169.
- Sanitary sewer lining in areas designated by City Staff as needing repairs.
- Spot sidewalk replacements in a zone of the city designated by City Staff.
- Depending on budget and bid results, maintenance may also occur on the following streets:
 - Reclamation and resurfacing of 10th Ave N, between Mainstreet and 1st St N.
 - Mill and overlay of 1st St N, between 14th Ave N and 10th Ave N.
 - Reclamation and resurfacing of 1st St N, between 10th Ave N and 8th Ave N.

The project in its entirety involves:

- Addition/replacement of storm sewer along 7th Ave S as necessary
- Water main replacement on 7th Ave S
- Water service replacement on 7th Ave S
- Sanitary sewer replacement and rehabilitation on 7th Ave S and other areas of need
- Sanitary sewer service replacement on 7th Ave S
- Concrete curb & gutter replacement on 7th Ave S and other areas of need
- Bituminous street removal and reconstruction
- Concrete walk replacement on 7th Ave S and other areas of need

III. Background

The Interlachen Park Street & Utility Improvements project was initiated following its presence for several years in the City's Capital Improvement Plan. The Hopkins City Council ordered the preparation of this feasibility report at its May 18, 2021 council meeting. The feasibility study and report has been completed to better identify the infrastructure improvements needed in the proposed project area and to better define costs associated with the improvements. This report will be used as the basis for final design and is also a required step in the State's Chapter 429 process for special assessments.

IV. Existing Conditions

A. STREETS

The bituminous streets within the project areas are aged and exhibit various levels of wear and distress. This is evident on the surface by transverse, block, and alligator cracking. There is evidence of previous additional street repairs and maintenance throughout the project area including numerous street patches. Examples of the existing pavement conditions are shown on the next page.



Consistent with observations of the existing pavements made during preparation of this report, the City of Hopkins' Pavement Management System also indicates that the "Pavement Condition Index" (PCI) for 7th Ave S is below the threshold where rehabilitation is cost effective. As such, street reconstruction efforts are appropriate along 7th Ave S.

7th Ave S and 6th Ave S have consistent street widths (measured curb face to curb face). Table 1 on the next page summarizes these and other existing conditions. Parking is typically allowed on both sides of the streets along 6th Ave & 7th Ave. Large, mature trees can be found throughout the project within the City's ROW and near the back of curb.

Table 1: Summary of Existing Corridor Conditions			
Roadway	Existing Street Width	Existing Curb Type	Existing ROW Width
7 th Avenue S	35.2 – 35.7 feet	Concrete B618 Curb & Gutter, with some older style curb with either no gutter or an overlaid gutter with bituminous	66 feet
6 th Avenue S	35.2 – 40.0 feet	Concrete B618 Curb & Gutter	66 feet

Subgrade soil sampling was completed throughout 6th Ave S and 7th Ave S by Braun Intertec in the Summer of 2021. A copy of Braun Intertec's Geotechnical Evaluation Report is included in Appendix E of this report. Six soil borings were taken along 6th Ave S and 7th Ave S, as well as 6 pavement cores along 2nd Ave S, and summarized in Table 2 below.

Table 2: Summary of Geotechnical Evaluation		
Street	Bituminous Thickness	Subgrade Material
7 th Avenue S	6" - 8"	Mixture of silty sand with gravel, poorly graded sand with gravel, clayey sand with slight organics, poorly graded sand with silt, and water observed at 12.5' to 18' while drilling.
6 th Avenue S	2" – 6"	Mixture of silty sand with gravel, poorly graded sand with gravel, and water observed at 12.5' to not observed while drilling.
2 nd Avenue S (North of 7 th St S)	4.5" – 8.5"	5.5" – 14" Aggregate Base; Poorly graded sand with silt, silty sand, and clay sand; some medium-severity to high-severity striping in the cores
2 nd Avenue S (South of 7 th St S)	3" – 4"	5" – 10" Aggregate Base; Clayey sand, silty sand, poorly graded sand with silt and gravel; cores in good condition

The soils found just beneath pavements in the project area were most commonly fill soils classified as poorly graded sand, silty sand, or clayey sand. One boring in the project area found traces of organic clay (buried topsoil). Buried topsoil is an undesirable material for roadway construction as it's unable to adequately support heavy vehicles, leading to earlier failure of overlying pavements. Some groundwater was also discovered near the pipe zone on the north end of 7th Ave S, which may require some dewatering efforts while replacing the sanitary sewer.

B. STORM SEWER

The existing storm sewer system materials were inventoried in Summer 2021. The existing storm sewer systems serving the neighborhood are comprised of reinforced concrete pipe (RCP), varying in size from 12-inch diameter to 54-inch diameter. The storm sewer catch basins and manholes are a mixture of concrete block and precast concrete structures.

There are multiple storm sewer systems serving the project area. Most of the project area drains to 2nd St S, over to 6th Ave S, and then crosses Excelsior Blvd to the south. The remaining project area drains to 8th Ave S, over to 1st St S, and south on 13th Ave S to Excelsior Blvd

Drainage issues have been identified throughout the project area through evaluation of site grades and elevations by the project team, through feedback from the neighborhood residents, and discussions with City Staff. These drainage issues can be generalized as:

1. Due to the flat grades of some of the streets and low points without catch basins localized drainage problems are prevalent.
2. There is a lack of gutters from excessive overlays on the north end of 7th Ave S to adequately direct water through areas of flat topography to drainage inlets.

Proposed storm sewer improvements are discussed later in this report.

C. SANITARY SEWER

The existing condition of the sanitary sewer system was evaluated through discussions with City staff and CCTV inspection of the interior of the sewer piping by a City contractor. Manhole structures were visually inspected in the field by Bolton & Menk. CCTV videos produced by others were reviewed by Bolton & Menk to confirm existing sanitary mainline pipe conditions and identify the location of existing sewer service line locations.

The existing sanitary sewer system consists of 8-inch diameter clay pipe on 7th Ave S. There is also 12-inch polyvinyl chloride pipe (PVC) on 6th Ave S. Clay pipe is susceptible to infiltration and root intrusion over time due to the large number of joints and the deterioration of the gasket material originally used to seal the joints.

The project's sanitary manholes are made of a mixture of brick and precast concrete structures. Brick structures were typically built around the early 1950's or earlier, whereas precast structures indicate these structures were replaced at some point after initial construction of the other infrastructure, likely in response to some deficiency with the original structure. Brick manholes are susceptible to infiltration over time due to cracks and deterioration of the mortared joints. Precast concrete manholes continue to be used in modern construction and are generally acceptable provided proper gaskets were provided with the initial construction and remain in good working order.

Service lines in the neighborhood are typically 4-inch or 6-inch and their material may be clay, cast iron, orangeburg, transite, or PVC. Clay and orangeburg sanitary sewer pipes are highly susceptible to infiltration by groundwater, causing groundwater to be treated by the Met Council at its treatment facilities downstream at a cost to the public. The vast majority of sanitary sewer mains and service lines on 7th Ave S are made of clay material. Based on observations of sewer service replacements to individual properties performed recently in nearby neighborhoods, potential exists for encountering orangeburg sewer service pipes during construction of the project. Orangeburg pipe, which can generally be described as layered tar paper wrapped in a round manner to create a pipe, was commonly installed around the time several neighborhoods in Hopkins originally developed. Orangeburg pipe is widely known to 'rot' where exposed to water, generally on the bottom of the pipe, and ultimately collapse as it ages and is unable to support the surrounding soil.

Proposed sanitary sewer improvements are discussed later in this report.

D. WATERMAIN

The existing layout and condition of the water main was determined from record drawings and discussions with City staff. The water main is 6-inch cast iron pipe (CIP) on 7th Ave S, and 6-inch ductile iron pipe (DIP) on 6th Ave S. CIP is a common watermain material, however upon reaching its useful life tends to fail. Because it is so brittle, as the soils around the pipe move slowly over decades, CIP cannot support shearing forces and ultimately breaks. These portions of the watermain system was installed in the 1950s and 1960s. CIP installed around this time period was also occasionally installed with lead-packed fittings. DIP is a much more durable pipe that is installed with projects today.

Service lines for single family homes in the project area are typically ¾-inch or 1-inch and their material may be copper, galvanized steel, or lead. The multi-family and commercial properties in the neighborhood have services of various sizes. Not all are known but may range from 1-inch to 8-inch diameter depending on the size of the property.

Proposed watermain improvements are discussed later in this report.

V. Proposed Improvements

A. STREETS

7th Ave S has reached a point where maintenance procedures such as seal coating or milling and overlaying are no longer cost-effective strategies. 7th Ave S is scheduled for full reconstruction. 6th Ave S has also reached a point where typical maintenance procedures are no longer cost-effective strategies, but it's also not in need of full reconstruction due to the curbs and underlying soils being in generally good shape. The underlying utilities on 6th Ave S are also in good condition which won't require excavation of the roadway to replace. Therefore, 6th Ave S is scheduled for full depth reclamation which will grind up the existing pavement into a base material for new bituminous pavement to be installed.

Proposed reconstruction improvements include replacement of concrete curb and gutter and replacement of the full depth of the pavement section with underlying aggregate base on 7th Ave S. Concrete curb and gutter will be replaced per City Policy 8.02. with B618 concrete curb and gutter, which will help extend the life of the pavement by keeping water out of the subgrade and will provide a solid edge for the asphalt pavement. Existing drainage patterns will be maintained and the elevation of the existing roadways at the curb is proposed to approximate the existing elevations. Attempts at lowering the road will be made (during final design) where appropriate to improve drainage toward the street where beneficial and practical.

Proposed street widths from face of curb to face of curb will generally remain the same throughout the project area. Proposed street widths have been determined based on a variety of factors, including the need for a consistent street width along each roadway's length, the existing roadway width, the existing right of way width, minimizing creation of additional impervious area, and avoidance of significant impacts due to even minor changes in street width. Attempts to avoid impacts to significant trees was a significant consideration during the preliminary design process used to determine proposed street widths.

The following specific improvements are proposed for each unique roadway corridor:

- 7th Ave S is proposed to be reconstructed, including the replacement of concrete curb and gutter, at 35 feet wide from curb face to face. This will narrow the road by

approximately 0.2 – 0.7 feet. Parking regulations will remain consistent with existing conditions throughout this area.

- 6th Ave S is proposed to be reclaimed, including spot replacement of concrete curb and gutter as needed, maintaining the existing roadway alignment and width at approximately 35 – 36 feet wide from curb face to face. The road also widens out to about 40 feet from curb face to curb face near Mainstreet, which is proposed to remain in place. Parking regulations will remain consistent with existing conditions throughout this area.

The minimum proposed street grade on 7th Ave S is 0.50% consistent with City standards. Street grades flatter than 0.50% are undesirable for drainage. In some areas of 7th Ave S, new low-points with adequate storm sewer will need to be created to increase roadway longitudinal slope for proper drainage. These locations will be confirmed during the final design process. Overall drainage patterns/directions throughout the project area are not proposed to change.

The preliminary proposed typical pavement section for 7th Ave S consists of 2” wearing course, 2” non-wear course, 8” aggregate base class 5, 12” select granular, and spot subgrade soil corrections. The preliminary proposed pavement section for 6th Ave S consists of 2” wearing course, 2” non-wearing course, 8” reclaimed material (blend of existing bituminous and aggregate base), and spot subgrade soil corrections.

2nd Ave S, between Nine Mile Cove and 5th St S, is proposed to be milled and overlaid with new bituminous pavement. The City typically has a mill and overlay project each year that is separate from the street and utility project, but the mill and overlay will be included in this year’s project because of the smaller size and somewhat close vicinity. 7th St S, from 2nd St S to TH 169 will also be part of the mill and overlay. 7th St S and 2nd St S, north of 7th St S, is proposed to be milled at a depth of 2” and paved with 2” of bituminous wearing course. 2nd St S, south of 7th St S, is proposed to be milled at a depth of 1.5” and paved with 1.5” of bituminous wearing course.

Other streets in Downtown Hopkins may be included in the project for maintenance if the budget allows and the bids from contractors are favorable. These streets are proposed to be included as add alternates to the project bid and can either be included in the contract or deleted from the contract per the discretion of City Staff and the project budget. These add alternates include the following proposed improvements:

- Reclamation and resurfacing of 10th Ave N, between Mainstreet and 1st St N.
 - 2” wearing course, 2” non-wearing course, 8” reclaimed material
- Mill and overlay of 1st St N, between 14th Ave N and 10th Ave N.
 - 2” mill and 2” wearing course
- Reclamation and resurfacing of 1st St N, between 10th Ave N and 8th Ave N.
 - 2” wearing course, 3” non-wearing course, 7” reclaimed material

B. STORM SEWER

All the storm sewer on 7th Ave S will be reconstructed for constructability of other utilities, changing curb alignment, and to replace deteriorating structures. Storm sewer will generally be replaced in the same location as the existing system, other than possibly some additional

catch basin inlets if it's determined that they are needed during final design. Through a preliminary analysis of the storm sewer system, it was determined that the system on 7th Ave S is adequate for pipe capacity in a 10-year storm event, so there will be no need to upsize the pipes.

The storm sewer on 6th Ave S will remain in place due to it being installed on more recent trunk storm sewer project where 54" concrete pipe was installed with new manholes and catch basin limits. A preliminary analysis was also performed on this system which was determined to be adequate for a 10-year storm event. There is also no proposed replacement of other utilities on 6th Ave S, so the storm sewer would not need to be replaced for any constructability reasons either.

C. SANITARY SEWER

As summarized in the existing conditions section of this report discussing sanitary sewer, the existing system on 7th Ave S is relatively old, made of an outdated (clay) material, and in poor condition. Given these conditions, the opportunity to excavate to this utility given removal of overlying roadway pavement for street reconstruction, and the City of Hopkins policy to replace clay sewers during street projects, the existing 8" Clay gravity sanitary sewer system on 7th Ave S is proposed to be replaced with 8" PVC pipe for most of the block. The north and south ends are proposed to be lined with new Cured-In-Place-Pipe (CIPP) material to avoid excavating the intersections of 2nd St S and Mainstreet. The system on 6th Ave S will not be replaced because the sanitary sewer on that block is relatively new with 12" PVC pipe.

Where gravity mains are to be replaced, new service wyes will be provided to each home. Per City policy, sanitary services which are not PVC are proposed to be replaced with PVC pipe to the right-of-way (ROW) line. New precast concrete manholes will be installed and will incorporate the City standard 27-inch diameter cover utilizing concealed pick-holes to minimize inflow and infiltration.

D. WATERMAIN

The existing 6" cast iron pipe (CIP) watermain on 7th Ave S is proposed to be replaced with new ductile iron pipe (DIP) as a part of this project. Watermain on 6th Ave S will not be replaced because the pipe on that block is relatively new with 6" DIP. An 8-inch ductile iron pipe is proposed on 7th Ave S to most cost effectively achieve adequate fire flows and water distribution.

Per City policy all water service lines to single family homes are proposed to be replaced, where watermain are to be replaced, to the right-of-way with a new 1-inch diameter copper service line. A new curb stop valve and box will be provided on each service, approximately on the right-of-way line. Multi-family residential properties and commercial properties will receive a new 6" service line or a service line matching their existing service diameter, whichever is greater.

E. PEDESTRIAN & BICYCLE FACILITIES

Replacement of the existing concrete sidewalk is proposed on both sides of 7th Ave S. This will be necessary due to the street and utility construction and because the existing sidewalk is in poor condition. The sidewalks are proposed to be constructed at 6 feet width. The proposed turf boulevard width will vary but will be somewhat consistent with the existing boulevard width. The preliminary proposed typical sidewalk section consists of 4" concrete, 4" aggregate base class 5, and spot subgrade soil corrections. Spot sidewalk replacements is

also proposed on 6th Ave S as determined by the engineer in the field for areas with poor drainage, cracked sidewalk, or settled sidewalk which could become a tripping hazard.

F. DRIVEWAYS

All single-family residential driveways on 7th Ave S receiving new concrete curb and gutter, will receive a new 5-foot-wide concrete apron adjacent to the concrete curb. The new concrete aprons will be constructed accordance with City standards in terms of depth and shape. In addition to the 5-foot driveway apron, additional driveway pavement disturbed as a part of the project will be replaced in-kind to match the existing driveway with the street improvements.

Non-residential and multi-family residential properties will receive the City's standard concrete commercial driveway entrance apron. Alley entrances will also be replaced with the City's standard concrete alley entrance.

G. LAWN SPRINKLER SYSTEMS

There may be existing sprinkler systems encountered in construction of the project. Adjacent property owners will need to assist in locating and identifying the type of sprinkler systems that are in place prior to and during construction, if these facilities are to be protected. The contractor will be required to make efforts to preserve the in-place systems during construction. Where this is found to be unfeasible, the contractor will be required to remove and replace or salvage and reinstall the existing sprinkler system.

H. STREET SIGNING & STRIPING

The existing street name signs will be replaced by the contractor to update the signs to the new City standards. Regulatory signs such as stop and parking enforcement signs will be replaced to conform to retroreflectivity requirements. Existing crosswalk blocks will be repainted upon completion of the paving at the intersections on 7th Ave S. Striping will also occur as necessary along the mill and overlay and reclaim project areas.

I. TURF & LANDSCAPING RESTORATION

Boulevards will be graded as necessary to facilitate drainage from the existing yards to the street on 7th Ave S. Turf areas disturbed by construction, either due to boulevard grading or utility service construction, will be graded to match the new street grades and restored with sod in residential yards. In other areas that are not irrigated, the boulevard will be restored with seed and mulch (hydroseed).

Landscaping within the project area will be protected where feasible. Landscaping that is within the right-of-way and/or cannot be protected will either be salvaged and reinstalled by the contractor or will be the owner's responsibility. Items including, but not limited to walls, fences, and pavers, will be salvaged and reinstalled by the contractor. The engineer will coordinate with individual homeowners on landscape impacts to items including, but not limited to plantings, decorative rock, and decorative pavers for removal and relocation by the homeowner.

J. BOULEVARD TREES

As with all projects being considered by the City of Hopkins, it is a goal of this project to protect healthy boulevard trees and/or make improvements to the urban tree canopy where feasible. Residents echoed the desire to protect healthy trees in questionnaire responses. Design and construction of improvements, including appropriate selection of street widths and utility main placement, are proposed to be completed in a manner to achieve the City's

goals to save healthy trees. An evaluation of boulevard tree species and condition was completed in consideration of the adjacent street and utility improvements to facilitate design and construction and meet these criteria.

