FEASIBILITY REPORT

2026 MISCELLANEOUS IMPROVEMENTS PROJECT

October 20, 2025

Prepared for:

City of Lakeville

20195 Holyoke Avenue

Lakeville, MN 55044

CITY PROJECT NO. 26-01

WSB PROJECT NO. 031254-000

October 20, 2025

Honorable Mayor and City Council
City of Lakeville
20195 Holyoke Avenue
Lakeville, MN 55044

Re: 2026 Miscellaneous Improvements Project
City of Lakeville Project No. 26-01
WSB Project No. 031254-000

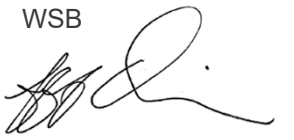
Dear Mayor and City Council:

Transmitted herewith for your review is a feasibility report which addresses improvements associated with 214th Street West in the 2026 Miscellaneous Improvements Project. This feasibility report describes the necessary improvements and associated costs for this street improvement project.

I am available at your convenience to discuss this report. Please do not hesitate to contact me at 612.523.7374 if you have any questions regarding this report.

Sincerely,

WSB



Jeff Oliver, PE
Senior Project Manager

Attachments

178 E 9TH STREET | SUITE 200 | SAINT PAUL, MN | 55101 | 651.286.8450 | WSBENG.COM

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Certification Sheet

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.

Rachel Scheu, PE

Date: October 20, 2025 Lic. No. 63257

Quality Control Review Completed By:

Monica Heil, PE

Date: October 20, 2025 Lic. No. 47497

Executive Summary

The City of Lakeville's 2026 Miscellaneous Improvements Project, City Project No. 26-01, was initiated based on the City's Pavement Management Program. This feasibility report discusses the Street Reconstruction of 214th Street West, which is located east of Hamburg Aveue. The project will include full depth reclamation and paving, and urbanizing of 214th Street West, east of Hamburg Avenue to the end of, and including, the cul-de-sac. 214th Street West includes the following subdivisions:

Imperial First Addition, Airlake Industrial Park 1st Addition, and Airlake Development Addition.

The project location map for 214th Street West is included in ***Figure 1*** of ***Appendix A*** of this report.

The Project includes roadway reclamation, based on pavement ratings, current roadway conditions, and utility needs in the area, as well as the overall Capital Improvement Plan budget. Surface improvements recommended for the project include full depth removal of the existing bituminous pavement, subgrade correction as necessary, spot replacement of existing curb and new installation of concrete curb and gutter along 214th Street that does not currently have curb, installation of concrete commercial driveway aprons at driveway entrances, and new pavement installation.

Replacing portions of the City's deteriorating utility infrastructure in conjunction with the proposed street improvements provides an opportunity to minimize the replacement costs and traffic disruptions associated with the work. Proposed utility improvements include the following:

- Installation of corrosion protection for the existing watermain along 214th Street West.
- Installation of stormwater quality best management practices (BMPs).
- Installation of additional storm sewer drainage structures and storm sewer.

The total estimated project cost for the City of Lakeville's 2026 Miscellaneous Improvements Project for 214th Street West is $577,374 which includes a 10% contingency and 28% indirect costs for legal, engineering, administrative, and financing costs. The project is proposed to be funded through various City funds and through special assessments to benefitting property owners in accordance with the City's current assessment policy.

Introduction

Authorization

On July 21, 2025, the Lakeville City Council authorized the preparation of a feasibility report for the 2026 Miscellaneous Improvements Project. This project is included in the City's 2025-2029 Capital Improvement Plan (CIP) and is designated as part of City Project No. 26-01.

Scope

This report investigates the feasibility of proposed street and utility improvements identified by the City Pavement Management Program (PMP) and CIP for 2026. The street proposed within the 2026 Miscellaneous Improvement Project was initially considered because of existing pavement conditions. The average Overall Condition Index (OCI) value for 214th Street West is twenty-five (25.0) using an OCI scale of 0 to 100 (with zero representing a completely failed street section and 100 representing a new street section free of deficiencies). Streets with OCI values less than 40 are considered to be in failing condition. Streets with OCI values of 40 – 60 are considered to be in weakened condition and will deteriorate more quickly based on a typical pavement performance curve.

Improvements outlined within this report include street reconstruction in the form of reclamation and paving, including partial replacement and installation of concrete curb and gutter, installation of corrosion protection on select watermain facilities, and stormwater management improvements.

Data Available

Information and materials used in the preparation of this report include the following:

- City of Lakeville Record Plans
- City of Lakeville Watermain and Storm Sewer inspection documentation
- City of Lakeville Water and Natural Resources Management Plan, Barr Engineering, dated January 2019
- Dakota County Topography Maps
- Topographic Survey
- Field Observations of the Area and Discussions with City Staff
- Draft Geotechnical Evaluation Report, Braun Intertec, dated October 13, 2025

Existing Conditions

Surface

214th Street West is aging and displays varying severities of wear and distress, including alligator, transverse, and longitudinal cracking. The western portion of 214th Street West is urbanized with surmountable concrete curb and gutter; however the eastern portion is a rural street section because it does not include curb. The curb and gutter condition is poor overall, with isolated instances of cracking, heaving, and settlements that may contribute to localized draining issues.

The project area contains landscaping, trees, irrigation systems, and numerous other private improvements beyond the edge of the roadway and within City right-of-way and easements.

The photos below illustrate some of the varying levels of pavement distress:

Photo 1. 214th Street West looking east.

Photo 2. 214th Street West looking east towards the cul de sac.

Soil borings and corings for streets within the 2026 project area were collected in August of 2025 by Braun Intertec. Ground penetrating radar (GPR) was employed in both directions on the street to collect interpretations on pavement layer thickness between boring and coring locations. The draft geotechnical report is included in ***Appendix C***, and the draft boring and coring logs were used to determine the feasibility of a full depth pavment removal and replacement including subgrade correction. The final geotechnical report will be available with final design. The quantities included in the Opinion of Probable Cost, ***Appendix B,*** are based on the draft geotechnical report.

Table 1 Below provides a summary of existing street conditions within the 2026 Miscellaneous Improvements Project.

Table 1 – 2026 Miscellaneous Improvements Project							
Summary of Existing Street Conditions							
Street Name	Public Roadway Easement (feet)	Street Width (feet)	Curb Type	Sub-base (aggregate) (inches)	Avg. Bituminous Section (inches)	OCI	Approx. Year of Most Recent Construction
214th Street West	30	24	Standard Surmountable	4	6	25	1986

Public Utilities

Public Sanitary Sewer

There is not any existing sanitary sewer within the 214th Street West portion of the project area.

Public Water Main

All of the existing watermain located in the 2026 Miscellaneous Improvements Project Area is ductile iron pipe (DIP) or cast-iron pipe (CIP). The diameter of watermain pipes varies throughout the project area from 12" CIP from Hamburg Avenue to the Airlake Water Tower, and east of the water tower is 16" DIP.

The Airlake Water Tower is located on the north side of 214th Street and connects to a 12" CIP trunk distribution line to the watermain system. Well #3, an emergency well, is located on the north side of 214th Street.

During city inspections of the existing watermain system, it was discovered that some of the hydrants in the project area do not have auxiliary valves on the leads.

City maintenance records indicate a sporadic and limited watermain break history on 214th Street West that have required typical maintenance efforts.

Public Storm Sewer

City record drawing information indicates that public storm sewer facilities exist within the 2026 Miscellaneous Improvements Project Area. 214th Street West is not an urban section with curb and gutter and storm sewer, except for the westerly portion of 214th Street West where surmountable curb and gutter exists. Storm sewer facilities are located within the storm basin on the south side of 214th Street W cul-de-sac and in the ditch along the east side of Hamburg Avenue.

All runoff for the 214th Street West area is discharged into the Vermillion River Watershed and is subject to review by the Vermillion River Watershed Joint Powers Organization (VRWJPO).

All storm sewer facilities within the 2026 Miscellaneous Roadway Improvement Project are constructed of reinforced concrete pipe (RCP). However, not all appear to provide the necessary collection and conveyance capacity for the 10-year 24-hour design storm event. The existing stormwater pond south of 214th Street West provides the necessary pretreatment volume prior to discharge.

All storm sewer structures have been inspected by City Public Works staff and repair recommendations have been incorporated into the Opinion of Probable Cost. Inspections were also made at storm sewer inlet and outlet structures within the project area and revealed that select stormwater basins will require excavation at the outlet in order to remove accumulated sediment deltas.

Proposed Improvements

Surface

Surface improvements recommended with the 2026 Miscellaneous Improvements Project Area are intended to extend the life of the existing roadway systems, improve isolated drainage issues, and improve the ride quality of the roadway.

Surface improvements include a full reconstruct of 214th Street West. Street grades will closely match the existing grades so as to minimize construction impacts to adjacent properties in the existing urban section, however the profile of the street on the east end will be lowered to accommodate the installation of new curb to the street. Adjustment to the eastern section of roadway vertical profiles are proposed to improve drainage conditions. A significant portion of the existing curb and gutter within the project is in structurally adequate condition, so only partial curb and gutter replacement is proposed as a part of the project.

214th Street West will be urbanized and fully reconstructed in accordance with the recommendations provided in the geotechnical report by Braun Intertec. Appendix A illustrates the proposed minor collector roadway sections, which in general, consist of 2 inches of bituminous wearing course, 2.5 inches of bituminous base course, a minimum of 8 inches of reclaimed aggregate base, and 12 inches of a sand section, over 12 inches of acceptable compacted subgrade along with surmountable curb on both ends. 214th Street West has been identified by the geotechnical report as a candidate for full depth reclamation, due to the cracking, stripping, and additional distresses evident in the bituminous cores and upon visual inspection of the pavement surface.

Public Utilities

Public Water Main

It is proposed that in conjunction with the street improvements, the service life of the existing watermain systems be extended by replacing all bolts at select existing watermain valves with stainless steel bolts, which are more resistant to the corrosive nature of the underlying soils. In addition to rebolting existing valves, select hydrants will be removed and replaced in order to install a auxiliary valve where it previously did not exist. Also, an isolation valve will be installed on the 12” watermain to better serve the surrounding businesses when water tower maintenance is required.

The City’s maintenance records show dispersed and limited watermain breaks and maintenance issues and therefore no watermain replacement is proposed with the Project.

Public Storm Sewer

Reconstruction of the street provides a timely opportunity to improve drainage conditions and increase the longevity of the streets within the project area by repairing existing and installing additional storm sewer facilities.

The eastern portion of 214th Street West drains to the cul de sac and into the stormwater basin. We are proposing to maintain similar drainage patterns; However, with the addition of curb and gutter to the roadway, curb inlet catch basins and storm sewer is proposed to direct drainage from the roadway into the stormwater pond.

The western portion of 214th Street West drains to a ditch along the eastern side of Hamburg Avenue. We are proposing to increase the capacity of the culvert below 214th Street West at the intersection of Hamburg Avenue, while maintaining similar drainage patterns to existing conditions.

Costs for this work are included in the Opinion of Probable Cost under street improvements.

Public Street Sign Replacement

Existing street signs within the project will not need to be replaced unless it is due to utility work, in which case they will be salvaged and reinstalled

Permits/Approvals

An NPDES permit for construction activity will be required if more than one acre will be disturbed by construction activities within the project, which will be determined in final design of the project.

Construction Access/Staging

The contractor will be responsible for providing access to all properties throughout the project. Adequately signed detours will be identified to direct traffic around the construction zones and notify users of the increased truck and construction activity.

Construction will be phased such that construction truck traffic will not need to access newly reconstructed streets to complete the project. Detailed construction phasing plans will be developed with final design of the project.

Public Involvement

A stake holder meeting will be held the week of November 3rd for anticipated Assessed Parcels. City and WSB staff will attend and provide property owners with information regarding the proposed improvements, funding, schedule, and impacts associated with the project. The meeting will update the property owners on the status of the project, and to solicit comments from them regarding any issues or concerns they have relating to the public infrastructure.

Financing

Opinion of Probable Cost

A detailed opinion of probable cost for the project area can be found in the ***Appendix B*** of this report. The opinion of cost incorporates estimated 2026 construction costs and includes a ten percent (10%) contingency factor. Indirect

costs are projected at twenty-eight percent (28%) of the construction cost and include engineering, legal, financing, and administrative costs.

Table 2 below provides a summary of the opinion of probable cost for the 2026 Miscellaneous Improvements Project:

Table 2 – 2026 Miscellaneous Improvements Project	
Opinion of Probable Cost Summary	
Schedule	Amount
Street Improvements	$429,970
Watermain Improvements	$81,810
Storm Sewer Improvements	$65,594
TOTAL	$577,374

Funding

Financing for the street, watermain, and storm sewer improvements within the 2026 Miscellaneous Improvements Project will come from Special Assessments, City CIP Funds, Water Operating Fund, and Stormwater Infrastructure Fund.

Special Assessments benefitting properties are proposed to fund forty percent (40%) of the roadway street and storm sewer improvements identified to be reconstructed with the project, with the remaining sixty percent (60%) funded using city funds. Assessments for this project were calculated in accordance with the City's Assessment Policy dated Septemeber 20, 2021, by the Front Foot basis and a per Unit basis. A comparison for both methods is illustrated in Table 3 below. It recommended that the Council adopt their preferred assessment method. Staff recommends the per Unit basis method be adopted by the Council to assess all lots at an equitable rate because they all use it as a main access route to their parking lots and loading docks.

Table 3 below provides the funding level anticipated through the levy of Special Assessments to benefitting property owners for the street and storm improvements is **$158,438.**

Table 3 – 2026 Miscellaneous Improvements Project	
Special Assessments	
Funding Level	Amount
Industrial Assessment Footage Rate	$120.12 per LF
Industrial Assessment Unit Rate	$31,687.94 per Unit

Table 4 below provides a funding summary for the 2026 Miscellaneous Improvements Project.

Table 4 – 2026 Miscellaneous Improvements Project	
Funding Summary	
Funding Source	Amount
Street and Storm Sewer Assessments (Effective rate 40%)	$158,438
City CIP Funds – Street/Storm	$262,197
City Water Operating Fund	$84,088
City Stormwater Infrastructure Fund	$72,651
TOTAL	$577,374

The 2026 Miscellaneous Improvements Project, City Project No. 26-01, overall cost of the proposed improvments to 214th Street West is $577,374.

Project Schedule

The proposed schedule for the 2026 Miscellaneous Improvements Project is as follows:

Task Description	Completion Date
Present Feasibility Report and Set Public Hearing	October 20, 2025
Stakeholder Meeting	Early November 2025
Public Hearing	November 17, 2025
City Council Approves Plans and Specifications	January 20, 2026
Open Bids	February 18, 2026
Award Contract and Assessment Hearing	March 2, 2026
Begin Construction	April 2026
Substantial Completion	May 2026
Final Completion	June 2026

*Schedule assumes any necessary private utility work is completed prior to the start of construction.

Feasibility and Recommendation

The 2026 Miscellaneous Improvements Project includes roadway urbanization and reconstruction, watermain improvements, partial repair and repalcement of structurally deficient concrete curb and gutter, installation of new concrete curb and gutter, and storm sewer improvements.