Due to their susceptibility to the emerald ash borer, green ash trees are generally considered undesirable trees. Similarly, silver maple trees are more susceptible to storm damage than other species, create more litter because of their soft wood and weak, brittle branches, and thus are not desirable trees to Public Works staff and local residents. Silver maples are also known to have an intrusive root system that can damage sidewalks and curbs and penetrate sewer joints. Finally, American Elm are still susceptible to Dutch Elm disease. These three undesirable species, as well as other trees that are either dead or in poor health, should either be removed or otherwise not protected through the design/construction process.

An inventory of the trees located in the right of way was performed in July 2021 by City public works staff. Consistent with all City of Hopkins annual street and utility improvement projects, trees that are dead or in very poor condition, and “undesirable” species in fair or poor condition, are proposed to be removed and replaced. Approximately 8 boulevard trees within the project area are considered undesirable due to condition/species. Proposed tree removals are shown in the figures within Appendix B. Those tree removals identified due to conflicts with utilities or street grading will be further evaluated during final design to see if reasonable measures can be taken to preserve them. Options to preserve highly desirable trees in harm’s way include small retaining walls or moving service lines around trees but is not always feasible.

This project provides an opportunity to increase the health of the neighborhood forest by replacing some of the undesirable species with trees better suited for boulevard areas. One tree is proposed to be installed per each tree removed, and additional trees are proposed to be installed in locations where there is currently no trees nearby. New 2-inch balled and burlapped trees are typically planted in replacement of those removed. The City will communicate with the property owners to replace trees as part of the project in the event tree removal is necessary. A list of species to be planted will be formulated during final design in cooperation with the City’s Public Works department. Properties located adjacent to boulevard tree removals will be contacted and allowed to provide input on their desire for a particular tree species to be planted based on the list provided.

VI. Neighborhood Meetings

A neighborhood meeting occurred on September 8, 2021 with residents and property owners that are affected by the improvements. The City Engineer, Assistant City Engineer, and Bolton & Menk, Inc. representatives presented the scope of the project with a discussion of existing and proposed street and utility conditions, preliminary assessment policies, other City policies, and project schedule. Additional information on the neighborhood meeting is documented in Appendix D of this report. There was only one property owner/resident who participated in the event live but the presentation was also broadcasted and recorded over Zoom, and the presentation will be available on the project website for residents to view. A second neighborhood meeting will be scheduled for the week of October 11, 2021 to review preliminary special assessments and again review proposed improvements.

Residents within the project area were also mailed questionnaires in May 2021 shown in Appendix D. The questionnaire focused on drainage issues, utilities, pedestrian facilities, landscaping, and other concerns the residents may have. 9 questionnaires were returned with comments. This might seem like a low number, but it is fairly common to see this amount of

responses in a smaller neighborhood, especially when the majority of the neighborhood is comprised of rental properties. The most common questionnaire responses related to:

1. Specific drainage problems on 7th Ave S
2. Desire to replace sidewalk on 7th Ave S
3. Pavement is in poor condition on 6th Ave S and 7th Ave S
4. Protect existing trees throughout the neighborhood

A summary of the responses to the resident questionnaire are provided in Table 3 below.

Table 3: Resident Questionnaire Response Summary				
	Yes	No	No Comment	Total # of Responses
Drainage Issue	2	6	1	9
Sanitary Issue	2	6	1	9
Water Issue	0	9	0	9
Pedestrian Facility Issue	5	2	2	9
Irrigation	1	2	6	9
Invisible Fence	0	2	7	9
Tree Concerns	2	5	2	9
Landscaping Concerns	1	6	2	9

VII. Estimated Costs

Estimated construction costs presented in this report include a 15 percent contingency factor. Overhead costs, estimated at 21 percent, include legal, engineering, administrative and fiscal costs. Final costs and assessments will be determined by using low-bid construction costs of the proposed work.

Proposed construction costs for the Interlachen Park Street & Utility Improvements (including curb and gutter, bituminous street, pedestrian facilities, storm sewer, sanitary sewer, water main, and turf restoration) are itemized in Appendix A and are summarized in Table 4 on the next page.

These cost estimates are based upon public construction cost information. Because the consultant has no control over the cost of labor, materials, competitive bidding process, weather conditions and other factors affecting the cost of construction, all cost estimates are opinions for general information of the client and no warranty or guarantee as to the accuracy of construction cost

2022 STREET & UTILITY IMPROVEMENTS

estimates is made. It is recommended that costs for project financing should be based upon actual, competitive bid prices with reasonable contingencies.

Table 4: Preliminary Estimated Cost of 2020 & 2021 Proposed Improvements	
Street (7 th Ave S)	\$732,000
Street (6 th Ave S)	\$180,000
Sanitary Sewer	\$188,000
Watermain	\$215,000
Storm Sewer	\$85,000
Mill & Overlay (2 nd Ave S)	\$292,000
Miscellaneous (CIPP Sanitary Lining & Spot Concrete)	\$99,000
Contingencies (15%)	\$269,000
Engineering & Administration (21%)	\$433,000
Total Estimated Project Costs	\$2,493,000
Add Alternates Total Est. Proj. Costs (10 th Ave N & 1 st St N)*	\$638,000
Potential Total Estimated Project Costs with Add Alternates*	\$3,131,000

*Add Alternates are areas of the project involving street maintenance that will be bid with the rest of the project, but the City will have the option to either move forward with the work or remove the work from the project depending on budget constraints and bid results. We are anticipating that at least part of the Add Alternate work will be included in the 2022 street improvements.

VIII. Special Assessments

Street improvements along 7th Ave S will be assessed to adjacent and benefitting properties according to the City of Hopkins' assessment policy. Street improvement work includes pavement removals, grading, subgrade correction, aggregate base, curbing, driveways, sidewalks, and pavements construction, and restoration. Properties along 6th Ave S and other maintenance areas of the project will not be assessed because the City does not assess for maintenance projects (reclaim and mill & overlay projects).

According to the City's assessment policy, residential street improvement costs are assessed to the benefitting properties. In summary, assessments to benefitting properties are determined based on the following criteria:

- Properties are assessed based on 70% of the actual street improvement costs. This is referred to as a **"Street Assessment"**.

2022 STREET & UTILITY IMPROVEMENTS

- Street improvements are typically assessed to properties with direct frontage based on a front foot basis (length) along the Street.
- For this project, 7th Ave S has properties with direct frontage.
- **“Street Assessments”** to any individual property are capped at front foot rate increase annually by 3% over the prior year’s amount. An assessment cap for residential properties of \$100.05 per front foot has been established by adding 3% to the 2021 assessment cap according to City policy.
- The assessment cap is applied to residential properties in the project area and is not applicable to properties which received a benefit appraisal in preparation of the assessment roll. For properties receiving a benefit appraisal, the lesser of the ‘per policy’ calculation and the benefit amount per the appraisal was used.
- Utility (sanitary sewer, storm sewer, water) main improvements are 100% paid by the respective utility funds. No assessment for utility mains is proposed and their costs do not contribute to either the **“Street Assessments”** or **“Utility Assessments”**.
- Utility service lines are owned by the individual property per City Code. As a result, the City assesses for the cost of the individual service line replacements. This is referred to as a **“Utility Assessment”**. The City participates in a share of these costs because the replacement is mandatory where mains are reconstructed, and therefore properties are assessed for only 50% of the cost of the service replacement. This cost share does not apply to commercial properties or apartment buildings that have larger services of varying sizes.
- The estimated cost of the water service replacement from the main to property line is \$3,150. With the proposed 50/50 **“Utility Assessment”** split, \$1,575 will be assessed to each property where water services are replaced. The estimated cost of the sewer service replacement from the main to the property line is \$2,850. With the proposed 50/50 **“Utility Assessment”** split, \$1,425 will be assessed to each property where sewer services are replaced. Thus, a residential property proposed to receive both a new water service and sewer service would have a proposed **“Utility Assessment”** of \$3,000.

In the case that sanitary sewer services are made of Orangeburg, or are in disrepair, replacement or lining of the entire line will also be required from the property line to the house. On past projects, the property owner has been given one year to affect the necessary repairs and the City will provide the option to use the City’s Contractor to perform this work and be fully assessed to the property owner.

A preliminary assessment roll is included in Appendix C of this report. Total estimated assessments are \$381,713.46.

IX. Right-Of-Way/Easements/Permits

The majority of the proposed improvements will be limited to the existing street ROW along all corridors. Temporary construction easements may be needed for work outside the street ROW such as driveway apron replacement, grading and turf restoration.

2022 STREET & UTILITY IMPROVEMENTS

Permits will be required from the Minnesota Pollution Control Agency for grading (National Pollutant Discharge Elimination System permit), Minnesota Department of Health for Water Main Replacement, and the Nine Mile Creek Watershed District.

X. Project Schedule

If this Preliminary Engineering Report is accepted by the City Council, the following schedule is proposed:

Order Public Improvement Hearing.....	September 21, 2021
Neighborhood Meeting 2	October 11-14, 2021 (Date TBD)
Conduct Improvement Hearing, Order Final Plans & Specifications.....	October 19, 2021
Final Design.....	October 20 – December 21, 2021
Present Final Plans / Authorize Ad for Bids	December 21, 2021
Open Bids	January 21, 2022
Accept Bids / Order Public Assessment Hearing.....	February 1, 2022
Neighborhood Meeting 3	February 21-24, 2022 (Date TBD)
Conduct Assessment Hearing / Adopt Assessment Roll / Award Project	March 1, 2022
Construction.....	May 2022 – October 2022

XI. Feasibility & Recommendation

From an engineering standpoint, this project is feasible, cost effective, and necessary and can best be accomplished by letting competitive bids for the work. It is recommended that the work be done under one contract, for all project areas, in order to complete the work in an orderly and efficient manner. The City, its financial consultant, and the persons assessed will have to determine the economic feasibility of the proposed improvements.

Appendix A: Preliminary Cost Estimates

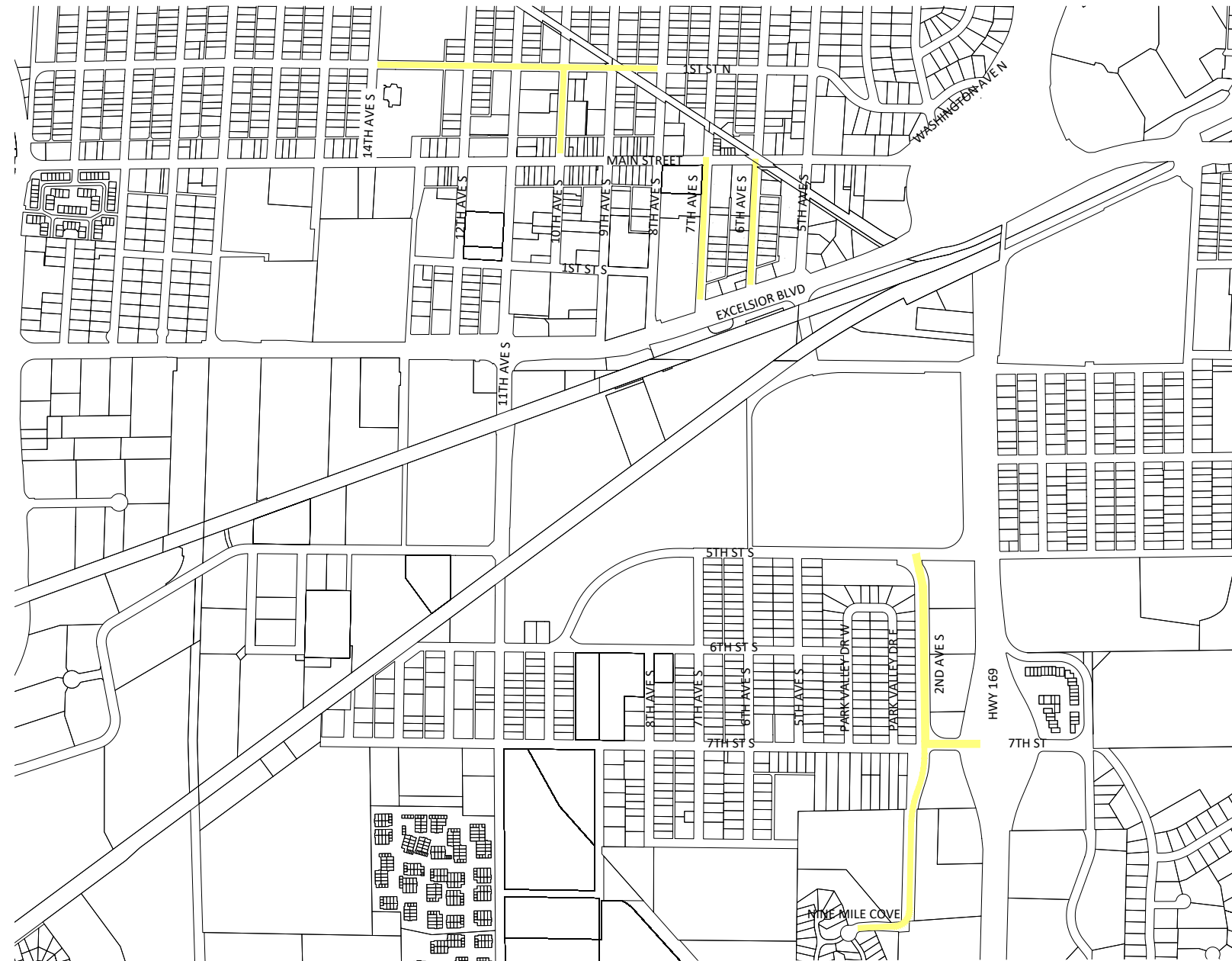
2022 STREET & UTILITY IMPROVEMENTS
CITY OF HOPKINS, MN
CITY PROJECT NO. 2021-010
BMI PROJECT NO. 0T1.124643