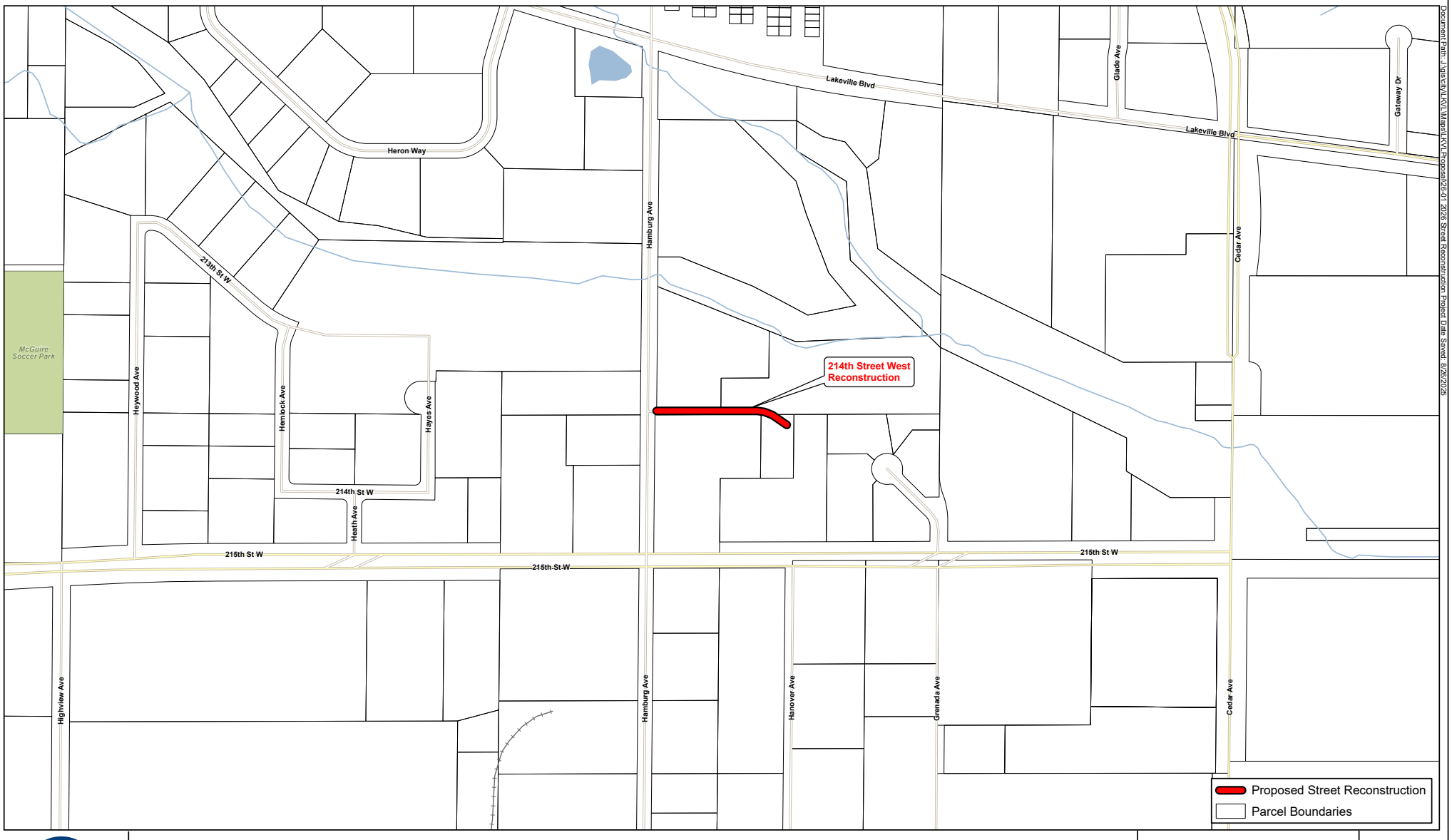
The total estimated cost for the reconstruction of 214th Street West, as part of the 2026 Miscellaneous Improvements Project, including roadway, watermain improvements, and storm sewer improvements is $577,374. Proposed funding for the project is provided through City Funds and Speciall Assessments. Construction costs are based on anticipated construction costs for 2026.

This project is feasible, necessary, cost-effective from an engineering standpoint. The project feasibility is subject to financial review by the City. Based on information contained in this report, it is recommended to proceed with the improvements as outlined. It is also recommended to assess the benefitting lots on a per Unit basis, because all properties use 214th Street West as a main access route to their parking lots and loading docks.

Appendix A

Figure 1 – Project Locations Map

Figure 2 – Typical Section



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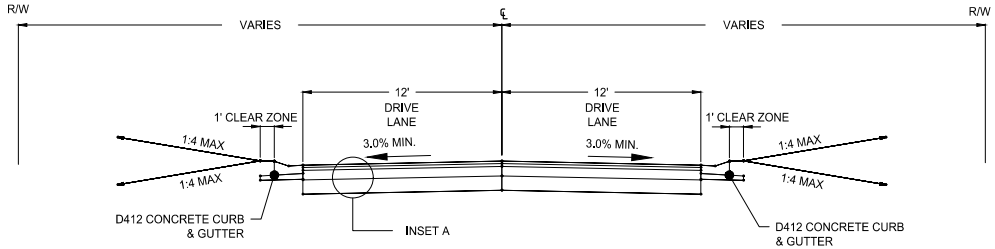
Project Location Map

26-01 2026 Street Reconstruction Project
City of Lakeville, Minnesota

N

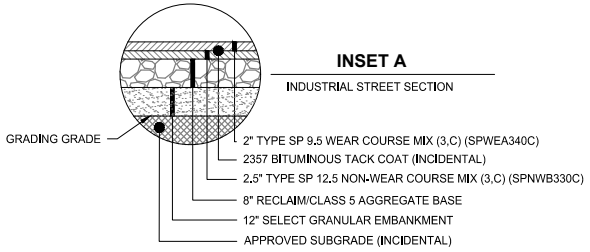
0 400 Feet

1 inch = 400 feet



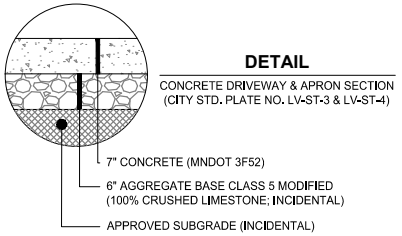
INDUSTRIAL - FULL RECONSTRUCT

214TH STREET W



INSET A

INDUSTRIAL STREET SECTION



DETAIL

CONCRETE DRIVEWAY & APRON SECTION
(CITY STD. PLATE NO. LV-ST-3 & LV-ST-4)

wsb

SCALE:	DESIGN BY:
########	###
PLAN BY:	CHECK BY:
###	###

REVISIONS

NO.	DATE	DESCRIPTION

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.

JEFF OLIVER LIC. NO. 23110

DATE: XX-XX-XXXX

TYPICAL SECTIONS

214TH STREET RECONSTRUCTION PROJECT
CITY OF LAKEVILLE

CLIENT PROJECT NO.
CP 26-01

WSB PROJECT NO.
031254-000

SHEET
OF

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Appendix B

Opinion of Probable Cost

OPINION OF PROBABLE COST

WSB Project: 214th Street Reconstruction Project — *Design By:* EKM
Project Location: City of Lakeville — *Checked By:* JAO
City Project No.: 26-01
WSB Project No: 031254-000 — *Date:* 10/16/2025

ITEM NO.	MNDOT SPECIFICATION NO.	DESCRIPTION	UNIT	ESTIMATED TOTAL QUANTITY	ESTIMATED UNIT PRICE	ESTIMATED TOTAL COST
A. Street Improvements						
1	2021.501	MOBILIZATION	LS	1	$ 14,541.73	$ 14,541.73
2	2104.502	REMOVE SIGN	EACH	1	$ 135.00	$ 135.00
3	2104.502	SALVAGE SIGN	EACH	2	$ 135.00	$ 270.00
4	2104.503	REMOVE CURB & GUTTER	L F	138	$ 15.00	$ 2,070.00
5	2104.503	SAWING BIT PAVEMENT (FULL DEPTH)	L F	132	$ 4.00	$ 528.00
6	2104.503	SAWING CONCRETE PAVEMENT (FULL DEPTH)	L F	60	$ 20.00	$ 1,200.00
7	2104.504	REMOVE BITUMINOUS PAVEMENT	S Y	3249	$ 8.00	$ 25,992.00
8	2104.504	REMOVE BITUMINOUS DRIVEWAY PAVEMENT	S Y	96	$ 20.00	$ 1,920.00
9	2104.601	SALVAGE AND REINSTALL LANDSCAPE STRUCTURES	LS	1	$ 7,500.00	$ 7,500.00
10	2106.507	EXCAVATION - COMMON	C Y	1768	$ 30.00	$ 53,040.00
11	2106.507	EXCAVATION - SUBGRADE	C Y	25	$ 45.00	$ 1,125.00
12	2106.507	SELECT GRANULAR EMBANKMENT	C Y	1036	$ 25.00	$ 25,897.50
13	2106.507	STABILIZING AGGREGATE (CV)	C Y	25	$ 40.00	$ 1,000.00
14	2106.509	STABILIZING AGGREGATE	TON	9	$ 40.00	$ 360.00
15	2106.610	EXPLORATORY EXCAVATION	HOUR	2	$ 500.00	$ 1,000.00
16	2112.519	SUBGRADE PREPARATION	RDST	7	$ 40.00	$ 280.00
17	2123.610	STREET SWEEPER (WITH PICKUP BROOM)	HOUR	7	$ 200.00	$ 1,400.00
18	2130.523	WATER	MGAL	15	$ 60.00	$ 900.00
19	2211.507	AGGREGATE BASE (CV) CLASS 5	C Y	684	$ 20.00	$ 13,680.00
20	2231.604	BITUMINOUS PATCH SPECIAL	TON	32	$ 150.00	$ 4,800.00
21	2360.509	TYPE SP 9.5 WEARING COURSE MIX (3;C)	TON	311	$ 98.00	$ 30,478.00
22	2360.509	TYPE SP 12.5 NON WEAR COURSE MIX (3;C)	TON	389	$ 95.00	$ 36,955.00
23	2521.518	5" CONCRETE WALK	SF	83	$ 20.00	$ 1,650.00
24	2531.503	CONCRETE CURB & GUTTER DESIGN D412	L F	138	$ 26.00	$ 3,588.00
25	2531.503	CONCRETE CURB & GUTTER DESIGN D412 (SLIP FORM)	L F	915	$ 20.00	$ 18,308.00
26	2531.504	7" CONCRETE DRIVEWAY PAVEMENT SPECIAL	S Y	48	$ 190.00	$ 9,120.00
27	2563.601	TRAFFIC CONTROL	LS	1	$ 8,000.00	$ 8,000.00
28	2573.501	STABILIZED CONSTRUCTION EXIT	LS	1	$ 700.00	$ 700.00
29	2573.503	SEDIMENT CONTROL LOG TYPE STRAW	L F	520	$ 5.00	$ 2,600.00
30	2575.504	ROLLED EROSION PREVENTION CATEGORY 25	S Y	794	$ 7.00	$ 5,558.00
31	2575.523	WATER	MGAL	18	$ 50.00	$ 900.00
32	2575.604	PERMANENT TURF ESTABLISHMENT	S Y	873	$ 18.00	$ 15,714.00
33	2575.604	TEMPORARY STABILIZATION	S Y	787	$ 18.00	$ 14,166.00
					CONSTRUCTION TOTAL	**$ 305,376.23**
					CONTINGENCY TOTAL (10%)	**$ 30,537.62**
					SUBTOTAL	**$ 335,913.85**
					INDIRECT COST TOTAL (28%)	**$ 94,055.88**
					TOTAL	**$ 429,969.72**
B. Watermain Improvements						
34	2021.501	MOBILIZATION	LS	1	$ 2,490.65	$ 2,490.65
35	2104.502	REMOVE GATE VALVE & BOX	EACH	1	$ 1,000.00	$ 1,000.00
36	2104.502	REMOVE HYDRANT	EACH	2	$ 750.00	$ 1,500.00
37	2104.503	REMOVE WATERMAIN	L F	43	$ 11.00	$ 473.00
38	2504.602	6" GATE VALVE & BOX	EACH	2	$ 3,500.00	$ 7,000.00
39	2504.602	12" GATE VALVE & BOX	EACH	1	$ 5,000.00	$ 5,000.00
39	2505.602	ADJUST VALVE BOX	EACH	2	$ 350.00	$ 700.00
40	2504.602	BOLT & VALVE BOX REPLACEMENT - VALVE	EACH	3	$ 3,500.00	$ 10,500.00
41	2504.602	HYDRANT	EACH	2	$ 10,000.00	$ 20,000.00
42	2504.602	INSTALL HYDRANT LEAD RESTRAINT	EACH	2	$ 1,000.00	$ 2,000.00
43	2504.603	6" PVC WATERMAIN	L F	33	$ 80.00	$ 2,640.00
43	2504.603	12" PVC WATERMAIN	L F	10	$ 100.00	$ 1,000.00
44	2504.608	DUCTILE IRON FITTINGS	LB	152	$ 25.00	$ 3,800.00
					CONSTRUCTION TOTAL	**$ 58,103.65**
					CONTINGENCY TOTAL (10%)	**$ 5,810.37**
					SUBTOTAL	**$ 63,914.02**
					INDIRECT COST TOTAL (28%)	**$ 17,895.92**
					TOTAL	**$ 81,809.94**
C. Storm Sewer Improvements						
45	2021.501	MOBILIZATION	LS	1	$ 1,781.50	$ 1,781.50
46	2104.502	REMOVE PIPE APRON	EACH	2	$ 400.00	$ 800.00
47	2104.503	REMOVE SEWER PIPE (STORM)	L F	50	$ 25.00	$ 1,250.00
48	2106.503	MINOR GRADING	L F	20	$ 20.00	$ 400.00
49	2501.502	12" RC PIPE APRON	EACH	4	$ 1,400.00	$ 5,600.00
50	2501.502	15" RC PIPE APRON	EACH	1	$ 1,500.00	$ 1,500.00
51	2502.503	4" PERF TP PIPE DRAIN	L F	40	$ 30.00	$ 1,200.00
52	2503.503	12" RC PIPE SEWER CLASS V	L F	100	$ 65.00	$ 6,500.00
53	2503.503	15" RC PIPE SEWER CLASS V	L F	169	$ 70.00	$ 11,830.00
54	2506.502	CASTING ASSEMBLY	EACH	3	$ 1,000.00	$ 3,000.00
55	2506.503	CONST DRAINAGE STRUCTURE DES 48-4020	EACH	13	$ 700.00	$ 9,100.00
56	2506.602	CONST DRAINAGE STRUCTURE DESIGN SPEC (2'X3')	EACH	1	$ 2,500.00	$ 2,500.00
57	2511.507	RANDOM RIPRAP CLASS III	C Y	9	$ 125.00	$ 1,125.00
					CONSTRUCTION TOTAL	**$ 46,586.50**
					CONTINGENCY TOTAL (0%)	**$ 4,658.65**
					SUBTOTAL	**$ 51,245.15**
					INDIRECT COST TOTAL (0%)	**$ 14,348.64**
					TOTAL	**$ 65,593.79**
					GRAND TOTAL	**$ 577,373.46**

Appendix C

Draft Geotechnical Report, Braun Intertec

Geotechnical Evaluation Report

City of Lakeville Project 26-01 Miscellaneous Street Maintenance and Repairs

Lakeville, Minnesota

Prepared for

City of Lakeville

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.

Richard S. Jett, PE
Senior Engineer
License Number: 58781
October 13, 2025

Braun Intertec Corporation

Project B2506310

October 13, 2025 Project B2506310

Stephen Ferraro
City of Lakeville
20195 Holyoke Ave
Lakeville, MN 55044

Re: Geotechnical Evaluation Report
City of Lakeville Project 26-01 Miscellaneous Street Maintenance and Repairs
Lakeville, Minnesota

Dear Mr. Ferraro:

We are pleased to present this Geotechnical Evaluation Report for the above-referenced project. The following report provides the results of our evaluation and should be read in its entirety.

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 Richard Jett at 815.545.7059 (rjett@braunintertec.com) or Matt Ruble at 952.995.2000 (mruble@braunintertec.com).

Sincerely,
Braun Intertec Corporation

Richard S. Jett, PE
Senior Engineer

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1.0 Introduction

1.1 Project Description

This geotechnical evaluation report addresses the design and rehabilitation of various local roadways throughout the City of Lakeville, Minnesota. As part of City Project 26-01, this project will include rehabilitation of the following bituminous roadways:

- **Upper 206th Street West** from Holyoke Avenue to approximately 700 feet north of 207th Street West
- **206th Street West** from Holyoke Avenue to Hollins Avenue West
- **Holt Avenue** from 207th Street West to 205th Street West
- **Hollins Avenue West** from 207th Street West to 205th Street West
- **Heron Way** from 210th Street West to 210th Street West
- **214th Street West** from Hamburg Avenue to Roundabout
- **210th Street West** from Hamburg Avenue to Cedar Avenue
- **Glade Avenue** from 210th Street West to Lakeville Boulevard
- **Gateway Drive** from Lakeville Boulevard to Roundabout
- **Gemini Trail** from Cedar Avenue to Roundabout
- **Fury Court** from Gemini Tail to Roundabout

It is anticipated that the majority of the rehabilitation work will consist of mill and overlay treatments with select areas potentially requiring full depth mill (FDM). We understand that 214th Street is expected to undergo full depth reclamation (FDR), with the potential for urbanization, including curb and gutter installation and storm sewer improvements. We also understand that the project will also include the completion of a new small trail segment south of Eclipse Avenue that will connect Eclipse Avenue to the adjacent walking path to the east. Figure 1-1 through Figure 1-4 below show an illustration of the existing roadway alignments.