ITEM NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITIES											ESTIMATED COSTS											TOTAL QUANTITY	TOTAL COST		
				1ST AVE		2ND AVE MILL & OVERLAY	6TH AVE S	7TH AVE S				10TH AVE RECLAIM	SPOT CIPP LINING	SPOT CONCRETE		1ST AVE		2ND AVE MILL & OVERLAY	6TH AVE S	7TH AVE S				10TH AVE RECLAIM	SPOT CIPP LINING			SPOT CONCRETE	
				8TH THRU 10TH RECLAIM	10TH THRU 14TH MILL			STREET	SANITARY	STORM	WATER					8TH THRU 10TH RECLAIM	10TH THRU 14TH MILL			STREET	SANITARY	STORM	WATER						
1	MOBILIZATION	LUMP SUM	\$125,000.00	0.05	0.05	0.1	0.15	0.25	0.15	0.05	0.15	0.05				\$6,250.00	\$6,250.00	\$12,500.00	\$18,750.00	\$31,250.00	\$18,750.00	\$6,250.00	\$18,750.00	\$6,250.00				1	\$125,000.00
2	CLEARING	TREE	\$500.00				5	4											\$2,500.00	\$2,000.00							9	\$4,500.00	
3	GRUBBING	TREE	\$500.00				5	5											\$2,500.00	\$2,500.00							10	\$5,000.00	
4	DECIDUOUS TREE 2" CAL B&B	EACH	\$600.00				10	20											\$6,000.00	\$12,000.00							30	\$18,000.00	
5	REMOVE SIGN POST	EACH	\$100.00					3												\$300.00							3	\$300.00	
6	REMOVE SIGN PANEL	EACH	\$50.00					9												\$450.00							9	\$450.00	
7	REMOVE CURB AND GUTTER	LIN FT	\$6.00	213	340	642	325	1836				292			\$1,278.00	\$2,040.00	\$3,852.00	\$1,950.00	\$11,016.00				\$1,752.00				3648	\$21,888.00	
8	REMOVE BITUMINOUS PAVEMENT	SQ YD	\$8.00					20											\$160.00							20	\$160.00		
9	REMOVE CONCRETE WALK	SQ FT	\$1.00	2700	3168		1924	11700				1200		5400	\$2,700.00	\$3,168.00		\$1,924.00	\$11,700.00				\$1,200.00			\$5,400.00	26092	\$26,092.00	
10	REMOVE CONCRETE DRIVEWAY PAVEMENT	SQ YD	\$10.00					498											\$4,980.00							498	\$4,980.00		
11	REMOVE PAVERS	SQ FT	\$3.00									450											\$1,350.00			450	\$1,350.00		
12	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LIN FT	\$6.00	50	50		649	230				45			\$300.00	\$300.00		\$3,894.00	\$1,380.00				\$270.00			1024	\$6,144.00		
13	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	\$4.00	100	195	157	70	217				90			\$400.00	\$780.00	\$628.00	\$280.00	\$868.00				\$360.00			829	\$3,316.00		
14	SALVAGE & REINSTALL STONE RETAINING WALL	LIN FT	\$300.00					30											\$9,000.00							30	\$9,000.00		
15	SALVAGE & REINSTALL BLOCK RETAINING WALL	LIN FT	\$100.00					10											\$1,000.00							10	\$1,000.00		
16	REMOVE HYDRANT	EACH	\$500.00								1											\$500.00				1	\$500.00		
17	REMOVE WATERMAIN	LIN FT	\$10.00																			\$9,570.00				957	\$9,570.00		
18	REMOVE DRAINAGE STRUCTURE (STORM)	EACH	\$500.00							6	957															6	\$3,000.00		
19	REMOVE STORM SEWER PIPE	LIN FT	\$15.00							292											\$3,000.00					292	\$4,380.00		
20	REMOVE SANITARY SEWER PIPE	LIN FT	\$8.00								856										\$6,848.00					856	\$6,848.00		
21	REMOVE SANITARY MANHOLE	EACH	\$600.00							2										\$1,200.00						2	\$1,200.00		
22	COMMON EXCAVATION	CU YD	\$30.00					3000											\$90,000.00							3000	\$90,000.00		
23	SUBGRADE EXCAVATION	CU YD	\$30.00	246			248	568				97			\$7,380.00			\$7,440.00	\$17,040.00				\$2,910.00			1159	\$34,770.00		
24	RECLAIM BITUMINOUS SURFACE (IN PLACE)	SQ YD	\$3.00	2941			2972					2900			\$8,823.00			\$8,916.00					\$8,700.00			8813	\$26,439.00		
25	RECLAIM BITUMINOUS SURFACE (LOAD & STOCKPILE)	SQ YD	\$2.50					3429											\$8,572.50							3429	\$8,572.50		
26	SUBGRADE PREPARATION	SQ YD	\$2.50	2941			2972					2900			\$7,352.50			\$7,430.00					\$7,250.00			8813	\$22,032.50		
27	GEOTEXTILE FABRIC TYPE V	SQ YD	\$3.00					3886											\$11,658.00							3886	\$11,658.00		
28	STABILIZING AGGREGATE	CU YD	\$50.00					568											\$28,400.00							568	\$28,400.00		
29	SELECT GRANULAR BORROW (CV)	TON	\$15.00					2362											\$35,430.00							2362	\$35,430.00		
30	CLASS 5 AGGREGATE BASE	TON	\$20.00	449			452	1582				177			\$8,980.00			\$9,040.00	\$31,640.00				\$3,540.00			2660	\$53,200.00		
31	CLASS 2 AGGREGATE SURFACING (GRAVEL DRIVEWAY)	TON	\$100.00					2											\$200.00							2	\$200.00		
32	BITUMINOUS WEARING COURSE (SPWEA240C)	TON	\$82.00	356	497	1410	360	415				351			\$29,192.00	\$40,754.00	\$115,620.00	\$29,520.00	\$34,030.00				\$28,782.00			3389	\$277,898.00		
33	BITUMINOUS -NON-WEARING COURSE (SPNWB230C)	TON	\$75.00	534			360	415				351			\$40,050.00			\$27,000.00	\$31,125.00				\$26,325.00			1660	\$124,500.00		
34	BITUMINOUS MATERIAL FOR TACK COAT	GAL	\$5.00	147	329	1005	149	171				145			\$735.00	\$1,645.00	\$5,025.00	\$745.00	\$855.00				\$725.00			1946	\$9,730.00		
35	2" BITUMINOUS STREET PATCH	SQ YD	\$30.00		1180	3000																				4180	\$125,400.00		
36	MILL BITUMINOUS SURFACE (1.5")	SQ YD	\$2.00			3708										\$35,400.00	\$90,000.00		\$7,416.00						3708	\$7,416.00			
37	MILL BITUMINOUS SURFACE (2")	SQ YD	\$2.00		4109	8855										\$8,218.00	\$17,710.00								12964	\$25,928.00			
38	3" BITUMINOUS DRIVEWAY	SQ YD	\$40.00					4											\$160.00							4	\$160.00		
39	JOINT ADHESIVE (MASTIC)	LIN FT	\$1.00	1251	2517	6420	1623	1836				1326			\$1,251.00	\$2,517.00	\$6,420.00	\$1,623.00	\$1,836.00				\$1,326.00			14973	\$14,973.00		
40	DEWATERING	LUMP SUM	\$50,000.00					1											\$50,000.00							1	\$50,000.00		
41	15" RC PIPE	EACH	\$65.00								339											\$22,035.00				339	\$22,035.00		
42	STORM MANHOLE	EACH	\$3,000.00							5																5	\$15,000.00		
43	STORM CATCH BASIN	EACH	\$2,000.00							5													\$10,000.00			5	\$10,000.00		
44	INSTALL CASTING (R-3067)(STORM)	EACH	\$750.00							6													\$4,500.00			6	\$4,500.00		
45	INSTALL CASTING (R-1733)(STORM)	EACH	\$1,000.00							6													\$6,000.00			6	\$6,000.00		
46	ADJUST FRAM & RING CASTINGS (STORM)	EACH	\$750.00	1			3					2			\$750.00			\$2,250.00				\$1,500.00			6	\$4,500.00			
47	CONNECT TO EXISTING STORM PIPE	EACH	\$1,500.00							5												\$7,500.00			5	\$7,500.00			
48	CONNECT TO EXISTING STORM STRUCTURE	EACH	\$2,000.00							2												\$4,000.00			2	\$4,000.00			
49	8" PVC SDR 35 SANITARY SEWER PIPE	LIN FT	\$65.00							856									\$55,640.00							856	\$55,640.00		
50	COARSE AGGREGATE BEDDING (TYPE B)	LIN FT	\$30.00							400									\$12,000.00							400	\$12,000.00		
51	8" CIPP LINING	LIN FT	\$35.00							147			1425						\$5,145.00				\$49,875.00			1572	\$55,020.00		
52	6" PVC SDR 26 SANITARY SEWER SERVICE PIPE	LIN FT	\$50.00							728									\$36,400.00							728	\$36,400.00		
53	8" X 6" SDR 26 PVC SERVICE WYE	EACH	\$600.00					22											\$13,200.00							22	\$13,200.00		
54	INSTALL CASTING (R-1733)(SANITARY)	EACH	\$1,200.00	1			1	4				2			\$1,200.00			\$1,200.00				\$2,400.00			8	\$9,600.00			
55	SANITARY MANHOLE	LIN FT	\$400.00					40											\$16,000.00							40	\$16,000.00		
56	RECONNECT SANITARY SEWER SERVICE	EACH	\$600.00					22											\$13,200.00							22	\$13,200.00		
57	CONNECT TO EXISTING SANITARY SEWER PIPE	EACH	\$2,500.00					2											\$5,000.00							2	\$5,000.00		
58	HYDRANT	EACH	\$6,000.00									1										\$6,000.00				1	\$6,000.00		
59	DUCTILE IRON FITTINGS	POUND	\$10.00								198											\$1,980.00				198	\$1,980.00		
60	6" GATE VALVE & BOX	EACH	\$2,000.00							7												\$14,000.00				7	\$14,000.00		
61	8" GATE VALVE & BOX	EACH	\$2,500.00							3												\$7,500.00				3	\$7,500.00		
62	6" DIP WATERMAIN	EACH	\$60.00							152												\$9,120.00				152	\$9,120.00		
63	8" DIP WATERMAIN	EACH	\$65.00							949									\$61,685.00							949	\$61,685.00		
64	1" TYPE K COPPER SERVICE PIPE	LIN FT	\$50.00							168												\$8,400.00				168	\$8,400.00		
65	1" CURBSTOP & BOX	EACH	\$500.00					7											\$3,500.00							7	\$3,500.00		
66	1" CORPORATION STOP	EACH	\$500.00					7														\$3,500.00				7	\$3,500.00		
67	RECONNECT WATER SERVICE	EACH	\$500.00					7														\$3,500.00				7	\$3,500.00		
68	CONNECT TO EXISTING WATERMAIN	EACH	\$2,000.00					6														\$12,000.00				6	\$12,000.00		
69	TEMPORARY WATER SERVICE	EACH	\$650.00																										

ITEM NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITIES										ESTIMATED COSTS										TOTAL QUANTITY	TOTAL COST		
				1ST AVE		2ND AVE MILL & OVERLAY	6TH AVE S	7TH AVE S				10TH AVE RECLAIM	SPOT CIPP LINING	SPOT CONCRETE	1ST AVE		2ND AVE MILL & OVERLAY	6TH AVE S	7TH AVE S				10TH AVE RECLAIM			SPOT CIPP LINING	SPOT CONCRETE
				8TH THRU 10TH RECLAIM	10TH THRU 14TH MILL			STREET	SANITARY	STORM	WATER				8TH THRU 10TH RECLAIM	10TH THRU 14TH MILL			STREET	SANITARY	STORM	WATER					
93	4" SOLID WHITE - MULTI COMPONENT LIQUID	LIN FT	\$1.00								342															342	\$342.00
94	4" BROKEN YELLOW - MULTI COMPONENT LIQUID	LIN FT	\$1.00	265	555										\$265.00	\$555.00										820	\$820.00
95	4" DOUBLE YELLOW - MULTI COMPONENT LIQUID	LIN FT	\$2.00			1577											\$3,154.00									1577	\$3,154.00
96	GREEN CROSSWALK - THERMOPLASTIC	SQ FT	\$25.00	216											\$5,400.00											216	\$5,400.00
97	CROSSWALK - THERMOPLASTIC	SQ FT	\$15.00	684	750	126		180			252				\$10,260.00	\$11,250.00	\$1,890.00		\$2,700.00				\$3,780.00			1992	\$29,880.00
SUBTOTAL														\$ 177,116.50	\$ 151,161.00	\$ 291,855.00	\$ 180,504.00	\$ 732,090.50	\$ 188,183.00	\$ 85,365.00	\$ 214,555.00	\$ 130,112.00	\$ 49,875.00	\$ 49,400.00		\$ 2,250,217.00	
CONTINGENCIES (15%)														\$ 26,567.48	\$ 22,674.15	\$ 43,778.25	\$ 27,075.60	\$ 109,813.58	\$ 28,227.45	\$ 12,804.75	\$ 32,183.25	\$ 19,516.80	\$ 7,481.25	\$ 7,410.00		\$ 337,532.55	
ENGINEERING AND ADMINISTRATION (21%)														\$ 42,773.63	\$ 36,505.38	\$ 70,482.98	\$ 43,591.72	\$ 176,799.86	\$ 45,446.19	\$ 20,615.65	\$ 51,815.03	\$ 31,422.05	\$ 12,044.81	\$ 11,930.10		\$ 543,427.41	
TOTAL ESTIMATED PROJECT COST														\$ 246,457.61	\$ 210,340.53	\$ 406,116.23	\$ 251,171.32	\$ 1,018,703.93	\$ 261,856.64	\$ 118,785.40	\$ 298,553.28	\$ 181,050.85	\$ 69,401.06	\$ 68,740.10		\$ 3,131,176.96	

Appendix B: Figures



LEGEND

 PROJECT AREA
















CITY OF HOPKINS
2022 STREET & UTILITY IMPROVEMENTS
PROJECT LAYOUT






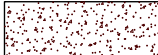

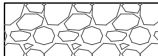





















H:\HOPK\OT1124643\CAD\C3D\FEAS\124643_FIG INDEX MAP.dwg 9/10/2021 9:54:15 AM

LEGEND

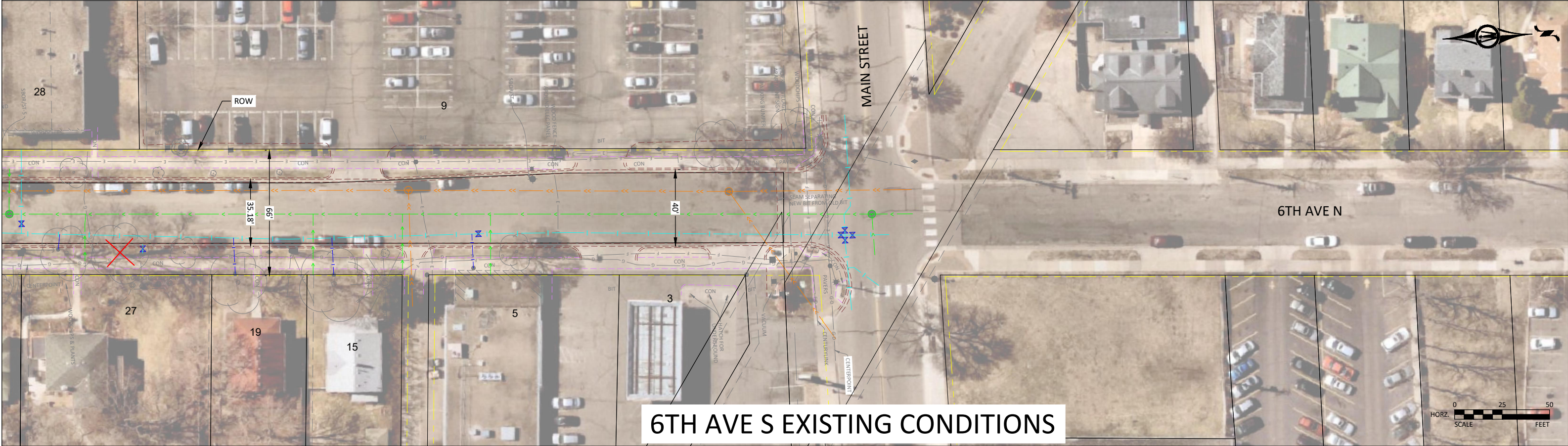
EXISTING FIGURES

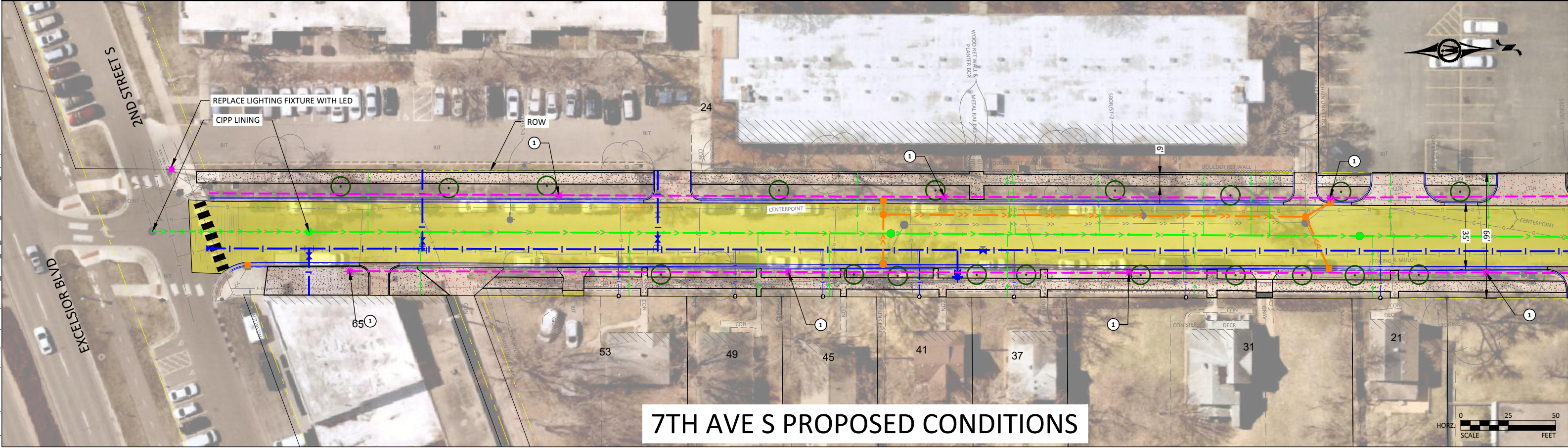
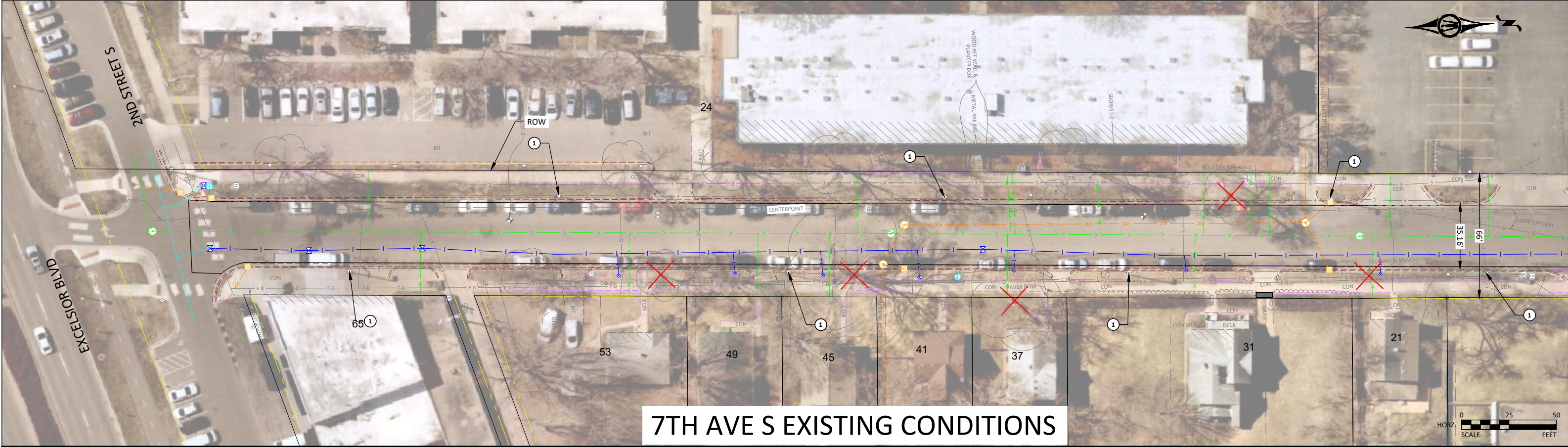
EXISTING	
	BITUMINOUS EDGE
	CONCRETE EDGE
	CONCRETE CURB
	GRAVEL EDGE
	RIGHT-OF-WAY
	SANITARY SEWER
	SANITARY MANHOLE
	STORM SEWER
	STORM MANHOLE
	STORM CATCH BASIN
	WATERMAIN
	HYDRANT
	GATE VALVE

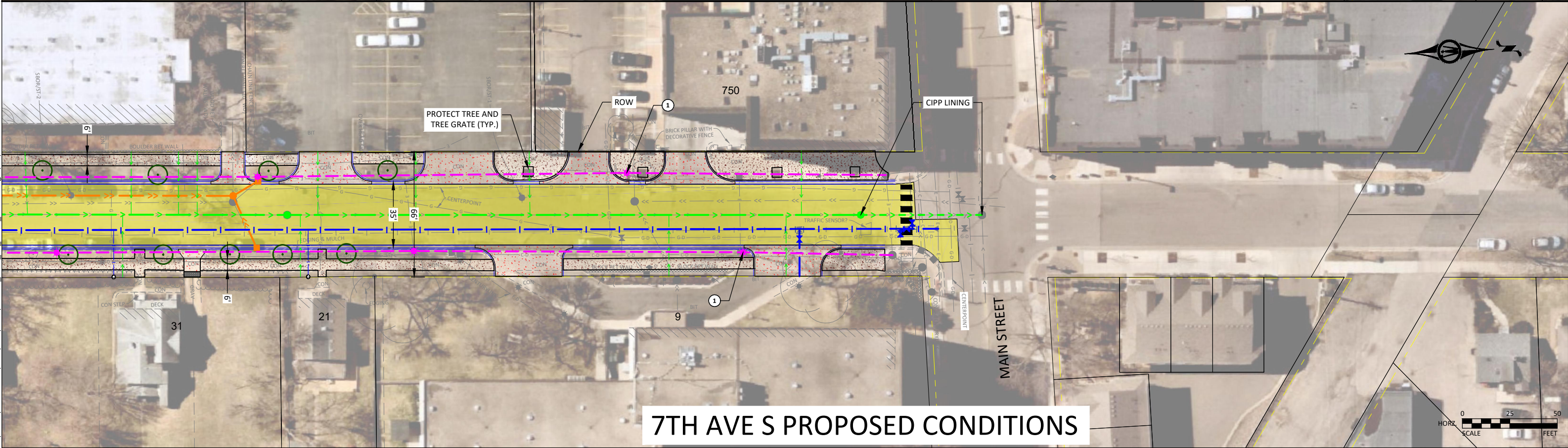
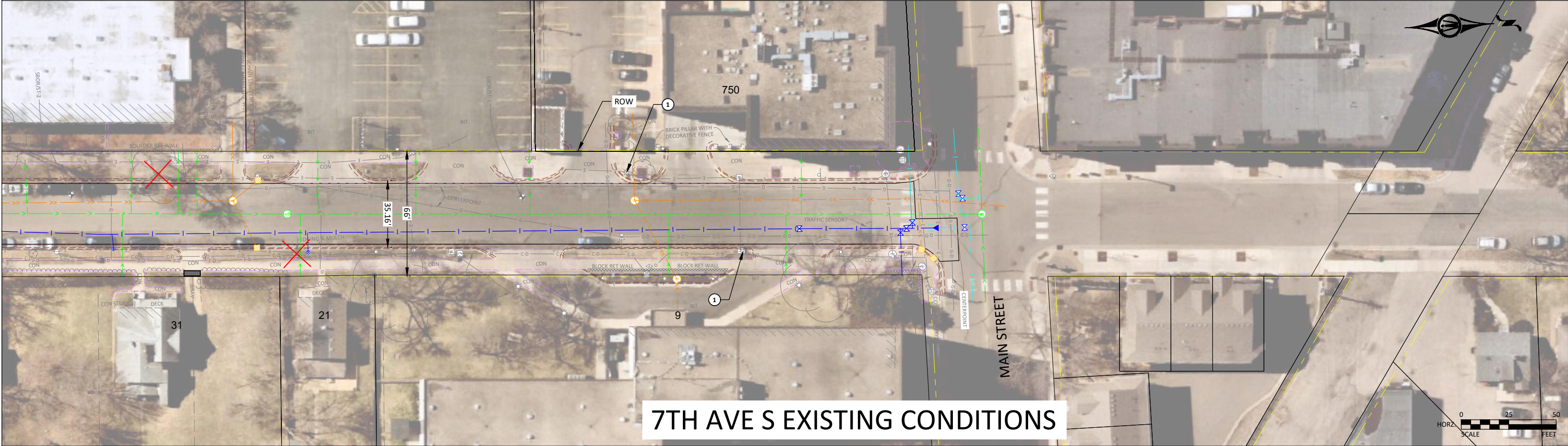
PROPOSED FIGURES

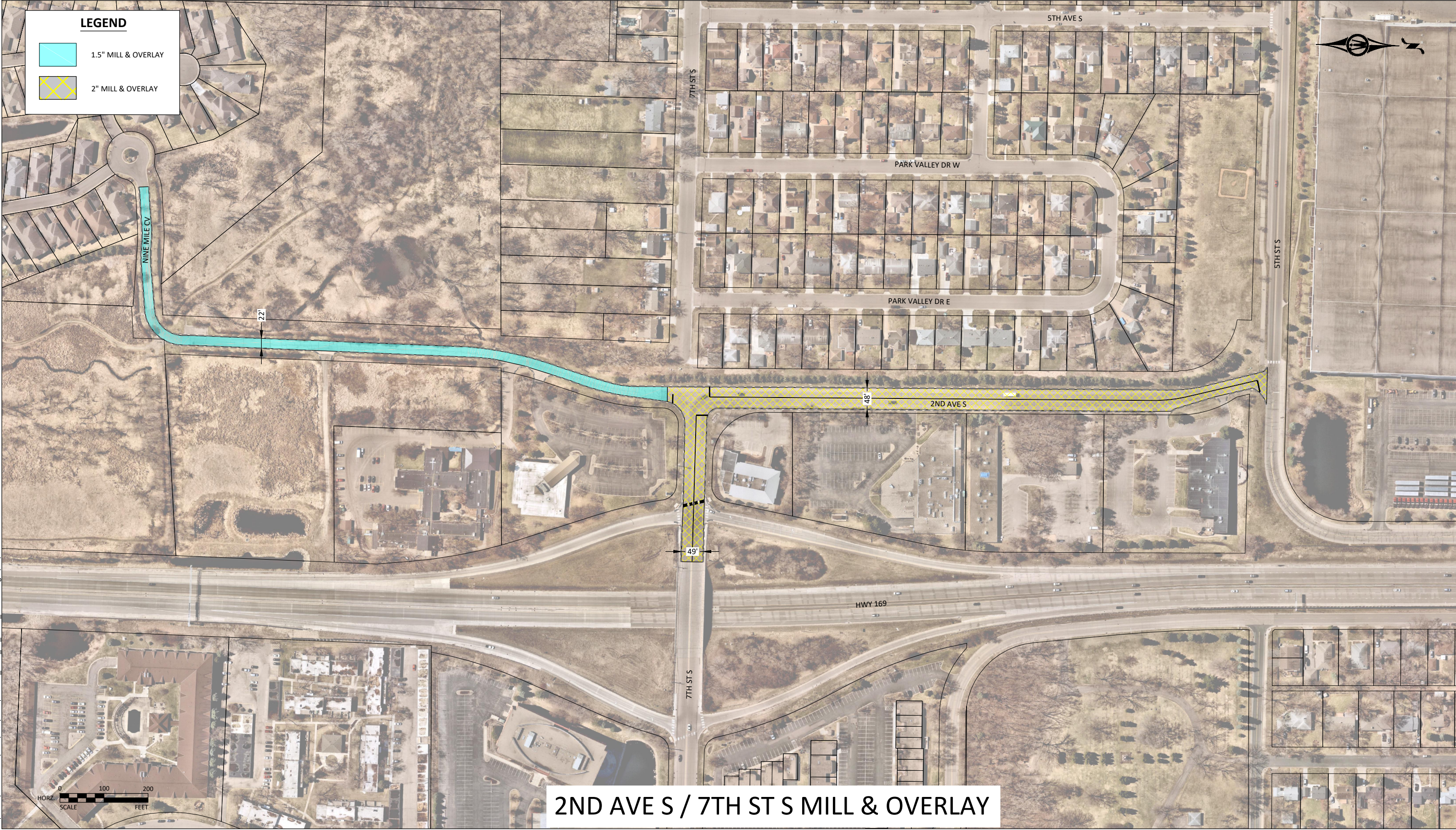
PROPOSED		EXISTING BACKGROUND	
	CURB & GUTTER		BITUMINOUS
	BITUMINOUS PAVEMENT		CONCRETE
	CONCRETE DRIVEWAY		CONCRETE CURB
	CONCRETE SIDEWALK		GRAVEL
	GRAVEL DRIVEWAY		RIGHT-OF-WAY
	STORM MANHOLE		SANITARY SEWER
	STORM CATCH BASIN		SANITARY MANHOLE
	STORM SEWER		STORM SEWER
	SANITARY SEWER MANHOLE		STORM MANHOLE
	SANITARY SEWER		STORM CATCH BASIN
	SANITARY CIPP LINING		WATERMAIN
	HYDRANT & VALVE		HYDRANT
	GATE VALVE		GATE VALVE
	WATERMAIN		
	TREE REMOVAL DUE TO SPECIES/CONDITION/LOCATION		
	PLANTED TREE		
	LIGHT POLE		
	ELECTRICAL CONDUIT		
	SALVAGE/REINSTALL LIGHTING UNIT, REPLACE FIXTURE WITH LED		





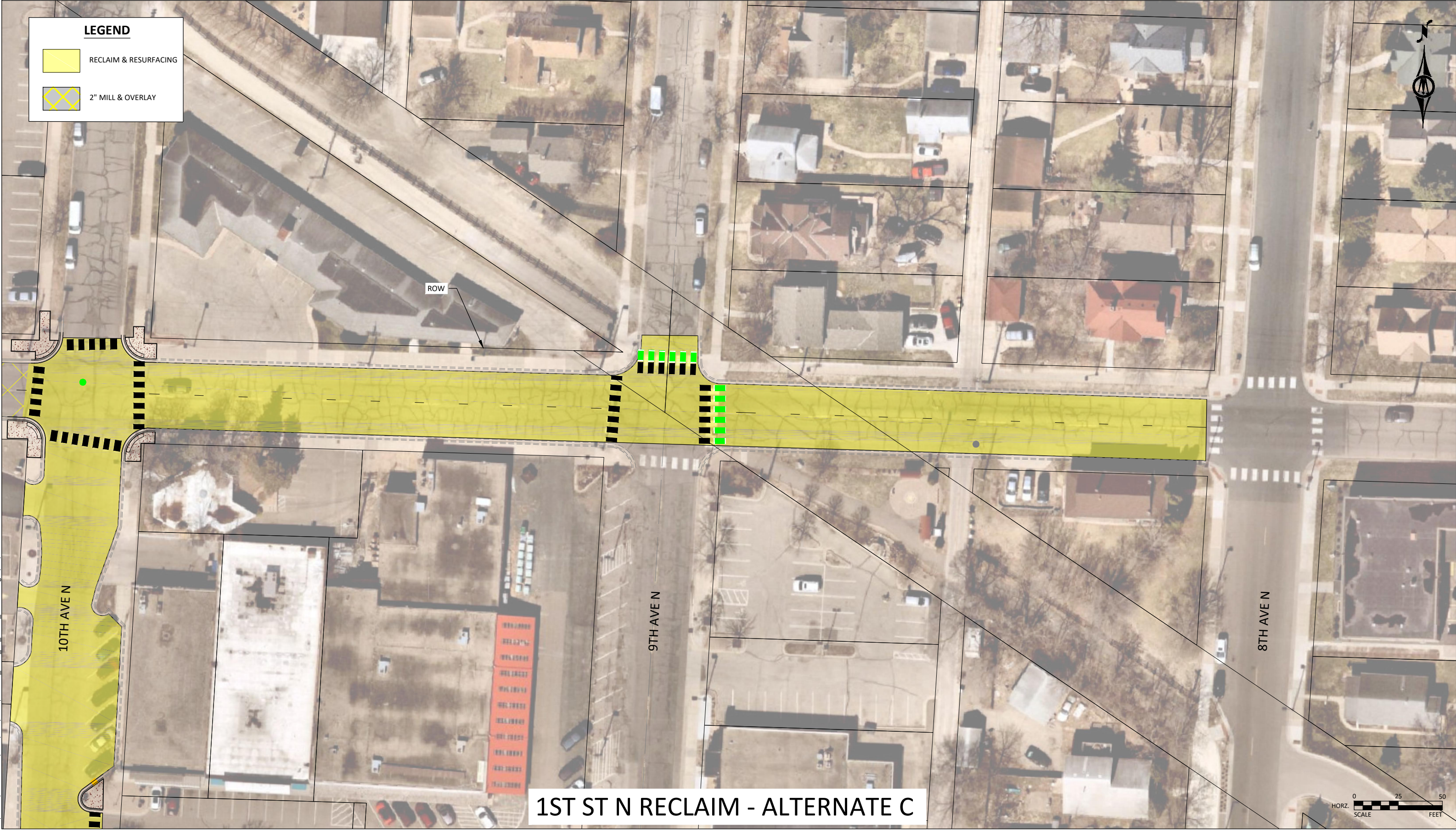












Appendix C: Preliminary Assessment Roll

PRELIMINARY ASSESSMENT ROLL

2022 STREET & UTILITY IMPROVEMENTS

CITY OF HOPKINS, MN

CITY PROJECT NO. 2021-010

BMI PROJECT NO. OT1.124643

PID	PROPERTY ADDRESS	TAXPAYER NAME	TAXPAYER ADDRESS (LINE 1)	TAXPAYER ADDRESS (LINE 2)	TAXPAYER ADDRESS (LINE 3)	PROPOSED STREET ASSESSMENT	PROPOSED WATER SERVICE ASSESSMENT	PROPOSED SEWER SERVICE ASSESSMENT	TOTAL PROPOSED ASSESSMENT
2411722430043	65 7th Avenue	65 7TH AVE S LLC	61 7TH AVE S	HOPKINS MN 55343		\$ 5,900.00	\$ 6,550.00	\$ 2,900.00	\$ 15,350.00
2411722430046	45 7th Avenue	RAHEL WOLDESILASSE	45 7TH AVE S	HOPKINS MN 55343		\$ 5,007.50	\$ 1,575.00	\$ 1,425.00	\$ 8,007.50
2411722430049	31 7th Avenue	ROBERT D ZEMAN	P O BOX 11055	MPLS MN 55411		\$ 12,506.25	\$ 1,575.00	\$ 1,425.00	\$ 15,506.25
2411722430050	21 7th Avenue	WILL OVERHOLT	512 5TH AVE S	HOPKINS MN 55343		\$ 5,002.50	\$ 1,575.00	\$ 1,425.00	\$ 8,002.50
2411722430048	37 7th Avenue	DANIEL ERICKSON/TANYA BROWN	37 7TH AVE S	HOPKINS MN 55343		\$ 5,007.50	\$ 1,575.00	\$ 1,425.00	\$ 8,007.50
2411722430047	41 7th Avenue	KENNETH LARSON	216 N QUINCY ST	ALEXANDRIA MN 56308		\$ 5,007.50	\$ 1,575.00	\$ 1,425.00	\$ 8,007.50
2411722430235	24 7th Avenue	HOPKINS PLAZA LTD PARTNERSHP	C/O STUART CO	1000 80TH ST W	BLOOMINGTON MN 55420	\$ 76,100.00	\$ 15,200.00	\$ 22,850.00	\$ 114,150.00
2411722430044	53 7th Avenue	ALEC JUDE ALBRECHT	53 7TH AVE S	HOPKINS MN 55343		\$ 11,199.60	\$ 1,575.00	\$ 1,425.00	\$ 14,199.60
2411722430045	49 7th Avenue	LOGAN HELLESETH	49 7TH AVE S	HOPKINS MN 55343		\$ 5,007.50	\$ 1,575.00	\$ 1,425.00	\$ 8,007.50
2411722430239	9 7th Avenue	HOPKINS VILLAGE LP	C/O COMM HOUSING DEVP CORP	614 1ST ST N STE100	MINNEAPOLIS MN 55401-310	\$ 111,144.76	\$ 6,550.00	\$ 5,650.00	\$ 123,344.76
2411722430159	15 8th Avenue	LOMMEN PROPERTIES LLC	17 8TH AVE S	HOPKINS MN 55343		\$ 21,200.00	\$ -	\$ 8,700.00	\$ 29,900.00
2411722430176	750 Mainstreet	PETERSON CAPITAL INVTS LLC	ROZ & TIM PETERSON	12295 162ND ST W	LAKEVILLE MN 55044	\$ 1,426.91	\$ -	\$ 53.70	\$ 1,480.61
2411722430178	750 Mainstreet	PETERSON CAPITAL INVTS LLC	ROZ & TIM PETERSON	12295 162ND ST W	LAKEVILLE MN 55044	\$ 1,426.91	\$ -	\$ 53.70	\$ 1,480.61
2411722430193	750 Mainstreet Unit 214	MICHAEL R HOFFMAN	750 MAINSTREET #214	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430198	750 Mainstreet Unit 224	ELLEN OAKES	750 MAINSTREET #224	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430201	750 Mainstreet Unit 230	GREGORY HUGH	LINDA HUGH	750 MAINSTREET #230	HOPKINS MN 55343	\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430203	750 Mainstreet Unit 302	SATYA GARG	9 9TH AVE N	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430208	750 Mainstreet Unit 312	BARBARA A CALDWELL	750 MAINSTREET #312	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430212	750 Mainstreet Unit 320	WENDY BROZIC	750 MAIN ST #320	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430214	750 Mainstreet Unit 324	QUINN JURGENS & SHARON MOE	750 MAINSTREET #324	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430215	750 Mainstreet Unit 326	MARK W REYNOLDS	DAWN H SIMONE	750 MAINSTREET #326	HOPKINS MN 55343	\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430219	750 Mainstreet Unit 402	PATRICIA E WARD	ELIZABETH WARD	750 MAINSTREET #402	HOPKINS MN 55343	\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430227	750 Mainstreet Unit 418	ROBERT F NELSEN	REGINA D NELSEN	750 MAINSTREET #418	HOPKINS MN 55343	\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430172	750 Mainstreet	PETERSON CAPITAL INVTS LLC	ROZ & TIM PETERSON	12295 162ND ST W	LAKEVILLE MN 55044	\$ 1,426.91	\$ -	\$ 53.70	\$ 1,480.61
2411722430188	750 Mainstreet Unit 204	LARRY ARDITO & KATHY ARDITO	16367 BARCLAY CT	NAPLES FL 34110		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430192	750 Mainstreet Unit 212	LUCILLE M RENAUD REV TRUST	750 MAINSTREET #212	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430196	750 Mainstreet Unit 220	MERLE GORDON OLSON	750 MAINSTREET #220	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430197	750 Mainstreet Unit 222	NANCY J MARTINI	696 MAIN ST #402	WALTHAM MA 02451		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430200	750 Mainstreet Unit 228	CHERIE ERICKSON	12411 HUNTINGDON LN	MINNETONKA MN 55305		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430202	750 Mainstreet Unit 300	JON WARK	750 MAINSTREET #300	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430206	750 Mainstreet Unit 308	KAREN CASH	750 MAINSTREET #308	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430207	750 Mainstreet Unit 310	JAMES J BRENNY	750 MAINSTREET #310	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430213	750 Mainstreet Unit 322	MARCIA KAY SOLETSKI CARLSON	750 MAINSTREET #322	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430218	750 Mainstreet Unit 400	PDS TAX SERVICES	PO BOX 13519	ARLINGTON TX 76094-1519		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430220	750 Mainstreet Unit 404	JOHN A RASINSKI	GLORIA J RASINSKI	750 MAIN ST #404	HOPKINS MN 55343	\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430221	750 Mainstreet Unit 406	MICHAEL LUGER	9427 OLYMPIA DRIVE	EDEN PRAIRIE MN 55347		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430226	750 Mainstreet Unit 416	DANA L HARRISON	750 MAINSTREET #416	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430230	750 Mainstreet Unit 424	JEFFREY W JOHNSON	JOSEPHINE L JOHNSON	750 MAINSTREET #424	HOPKINS MN 55343	\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430231	750 Mainstreet Unit 426	PATRICIA MCDIVITT	JERRY HOPKINS	750 MAIN ST #426	HOPKINS MN 55343	\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430232	750 Mainstreet Unit 428	JEANNE E FLAVIN	750 MAINSTREET #428	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430171	750 Mainstreet	PETERSON CAPITAL INVTS LLC	ROZ & TIM PETERSON	12295 162ND ST W	LAKEVILLE MN 55044	\$ 1,426.91	\$ -	\$ 53.70	\$ 1,480.61
2411722430175	750 Mainstreet	PETERSON CAPITAL INVTS LLC	ROZ & TIM PETERSON	12295 162ND ST W	LAKEVILLE MN 55044	\$ 1,426.91	\$ -	\$ 53.70	\$ 1,480.61
2411722430179	750 Mainstreet	PETERSON CAPITAL INVTS LLC	ROZ & TIM PETERSON	12295 162ND ST W	LAKEVILLE MN 55044	\$ 1,426.91	\$ -	\$ 53.70	\$ 1,480.61
2411722430187	750 Mainstreet Unit 202	MELISSA A JANE CARMICHAEL	750 MAINSTREET #202	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430190	750 Mainstreet Unit 208	JOSEPH SICORA	4732 HAMILTON RD	MINNETONKA MN 55345		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430191	750 Mainstreet Unit 210	MITCHELL URLAUB	750 MAINSTREET #210	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430195	750 Mainstreet Unit 218	MARLENE C MCEWAN	750 MAINSTREET #218	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430199	750 Mainstreet Unit 226	ALAN T & COLLEEN A KELLER	750 MAINSTREET #226	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430205	750 Mainstreet Unit 306	ANDREA ALBRECHT	750 MAINSTREET #306	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430217	750 Mainstreet Unit 330	MARY ELLEN WARD	750 MAINSTREET #330	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430222	750 Mainstreet Unit 408	ELLEN H KERBER	750 MAINSTREET #408	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430225	750 Mainstreet Unit 414	JEAN ANDRE LATONDRESSE	BARBARA ANN LATONDRESSE	750 MAINSTREET #414	HOPKINS MN 55343	\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430229	750 Mainstreet Unit 422	ELAINE KOYAMA	750 MAINSTREET #422	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430186	750 Mainstreet Unit 200	JOCELYN ANDRES	750 MAIN ST #200	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430189	750 Mainstreet Unit 206	BLAKE E TANBERK	505 DEL RIO DR	CHANHASSEN MN 55317		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430194	750 Mainstreet Unit 216	SCOTT J OLSON	750 MAINSTREET #216	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89