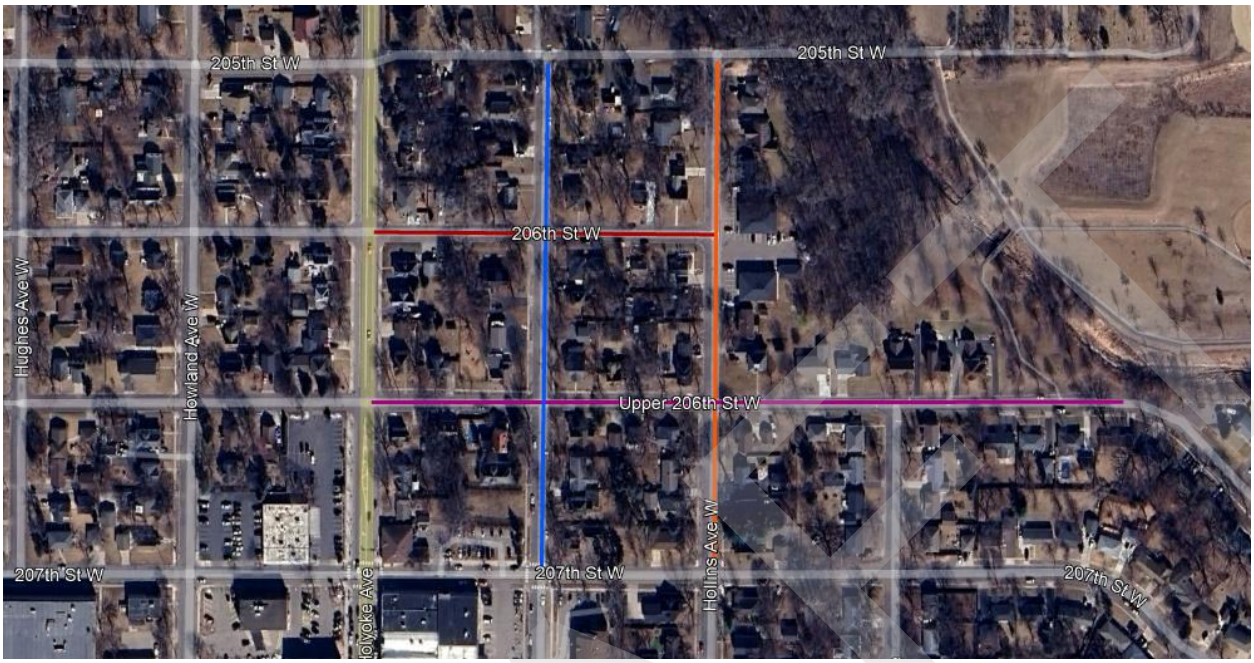

Figure 1-1. Existing roadway layout showing Upper 206th Street West (purple), 206th Street West (red), Holt Avenue (blue), and Hollins Avenue West (orange).
Figure taken from Google Earth.

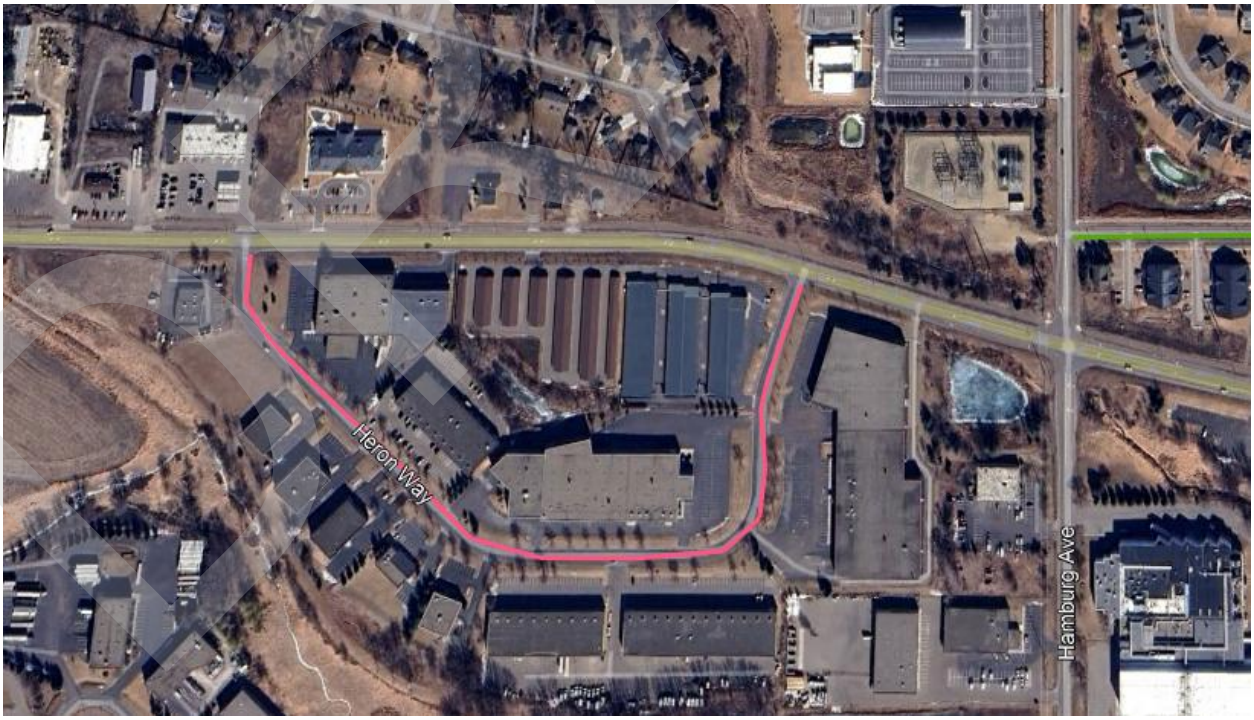

Figure 1-2. Existing roadway layout showing Heron Way (pink)
Figure taken from Google Earth.

Figure 1-3. Existing roadway layout showing 214th Street West (light blue), 210th Street West (green), Glade Avenue (brown), and Gateway Drive (yellow).
Figure taken from Google Earth.

Figure 1-4. Existing roadway layout showing Gemini Trail (light blue) and Fury Court (purple).
Figure taken from Google Earth.

Additionally, Figure 1-5 below shows the approximate profile of the new trail segment connecting Eclipse Avenue with the adjacent walking path.

Figure 1-5. New Trail Segment
Figure provided by the City of Lakeville, approximate trail alignment shown in red.

1.2 Site Conditions

All roadways are generally classified as low volume bituminous residential roadways with Average Annual Daily Traffic (AADT) values of less than 600 vehicles per day. We understand that these roadways are currently maintained under the existing City of Lakeville Street maintenance program.

1.3 Purpose

The purpose of the geotechnical services was to characterize existing pavement conditions throughout the proposed corridors and provide geotechnical recommendations for use in the design and rehabilitation of the outlined roadways.

1.4 Background Information and Reference Documents

We reviewed the City of Lakeville 26-01 Project Map, provided by the City of Lakeville (undated). In addition, we have used several publicly available sources of information including topography maps obtained from the Minnesota Department of Natural Resources (MnTOPO website), MnPAVE, MnDOT's Traffic Mapping application, and Google Earth aerial photographs.

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.

1.5 Scope of Services

We performed our scope of services for the project in accordance with our Proposal for a Geotechnical Evaluation (QTB217238), dated June 30, 2025. 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 coordinating the clearing of the exploration location of underground utilities. We coordinated boring locations with the City and we staked the exploration locations. We acquired the surface elevations and locations with GPS technology using the State of Minnesota's permanent GPS base station network. The Boring and Coring Location sketch included in the Appendix illustrates the approximate locations of the soil borings, pavement cores, and power auger borings.
- Performing Ground Penetrating Radar (GPR) scans in both travel directions along the length of each roadway included in this project.
- Performing 10 standard penetration test (SPT) borings, denoted as ST-1 to ST-10, to nominal depths of 5 to 15 feet below grade across the project site. One additional 10 foot deep soil boring, denoted as ST-11, was added to the project scope following issuance of the project agreement.
- Performing 38 pavement cores with shallow hand auger borings (denoted as C-1 through C-38) along the project alignment.
- Performing 12 companion pavement cores, designated as C-2a, C-5a, C-10a, C-14a, C-17a, C-21a, C-25a, C-27a, C-28a, C-3a, C-34a, C-36a near the curbline of the roadway to evaluate pavement thickness consistency across the roadway profile. At these companion locations, only the bituminous thickness was measured.
- 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, recommendations for rehabilitation of existing pavements, and recommendations for use in the design of proposed utilities and trail.

Our scope of services did not include environmental services or testing and our geotechnical personnel performing this evaluation are not trained to provide environmental services or testing. We can provide environmental services or testing at your request.

2.0 Results

2.1 Geologic Overview

We based the geologic origins used in this report on the soil types, 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.

2.2 Pavement Coring and Power Auger Results

Table 2-1 outlines the results of our pavement coring and power auger borings performed as part of this project.

Table 2-1. Pavement Coring and Power Auger Summary

Core Number	Associated Roadway	Bituminous Thickness (inches)	Apparent Aggregate Base Thickness (inches)	Subgrade Soils	Pavement Core Conditions
C-1	Holt Avenue	3 3/4	5.5	SP	Good condition
C-2		4 3/4	10	SP-SM	Good condition
C-2a		4	---	---	Good condition
C-3		4 3/4	13	SM	Minor stripping and raveling, and debonded 1” from the surface
C-4	Hollins Avenue W	3 1/4	13	SM	Good condition
C-5		4 1/2	14	SM	Good condition
C-5a		4 ½	---	---	Good condition
C-6		6	0	SM	Moderate raveling and debonded 1” and 2.5” from the surface
C-7	206th Street W	4	14	SM	Good condition
C-8*		3 1/2	---	---	Raveling and debonded 2” from the surface

Core Number	Associated Roadway	Bituminous Thickness (inches)	Apparent Aggregate Base Thickness (inches)	Subgrade Soils	Pavement Core Conditions
C-9	Upper 206th Street W	4	10	SM	Good condition
C-10		4	10	SM	Moderate raveling and debonded 1” from the surface
C-10a		3 3/4	---	---	Minor stripping and minor raveling
C-11		4	10	SP-SM	Minor raveling
C-12		4 3/4	18	SM	Moderate stripping
C-13	Heron Way	3 3/4	5 1/4	SM	Moderate raveling and stripping
C-14**		3	6	SP	Good condition
C-14a		3 1/4	---	---	Minor raveling
C-15**		3	10	SP-SM	Moderate stripping
C-16**		3 1/2	10	SP-SM	Moderate raveling and stripping, debonded 1” from the surface
C-17**		3 3/4	10	SP-SM	Significant raveling and stripping, debonded 1 3/4" from the surface
C-17a		4 1/2	---	---	Significant raveling and stripping, debonded 1 1/2" from the surface
C-18**		3	11	SM	Good Condition
C-19	210th Street West	4 1/2	18	SP	Good Condition
C-20		4 3/4	18	SP	Significant raveling, debonded 1 1/2" from the surface
C-21		3 3/4	17	SP	Minor surface raveling
C-21a		4	---	---	Minor surface raveling
C-22		4 1/2	17	SP	Severe surface raveling, minor stripping, debonded 1 1/2" from the surface
C-23		3 1/2	17	SP	Minor raveling
C-24		3 3/4	17	SM	Good condition
C-25	Glade Avenue	3 3/4	17	SP	Good condition
C-25a		4	---	---	Good condition
C-26		5	15	SP	Good condition
C-27	Gateway Drive	4 1/4	15	SM	Good condition
C-27a		6	---	---	Good condition

Core Number	Associated Roadway	Bituminous Thickness (inches)	Apparent Aggregate Base Thickness (inches)	Subgrade Soils	Pavement Core Conditions
C-28	214th Street West	4	14	SC	Good condition
C-28a		4	---	---	Moderate stripping
C-29	Gemini Trail	3 1/2" bituminous over 3 1/2" rehydrated concrete	10	SP	Minor stripping
C-30**		3 1/2	10	SP	Minor surface raveling
C-31**		3 3/4	6	SP	Minor stripping
C-31a		4	---	---	Minor stripping and debonded at 1 1/2" from the surface
C-32		4 1/4" bituminous over 2" rehydrated concrete	10	SP	Good condition
C-33		3 3/4" bituminous over 4" rehydrated concrete	10	SP	Minor surface raveling
C-34		4 1/4" bituminous over 6 1/2" rehydrated concrete	10	SP	Good condition
C-34a		4 1/4	---	---	Good condition
C-35		4 1/2" bituminous over 3" rehydrated concrete	10	SP	Good condition
C-36		3 1/2" bituminous over 4 1/2" rehydrated concrete	10	SP	Good condition
C-36a		3 3/4	---	---	Good condition
C-37**		4 1/2	10	SP-SM	Minor stripping

Core Number	Associated Roadway	Bituminous Thickness (inches)	Apparent Aggregate Base Thickness (inches)	Subgrade Soils	Pavement Core Conditions
C-38	Fury Court	3 1/4" bituminous over 3 3/4" rehydrated concrete	6	SP	Minor stripping

*Encountered refusal at 9 inches within apparent aggregate base
**Concrete was encountered beneath the bituminous layer; however, it could not be retained in the cores and is therefore not visible in the pavement core photographs.

2.3 Ground Penetrating Radar (GPR) Results

GPR was used to approximate pavement layer thicknesses along each of the roadways for this project. The data was collected at a nominal 1-foot interval in both directions of travel. Where "ground truth" (soil boring) data was obtained, the interpreted layers from the GPR scan were compared directly to the measured thicknesses to validate the accuracy of the GPR analysis.

Based on our analysis using the RADAN software program, Table 2-2 provides the interpreted average pavement layer thicknesses and statistical data for the roadways in this project. The graphs in the Appendix show the interpreted layer depth per foot along the roadway. We recommend referring to these graphs to see how thicknesses vary.

Table 2-2. Statistics of GPR-Estimated Bituminous Pavement Thicknesses

Segment	Direction	Bituminous Thickness (inches)					Apparent Aggregate Base[2] (inches)				
		Avg	Std Dev	Min[1]	Max	10th Pctl	Avg	Std Dev	Min[1]	Max	10th Pctl
Upper 206th Street West	EB	4.2	0.6	2.6	10.0	3.4	6.9	1.3	2.9	11.4	5.3
	WB	4.0	0.8	2.1	8.6	3.0	---	---	---	---	---
206th Street West	EB	4.2	0.7	2.6	8.5	3.4	3.1	0.8	1.3	5.1	2.2
	WB	4.0	0.7	2.5	6.4	3.1	4.3	1.9	1.1	9.4	1.9
Holt Avenue West	NB	4.4	0.4	3.1	7.1	3.9	---	---	---	---	---
	SB	4.5	0.6	3.0	13.4	3.8	7.0	1.0	4.1	10.1	5.6
Hollins Avenue West	NB	4.2	0.7	1.9	6.7	3.4	5.7	2.9	1.2	17.5	2.7
	SB	4.2	0.7	0.3	13.3	3.5	7.6	1.5	4.2	11.9	5.7

Segment	Direction	Bituminous Thickness (inches)					Apparent Aggregate Base[2] (inches)				
		Avg	Std Dev	Min[1]	Max	10th Pctl	Avg	Std Dev	Min[1]	Max	10th Pctl
Heron Way	EB	3.7	0.6	1.8	6.8	2.9	5.6	2.5	1.0	12.6	2.6
	WB	3.3	0.5	1.4	5.8	2.7	4.8	1.5	1.5	9.1	2.8
214th Street West	EB	3.9	0.9	0.0	9.5	2.8	---	---	---	---	----
	WB	4.3	1.0	1.0	10.3	3.2	---	---	---	---	---
210th Street West	EB	4.1	0.6	2.3	8.1	3.5	---	---	---	---	---
	WB	4.4	0.7	0.3	9.8	3.7	4.3	0.9	2.1	8.3	3.1
Glade Avenue	NB	4.2	0.5	2.0	6.0	3.5	---	---	---	---	---
	SB	3.9	0.5	2.2	5.6	3.4	---	---	---	---	---
Gateway Drive	NB	7.2	2.3	3.1	11.9	3.9	---	---	---	---	---
	SB	7.0	2.3	2.9	11.3	3.8	---	---	---	---	---
Gemini Trail	EB	3.8	0.5	2.2	9.8	3.1	7.8	3.1	1.2	18.0	4.2
	WB	3.8	0.5	2.4	7.2	3.1	8.6	2.2	2.1	15.8	5.8
Fury Court	NB	3.4	0.4	2.5	4.6	3.0	8.7	1.4	5.3	12.4	6.9
	SB	3.4	0.4	2.7	5.7	2.9	8.0	1.5	4.5	12.4	6.3

1. Minimum values can be extreme outliers resulting from noise and other erroneous readings. We recommend using 10th percentile values and consulting the graphics attached to this report.
2. Apparent aggregate base was not observed continuously throughout the scanned road profile. Values provided in this table are based on very limited data and may not be representative of actual conditions.

Substantial ambient interference of the GPR signal made it difficult to interpret layer transitions below those of the bituminous layer. As such, a second layer (likely aggregate base) was not visible throughout large portions of the project alignment. We included thickness data in Table 2-1 in the limited areas which there was a discernable apparent aggregate base layer. A lack of a visible layer in the GPR scan does not imply an absence of one within the pavement section. Our cores suggested a probable aggregate base layer within the pavement section throughout all of the project areas.

2.4 Boring Results

Table 2-3 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.

Table 2-3. Subsurface Profile Summary*

Strata	Soil Type -USCS Classification	N-Values	Commentary and Details
Pavement section	---	---	▪ Encountered at the surface in all the borings **except** in Borings ST-9 through ST-11. ▪ Overall pavement section thicknesses at boring locations ranged from approximately 9 1/2 to 25 inches. ▪ Bituminous thicknesses ranged from approximately 4 to 10 inches. ▪ Apparent aggregate base[1] thicknesses ranged from approximately 3 1/2 to 15 inches.
Topsoil/Topsoil fill	SC	---	▪ Encountered at the surface in Borings ST-9 through ST-11 with thicknesses ranging from approximately 1 to 1 1/2 feet. ▪ Generally dark brown to black in color. ▪ Moisture conditions were generally moist.
Fill[2]	SM, CL, SP-SM, SC, SP, SP-SW	9 to 28	▪ Encountered beneath the topsoil or pavement surface in each boring, **except** in Boring ST-11, and extended to depths ranging from approximately 3 to 91/2 feet below existing grade. ▪ Borings ST-5 and ST-6 terminated within the existing fill soils. ▪ Existing fill soils in Borings ST-1 through ST-3 contained bituminous debris ▪ Slightly organic layers were intermixed within fill soils in Borings ST-1, ST-4, ST-7, and ST-8. ▪ Granular fill soils were typically intermixed with clay lenses and seams. ▪ Generally, light brown to dark brown in color. ▪ Moisture conditions were generally moist.
Glacial deposits	SP	6 to 38	▪ Encountered beneath the fill soils and extended to the boring termination depths. ▪ Varying amounts of gravel. ▪ Relative densities of the sand soils were generally loose to medium dense with occasional zones of dense soils. ▪ Relative consistencies of the clay laden soils were generally medium to stiff. ▪ Generally light brown to dark gray in color. ▪ Moisture conditions were generally moist to wet.
	CL	5 to 15	

*Abbreviations are defined in the attached Descriptive Terminology sheets.

[1]We did not perform gradation analysis on the apparent aggregate base or topsoil material encountered as part of the pavement section, in accordance with our scope of work. Therefore, we cannot conclusively determine if the encountered material satisfies a particular specification, and it should not be assumed it is suitable for reuse.

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

2.5 Groundwater

Table 2-4 summarizes the depths where we observed groundwater; the attached Log of Boring sheets in the Appendix also include this information and additional details.

Table 2-4. Groundwater Summary

Locations	Measured Surface Elevation (ft)	Measured or Estimated Depth to Groundwater (ft)	Corresponding Groundwater Elevation (ft)
ST-1	969.5	9 1/2	960
ST-2	966.8	9 1/2	957 ½
ST-3	964.8	9 1/2	955
ST-8	954.5	12 1/2	942
ST-9	915.2	5	910
ST-10	915.9	5	911
ST-11	914.4	5	909 ½

Groundwater may take days or longer to reach equilibrium in the boreholes and we immediately backfilled the boreholes, in accordance with our scope of work. If the project team identifies a need for more accurate determination of groundwater depth, we recommend the installation of piezometers and the implementation of a long-term groundwater monitoring program. Project planning should anticipate seasonal and annual fluctuations of groundwater.

The large variation in water elevations indicates that the water is lightly perched on top of lower permeability soils.

2.6 Laboratory Test Results

The boring logs show the results of laboratory testing we performed next to the tested sample depth. Moisture content tests performed on select soil samples indicated moisture contents ranging from 3 to 22 percent moisture by weight. Sieve analysis tests performed on select soil samples indicated from 2 to 63 percent of particles, by weight, passing the No. 200 sieve. Organic content tests performed on select soil samples indicated organic contents ranging from 1 to 3 percent organic material by weight.

3.0 Recommendations

3.1 Design and Construction Discussion

3.1.1 Pavement Rehabilitation Approach

Based on the results of our pavement cores, soil borings, and ground penetrating radar (GPR) scans, a majority of the project roadways included in the City of Lakeville CP 26-01 as outlined in Section 1.1 are suitable for rehabilitation using Mill and Overlay techniques. Table below outlines our recommended rehabilitation methods for each of the project roadways.

Table 3-1. Pavement Rehabilitation Approach

Roadway	Rehabilitation Recommendation
Holt Avenue	1 1/2 or 2 inch mill and overlay
Hollins Avenue (north of Upper 206th Street)	1 1/2 inch mill and overlay
Hollins Avenue (south of Upper 206th Street)	Full depth mill
206th Street West	2 inch mill and overlay
Upper 206th Street West	1 1/2 or 2 inch mill and overlay
Heron Way	2 inch mill and overlay
210th Street West	1 1/2 or 2 inch mill and overlay
Glade Avenue	1 1/2 or 2 inch mill and overlay
Gateway Drive	1 1/2 or 2 inch mill and overlay
214th Street	FDR with shallow soil corrections
Gemini Trail	1 1/2 inch mill and overlay
Fury Court	1 1/2 inch mill and overlay

It should be noted that our recommended rehabilitation methods in the above table are based on the assumption that approximately 1 1/2 inches of bituminous pavement or more will be present following milling operations. Areas which exhibit thinner than anticipated bituminous thicknesses may need to adjust milling depths to accommodate the thinner layers. Specifically, this may be a considerations along Heron Way.

Based on the core conditions, subgrade soils, and encountered bituminous thicknesses, Holt Avenue, Upper 206th Street West, 210th Street West, Glade Avenue, and Gateway Drive are generally considered suitable for a 1 1/2 inch or 2 inch mill depending on the City's preference. The pavement in these areas are in reasonable to good condition with adequate thickness to facilitate mill and overlay operations.

The existing conditions along Hollins Avenue (north of upper 206th Street West only), 206th Street West, Heron Way, Gemini Trail, and Fury Court indicate that either a 1 1/2 mill and overlay or a 2 inch mill and overlay respectively (as outlined in the above table) should be used due to debonding observed in the

pavement cores. It should be noted that mill depths in these areas will likely need to be adjusted during milling where debonding was encountered, as it will be especially important in these areas to make sure that the entire debonded layer is milled.

Due to the pavement conditions along Hollins Avenue south of 206th Street, we recommend that a full depth mill is considered to accommodate for the significant debonding observed in the pavement cores. This will make sure that the same equipment used along adjacent roadways can be used along this stretch of roadway even with the existing poor pavement conditions.

As part of the project scope, we also understand that 214th Street is likely to undergo a full depth reclamation (FDR) with the potential for urbanization. Given the existing pavement thickness in this area, a full depth reclamation appears to be a suitable method for rehabilitation. However, the soil boring (Boring ST-8) encountered a thinner pavement section and poor subgrade soils to a depth of approximately 2 feet below existing grade. We recommend for this roadway that the entire pavement section is reclaimed, the resulting material is stockpiled, utilities are installed as needed, minor soil corrections of the existing organic soils, and the reclaimed material is placed back as the aggregate base layer prior to paving.

A detailed evaluation of pavement surface conditions, which will influence the suitability and service life of the overlays, was outside of the scope of our evaluation. This will be the primary factor influencing the performance of the selected rehabilitation option. The risk and additional cost of repairs with additional milling and/or excavation to reach a suitable surface for overlay placement must also be considered. In general, this will include areas with surface distresses such as fatigue/alligator distress and edge cracks. We recommend further reviewing the condition data from the city's pavement management system for signs that these types of distresses are prevalent within the project area.

3.1.2 Rehydrated Concrete Considerations

During our exploration of the project areas, we encountered what appeared to be rehydrated concrete layers, both intact and decomposed, located directly below the bituminous layer along Heron Way, Gemini Trail, and Fury Court. We are recommending that surficial bituminous pavement in these areas be rehabilitated using shallow mill and overlay techniques, so the rehydrated concrete layer will not be disturbed during rehabilitation. The project team should be aware, however, that the potential presence of the more rigid rehydrated concrete layer directly below the bituminous layer has a higher probability of future reflective cracking within the new bituminous layer above, however reflective cracking is common in many overlay areas. If the project team wishes to prevent these additional reflective cracking, this rehydrated concrete layer should be removed and replaced with compacted aggregate base. Should it be left in place, additional maintenance efforts should be anticipated in this area.

3.1.3 Pedestrian Trail

We understand that part of this project will include the construction of a new pedestrian walking trail linking Eclipse Avenue to the existing pedestrian trail to the east. Based on the subgrade soils observed in Borings ST-9 through ST-11, the existing subgrade soils appear suitable for support of the proposed trail following removal of topsoil and minor soil corrections of unsuitable clay soils if needed. Topsoil thicknesses in this area ranged from approximately 1 to 1 1/2 feet.

3.1.4 Groundwater

Groundwater was observed at seven of the eleven completed soil borings at depths ranging from approximately 5 to 12 1/2 feet below existing grade. While a majority of these soil borings are in areas where shallow rehabilitation methods will be used, the project team should anticipate that utility improvement areas of the project will likely encounter groundwater during excavations.

3.2 Site Grading and Excavations

3.2.1 Overview

We understand that a new pedestrian trail will be constructed extending from Eclipse Avenue to the existing pedestrian trail to the east. We also anticipate that 214th Street may include urbanization and full depth reclamation of the existing pavement section.

3.2.2 Pavement Subgrade Preparation

For the new pedestrian trail and 214th Street, we recommend the following steps for pavement subgrade preparation. We recommend roadway construction be completed in accordance with MnDOT Specification 2106.

1. Reclaim and stockpile the top 10 inches of pavement section as outlined in Section 3.3.2. this step is not necessary for the pedestrian trail.
2. Remove the exposed unsuitable soils, including organic soils, topsoil, and soft clay soils from below the proposed pavement grade. Soils used as engineered backfill should be moisture conditioned, placed, and compacted as outlined in Section 3.2.7.
3. Have a geotechnical representative observe the excavated subgrade to evaluate if additional subgrade improvements are necessary. Hand auger borings and dynamic cone penetrometer testing should be completed on the exposed subgrade prior to the placement of new engineered fill.
4. Slope subgrade soils to allow the removal of accumulating water.
5. Test roll the exposed subgrade as described in Section 3.2.6Areas that yield or rut in excess of project requirements should be corrected.
6. Test roll the final subgrade, following placement of reclaimed aggregate base material, as described in Section 3.2.6.

3.2.3 Excavation Oversizing

When removing unsuitable materials below pavements, we recommend the excavation extend outward and downward at a slope of 1H:1V (horizontal:vertical) or flatter. See Figure 3-1 for an illustration of excavation oversizing.

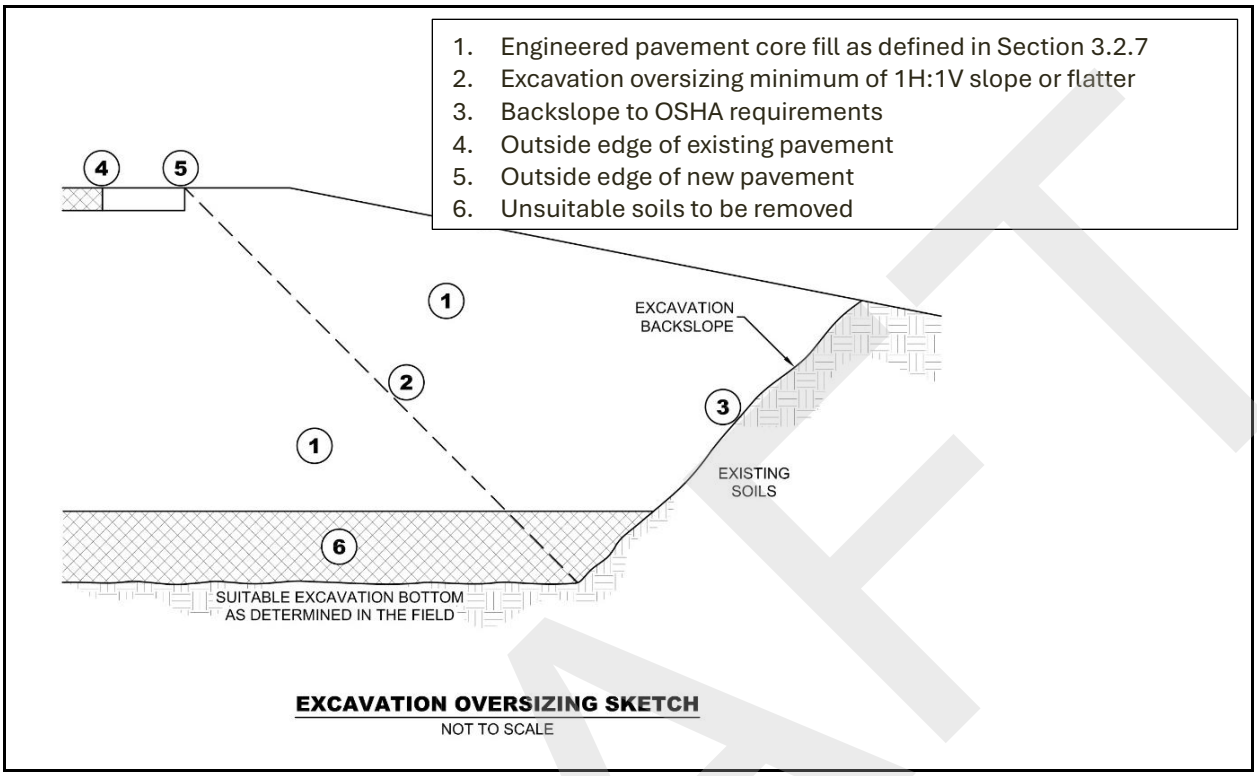

Figure 3-1. Generalized Illustration of Oversizing

3.2.4 Excavated Slopes

Based on the borings, we anticipate on-site soils in excavations will consist of existing fill soils and granular soils. 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 1/2H:1V. Slopes constructed in this manner may still exhibit surface sloughing.

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 that excavation safety is the responsibility of the contractor. The project specifications should reference these OSHA requirements.

3.2.5 Excavation Dewatering

Groundwater was observed in seven of the completed eleven soil borings at depths ranging from approximately 5 to 12 1/2 feet below existing grade. Specifically, relatively shallow groundwater was observed in ST-9 through ST-11 where the new pedestrian trail will be constructed. Where encountered, we recommend removing groundwater from the excavations. Dewatering of high-permeability soils (e.g., sands) from within the excavation with conventional pumps has the potential to loosen the soils, due to upward flow. Where non-granular soils are encountered, Project planning should include temporary sumps and pumps. A well contractor should develop a dewatering plan; the design team should review this plan.

We recommend that groundwater be kept a minimum of 2 feet below the bottom of the excavation to help facilitate a more stable working platform.

3.2.6 Pavement Subgrade test roll

After preparing the subgrade as described above and prior to the placement of the aggregate base, 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 fail to meet the test roll acceptance criteria. Possible options for subgrade correction include moisture conditioning and recompaction, subcutting and replacement with soil or crushed aggregate, and/or geotextiles. We recommend performing a second test roll after the aggregate base material is in place, and prior to placing bituminous pavement.

We recommend performing test rolls in accordance with MnDOT Specification 2111.

3.2.7 Engineered Fill Materials and Compaction

Table 3-2 contains our recommendations for engineered fill materials and compaction specifications.

Table 3-2. Recommended Fill and Compaction Specifications

Material	Material Specification	Compaction Specification
New road core fill (<3 feet below Grading Grade of Road Core)	Select Grading Material MnDOT 2106.1.B.1	MnDOT 2106.3.G.1
New road core fill (>3 feet below Grading Grade of Road Core)	Select Grading Material MnDOT 2106.1.B.1	MnDOT 2106.3.G.1
Below landscaped surfaces, where subsidence is not a concern	Non-Structural Grading Material MnDOT 2106.1.B.8	MnDOT 2106.3.G.2

*More select soils comprised of coarse sands with < 5% passing #200 sieve such as MnDOT 3149.2G Fine Filter Aggregate may be needed to accommodate work occurring in periods of wet or freezing weather.

We recommend placing engineered fill in accordance with MnDOT Specification 2106. We recommend compacting engineered fill in accordance with the MnDOT specifications listed in Table 3-2. The project documents should specify relative compaction of engineered fill, based on the structure located above the engineered fill, and vertical proximity to that structure.

The project documents should not allow the contractor to use frozen material as engineered fill or to place engineered fill on frozen material. Frost should not penetrate under pavements during construction.

We recommend performing density tests in engineered fill to evaluate if the contractors are effectively compacting the soil and meeting project requirements.