2411722430204	750 Mainstreet Unit 304	PALLADIUM HOLDINGS LLC	315 CLOVER LEAF DR	GOLDEN VALLEY MN 55422		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430209	750 Mainstreet Unit 314	JEFFREY P BORDENAVE	JESSICA M BORDENAVE	750 MAINSTREET #314	HOPKINS MN 55343	\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430210	750 Mainstreet Unit 316	GRETCHEN R BARSNESS	750 MAIN ST #316	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430211	750 Mainstreet Unit 318	PHILLIP BAUTCH	SANDRA BAUTCH	750 MAINSTREET	HOPKINS MN 55343	\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430216	750 Mainstreet Unit 328	WILLIAM A FARRELL	KAREN J FARRELL	750 MAINSTREET #328	HOPKINS MN 55343	\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430223	750 Mainstreet Unit 410	HOPE V BJELLAND	750 MAINSTREET #410	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430224	750 Mainstreet Unit 412	STEFANIE SCHAFER	1440 WATER TOWER PL NE	OWATONA MN 55060		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430228	750 Mainstreet Unit 420	WILLIAM W ENTINGER	CAROLINE R WICKLAND	750 MAIN ST #420	HOPKINS MN 55343	\$ 370.19	\$ -	\$ 53.70	\$ 423.89
2411722430233	750 Mainstreet Unit 430	ANNE COOPER	750 MAINSTREET #430	HOPKINS MN 55343		\$ 370.19	\$ -	\$ 53.70	\$ 423.89
								PRELIMINARY TOTAL AMOUNT TO BE ASSESSED	\$ 381,713.46

Appendix D: Resident Questionnaires & Neighborhood Meetings



CITY OF HOPKINS

PUBLIC WORKS-ENGINEERING DIVISION

2022 STREET AND UTILITY IMPROVEMENT QUESTIONNAIRE

PLEASE RETURN TO CITY HALL (1010 1ST ST S, HOPKINS MN 55343) BY: JUNE 30, 2021

QUESTIONNAIRES CAN ALSO BE SCANNED AND EMAILED TO NICKAM@BOLTON-MENK.COM

Street and utility improvements are proposed on 6th Ave S & 7th Ave S in 2022. This questionnaire is a valuable resource for the City in identifying issues to receive attention. Your comments are greatly appreciated.

1. DRAINAGE

Have you observed standing water in the street or your front yard after a significant rain? If so, where is it located?

2. SANITARY SEWER, please indicate 'yes' with an X as applicable:

☐ We have NOT experienced problems with our sanitary sewer service.

☐ We have experienced problems or replaced our sewer service. Please describe:

3. WATERMAIN, please indicate 'yes' with an X as applicable:

☐ We have NOT experienced problems with our water service.

☐ We have experienced problems or replaced our water service. Please describe:

4. PEDESTRIAN SAFETY & FACILITIES

Are there any areas of concern with respect to pedestrian safety? If so, where?

5. IRRIGATION SYSTEM / INVISIBLE FENCE, please indicate 'yes' with an X as applicable:

☐ Yes, we have an irrigation system. ☐ Yes, we have an invisible pet fence.

6. TREES / LANDSCAPING

Do you have concerns about the condition of trees or potential impacts to landscaping in your front yard? If so, describe.

7. GENERAL COMMENTS / QUESTIONS

Please describe any issues you suggest be considered as part of this project:

The following information is optional but is useful if we have a question about your responses:

Name: _____ Phone No.: _____

Address: _____ Email: _____

THANK YOU FOR YOUR RESPONSE!

Should you have any questions please contact Eric Klingbeil, Assistant City Engineer, at 952-548-6357 or eklingbeil@hopkinsmn.com or Nick Amatuccio at 612-965-3926 or nickam@bolton-menk.com



City of Hopkins
2022 Street & Utility Improvements
Neighborhood Meeting 1



Time: 5:00 PM
Date: September 8, 2021
Location: Hopkins City Hall - Council Chambers
Hopkins, MN

[illegible]

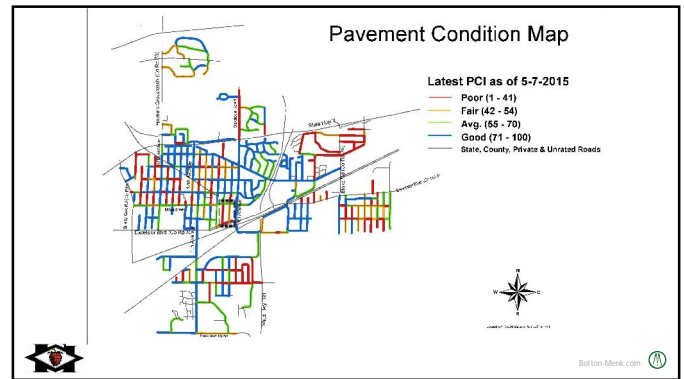


Neighborhood Meeting #1 2022 Street & Utility Improvements

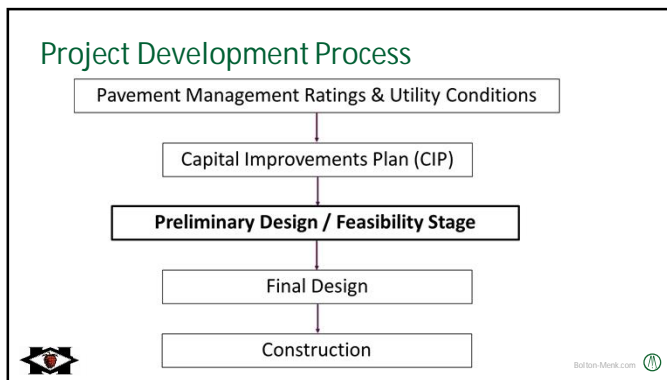
City of Hopkins
September 8, 2021

Bolton-Monk.com

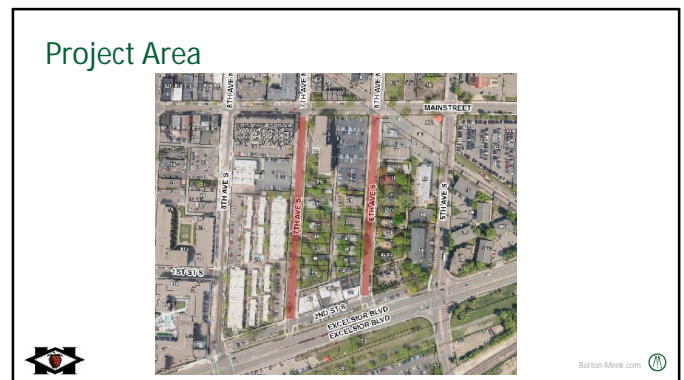
1



2



3



4

Resident Questionnaire Summary

9 Questionnaires Received

Most Common Responses:

- Sidewalk on 7th Ave in poor condition
 - Full replacement of sidewalk on 7th Ave S – both sides
- Drainage Issues on 7th Ave, especially on north end
 - New curb and gutter and storm sewer catch basins as needed to improve drainage on the entire block of 7th Ave S
- Pavement in poor condition on both 6th and 7th Avenue
 - Removing the old pavement and installing new asphalt pavement on both blocks – examples of pavement condition on upcoming slides
- Protect Trees
 - Some trees will need to be removed, but most trees, especially healthy trees will remain – more info on upcoming slide

Bolton-Monk.com

5



6

Reconstructed Street Example



Bolton-Monk.com

7

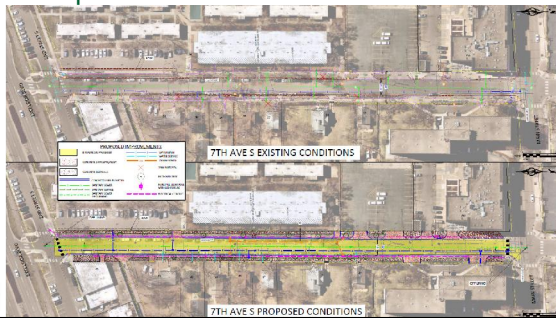
Street Improvements – 6th Ave S



Bolton-Monk.com

8

Street Improvements – 7th Ave S



Bolton-Monk.com

9

Utility Improvements – Sanitary Sewer



Bolton-Monk.com

10

Utility Improvements – Watermain



Bolton-Monk.com

11

Service Line Replacement

Water & sewer services to be replaced from City's main (in the street) to the right-of-way property line, about 10'-15' from the edge of road



Bolton-Monk.com

12

Boulevard Trees

Trees may be removed for one of the following reasons:

- Susceptible to disease or invasive species – Ash trees
- Poor condition – Dead, dying, leaning, etc.
- Conflict with utilities (Sewer and Water lines)
- Conflict with road construction or grading

Trees that are removed will be replaced with a tree at the end of the project. Additional trees will be planted throughout the project corridor where there are none today.



Source: extension.umn.edu/tree-and-shrub-insects/emerald-ash-borer



Bolton-Monk.com



13

Street Lighting

- Light Poles on 7th Ave S to be salvaged and reinstalled due to adjacent utility work
- Light Fixtures on 6th Ave S and 7th Ave S to be replaced with LED light fixtures



Bolton-Monk.com



14

Special Assessment Policies

- Assessments for 7th Ave S (Reconstruction): No assessments anticipated for 6th Ave S at this time (Reclaim)
 - Individual letters with estimated assessment amounts will be mailed in late September/early October
- Streets (Street Assessment)
 - 70% of the total street improvement cost
 - Varies for each property based on front footage
 - Front foot rate subject to cap
- Utility Mains
 - No Assessments
- Utility Services (Utility Assessment)
 - 50% of as-bid, actual service costs
- Total Assessment = Utility Assessment + Street Assessment



Bolton-Monk.com



15

Special Assessment Caps

- 2021 Front Foot Rate Cap
 - \$100.05 / front foot
- Front Footage Cap
 - Front footage counted up to 125 feet
- Caps do not apply to commercial properties or apartment buildings
 - Benefit Appraisals for these properties – lower amount used (appraisal vs. policy)
- Preliminary Assessment amounts will be mailed to each property receiving an assessment within the next month
 - Prior to Neighborhood Meeting #2 and the Public Improvement Hearing (City Council Meeting) in October



Bolton-Monk.com



16

Project Schedule (2021)

- September 8 – Neighborhood Meeting 1
 - Review Existing Conditions, present proposed improvements, collect input
- September 21 – City Council Meeting
 - Present Feasibility Report and Council calls for the public hearing
- Mid-October (Date TBD) – Neighborhood Meeting 2
 - Review of proposed improvements, review preliminary assessments, collect input
- October 19 – City Council Meeting
 - Council conducts public hearing on improvements and considers ordering final plans
- December 21 – City Council Meeting
 - Approve final plans and authorize bidding



Bolton-Monk.com



17

Project Schedule (2022)

- January 21 – Open Bids
- February 1 – City Council Meeting
 - Council orders public hearing on assessments
- Late February (Date TBD) – Neighborhood Meeting 3
 - Review final assessments, final plans, collect input
- March 1 – City Council Meeting
 - Conduct public hearing on assessments and consider adopting assessments
 - Award contract
- May to October – Construction
 - Overall duration will be shorter but start and end dates are TBD



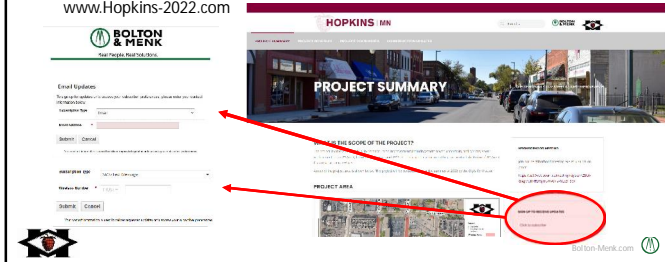
Bolton-Monk.com



18

Project Communication

Bolton & Menk Project Website
www.Hopkins-2022.com



19

Project Contacts

Nick Amatuccion, P.E. – Project Engineer

- nickam@bolton-menk.com; 612-965-3926



Eric Klingbeil, P.E. – Hopkins Assistant City Engineer

- eklingbeil@hopkinsmn.com; 952-548-6357

20

Nick Amatuccion, PE
Project Engineer

Eric Klingbeil, PE
Assistant City Engineer

Bolton-Menk.com

21

Appendix E: Geotechnical Evaluation

Geotechnical Evaluation Report

City of Hopkins 2022 Street and Utility Improvements Project
6th and 7th Avenues South
Hopkins, Minnesota

Prepared for

Bolton & Menk, Inc.

Professional Certification:

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.



Neil G. Lund, PE
Senior Engineer
License Number: 46212
September 10, 2021



September 10, 2021

Project B2104532

Nick Amatuccio, PE
Bolton & Menk, Inc.
12224 Nicollet Avenue
Burnsville, MN 55337

Re: Geotechnical Evaluation
City of Hopkins 2022 Street and Utility Improvements Project
6th and 7th Avenues South
Hopkins, Minnesota

Dear Mr. Amatuccio:

We are pleased to present this Geotechnical Evaluation for the proposed City of Hopkins 2022 Street and Utility Improvements Project in Hopkins, Minnesota.

Thank you for making Braun Intertec your geotechnical consultant for this project. If you have questions about this report, or if there are other services that we can provide in support of our work to date, please contact Neil Lund at 612.369.3163 or nlund@braunintertec.com.

Sincerely,

BRAUN INTERTEC CORPORATION



Neil G. Lund, PE
Senior Engineer



Bryan C. Field, PE
Account Leader, Senior Engineer

Table of Contents

Description	Page
A. Introduction.....	1
A.1. Project Description.....	1
A.2. Project Area Conditions.....	2
A.3. Purpose.....	3
A.4. Background Information and Reference Documents.....	3
A.5. Scope of Services.....	3
B. Results.....	4
B.1. Geologic Overview	4
B.2. Boring Results.....	4
B.3. Groundwater	5
B.4. Laboratory Test Results.....	6
B.5. Core and Hand Auger Boring Results (2nd Avenue South)	6
C. Recommendations	7
C.1. Design and Construction Discussion	7
C.1.a. Pavement Reuse (6th and 7th Avenue South)	7
C.1.b. Soil Reuse	8
C.1.c. Utilities	8
C.1.d. Mill and Overlay of 2nd Avenue South	9
C.2. Utility Replacement.....	9
C.2.a. Excavation Oversizing.....	9
C.2.b. Utility Subgrade Stabilization	9
C.2.c. Excavated Slopes	9
C.2.d. Selection, Placement and Compaction of Backfill.....	10
C.2.e. Excavation Dewatering.....	11
C.2.f. Corrosion Potential	11
C.3. New Pavements.....	12
C.3.a. Pavement Subgrade Preparation	12
C.3.b. Pavement Subgrade Test Roll.....	12
C.3.c. Engineered Fill Materials and Compaction	13
C.3.d. Pavement Design Sections, 6th and 7th Avenues South	13
C.3.e. Pavement Materials Placement	14
C.4. Mill and Overlay	14
D. Procedures.....	14
D.1. Penetration Test Borings.....	14
D.2. Exploration Logs	15
D.2.a. Log of Boring Sheets.....	15
D.2.b. Geologic Origins	15
D.3. Material Classification and Testing	15
D.3.a. Visual and Manual Classification.....	15
D.3.b. Laboratory Testing	15
D.4. Groundwater Measurements.....	16
E. Qualifications.....	16
E.1. Variations in Subsurface Conditions.....	16
E.1.a. Material Strata	16
E.1.b. Groundwater Levels	16

Table of Contents (continued)

Description	Page
E.2. Continuity of Professional Responsibility.....	17
E.2.a. Plan Review	17
E.2.b. Construction Observations and Testing	17
E.3. Use of Report.....	17
E.4. Standard of Care.....	17

Appendix

Soil Boring Location Sketch

Log of Boring Sheets ST-1 to ST-6

Descriptive Terminology of Soil

Core Location Sketch (2nd Avenue South)

Pavement Core Photos (2nd Avenue South)

A. Introduction

A.1. Project Description

This Geotechnical Evaluation Report addresses the proposed 2022 Street and Utility Improvements Project in Hopkins, Minnesota. The project area includes 6th and 7th Avenues South between 2nd Street South and Mainstreet as shown on the Soil Boring Location Sketch attached to this report.

Proposed work on the project will include utility replacements and street reconstruction.

Table 1. Project Description – 2022 Street and Utility Improvements Project

Project Component	Description	Source
Pavement type(s)	Bituminous	Assumed based on in-place pavements/City of Hopkins standards
Pavement loads	Residential streets: 100,000 ESALs	Assumed – traffic data not available
Grade changes	Streets < 1 foot	Bolton & Menk, Inc. (BMI)
Utilities	Storm sewer, water main and sanitary sewer replacement Maximum utility depth of approximately 14 feet	BMI

In addition to the reconstruction areas, the City is also proposing to rehabilitate 2nd Avenue South between 9 Mile Cove and 5th Street South via mill and overlay.

We have described our understanding of the proposed construction and site to the extent others reported it to us. Depending on the extent of available information, we may have made assumptions based on our experience with similar projects. If we have not correctly recorded or interpreted the project details, the project team should notify us. New or changed information could require additional evaluation, analyses and/or recommendations.

A.2. Project Area Conditions

The in-place streets are bituminous-surfaced with urban sections and concrete curb and gutter.