3.3 Pavements

3.3.1 Rehabilitation via Mill and Overlay

A detailed visual assessment of the pavement surface condition was not included in the scope of this evaluation. However, based on the completed pavement cores and power auger borings performed along the roadways as outlined in Section 3.1.1, it appears that a majority of the project roadways are suitable for rehabilitation via mill and overlay techniques. We recommend an experienced engineer walk the milled surface to delineate areas for these repairs based on conditions exposed by the milling process.

As typical for an overlay, reflective cracking will occur quickly, and crack sealing and other maintenance will be necessary. We recommend a mill thickness of as outlined in 3.1.1, with the replacement mix meeting SPWEA340C. In roadways where multiple mill depths are provided, the final mill depth will be up to the City's preference, as both options are suitable based on the pavement samples we obtained. The thicker mill and overlay will generally provide a slightly longer lifespan with a generally higher initial cost. The mill and overlay should proceed in general accordance with MnDOT Specifications 2232 and 2360.

The surface condition prior to milling can also indicate where repairs may be necessary. This includes distresses such as severe longitudinal and transverse cracking, alligator/fatigue cracking of any severity, potholes, and other similar failures. MnDOT defines these distresses in their surface rating procedure as follows:

- High-severity transverse cracking: Any crack running transverse to the centerline of the roadway with significant adjacent random cracking (12 inches or more apart), have large areas of spalling, missing material, and/or potholes.
- High-severity longitudinal cracking: Any crack running parallel to the centerline of the roadway with significant adjacent random cracking (12 inches or more apart), large areas of spalling, missing material, and/or potholes.
- Alligator cracking: A series of interconnected cracks forming many-sided, sharp-angled pieces, 6 inches or less in size typically located in the wheel paths or where traffic loads are concentrated.

3.3.2 Rehabilitation via Full Depth Reclamation

Based on the results of our completed soil borings and GPR scans, we anticipate the existing Pavement section along 214th Street has between 4 and 6 inches of existing bituminous overlying between 4 and 14 inches of existing aggregate base. In our opinion, the GPR data representing the 10th percentile of values will provide a general representation of the existing pavement section. For reference, the 10th percentile of the recorded GPR data provides a bituminous thickness of approximately 3 inches.

In our opinion, a reclamation with a depth of 8 inches can generally be used along 214th Street West. Based on the pavement measurements from the completed soil borings and hand auger borings, these reclamation depths will generally avoid subgrade soils through much of 214th Street West. In areas where subgrade may be penetrated due to an isolated area of thin aggregate base, the reclamation depth may need to be adjusted. Variation of existing pavement depth should be anticipated across the alignment, which will require adjustment of the reclaim depth.

We recommend implementing thorough quality control practices, including frequent sieve analyses, to achieve a desirable gradation of the reclaimed material. The gradation requirements of MnDOT Specification 2215 (Reclamation) or Specification 3138 (Aggregate for Surface and Base Courses) can be used for the aggregate base; the latter specification's controls on gradation and asphalt content are stricter and will generally be more difficult to meet. We 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.

Given the existing slightly organic clay soils that were encountered in the existing subgrade of 214th Street, we recommend that following reclamation, the existing slightly organic clay soils were removed down to the more suitable granular soils around a depth of 2 feet below existing grade and replaced with material as outlined in Section 3.2.7. Removal of this material will be incidental to excavations needed to construct the proposed sand subbase layer.

3.3.3 Design Sections

Our scope of services for this project did not include laboratory tests on subgrade soils to determine an R-value for pavement design. Based on our experience with similar soils anticipated at the pavement subgrade elevation, we recommend pavement design assume an R-value of 30 following removal of the soft clay soils and organic soils. Table 3-3 provides recommended pavement sections, based on the soils support and traffic loads. It should be noted that we used an AADT of less than 600 vehicles and the State Aid 10-ton Traffic Forecast Calculator to provide an ESAL forecast of 69,000.

Table 3-3. Recommended Bituminous Pavement Sections – 214th Street

Material	Thickness	Designation	Specification
Bituminous	4	SPWEA340C	2360
Reclaimed Aggregate Base	4	Class 5 or 6, modified aggregate base	3138 or 2215
Virgin Aggregate Base	4	Class 5 or 6	2211
Minimum granular subbase	12*	Select Granular	3149

*Depth will vary depending on depth of in place granular soils.

Table 3-4. Recommended Bituminous Pavement Sections – Pedestrian Trail

Material	Thickness	Designation	Specification
Bituminous	3	SPWEA240B	2360
Aggregate Base	6	Class 5 or 6	2211

3.3.4 Subgrade Drainage

Where granular soils (SP, SP-SM) are not exposed at the pavement subgrade, we recommend installing perforated drainpipes at low points and around catch basins. We also recommend installing drainpipes along pavement and exterior slab edges where exterior grades promote drainage toward those edge areas. The contractor should place drainpipes in small trenches, extended at least 8 inches below the granular subbase layer, or below the aggregate base material where no subbase is present.

3.3.5 Performance and Maintenance

We based the above pavement designs on a 20-year performance life for pavements. This is the amount of time before we anticipate the pavement will require major rehabilitation. This performance 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.

It is common to place the non-wear course of bituminous and then delay placement of wear course. For this situation, we recommend evaluating if the reduced pavement section will have sufficient structure to support construction traffic.

Many conditions affect the overall performance of the pavements. Some of these conditions include the environment, loading conditions and the level of ongoing maintenance. With regard to bituminous pavements in particular, 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.

3.4 Utilities

3.4.1 Subgrade Stabilization

For new utility installation along 214th Street, we anticipate the soils at typical invert elevations will be suitable for utility support. However, if construction encounters unfavorable conditions such as soft clay, organic soils, or water at invert grades, the unsuitable soils may require some additional subcutting and replacement with sand or crushed rock to prepare a proper subgrade for pipe support. Project design and construction should not place utilities within the 1H:1V oversizing of foundations.

3.4.2 Corrosion Potential

The soil boring performed along 214th Street indicated the subgrade predominantly consists of sandy soils. We consider these soils to be non- to slightly corrosive to metallic conduits. If utilities extend through clay soils, we recommend bedding the utilities in sandy soil free of any clay lumps or constructing the utilities with non-corrosive materials.

3.4.3 Dewatering

As previously outlined, apparent groundwater may be encountered during excavations, specifically for utility installation. Where encountered, we recommend groundwater is removed from excavations. Dewatering of high-permeability soils (e.g., sands) from within the excavation with conventional pumps has the potential to loosen the soils, due to upward flow. A well contractor should develop a dewatering plan; the design team should review this plan.

We recommend that apparent groundwater be kept a minimum of 2 feet below the bottom of the excavation to help facilitate a more stable working platform.

4.0 Procedures

4.1 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.

4.2 Ground Penetrating Radar

4.2.1 GPR Data Collection

GPR data was collected in August of 2025. GPR collection occurred at posted speed limits and data was recorded continuously along each street (scan interval of 1-foot), in both directions of travel except for cul-de-sac sections. A calibration file, required for data post-processing, was collected at the onset of testing.

4.2.2 GPR Analysis

Data collected by the GPR unit was returned to our office and analyzed to estimate the pavement thickness using RADAN 7.0, a software package included with the GSSI RoadScan system. The software includes tools to delineate pavement layer transitions with thickness estimates based on measured signal time and amplitude.

Where “ground-truth” data (ores) were performed, the interpreted layers from the GPR scan were compared directly to the measured thicknesses from the borings to validate the accuracy of the GPR analysis, with adjustments if necessary to improve accuracy or data clarity.

4.3 Power Auger Borings

We obtained core samples of the pavement using a portable coring machine advancing a 4-inch diameter core barrel. Immediately after completing the coring, we repaired the bituminous pavement with a coldmix bituminous patch. We measured the cores to obtain approximate bituminous thickness and noted their material conditions based on visual observation. The Appendix includes images of the cores.

We performed the power auger borings using a truck mounted auger. We inferred the soil classifications and strata depths from the cuttings brought to the surface by dead pulling the auger after screwing it to selected depths in the ground. At desired depths, we placed auger cuttings in bags and jars.

4.4 Exploration Logs

4.4.1 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 and other in-situ 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.

4.4.2 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 and other in-situ 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 .

4.5 Material Classification and Testing

4.5.1 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.

4.5.2 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 procedures.

4.6 Groundwater Measurements

The drillers checked for groundwater while advancing the penetration test borings, and again after auger withdrawal. We then filled the boreholes noted on the boring logs.

5.0 Qualifications

5.1 Variations in Subsurface Conditions

5.1.1 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.

5.1.2 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.

5.2 Continuity of Professional Responsibility

5.2.1 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.

5.2.2 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.

5.3 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.

5.4 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

Soil Boring Location Sketch
Log of Boring Sheets ST-1 through ST-11
Core Photographs
GPR Scans
Descriptive Terminology of Soil

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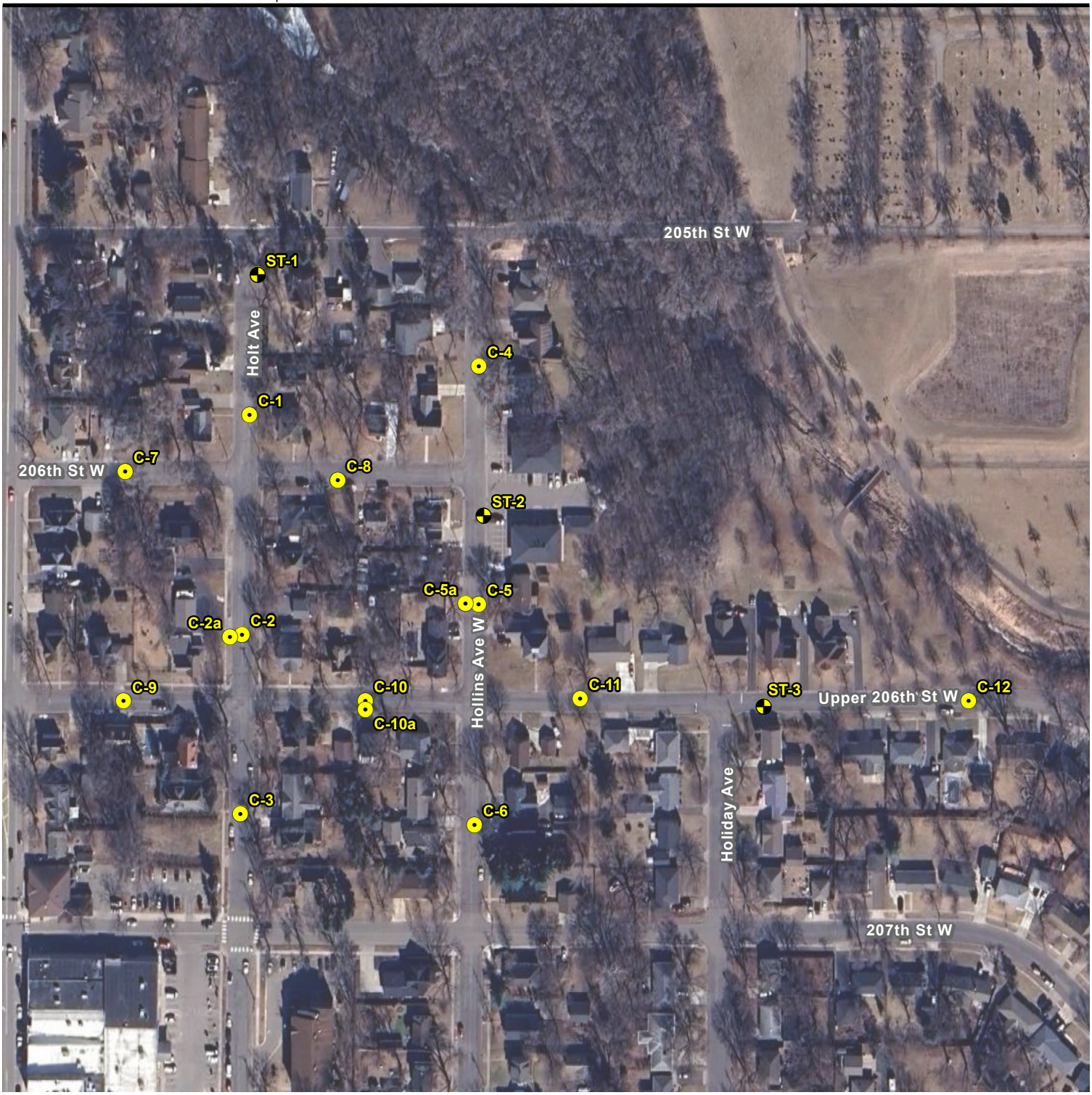

Coring Location

Boring Location

N

0 100 200 '

SCALE: 1" = 200'

Source: Google Earth Imagery

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Minneapolis, MN 55438
952.995.2000
braunintertec.com

Project No: B2506310

Drawing No: Boring Coring Sketch

Drawn By:	ZS
Date Drawn:	8/7/2025
Checked By:	RSJ
Last Modified:	10/7/2025

City of Lakeville Project 26-01 Miscellaneous Street Repairs

Various Streets

Lakeville, Minnesota

Boring and Coring Location Sketch

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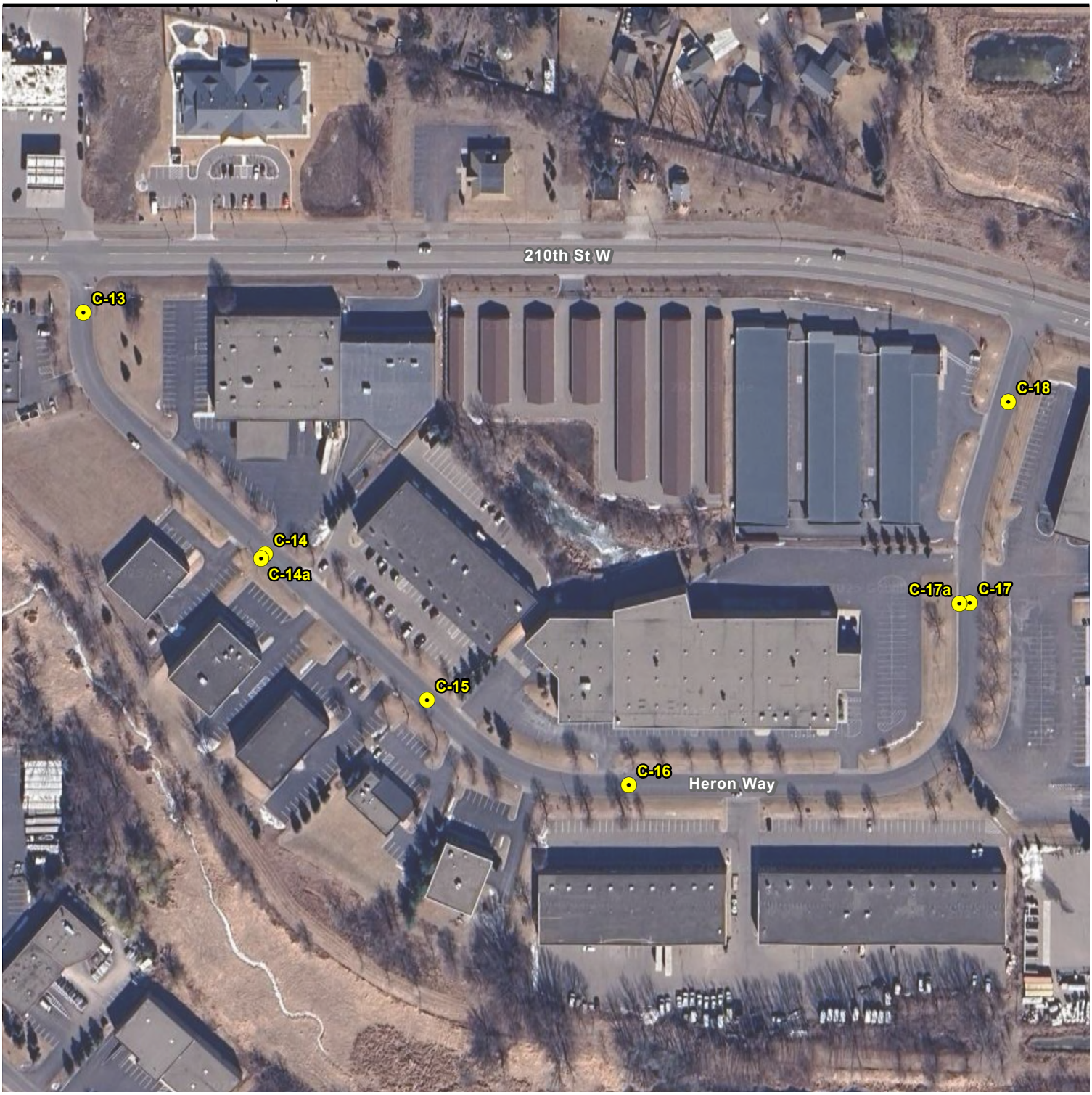