The project area for 6th and 7th Avenues South is zoned as residential of varying density. The proposed rehabilitation of 2nd Avenue South is in an area of mixed business and low-density residential.

Street grades are flat at 6th and 7th Avenues South, with grades at the boring locations between 919.9 to 923.4 feet above mean sea level (MSL). The grade along 2nd Avenue South is rolling.

Pavement surface condition on 2nd Avenue South varied from poor to good. Major distresses included recent skin patches that appeared to be covering raveled surface pavements. This distress was much more prevalent on the curb-adjacent pass of pavement, suggesting water has contributed to the damage. Photo 1 shows this contrast in conditions between passes, along with some local patches, transverse cracks and edge cracks.

The patches were more prevalent north of the 7th Avenue intersection, and overall pavement condition was generally better in the south half of the segment.

Photo 1. Common Distresses on 2nd Avenue South



A.3. Purpose

The purpose of our geotechnical evaluation was to characterize subsurface geologic conditions at selected exploration locations, evaluate their impact on the project, and provide geotechnical recommendations for the design and construction of the 2022 Street and Utility Improvements Project in the City of Hopkins, Minnesota.

A.4. Background Information and Reference Documents

We reviewed the following information:

- Communications with BMI regarding the proposed street and utility rehabilitation.
- Aerial imagery of the site provided by BMI and available on Google Earth.
- Geologic map *C-45, Part A, Geologic Atlas of Hennepin County, Minnesota* prepared by the Minnesota Geological Survey and dated 2018.

A.5. Scope of Services

We performed our scope of services for the project in accordance with our Proposal for a Geotechnical Evaluation to BMI dated May 7, 2021. The following list describes the geotechnical tasks completed in accordance with our authorized scope of services.

- Reviewing the background information and reference documents previously cited.
- Staking and clearing the exploration location of underground utilities. We acquired the surface elevations and locations with GPS technology using the State of Minnesota's permanent GPS base station network. The Soil Boring Location Sketch included in the Appendix shows the approximate locations of the borings.
- Performing six standard penetration test (SPT) borings, denoted as ST-1 to ST-6, to a nominal depth of 20 feet below grade.

- As an additional scope, coring and performing hand auger borings for six locations along 2nd Street South to evaluate the feasibility of mill and overlay or alternative rehabilitation strategy.
- Performing laboratory testing on select samples to aid in soil classification and engineering analysis.
- Preparing this report containing a boring location sketch, logs of soil borings, a summary of the soils encountered, results of laboratory tests, and recommendations for pavement subgrade preparation, pavement design and utility improvements.

B. Results

B.1. Geologic Overview

Based on the review of geologic information and our experience, granular fill soils overly native soils consisting of sand and gravel glacial outwash.

We based the geologic origins used in this report on the soil types and laboratory testing, and available common knowledge of the geological history of the site. Because of the complex depositional history, geologic origins can be difficult to ascertain. We did not perform a detailed investigation of the geologic history for the site.

B.2. Boring Results

Table 2 provides a summary of the soil boring results in the general order we encountered the strata. Please refer to the Log of Boring sheets in the Appendix for additional details.

For simplicity in this report, we define fill to mean existing, uncontrolled, or undocumented fill.

Table 2. Subsurface Profile Summary*

Strata	Soil Type - ASTM Classification*	Range of Penetration Resistances	Commentary and Details
Pavement section (6th and 7th Avenue)	---	---	<ul style="list-style-type: none"> Between 2 and 8 inches of bituminous pavement over 4 to 14 inches of probable aggregate base. The 2-inch bituminous thickness measured in ST-6 is likely the result of breakup of the pavement from the auger. Bituminous thickness in the remaining borings ranged from 5 to 8 inches. "Aggregate base" does not imply conformance with MnDOT standard specifications (e.g. Class 5). The aggregate base thicknesses should be considered approximate. See Section B.5 for information on 2nd Avenue South.
Fill	SP-SM, SM, SC	3 to 26 BPF**	<ul style="list-style-type: none"> Mostly sandy soils; clayey fill soils in ST-2. Extended to depths ranging from 4 to 12 feet where present. Generally moist.
Buried topsoil	SC	4 BPF	<ul style="list-style-type: none"> Present in ST-1 only from 4 to 6 feet below surface. Dark brown, slightly organic clayey sand.
Glacial outwash	SP, SP-SM, SM	3 to 38 BPF	<ul style="list-style-type: none"> Sandy soils of varying fine and gravel content. Loose to very loose in ST-1, mostly medium dense elsewhere. Brown fine-to-coarse grained, moist to wet. Glacial deposits may include cobbles and/or boulders.

*Abbreviations defined in the attached Descriptive Terminology of Soil sheet.

** BPF – blows per foot.

B.3. Groundwater

Groundwater was observed as summarized in Table 3. The Log of Boring sheets in the Appendix also include this information and additional details. The table includes multiple observations where the apparent groundwater level changed from the initial measurement to the end of drilling.

Table 3. Groundwater Summary

Location	Surface Elevation	Initial Observation		End of Drilling	
		Measured or Estimated Depth to Groundwater (ft)	Corresponding Groundwater Elevation* (ft)	Measured or Estimated Depth to Groundwater (ft)	Corresponding Groundwater Elevation * (ft)
ST-1	921.5	12 1/2	909	18	903 1/2
ST-2	920.9	18	903	---	---
ST-3	919.9	17	903	---	---
ST-4	923.4	15	908 1/2	---	---
ST-5	922.0	12 1/2	909 1/2	18 1/2	903 1/2

*Rounded to nearest 1/2 foot.

In general, the observations suggest static groundwater to be at approximately 903 to 903 1/2 feet in elevation. Zones of wet sand may be encountered above that level due to perched conditions or fluctuations of groundwater levels.

If the project team identifies a need for more accurate determination of groundwater depth, we can install piezometers. Project planning should anticipate seasonal and annual fluctuations of groundwater.

B.4. Laboratory Test Results

We performed moisture content (MC) tests (per ASTM D2216) on selected samples to aid in our classifications and estimations of the materials' engineering properties. The Log of Boring Sheets attached in the Appendix present the results of the MC tests in the "MC" column.

We also performed wash loss (P200) tests (per ASTM D1140) and organic content (OC) tests (per ASTM D2974) on selected samples to determine the reusability of the material within trenches. The Log of Boring sheets in the Appendix show the results of the OC test in the "Tests or Remarks" column.

B.5. Core and Hand Auger Boring Results (2nd Avenue South)

Table 4 summarizes the pavement cores and hand auger borings performed on 2nd Avenue South. A photo log of the cores can be found in the report Appendix.

Table 4. Core and Hand Auger Boring Results, 2nd Avenue South

Boring/Core	Thickness (inches)		Base Description	Core Condition	Soil Description	Notes
	HMA	Aggregate Base				
C-1	4 1/2	14	Crushed limestone	---	Poorly graded sand with silt, fine-grained, brown, moist	---
C-2A	6 1/2	---	---	Good condition	---	Taken as companion core to compare adjacent passes of asphalt. Core C-2A on inside pass
C-2B	6 1/2	10 1/2	Sand and gravel	Medium-severity stripping, debonded top layer/skin patch	Silty sand, fine-to-medium-grained, brown, moist	Taken in outside pass, closer to curb, in area showing extensive raveling
C-3	8 1/2	5 1/2	Sand and gravel	High-severity stripping, debonding of multiple skin patches	Clayey sand, brown/gray, moist	---
C-4	4	8	Sand and gravel	Good condition	Clayey sand/silty sand, gray, moist	---
C-5	4	10	Sand and gravel	Good condition	Poorly graded sand with silt, fine-grained, brown, moist	---
C-6	3	5	Crushed limestone	Good condition	Poorly graded sand with silt and gravel, fine-grained, brown, moist	---

C. Recommendations

C.1. Design and Construction Discussion

C.1.a. Pavement Reuse (6th and 7th Avenue South)

If the pavements are to be reused or reclaimed, our pavement thickness measurements suggest a 10-inch or greater full-depth reclamation (FDR) depth can be used. Variation of existing pavement depth should be anticipated.

We recommend implementing thorough quality control practices, including frequent sieve analyses, to achieve a desirable gradation of the reclaimed material. We also suggest that the contractor assume some contingency for importing clean, crushed rock that can be blended with the reclaimed material to improve the uniformity of the resulting gradation prior to reuse as an aggregate base.

C.1.b. Soil Reuse

Based on the soil boring results, we anticipate the subgrade soils will generally consist of silty sand with a lesser amount of clayey soils. Since grade changes are not proposed, the subgrade soils present beneath the existing roads will generally be suitable for pavement support.

Clayey soils were only present in limited quantities, including the buried topsoil clayey sand in ST-1, and the shallow clayey sand fill in ST-2. It also appears these soils can be reused. We recommend tapering zones of clayey soils adjacent to more granular material to avoid abrupt transitions that may result in differential movements at the surface.

Although we did not note cobbles and boulders in our borings, glacial deposits contain them, and their presence may slow excavation and limit the quantity of soil that can be reused.

C.1.c. Utilities

The reuse of the utility trench backfill soils will have potential impacts on the pavement subgrades. If the backfill is not properly compacted, there is the potential for subgrade instability and settlement, with premature deterioration of the pavement surface. On this project, we anticipate that most of the trench soils will consist of relatively granular soils that can be readily recompacted provided they are conditioned to the recommended moisture content.

It appears the sanitary sewer excavations may encroach on the static groundwater table, and temporary dewatering of these excavations may be required. We are recommending using at least 12 inches of crushed rock to support the sanitary sewer pipes due to the potential for groundwater.

Care should be used to avoid disturbance of the soils supporting utilities or impacting the utilities themselves during pavement removals and reconstruction.

C.1.d. Mill and Overlay of 2nd Avenue South

The segment of 2nd Avenue South from 9 Mile Cove to 5th Street generally appears to be suitable for mill and overlay based on the visually assessed material condition and pavement thickness, with the following considerations:

- The skin-patched areas previously discussed were almost exclusively in the outside paving pass adjacent to curb. It appeared based on cores through these areas (C-2B, C-3) that they are correlated with asphalt stripping. However, in each of these cases the cores were relatively thick, and although the asphalt remained intact overall, there is risk there are areas of more advanced breakage or that this will occur during construction.
- The route is restricted to truck traffic, and most of the traffic consists of autos and light trucks. In our opinion, a 2-inch mill and overlay will suffice, with the understanding the overlay may have a reduced service life in the noted areas of stripping/raveling.
- Although the raveling and skin patching was not as prevalent south of 7th, the pavement was also thinner. The mill and overlay thickness in this area can be reduced to 1 1/2 inches to limit the risk of damaging the pavement materials and subgrade during construction.

C.2. Utility Replacement

C.2.a. Excavation Oversizing

When removing unsuitable materials below utilities, we recommend the excavation extend outward and downward at a slope of 1:1 V:H or flatter.

C.2.b. Utility Subgrade Stabilization

We anticipate the soils at typical invert elevations for utilities will generally be suitable for utility support after the recommended subgrade preparation. However, it is likely groundwater and wet soils will be encountered near sanitary sewer invert elevations and additional subcutting and replacement crushed rock will likely be required for pipe support. For this purpose, we recommend using MnDOT coarse aggregate bedding (MnDOT 3149.G.3) as referenced in Table 5. We recommend a minimum coarse aggregate bedding thickness of 1 foot.

C.2.c. Excavated Slopes

Based on the borings, we anticipate many of the on-site soils in excavations will consist of granular glacial deposits. These soils are typically considered Type C Soil under OSHA (Occupational Safety and Health Administration) guidelines. OSHA guidelines indicate unsupported excavations in Type C soils should have

a gradient no steeper than 1:1 1/2 V:H. Slopes constructed in this manner may still exhibit surface sloughing. OSHA requires an engineer to evaluate slopes or excavations over 20 feet in depth.

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.

C.2.d. Selection, Placement and Compaction of Backfill

We recommend compacting soils per the requirements outlined in Table 5.

Table 5. Engineered Fill Materials*

Locations to Be Used	Engineered Fill Classification	Possible Soil Type Descriptions	Gradation	Additional Requirements
Pavement subgrades Trench backfill Embankment fill (areas with sandy soils)	MnDOT granular material	SP, SP-SM, SM	See MnDOT 3149.2.B	---
Pavement subgrades Trench backfill Embankment fill (areas with clayey soils)	MnDOT select grading	SP, SP-SM, SC, CL	MnDOT 2106	< 80% silt < 6% OC
Pavement subbase/drainage layer Non-frost-susceptible Utility bedding (dry or moist conditions)	Free draining Non-frost-susceptible fill MnDOT select granular	GP, GW, SP, SP-SM, SW	See MnDOT 3149.2.B	---
Utility bedding (wet or unstable conditions)*	Coarse aggregate bedding	GP, GW, SP, SW	100% passing 1 1/2-inch sieve 0 to 10% passing #4 sieve See MnDOT 3149.G.2	---
Below landscaped surfaces, where subsidence is not a concern	Non-structural fill	---	100% passing 6-inch sieve	< 10% OC

*Thicknesses will vary by condition and alternative materials may be required; consult the geotechnical representative to evaluate utility excavations.

We recommend spreading engineered fill in loose lifts approximately 12 inches thick. We recommend compacting engineered fill in accordance with the criteria presented below in Table 6.

Table 6. Compaction Recommendations Summary

Reference	Relative Compaction, percent (ASTM D698 – Standard Proctor)	Moisture Content Variance from Optimum, percentage points*	
		< 12% Passing #200 Sieve (typically SP, SP-SM)	> 12% Passing #200 Sieve (typically CL, SC, ML, SM)
Within 3 feet of top of pavement subgrade	100	±3	-1 to +3
More than 3 feet below top of pavement subgrade	95	±3	±3
Below landscaped surfaces	90	±5	±4

*Alternatively, use the penetration index method (MnDOT Specification 2106.3.G.3) for soils with P200 < 20%. Consult MnDOT 2106.3.C for alternative moisture content controls when using Specified Density for soils.

The project documents should not allow the contractor to use frozen material as engineered fill or to place engineered fill on frozen material.

C.2.e. Excavation Dewatering

It appears the static groundwater table will be above or near the depth of the proposed utility work in some locations. We recommend removing groundwater from the utility excavations, where encountered, and removing any water that seeps into excavations from sidewalls or the adjacent sitework.

The contractor should use care when excavations extend to near the waterbearing sands as the water coupled with vibration and disturbance from construction activities could result in temporary “quick” conditions in the soils. These soils would then not stabilize without temporary dewatering and compaction, and the contractor will likely need to subcut the compromised soils. A well contractor should develop a dewatering plan; the design team should review this plan.

C.2.f. Corrosion Potential

Most of the soil borings indicated the site predominantly consists of silty sand soils. We consider these soils non-to-slightly-corrosive to metallic conduits, and utilities should not require cathodic protection.

C.3. New Pavements

C.3.a. Pavement Subgrade Preparation

We recommend the following steps for pavement subgrade preparation, understanding the reconstruction will generally match existing grades.

1. Remove or reclaim and stockpile/windrow the pavement.
2. Once the roadway sections are cut to grade, have a geotechnical representative observe the excavated subgrade to evaluate if additional subgrade improvements are necessary. We recommend extending excavations outward from the bottom of the subgrade elevation at a slope of 1:1 V:H (vertical:horizontal) or flatter.
3. Scarify, moisture condition, and surface compact to at least 100 percent of Standard Proctor density (non-granular soils) or to the requirements of the MnDOT penetration index method (granular soils).
4. Place pavement engineered fill to grade where required and compact in accordance with Section C.2.d to bottom of pavement section.
5. Test roll the pavement subgrade as described in Section C.3.b.

C.3.b. Pavement Subgrade Test Roll

After preparing the subgrade as described above and prior to the placement of the sand subbase or aggregate base/reclaim, where it is windrowed, we recommend test rolling the subgrade soils with a fully loaded tandem-axle truck. We also recommend having a geotechnical representative observe the test roll. Areas that fail the test roll likely indicate soft or weak soils that will require additional correction work to support pavements.

The contractor should correct areas that display yielding or rutting greater as described in MnDOT Specification 2111. Possible options for subgrade correction include moisture conditioning and recompaction, subcutting and replacement with soil or crushed aggregate, chemical stabilization and/or geotextiles. We recommend performing a second test roll after the aggregate base material is in place prior to placing bituminous pavement.

C.3.c. Engineered Fill Materials and Compaction

The on-site soils with an organic content less than 5 percent and free of debris are suitable for reuse as trench backfill. The limited clayey soils encountered will be more difficult to compact if wet, allowed to become wet, or if spread and compacted over wet surfaces.

If imported material is to be used, Table 5 contains our recommendations for engineered fill. Similar materials compared to existing should be used to the degree possible; as such, we recommend that imported fill meet the requirements of MnDOT granular material in areas with sandy soils.

C.3.d. Pavement Design Sections, 6th and 7th Avenues South

Our scope of services for this project did not include laboratory tests on subgrade soils to determine an R-value for pavement design. However, given the variable nature of typical subgrades, which were generally silty sand, we recommend using a design R-value of 30 for pavement design on the project. The contractor may need to perform limited removal of unsuitable or less suitable soils, such as those revealed by test roll, to achieve this value.

Based upon the estimated traffic loads and an R-value of 30, we recommend that new pavement sections include the following materials and thicknesses per Table 7.

Table 7. Recommended Bituminous Pavement Thickness Design

Layer	Thickness (inches)	Material (Specification)
Bituminous wear course	2	SPWEA240C (MnDOT 2360)
Bituminous non-wear course	2	SPNWB230C (MnDOT 2360)
Aggregate base	8	Class 5 or 6 (3138); modified aggregate base (3151)
Approved subgrade	---	---

The above pavement design assumes on a 20-year performance life. This is the amount of time before we anticipate the pavement will require major rehabilitation. This performance life assumes routine maintenance, such as seal coating and crack sealing. The actual pavement life will vary depending on variations in weather, traffic conditions, and maintenance.

Many conditions affect the overall performance of the pavements. Some of these conditions include the environment, loading conditions and the level of ongoing maintenance. Regarding bituminous pavements, it is common to have thermal cracking develop within the first few years of placement and continue throughout the life of the pavement. We recommend developing a regular maintenance plan for filling cracks in pavements to lessen the potential impacts for cold weather distress due to frost heave or warm weather distress due to wetting and softening of the subgrade.

C.3.e. Pavement Materials Placement

We recommend placing the bituminous wear and non-wear courses to meet the requirements of MnDOT Specification 2360.

We recommend compacting the aggregate base to meet the requirements of MnDOT Specification 2211.3.D.2.c (Penetration Index Method for the dynamic cone penetrometer [DCP]).

C.4. Mill and Overlay

Milling should proceed per MnDOT Specification 2232, with bituminous paving in general accordance with MnDOT Specification 2360. We recommend a minimum mill depth of 2 inches north of 7th Avenue, and a maximum mill depth of 1 1/2 inches south of 7th Avenue, with a replacement overlay mix consisting of SPWEA240B or SPWEA240C.

D. Procedures

D.1. Penetration Test Borings

We drilled the penetration test borings with a truck-mounted core and auger drill equipped with hollow-stem auger. We performed the borings in general accordance with ASTM D6151 taking penetration test samples at 2 1/2- or 5-foot intervals in general accordance with ASTM D1586. The boring logs show the actual sample intervals and corresponding depths.

D.2. Exploration Logs

D.2.a. Log of Boring Sheets

The Appendix includes Log of Boring sheets for our penetration test borings. The logs identify and describe the penetrated geologic materials and present the results of penetration resistance tests performed. The logs also present the results of laboratory tests performed on penetration test samples, and groundwater measurements.

We inferred strata boundaries from changes in the penetration test samples and the auger cuttings. Because we did not perform continuous sampling, the strata boundary depths are only approximate. The boundary depths likely vary away from the boring locations, and the boundaries themselves may occur as gradual rather than abrupt transitions.

D.2.b. Geologic Origins

We assigned geologic origins to the materials shown on the logs and referenced within this report, based on: (1) a review of the background information and reference documents cited above, (2) visual classification of the various geologic material samples retrieved during the course of our subsurface exploration, (3) penetration resistance testing performed for the project, (4) laboratory test results, and (5) available common knowledge of the geologic processes and environments that have impacted the site and surrounding area in the past.

D.3. Material Classification and Testing

D.3.a. Visual and Manual Classification

We visually and manually classified the geologic materials encountered based on ASTM D2488. When we performed laboratory classification tests, we used the results to classify the geologic materials in accordance with ASTM D2487. The Appendix includes a chart explaining the classification system we used.

D.3.b. Laboratory Testing

The exploration logs in the Appendix note the results of the laboratory tests performed on geologic material samples. We performed the tests in general accordance with ASTM or AASHTO procedures.

D.4. Groundwater Measurements

The drillers checked for groundwater while advancing the penetration test borings, and again after auger withdrawal. We then filled the boreholes or allowed them to remain open for an extended period of observation, as noted on the boring logs.

E. Qualifications

E.1. Variations in Subsurface Conditions

E.1.a. Material Strata

We developed our evaluation, analyses, and recommendations from a limited amount of site and subsurface information. It is not standard engineering practice to retrieve material samples from exploration locations continuously with depth. Therefore, we must infer strata boundaries and thicknesses to some extent. Strata boundaries may also be gradual transitions, and project planning should expect the strata to vary in depth, elevation, and thickness away from the exploration locations.

Variations in subsurface conditions present between exploration locations may not be revealed until performing additional exploration work or starting construction. If future activity for this project reveals any such variations, you should notify us so that we may reevaluate our recommendations. Such variations could increase construction costs, and we recommend including a contingency to accommodate them.

E.1.b. Groundwater Levels

We made groundwater measurements under the conditions reported herein and shown on the exploration logs and interpreted in the text of this report. Note that the observation periods were relatively short, and project planning can expect groundwater levels to fluctuate in response to rainfall, flooding, irrigation, seasonal freezing and thawing, surface drainage modifications, and other seasonal and annual factors.

E.2. Continuity of Professional Responsibility

E.2.a. Plan Review

We based this report on a limited amount of information, and we made a number of assumptions to help us develop our recommendations. We should be retained to review the geotechnical aspects of the designs and specifications. This review will allow us to evaluate whether we anticipated the design correctly, if any design changes affect the validity of our recommendations, and if the design and specifications correctly interpret and implement our recommendations.

E.2.b. Construction Observations and Testing

We recommend retaining us to perform the required observations and testing during construction as part of the ongoing geotechnical evaluation. This will allow us to correlate the subsurface conditions exposed during construction with those encountered by the borings and provide professional continuity from the design phase to the construction phase. If we do not perform observations and testing during construction, it becomes the responsibility of others to validate the assumption made during the preparation of this report and to accept the construction-related geotechnical engineer-of-record responsibilities.

E.3. Use of Report

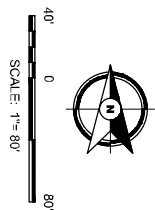
This report is for the exclusive use of the addressed parties. Without written approval, we assume no responsibility to other parties regarding this report. Our evaluation, analyses, and recommendations may not be appropriate for other parties or projects.

E.4. Standard of Care

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

Appendix

● DENOTES APPROXIMATE LOCATION OF
STANDARD PENETRATION TEST BORING



BRAUN
INTERTEC
Soil Systems, Inc. 800-848-6644
11001 Hampshire Avenue S
Minneapolis, MN 55438
braunintertec.com

Drawing Information

Project No.
B2104532
Drawing No.
B2104532
Drawn By
JAG
Date Drawn
6/1/21
Checked By
NGL
Last Modified
6/10/21
Project Information

**2022 Street and Utility
Improvements Project**

6th and 7th Avenues S.

Hopkins, Minnesota

**Soil Boring
Location Sketch**

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2104532 Geotechnical Evaluation City of Hopkins 2022 Street & Utility Improvements 6th and 7th Avenues S, 2nd Street to Mainstreet Hopkins, Minnesota					BORING: ST-1	
					LOCATION: See attached sketch	
					NORTHING: 148362	EASTING: 493376
DRILLER: C. McClain		LOGGED BY: N. Lund		START DATE: 06/04/21	END DATE: 06/04/21	
SURFACE ELEVATION: 921.5 ft		RIG: 7514	METHOD: 3 1/4" HSA	SURFACING: Bituminous	WEATHER: Hot	

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q _p tsf	MC %	Tests or Remarks
919.8		PAVEMENT, 8 inches of bituminous over 12 inches of apparent aggregate base					
1.7		FILL: SILTY SAND (SM), fine to coarse-grained, with Gravel, dark brown, moist		3-5-5 (10) 16"			
917.5		CLAYEY SAND (SC), slightly organic, dark brown, moist (BURIED TOPSOIL)	5	3-2-2 (4) 18"		24	OC=4%
4.0		POORLY GRADED SAND (SP), fine to coarse-grained, trace Gravel, brown, moist, very loose to loose (GLACIAL OUTWASH)		2-2-2 (4) 10"			
915.5			10	3-2-1 (3) 18"			
6.0				2-3-6 (9) 12"			
		With Gravel, wet at 12 1/2 feet	15	3-4-4 (8) 2"			
903.5		SILTY SAND (SM), fine to medium-grained, trace Gravel, brown, wet, medium dense (GLACIAL OUTWASH)	20	4-6-6 (12) 12"			
18.0		END OF BORING					Water observed at 12.5 feet while drilling.
900.5		Boring then grouted					Water observed at 18.0 feet with 20.0 feet of tooling in the ground at end of drilling.
21.0							
			25				
			30				

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2104532 Geotechnical Evaluation City of Hopkins 2022 Street & Utility Improvements 6th and 7th Avenues S, 2nd Street to Mainstreet Hopkins, Minnesota					BORING: ST-2		
					LOCATION: See attached sketch		
					NORTHING: 148125	EASTING: 493366	
DRILLER: C. McClain		LOGGED BY: N. Lund		START DATE: 06/04/21	END DATE: 06/04/21		
SURFACE ELEVATION: 920.9 ft		RIG: 7514	METHOD: 3 1/4" HSA	SURFACING: Bituminous	WEATHER: Hot		
Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q _p tsf	MC %	Tests or Remarks
919.8		PAVEMENT, 7 inches of bituminous over 6 inches of apparent aggregate base					
1.1		FILL: CLAYEY SAND (SC), dark brown, moist		1-1-2 (3) 10"			
916.9		POORLY GRADED SAND (SP), fine to coarse-grained, with Gravel, brown, moist, medium dense (GLACIAL OUTWASH)	5	6-8-8 (16) 18"			
4.0				10-10-10 (20) 12"			
909.9			10	6-7-10 (17) 12"			
11.0		SILTY SAND (SM), fine to medium-grained, trace Gravel, brown, wet, loose to medium dense (GLACIAL OUTWASH)		5-7-12 (19) 15"		10	P200=23%
			15	6-8-11 (19) 15"			
899.9		With Gravel at 20 feet	20	5-4-5 (9) 18"			
21.0		END OF BORING					
		Boring then grouted					
			25				
			30				
							Water observed at 18.0 feet with 20.0 feet of tooling in the ground while drilling.

Project Number B2104532 Geotechnical Evaluation City of Hopkins 2022 Street & Utility Improvements 6th and 7th Avenues S, 2nd Street to Mainstreet Hopkins, Minnesota					BORING: ST-3		
					LOCATION: See attached sketch		
					NORTHING: 147798	EASTING: 493349	
DRILLER: C. McClain		LOGGED BY: N. Lund		START DATE: 06/04/21	END DATE: 06/04/21		
SURFACE ELEVATION: 919.9 ft		RIG: 7514	METHOD: 3 1/4" HSA	SURFACING: Bituminous	WEATHER: Hot		
Elev./Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q _p tsf	MC %	Tests or Remarks
919.0		PAVEMENT, 6 inches of bituminous over 5 inches of apparent aggregate base					
0.9		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained, trace Gravel, brown, moist		2-3-5 (8) 16"		4	P200=6%
915.9		POORLY GRADED SAND (SP), fine to coarse-grained, with Gravel, brown, moist, medium dense to dense (GLACIAL OUTWASH)	5	10-22-16 (38) 18"			
4.0				9-14-13 (27) 16"			
			10	9-8-11 (19) 17"			
		Wet at 12 1/2 feet		8-9-12 (21) 18"		6	
905.9		SILTY SAND (SM), fine to medium-grained, brown, wet, loose to medium dense (GLACIAL OUTWASH)	15	5-4-5 (9) 18"			
14.0				6-5-7 (12) 15"			
898.9		END OF BORING					Water observed at 17.0 feet with 20.0 feet of tooling in the ground while drilling.
21.0		Boring then grouted					
			25				
			30				

Project Number B2104532 Geotechnical Evaluation City of Hopkins 2022 Street & Utility Improvements 6th and 7th Avenues S, 2nd Street to Mainstreet Hopkins, Minnesota					BORING: ST-4		
					LOCATION: See attached sketch		
					NORTHING: 148428	EASTING: 493715	
DRILLER: C. McClain		LOGGED BY: N. Lund		START DATE: 06/04/21	END DATE: 06/04/21		
SURFACE ELEVATION: 923.4 ft		RIG: 7514	METHOD: 3 1/4" HSA	SURFACING: Bituminous	WEATHER: Hot		
Elev./Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q _p tsf	MC %	Tests or Remarks
921.7		PAVEMENT, 6 inches of bituminous over 14 inches of apparent aggregate base					
1.7		FILL: SILTY SAND (SM), fine to coarse-grained, with Gravel, dark brown, moist		1-3-5 (8) 2"			
			5	5-6-6 (12) 14"		12	P200=29%
				6-6-8 (14) 16"			
			10	4-3-4 (7) 16"			
911.4		POORLY GRADED SAND (SP), fine to coarse-grained, with Gravel, brown, moist, medium dense (GLACIAL OUTWASH)		8-9-8 (17) 4"			
12.0		Wet at 15 feet	15	6-7-9 (16) 16"		16	
				3-10-9 (19) 18"			
902.4		END OF BORING					
21.0		Boring then grouted					Water observed at 15.0 feet with 15.0 feet of tooling in the ground while drilling.
			25				
			30				

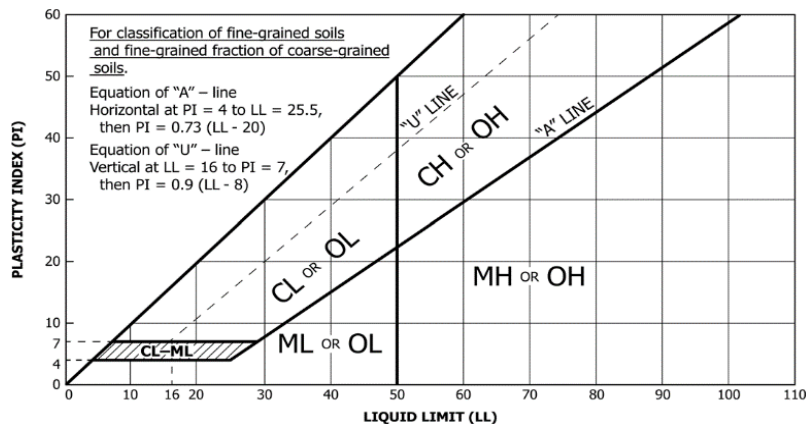
See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2104532 Geotechnical Evaluation City of Hopkins 2022 Street & Utility Improvements 6th and 7th Avenues S, 2nd Street to Mainstreet Hopkins, Minnesota					BORING: ST-5		
					LOCATION: See attached sketch		
					NORTHING: 148145	EASTING: 493710	
DRILLER: C. McClain		LOGGED BY: N. Lund		START DATE: 06/04/21	END DATE: 06/04/21		
SURFACE ELEVATION: 922.0 ft		RIG: 7514	METHOD: 3 1/4" HSA	SURFACING: Bituminous	WEATHER: Hot		
Elev./Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q _p tsf	MC %	Tests or Remarks
921.1 0.9		PAVEMENT, 5 inches of bituminous over 6 inches of apparent aggregate base FILL: SILTY SAND (SM), fine to coarse-grained, with Gravel, brown, moist		5-10-9 (19) 14"		6	
			5	7-5-5 (10) 15"			
914.0 8.0		POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained, with Gravel, brown, moist, medium dense (GLACIAL OUTWASH)	10	1-3-2 (5) 10"			
				5-8-8 (16) 16"		12	
				5-7-7 (14) 16"			
		Wet at 12 1/2 feet	15	6-5-5 (10) 18"			
904.0 18.0		SILTY SAND (SM), fine to coarse-grained, trace Gravel, brown, wet, loose (GLACIAL OUTWASH)	20	4-3-4 (7) 18"			
901.0 21.0		END OF BORING					Water observed at 12.5 feet with 12.5 feet of tooling in the ground while drilling.
		Boring then grouted					Water observed at 18.5 feet with 20.0 feet of tooling in the ground at end of drilling.
			25				
			30				

B2104532 Braun Intertec Corporation Print Date:09/10/2021 ST-6 page 1 of 1

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A					Soil 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 (Less than 5% fines ^C)	$C_u \geq 4$ and $1 \leq C_c \leq 3$ ^D	GW	Well-graded gravel ^E	
			$C_u < 4$ and/or ($C_c < 1$ or $C_c > 3$) ^D	GP	Poorly graded gravel ^E	
		Gravels with Fines (More than 12% fines ^C)	Fines classify as ML or MH	GM	Silty gravel ^{F,G}	
			Fines Classify as CL or CH	GC	Clayey gravel ^{F,G}	
	Sands (50% or more coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5% fines ^H)	$C_u \geq 6$ and $1 \leq C_c \leq 3$ ^D	SW	Well-graded sand ^I	
			$C_u < 6$ and/or ($C_c < 1$ or $C_c > 3$) ^D	SP	Poorly graded sand ^I	
		Sands with Fines (More than 12% fines ^H)	Fines classify as ML or MH	SM	Silty sand ^{F,G,I}	
			Fines classify as CL or CH	SC	Clayey sand ^{F,G,I}	
Fine-grained Soils (50% or more passes 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,L,M}	
			PI < 4 or plots below "A" line ^J	ML	Silt ^{K,L,M}	
		Organic	Liquid Limit – oven dried	OL	Organic clay ^{K,L,M,N}	
			Liquid Limit – not dried <0.75		Organic silt ^{K,L,M,O}	
	Silts and Clays (Liquid limit 50 or more)	Inorganic	PI plots on or above "A" line	CH	Fat clay ^{K,L,M}	
			PI plots below "A" line	MH	Elastic silt ^{K,L,M}	
		Organic	Liquid Limit – oven dried	OH	Organic clay ^{K,L,M,P}	
			Liquid Limit – not dried <0.75		Organic silt ^{K,L,M,Q}	
Highly Organic Soils		Primarily organic matter, dark in color, and organic odor		PT	Peat	

- A. Based on the material passing the 3-inch (75-mm) sieve.
B. If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
C. 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
D. $C_u = D_{60} / D_{10}$ $C_c = (D_{30})^2 / (D_{10} \times D_{60})$
E. If soil contains $\geq 15\%$ sand, add "with sand" to group name.
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. 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
I. If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.
J. If Atterberg limits plot in hatched area, soil is CL-ML, silty clay.
K. If soil contains 15 to $< 30\%$ 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. PI ≥ 4 and plots on or above "A" line.
O. 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	q_p	Pocket penetrometer strength, tsf
WD	Wet density, pcf	q_u	Unconfined compression test, tsf
P200	% Passing #200 sieve	LL	Liquid limit
MC	Moisture content, %	PL	Plastic limit
OC	Organic content, %	PI	Plasticity index

Particle Size Identification

Boulders..... over 12"
Cobbles..... 3" to 12"
Gravel
Coarse..... 3/4" to 3" (19.00 mm to 75.00 mm)
Fine..... No. 4 to 3/4" (4.75 mm to 19.00 mm)
Sand
Coarse..... No. 10 to No. 4 (2.00 mm to 4.75 mm)
Medium..... No. 40 to No. 10 (0.425 mm to 2.00 mm)
Fine..... No. 200 to No. 40 (0.075 mm to 0.425 mm)
Silt..... No. 200 (0.075 mm) to .005 mm
Clay..... $< .005$ mm

Relative Proportions^{L,M}

trace..... 0 to 5%
little..... 6 to 14%
with..... $\geq 15\%$

Inclusion Thicknesses

lens..... 0 to 1/8"
seam..... 1/8" to 1"
layer..... over 1"

Apparent 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..... < 0.25 tsf
Soft..... 2 to 4 BPF..... 0.25 to 0.5 tsf
Medium..... 5 to 8 BPF..... 0.5 to 1 tsf
Stiff..... 9 to 15 BPF..... 1 to 2 tsf
Very Stiff..... 16 to 30 BPF..... 2 to 4 tsf
Hard..... over 30 BPF..... > 4 tsf

Moisture Content:

Dry: Absence of moisture, dusty, dry to the touch.
Moist: Damp but no visible water.
Wet: Visible free water, usually soil is below water table.

Drilling Notes:




Blows/N-value: Blows indicate the driving resistance recorded for each 6-inch interval. The reported N-value is the blows per foot recorded by summing the second and third interval in accordance with the Standard Penetration Test, ASTM D1586.