Coring Location

Boring Location

N

0 100 200 '

SCALE: 1" = 200'

Source: Google Earth Imagery

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Boring and Coring Location Sketch

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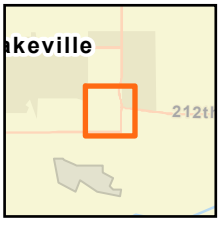

Coring Location

Boring Location

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SCALE: 1" = 500'

Source: Google Earth Imagery

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Drawn By:	ZS
Date Drawn:	8/7/2025
Checked By:	RSJ
Last Modified:	10/7/2025

City of Lakeville Project 26-01 Miscellaneous Street Repairs

Various Streets

Lakeville, Minnesota

Boring and Coring Location Sketch

Sheet: 3 of 5

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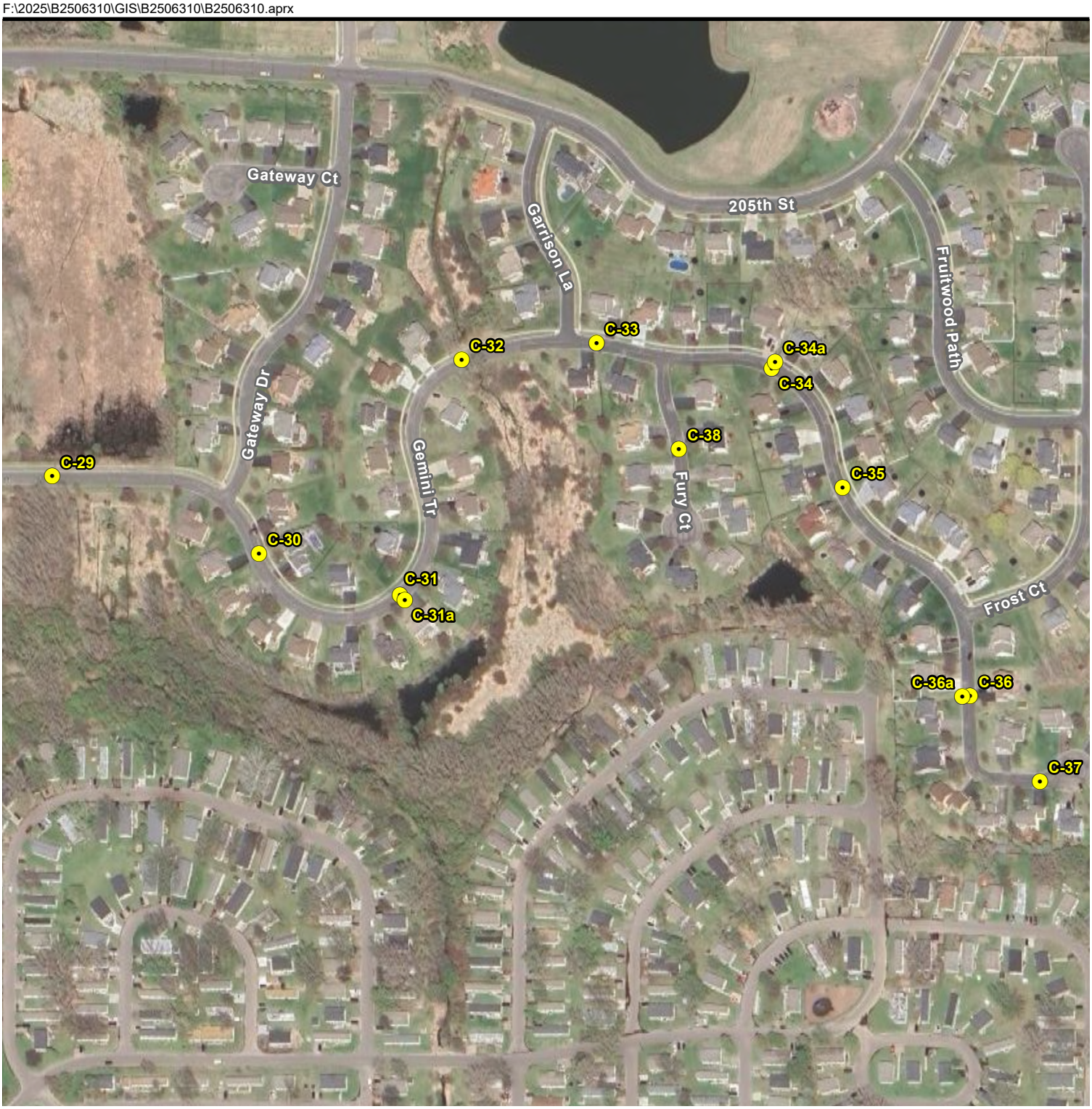

Coring Location

Boring Location

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SCALE: 1" = 300'

Source: Google Earth Imagery

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City of Lakeville Project 26-01 Miscellaneous Street Repairs

Various Streets

Lakeville, Minnesota

Boring and Coring Location Sketch

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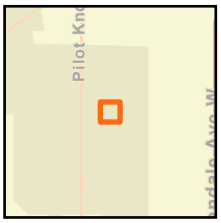

Boring Location

N

0 100 200 '

SCALE: 1" = 200'

Source: Google Earth Imagery

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Project No: B2506310

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Drawn By:	ZS
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Checked By:	RSJ
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City of Lakeville Project 26-01 Miscellaneous Street Repairs

Various Streets

Lakeville, Minnesota

Boring and Coring Location Sketch

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2506310
Geotechnical Evaluation
City of Lakeville Project 26-01 Miscellaneous Street Repairs
Lakeville, Minnesota

BORING: **ST-1**
LOCATION: Captured with RTK GPS.
DATUM: NAD 1983 HARN Adj MN Dakota (US Feet)
NORTHING: 165759.7 EASTING: 519585.0
DRILLER: M. Barber LOGGED BY: R. Jett START DATE: 09/02/25 END DATE: 09/02/25
SURFACE ELEVATION: 969.5 ft RIG: GP-1 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER: Rain

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
968.6		BITUMINOUS, 6 1/2 inches of bituminous over 3 1/2 inches of apparent aggregate base					
0.8 / 967.5		FILL: SILTY SAND (SM), fine to coarse-grained, trace Gravel, bituminous debris, dark brown, moist					
2.0 / 965.0		FILL: CLAYEY SAND (SC), trace Gravel, slightly organic, dark brown to brown, moist		2-4-7 (11) 13"		10	OC=1%
4.5 / 964.0		FILL: SANDY LEAN CLAY (CL), gray to light brown, moist	5	3-8-13 (21) 15"		15	
5.5 / 960.0	▽	POORLY GRADED SAND (SP), fine to medium-grained, trace Gravel, brown, moist, dense (GLACIAL OUTWASH)		17-14-17 (31) 12"			
9.5 / 955.0		POORLY GRADED SAND with GRAVEL (SP), fine to coarse-grained, brown, wet, medium dense (GLACIAL OUTWASH)	10	7-7-7 (14) 13"			
				10-11-12-10 (23) 19"			
14.5		END OF BORING Boring then backfilled with auger cuttings	15				Water observed at 9.5 feet while drilling.

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2506310
Geotechnical Evaluation
City of Lakeville Project 26-01 Miscellaneous Street Repairs
Lakeville, Minnesota

BORING: **ST-2**
LOCATION: Captured with RTK GPS.
DATUM: NAD 1983 HARN Adj MN Dakota (US Feet)
NORTHING: 165413.7 EASTING: 519909.4
DRILLER: J. Vloo LOGGED BY: R. Jett START DATE: 08/20/25 END DATE: 08/20/25
SURFACE ELEVATION: 966.8 ft RIG: 7519 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER:

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
965.9		BITUMINOUS, 5 inches of bituminous over 6 1/2 inches of apparent aggregate base					
0.9 964.8		FILL: SILTY SAND with GRAVEL (SM), fine to coarse-grained, bituminous debris, dark brown, moist		9-2-7 (9) 14"		5	P200=9%
2.0 959.8		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained, trace Gravel, Clay balls, light brown, moist	5	5-6-5 (11) 14"			
7.0 957.3		POORLY GRADED SAND (SP), fine to coarse-grained, trace Gravel, light brown, moist, medium dense (GLACIAL OUTWASH) *Wet below 9 1/2 feet*		5-6-5 (11) 16"			
9.5 952.3	▽	POORLY GRADED SAND (SP), fine to coarse-grained, little Gravel, brown, wet, medium dense (GLACIAL OUTWASH)	10	6-8-8 (16) 14"		10	
				8-6-5-9 (11) 16"			
14.5		END OF BORING Boring then backfilled with auger cuttings	15				Water observed at 9.5 feet while drilling.

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See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2506310
Geotechnical Evaluation
City of Lakeville Project 26-01 Miscellaneous Street Repairs
Lakeville, Minnesota

BORING: **ST-3**
LOCATION: Captured with RTK GPS.
DATUM: NAD 1983 HARN Adj MN Dakota (US Feet)
NORTHING: 165139.9 EASTING: 520311.5
DRILLER: J. Vloo LOGGED BY: R. Jett START DATE: 08/20/25 END DATE: 08/20/25
SURFACE ELEVATION: 964.8 ft RIG: 7519 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER:

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
964.0		BITUMINOUS, 5 1/2 inches of bituminous over 4 inches of apparent aggregate base					
0.8 / 962.8		FILL: SILTY SAND with GRAVEL (SM), fine to coarse-grained, trace Gravel, dark brown, moist					
2.0 / 960.2		FILL: SILTY SAND (SM), fine to coarse-grained, trace Gravel, bituminous debris, brown, moist		7-5-5 (10) 14"			
4.5 / 955.2		FILL: POORLY GRADED SAND (SP), fine to coarse-grained, trace Gravel, light brown, moist	5	7-5-9 (14) 16"		3	
				10-14-14 (28) 16"			
9.5 / 950.2	▽	POORLY GRADED SAND (SP), fine to coarse-grained, little Gravel, brown, wet, medium dense (GLACIAL OUTWASH) *Wet below 9 1/2 feet*	10	7-6-8 (14) 14"		11	
				4-6-7-9 (13) 14"			
14.5		END OF BORING	15				Water observed at 9.5 feet while drilling.
		Boring then backfilled with auger cuttings					

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2506310
Geotechnical Evaluation
City of Lakeville Project 26-01 Miscellaneous Street Repairs
Lakeville, Minnesota

BORING: **ST-4**
LOCATION: Captured with RTK GPS.
DATUM: NAD 1983 HARN Adj MN Dakota (US Feet)
NORTHING: 163165.7 EASTING: 525331.7
DRILLER: J. Vloo LOGGED BY: R. Jett START DATE: 08/21/25 END DATE: 08/21/25
SURFACE ELEVATION: 965.1 ft RIG: 7519 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER:

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
964.1		BITUMINOUS, 4 1/2 inches of bituminous over 7 1/2 inches of apparent aggregate base					
1.0		FILL: POORLY GRADED SAND (SP), fine to coarse-grained, trace Gravel, Clay balls, light brown, moist		11-12-9 (21) 14"			
960.6							
4.5		FILL: SANDY LEAN CLAY (CL), trace Gravel, contains organic seams, brown to dark brown, moist	5	3-4-5 (9) 16"		16	
958.1							
7.0		SANDY LEAN CLAY (CL), trace Gravel, light brown, moist, medium (GLACIAL TILL)		3-4-3 (7) 16"		22	P200=63%
			10	1-2-3 (5) 16"			
952.6							
12.5		SANDY LEAN CLAY (CL), trace Gravel, dark gray to dark brown, moist, stiff (GLACIAL TILL)		2-8-7-6 (15) 16"			
950.6							
14.5		END OF BORING	15				Water not observed while drilling.
		Boring then backfilled with auger cuttings					

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2506310
Geotechnical Evaluation
City of Lakeville Project 26-01 Miscellaneous Street Repairs
Lakeville, Minnesota

BORING: **ST-5**
LOCATION: Captured with RTK GPS.
DATUM: NAD 1983 HARN Adj MN Dakota (US Feet)
NORTHING: 162921.4 EASTING: 525272.0
DRILLER: J. Vloo LOGGED BY: R. Jett START DATE: 08/21/25 END DATE: 08/21/25
SURFACE ELEVATION: 961.4 ft RIG: 7519 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER:

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
960.4		BITUMINOUS, 4 inches of bituminous over 8 inches of apparent aggregate base					
1.0		FILL: POORLY GRADED SAND (SP), fine to coarse-grained, trace Gravel, contains seams of Clay, brown, moist		5-6-6 (12) 6"			
956.9							
4.5		FILL: SANDY LEAN CLAY (CL), trace Gravel, brown, moist	5	4-5-5 (10) 12"		14	
955.4							
6.0		END OF BORING Boring then backfilled with auger cuttings					Water not observed while drilling.
			10				
			15				

BRAUN INTERTEC
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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2506310
Geotechnical Evaluation
City of Lakeville Project 26-01 Miscellaneous Street Repairs
Lakeville, Minnesota

BORING: **ST-6**
LOCATION: Captured with RTK GPS.
DATUM: NAD 1983 HARN Adj MN Dakota (US Feet)
NORTHING: 163184.5 EASTING: 523563.2
DRILLER: J. Vloo LOGGED BY: R. Jett START DATE: 08/21/25 END DATE: 08/21/25
SURFACE ELEVATION: 957.4 ft RIG: 7519 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER:

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
956.6		BITUMINOUS, 4 inches of bituminous over 6 inches of apparent aggregate base					
0.8 955.4		FILL: SILTY SAND with GRAVEL (SM), fine to coarse-grained, cement odor, dark brown, moist					
2.0 952.9		FILL: WELL-GRADED SAND with SILT and GRAVEL (SW-SM), fine to coarse-grained, Clay balls, light brown, moist		5-4-5 (9) 14"		4	P200=10%
4.5 951.4		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, trace Gravel, contains seams of Clay, brown, moist	5	3-4-5 (9) 14"			
6.0		END OF BORING Boring then backfilled with auger cuttings					Water not observed while drilling.
			10				
			15				

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2506310
Geotechnical Evaluation
City of Lakeville Project 26-01 Miscellaneous Street Repairs
Lakeville, Minnesota

BORING: **ST-7**
LOCATION: Captured with RTK GPS.
DATUM: NAD 1983 HARN Adj MN Dakota (US Feet)
NORTHING: 162544.0 EASTING: 526556.5
DRILLER: J. Vloo LOGGED BY: R. Jett START DATE: 08/21/25 END DATE: 08/21/25
SURFACE ELEVATION: 956.1 ft RIG: 7519 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER:

Elev./ Depth ft	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
954.0	BITUMINOUS, 10 inches of bituminous over 15 inches of apparent aggregate base					
2.1	FILL: SILTY SAND (SM), fine to medium-grained, trace Gravel, contains seams of Clay, brown, moist		8-7-10 (17) 16"		5	
951.6						
4.5	FILL: CLAYEY SAND (SC), trace Gravel, contains seams of organic, brown, moist	5	8-8-7 (15) 14"		11	P200=36%
949.1						
7.0	SANDY LEAN CLAY (CL), trace Gravel, light brown, moist, stiff (GLACIAL TILL)		5-7-7 (14) 16"			
		10	4-5-5 (10) 16"		18	
			3-4-4-5 (8) 16"			
941.6						
14.5	END OF BORING	15				Water not observed while drilling.
	Boring then backfilled with auger cuttings					

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2506310
Geotechnical Evaluation
City of Lakeville Project 26-01 Miscellaneous Street Repairs
Lakeville, Minnesota

BORING: **ST-8**
LOCATION: Captured with RTK GPS.
DATUM: NAD 1983 HARN Adj MN Dakota (US Feet)
NORTHING: 161227.1 EASTING: 523578.4
DRILLER: M. Barber LOGGED BY: R. Jett START DATE: 09/02/25 END DATE: 09/02/25
SURFACE ELEVATION: 954.5 ft RIG: GP-1 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER: Rain

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
953.6		BITUMINOUS, 6 inches of bituminous over 4 inches of apparent aggregate base					
0.8 952.5		FILL: CLAYEY SAND (SC), trace Gravel, organic, black, moist				14	OC=3%
2.0 950.0		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained, trace Gravel, brown, moist		3-4-5 (9) 13"			
4.5		POORLY GRADED SAND (SP), fine to coarse-grained, trace Gravel, light brown, moist, dense to medium dense (GLACIAL OUTWASH)	5	11-10-14 (24) 15"		4	P200=5%
				21-17-21 (38) 12"			
			10	14-10-11 (21) 13"			
	▽			8-8-7-5 (15) 16"			Wet below 12 1/2 feet
940.0 14.5		END OF BORING Boring then backfilled with auger cuttings	15				Water observed at 12.5 feet while drilling.

BRAUN INTERTEC
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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2506310
Geotechnical Evaluation
City of Lakeville Project 26-01 Miscellaneous Street Repairs
Lakeville, Minnesota

BORING: **ST-9**
LOCATION: Captured with RTK GPS.
DATUM: NAD 1983 HARN Adj MN Dakota (US Feet)
NORTHING: 179180.0 EASTING: 538948.2
DRILLER: M. Barber LOGGED BY: R. Jett START DATE: 09/02/25 END DATE: 09/02/25
SURFACE ELEVATION: 915.2 ft RIG: GP-1 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER: Rain

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
913.7		CLAYEY SAND (SC), trace Gravel, black to dark brown, moist (TOPSOIL FILL)					
1.4		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, trace Gravel, brown, moist		6-8-7 (15) 13"			
912.2							
3.0	▽	POORLY GRADED SAND (SP), fine to coarse-grained, trace Gravel, brown, moist, medium dense (GLACIAL OUTWASH)		10-9-8 (17) 11"		19	Wet below 5 feet P200=2%
5				9-9-10 (19) 18"			
10				8-10-11 (21) 18"			
904.2							
11.0		END OF BORING					Water observed at 5.0 feet while drilling.
		Boring then backfilled with auger cuttings					
15							

BRAUN INTERTEC
the science you build on

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2506310
Geotechnical Evaluation
City of Lakeville Project 26-01 Miscellaneous Street Repairs
Lakeville, Minnesota

BORING: **ST-10**
LOCATION: Captured with RTK GPS.
DATUM: NAD 1983 HARN Adj MN Dakota (US Feet)
NORTHING: 179178.0 EASTING: 538698.9
DRILLER: M. Barber LOGGED BY: R. Jett START DATE: 09/02/25 END DATE: 09/02/25
SURFACE ELEVATION: 915.9 ft RIG: GP-1 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER: Rain

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
914.7		CLAYEY SAND (SC), trace Gravel, black to dark brown, moist (TOPSOIL FILL)					
1.2		FILL: SANDY LEAN CLAY (CL), trace Gravel, brown, moist		2-5-8 (13) 14"		12	
912.9							
3.0	▽	POORLY GRADED SAND (SP), fine to coarse-grained, trace Gravel, brown, moist, loose to medium dense (GLACIAL OUTWASH)	5	4-4-5 (9) 13"		20	Wet below 5 feet
				2-4-6 (10) 14"			
			10	2-4-5 (9) 18"			
904.9							
11.0		END OF BORING					Water observed at 5.0 feet while drilling.
		Boring then backfilled with auger cuttings					
			15				

BRAUN INTERTEC
the science you build on

LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B2506310
Geotechnical Evaluation
City of Lakeville Project 26-01 Miscellaneous Street Repairs
Lakeville, Minnesota

BORING: **ST-11**
LOCATION: Captured with RTK GPS.
DATUM: NAD 1983 HARN Adj MN Dakota (US Feet)
NORTHING: 179075.6 EASTING: 538391.2
DRILLER: M. Barber LOGGED BY: R. Jett START DATE: 09/02/25 END DATE: 09/02/25
SURFACE ELEVATION: 914.4 ft RIG: GP-1 METHOD: 3 1/4" HSA SURFACING: Vegetation WEATHER: Rain

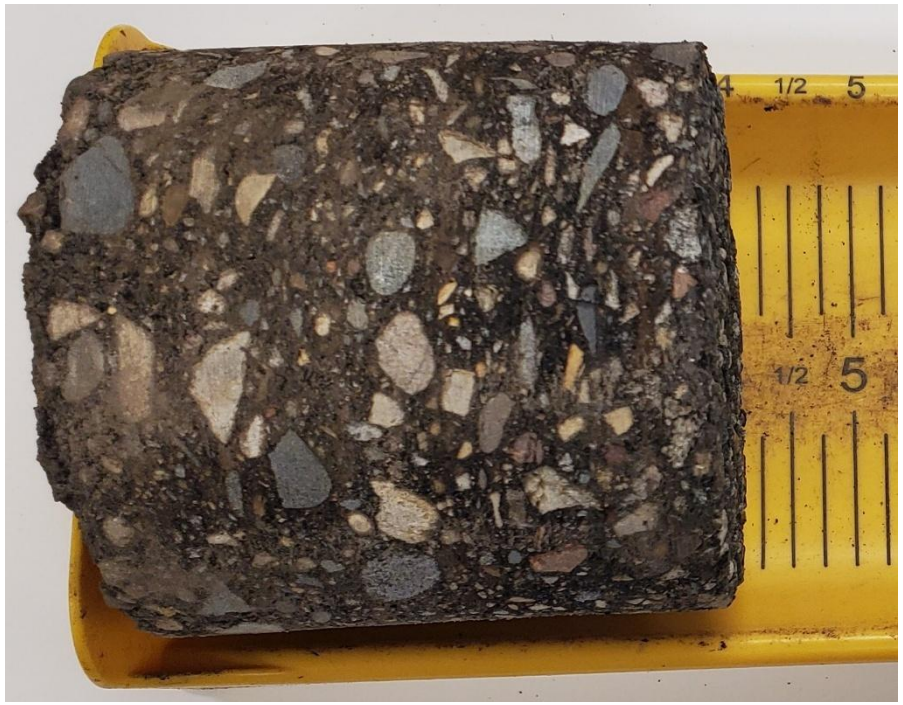
Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	q_p tsf	MC %	Tests or Remarks
913.4		CLAYEY SAND (SC), trace Gravel, black to dark brown, moist (TOPSOIL FILL)					
1.0		POORLY GRADED SAND (SP), fine to coarse-grained, trace Gravel, brown, moist to wet, medium dense to loose (GLACIAL OUTWASH)		8-8-8 (16) 13"		16	
	▽		5	1-2-4 (6) 16"		19	Wet below 5 feet
				6-8-11 (19) 18"			
			10	8-8-10 (18) 18"			
903.4							
11.0		END OF BORING Boring then backfilled with auger cuttings					Water observed at 5.0 feet while drilling.
			15				

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-1

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-1 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-2

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-2 Surface



BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-2A

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-2A Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-3

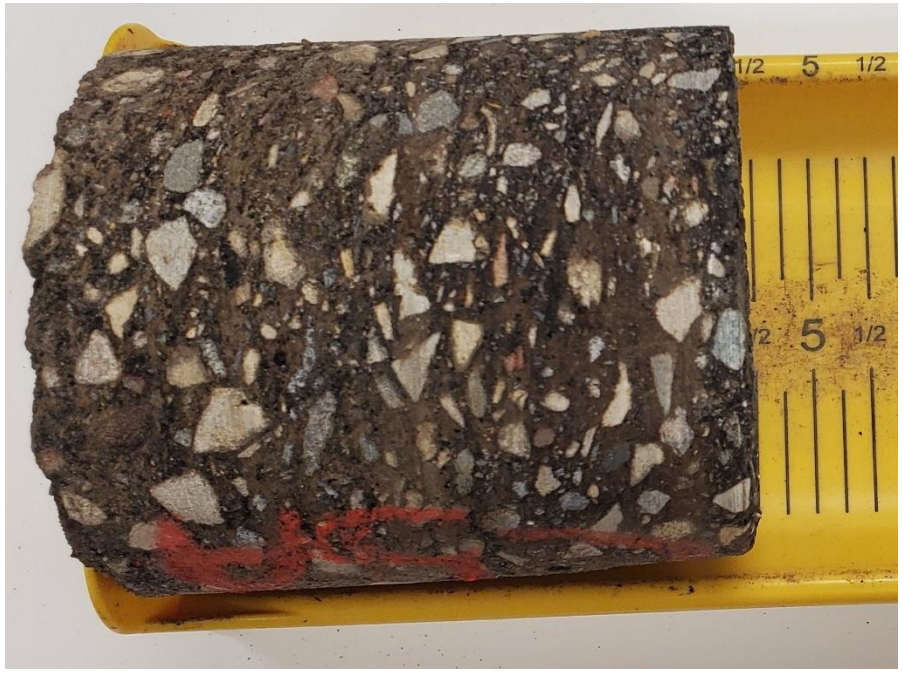
BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-3 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-4

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-4 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-5

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-5 Surface



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BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-5A Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-6

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-6 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-7

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-7A Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-8

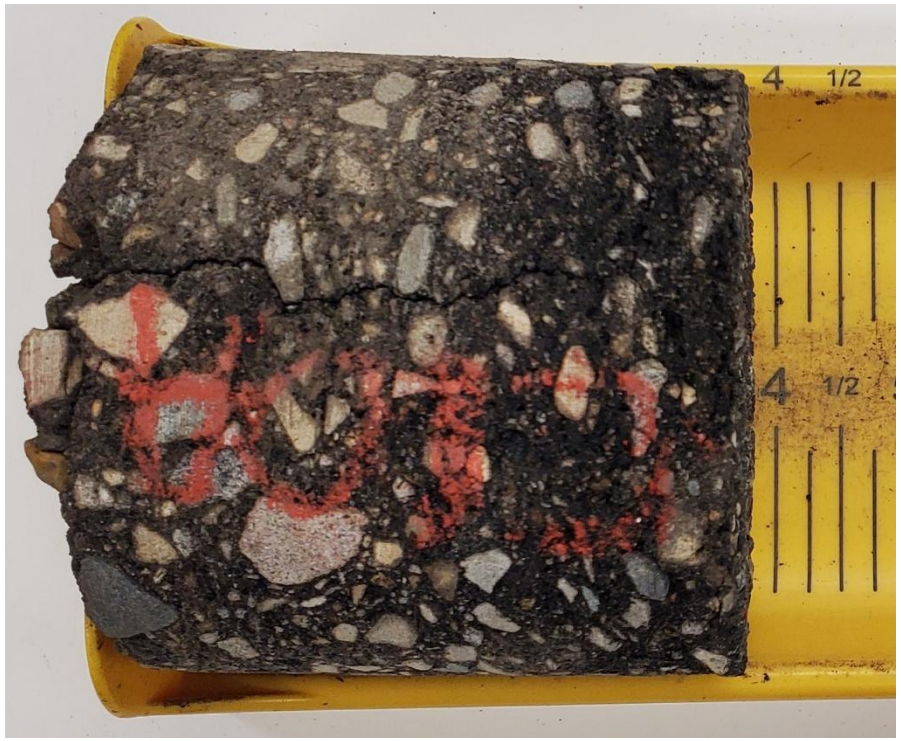
BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-8A Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-9

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-9A Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-10

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-10 Surface



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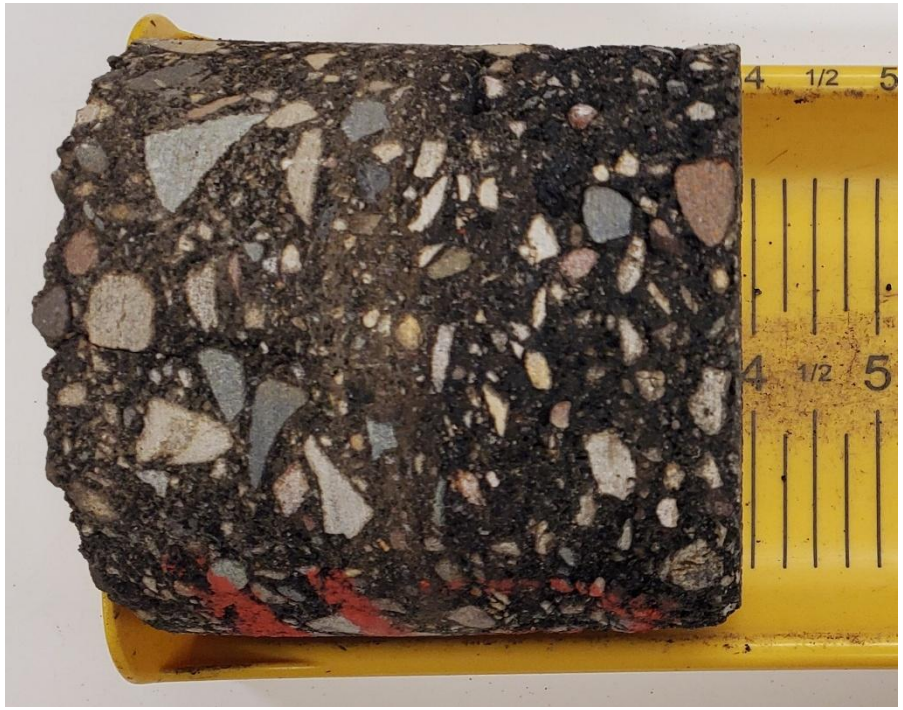
BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-10A Surface

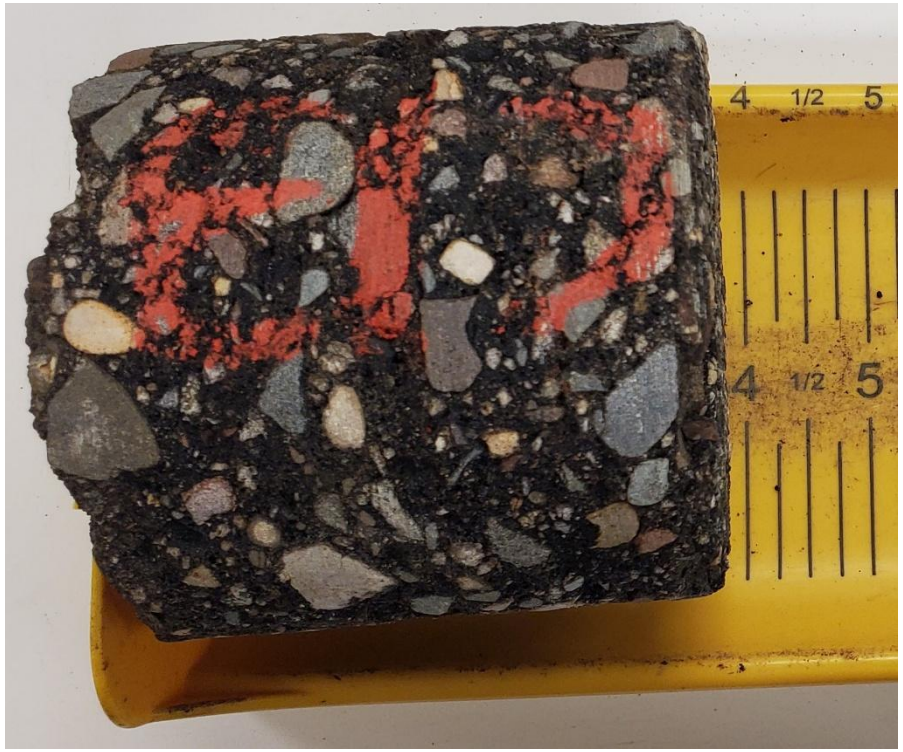


BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-11

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-11 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-12

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-12 Surface



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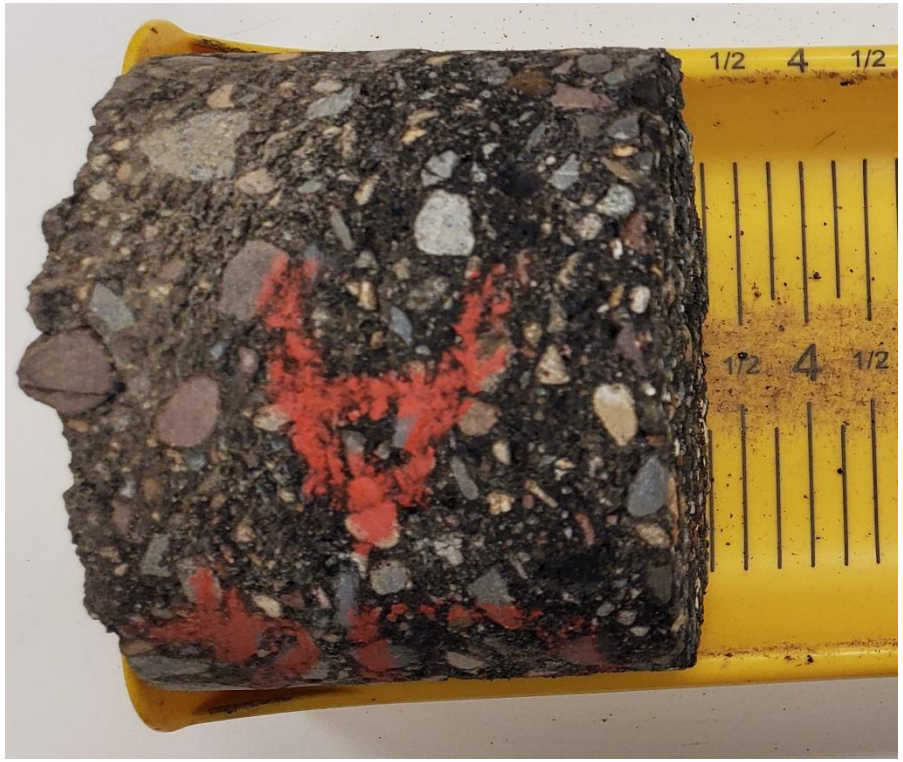
BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-13 Surface