Partial Penetration: If the sampler could not be driven through a full 6-inch interval, the number of blows for that partial penetration is shown as #/x" (i.e. 50/2"). The N-value is reported as "REF" indicating refusal.









Recovery: Indicates the inches of sample recovered from the sampled interval. For a standard penetration test, full recovery is 18", and is 24" for a thinwall/shelby tube sample.

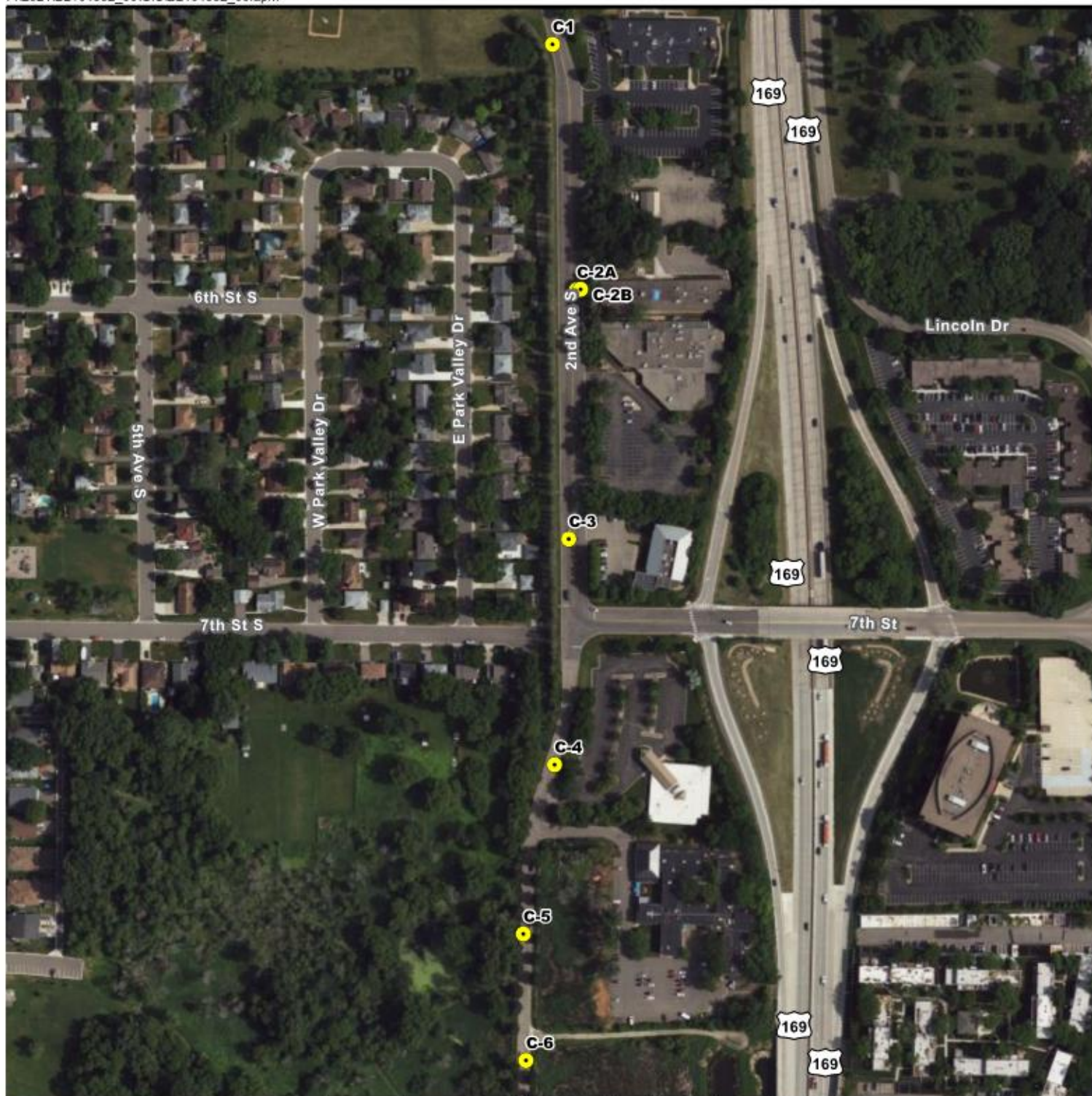
WOH: Indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

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

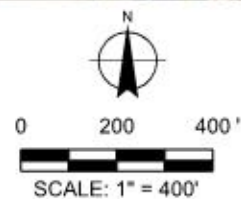
Water Level: Indicates the water level measured by the drillers either while drilling (, at the end of drilling (, or at some time after drilling (.

Sample Symbols

	Standard Penetration Test		Rock Core
	Modified California (MC)		Thinwall (TW)/Shelby Tube (SH)
	Auger		Texas Cone Penetrometer
	Grab Sample		Dynamic Cone Penetrometer



● Coring Location



**BRAUN
INTERTEC**
The Science You Build On.

11001 Hampshire Avenue S
Minneapolis, MN 55438
952.995.2000
braunintertec.com

Project No:
B2104532_00

Drawing No:
B2104532_00_Corings

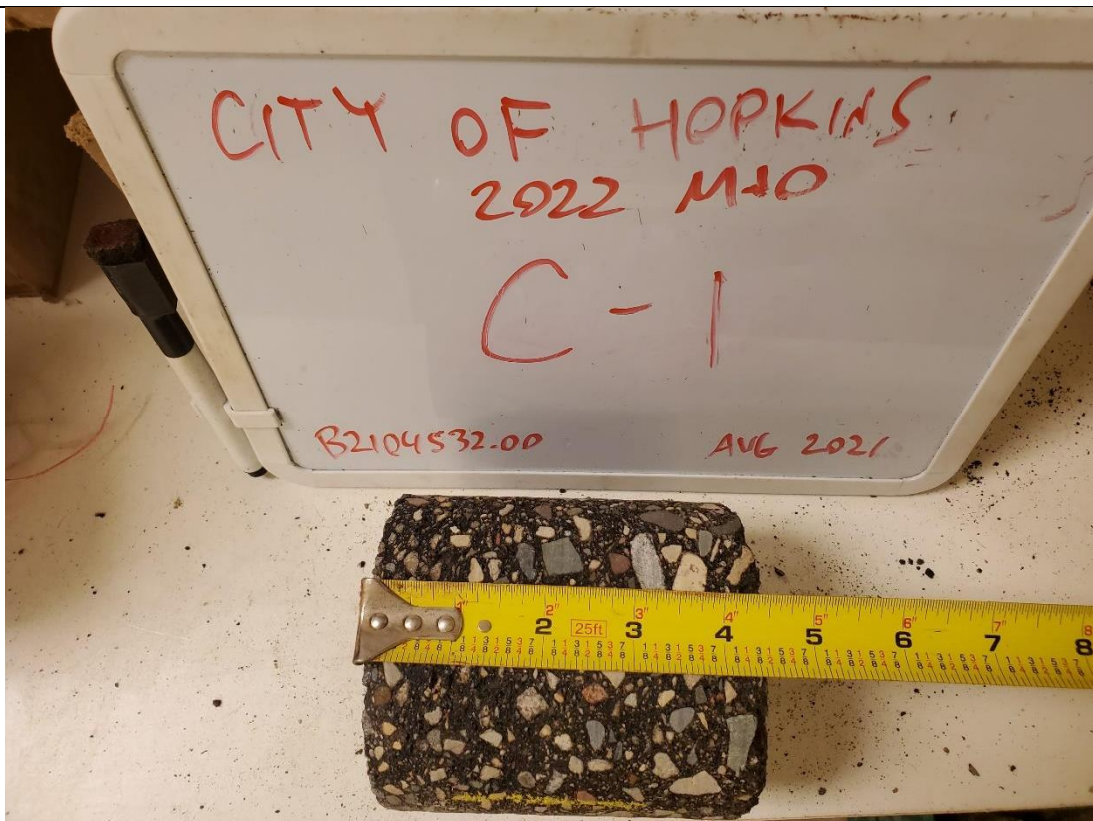
Drawn By: JPM
Date Drawn: 9/10/2021
Checked By: NL
Last Modified: 9/10/2021

City of Hopkins 2022 Mill & Overlay

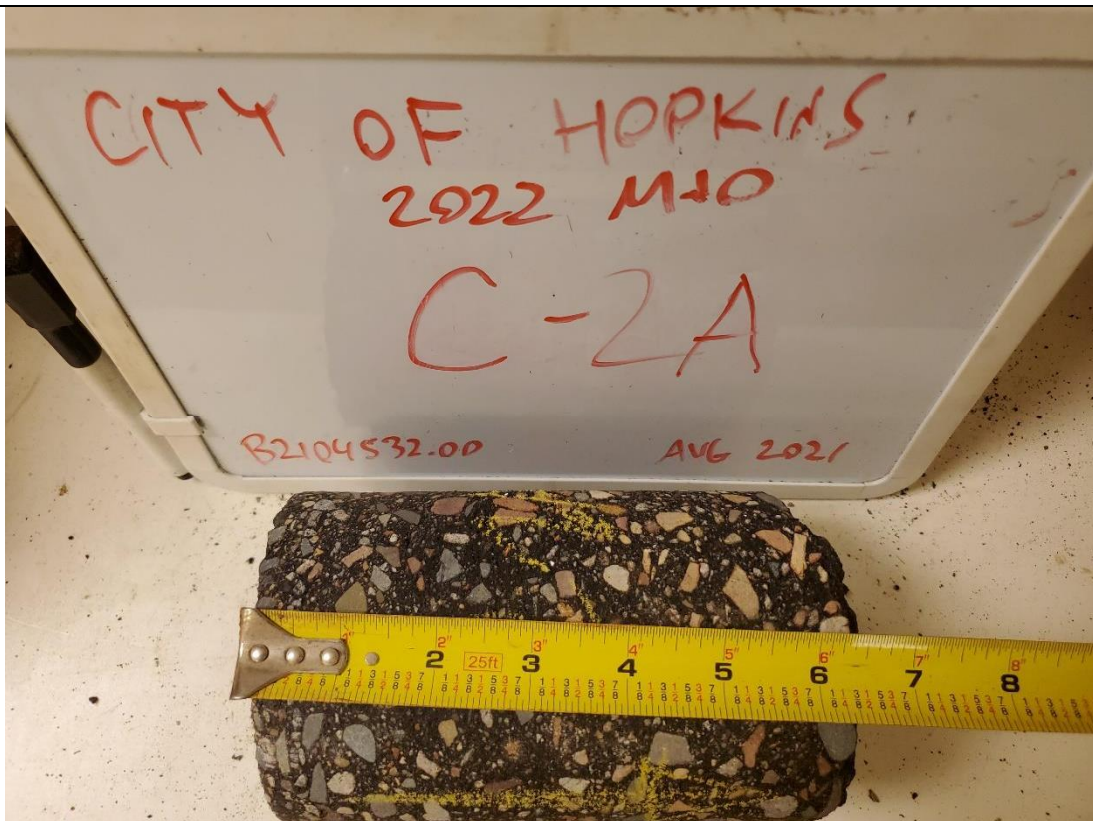
2nd Ave S from 9 Mile Cove to 5th St S

Hopkins, Minnesota

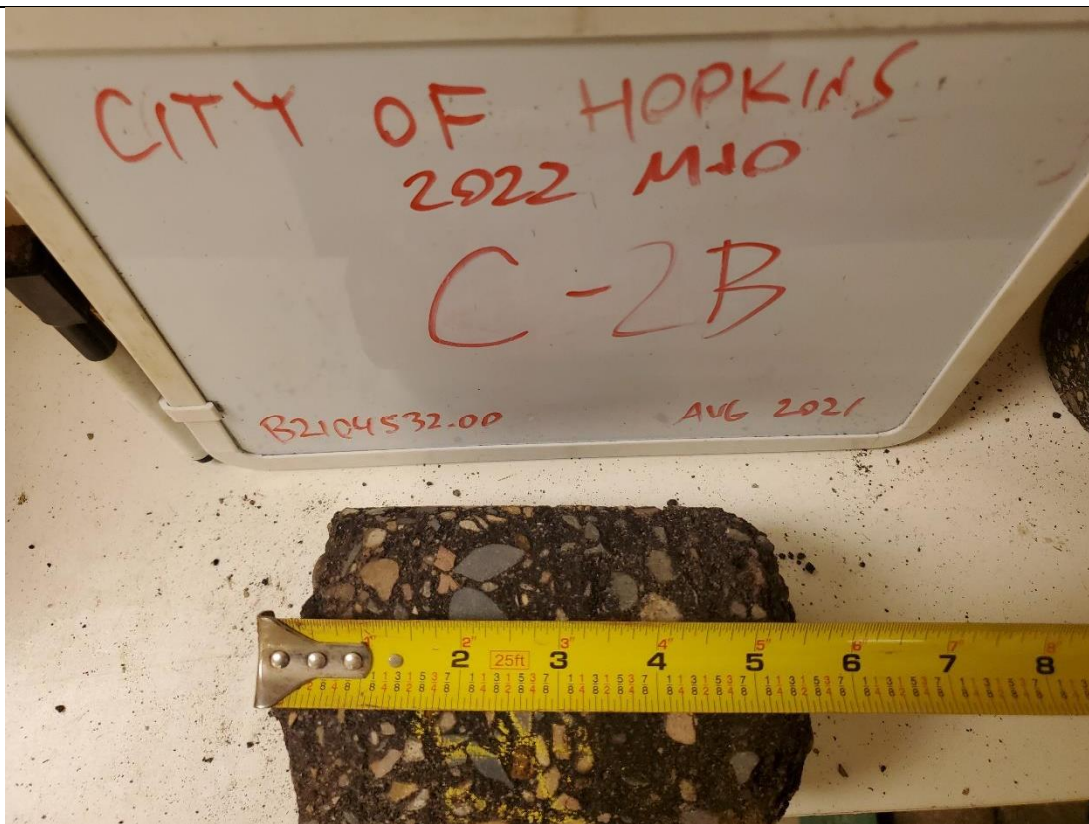
**Core and Hand
Auger Location
Sketch**



Core #:	C-1			Project: B2104532 BRAUN INTERTEC
Pavement thickness:	4 1/2 inches	Agg base thickness:	14 inches	
Facility:	City of Hopkins			
Date:	August 2021			
Notes:				



Core #:	C-2A			Project: B2104532 BRAUN INTERTEC
Pavement thickness	6 1/2 inches	Agg base thickness:	Not measured	
Facility:	City of Hopkins			
Date:	August 2021			
Notes:				



Core #:	C-2B			Project: B2104532 BRAUN INTERTEC
Pavement thickness:	6 1/2 inches	Agg base thickness:	10 1/2 inches	
Facility:	City of Hopkins			
Date:	August 2021			
Notes:				



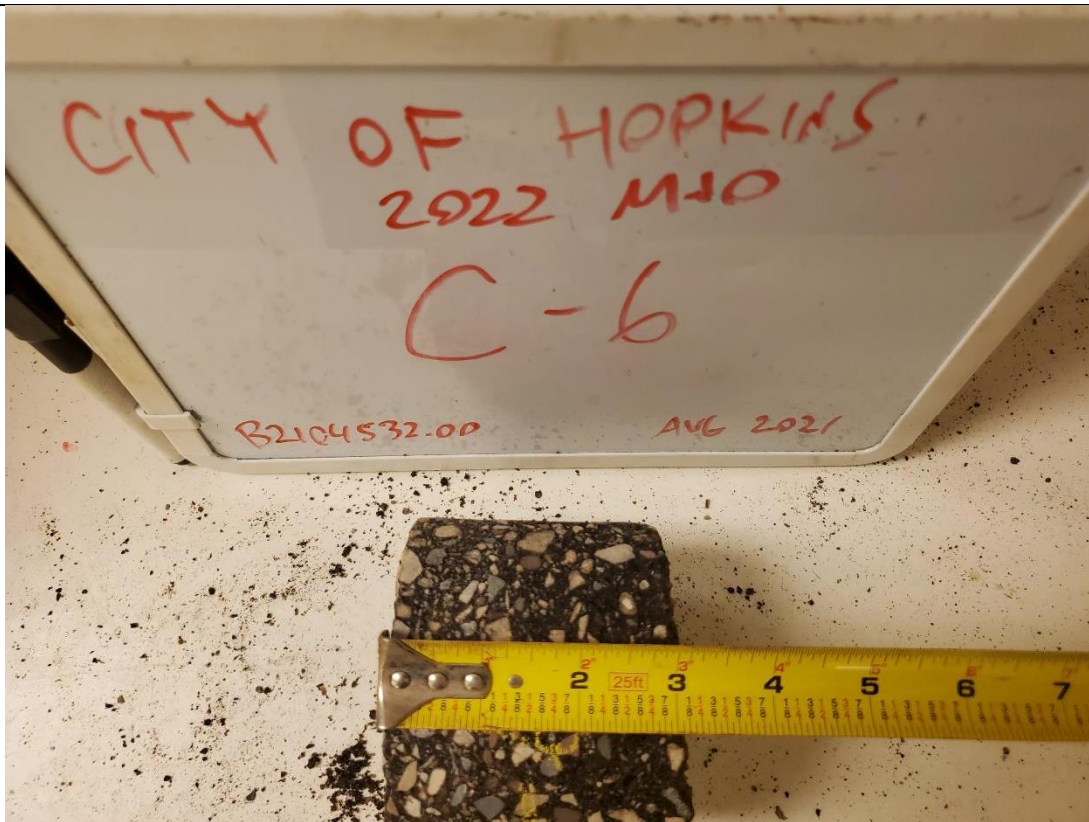
Core #:	C-3			Project: B2104532 BRAUN INTERTEC
Pavement thickness	8 1/2 inches	Agg base thickness:	5 1/2 inches	
Facility:	City of Hopkins			
Date:	August 2021			
Notes:				



Core #:	C-4			Project: B2104532 BRAUN INTERTEC
Pavement thickness:	4 inches	Agg base thickness:	8 inches	
Facility:	City of Hopkins			
Date:	August 2021			
Notes:				

[No photo]

Core #:	C-5			Project: B2104532 BRAUN INTERTEC
Pavement thickness	4 inches	Agg base thickness:	10 inches	
Facility:	City of Hopkins			
Date:	August 2021			
Notes:				



Core #:	C-6			Project: B2104532 BRAUN INTERTEC
Pavement thickness:	3 inches	Agg base thickness:	5 inches	
Facility:	City of Hopkins			
Date:	August 2021			
Notes:				

Services Provided:

Civil and Municipal Engineering
Water and Wastewater Engineering
Traffic and Transportation Engineering
Aviation Planning and Engineering
Water Resources Engineering
Coatings Inspection Services
Landscape Architecture Services
Surveying and Mapping
Geographic Information System Services
Funding Assistance

www.bolton-menk.com