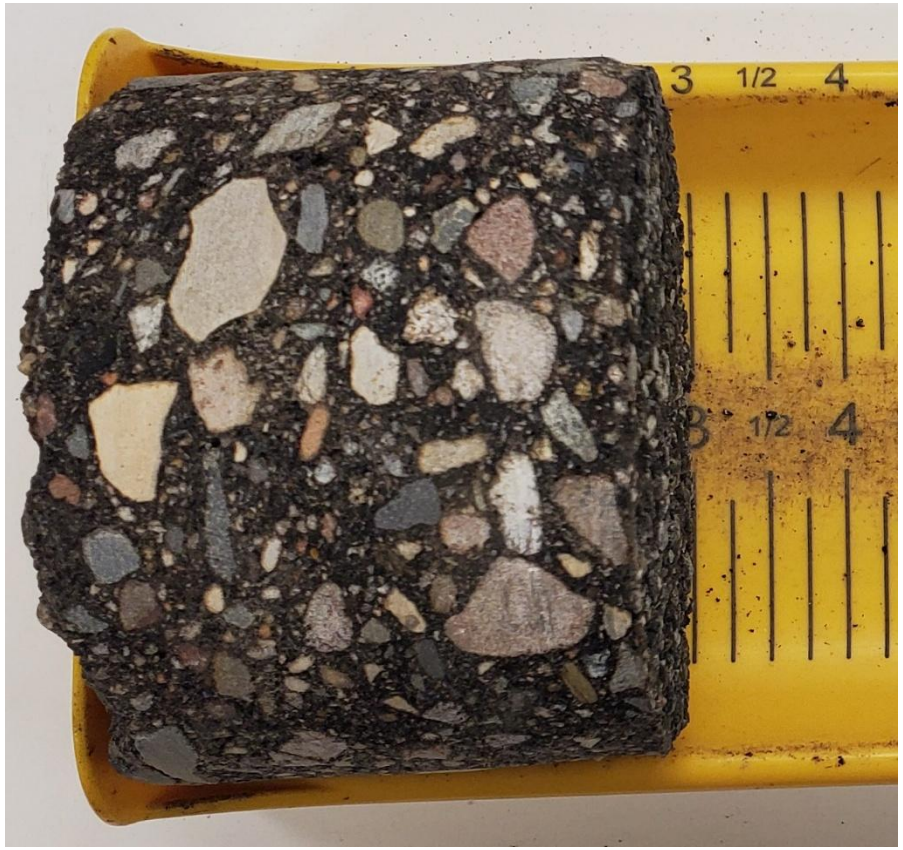
BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-14

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-14 Surface



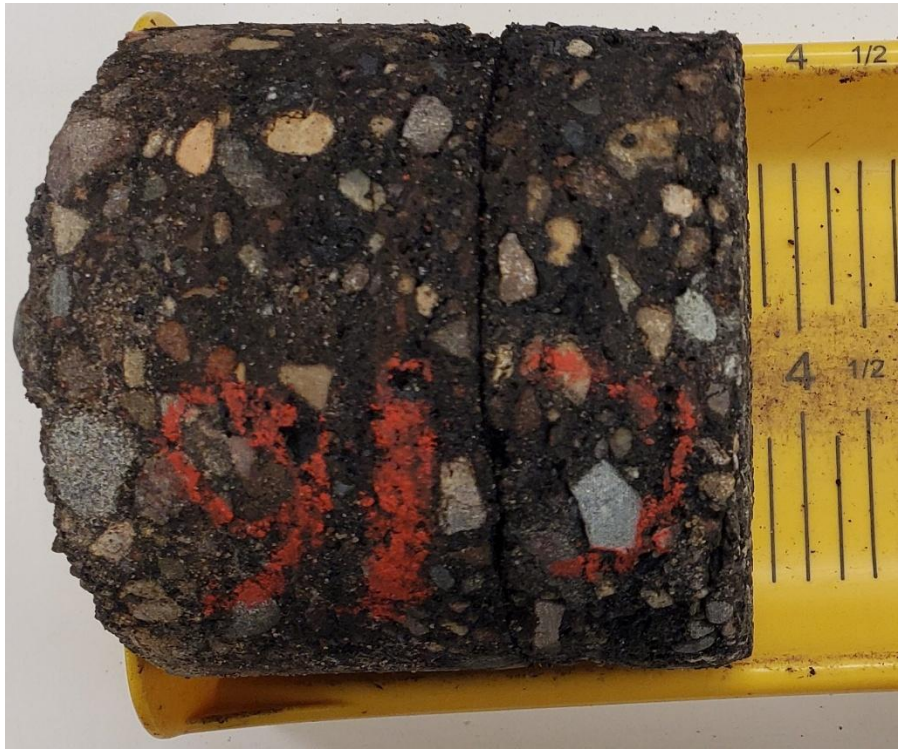
BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-14A

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-14A Surface



BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-15

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-15 Surface



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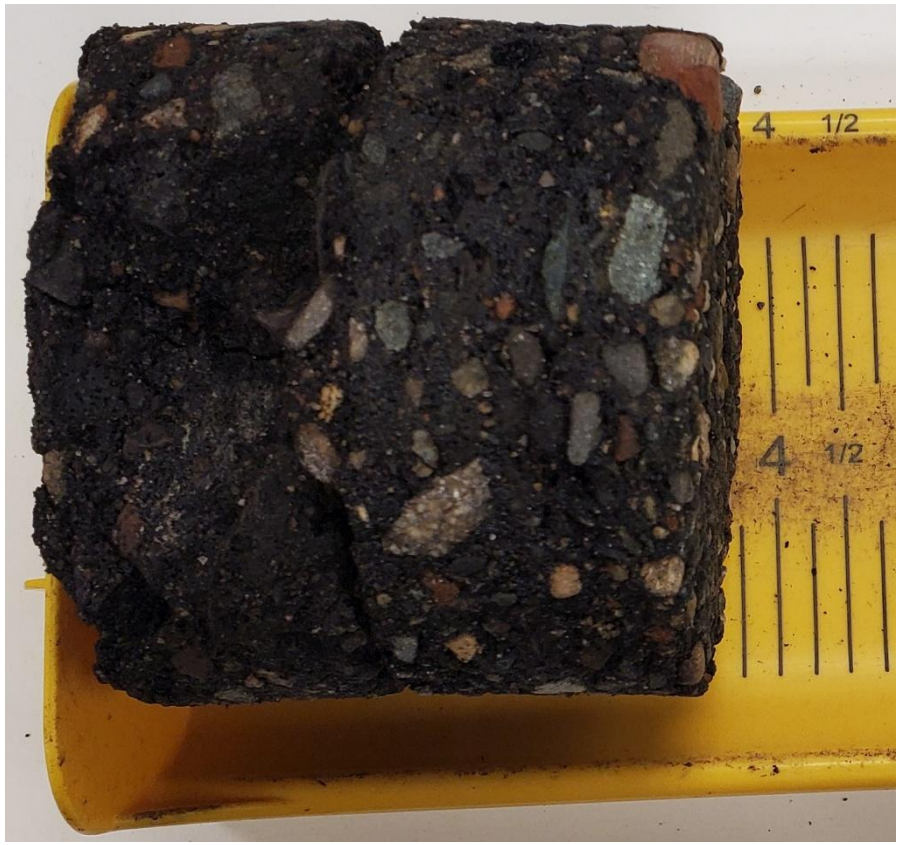
BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-16 Surface



BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-17

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-17 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-17A

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-17A Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-18

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-18 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-19

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-19 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-20

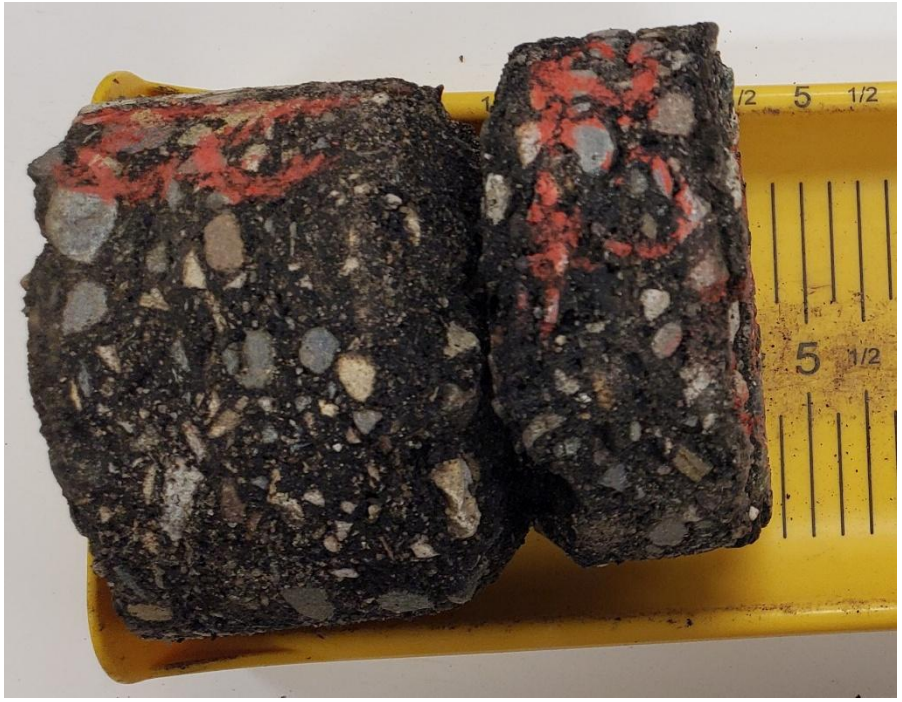
BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-20 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-21

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-21 Surface

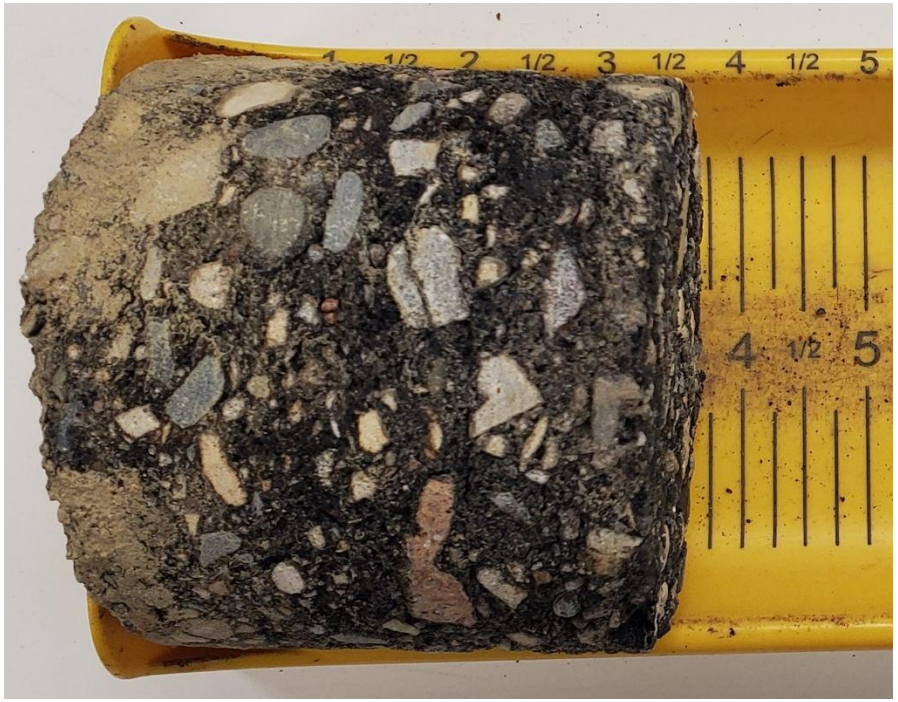
BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-21A

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-21A Surface



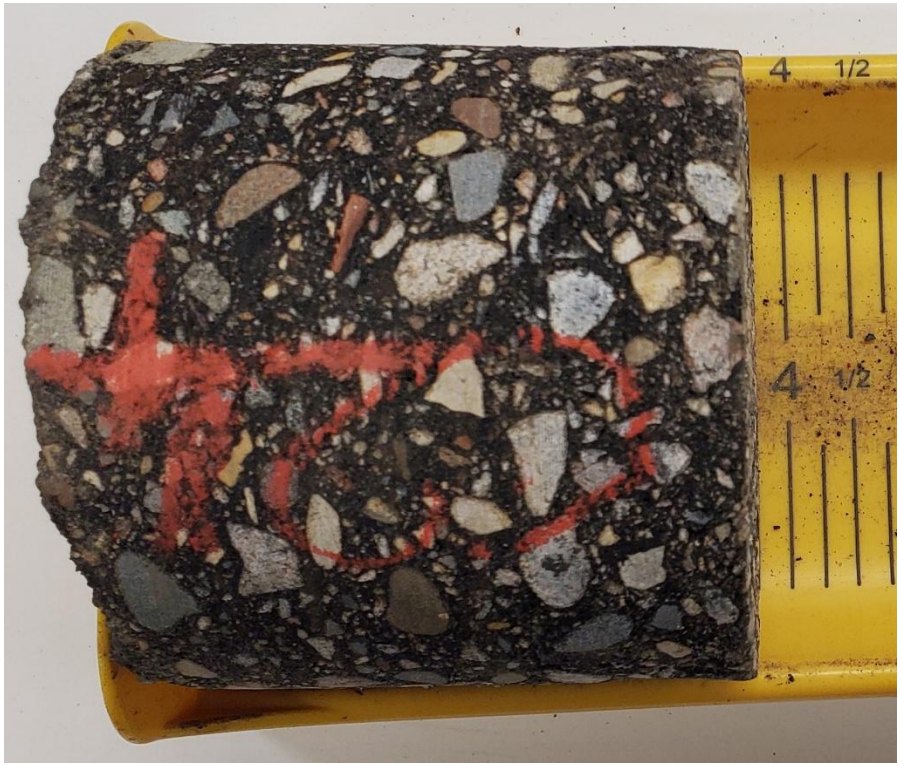
BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-22

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-22 Surface



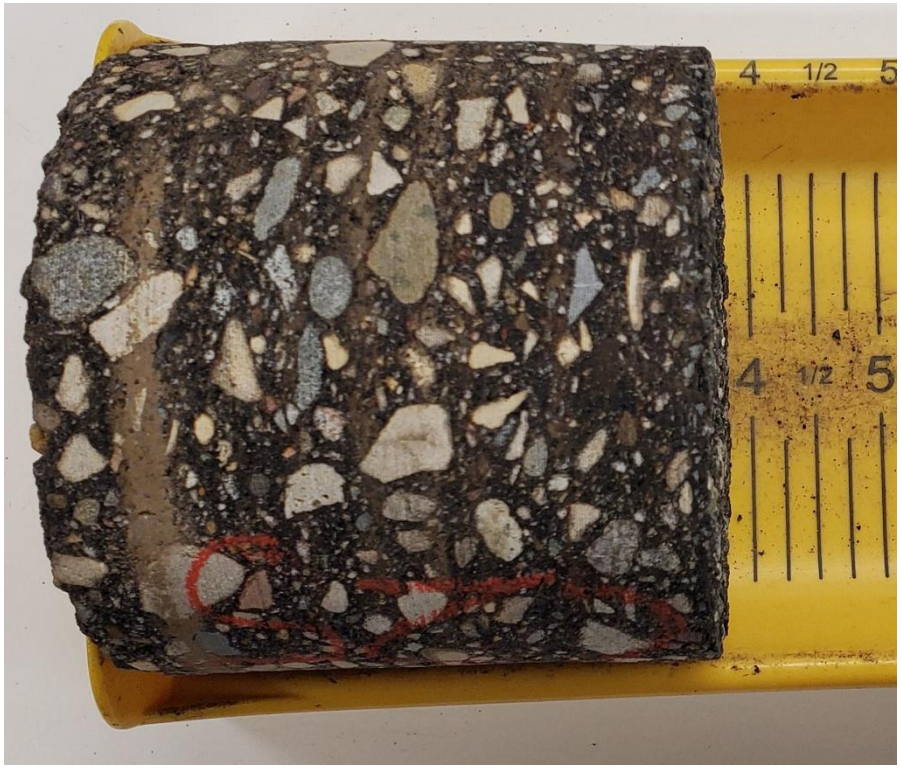
BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-23

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-23 Surface



BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-24

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-24 Surface



BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-25

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-25 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-25A

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-25A Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-26

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-26 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-27

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-27 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-27A

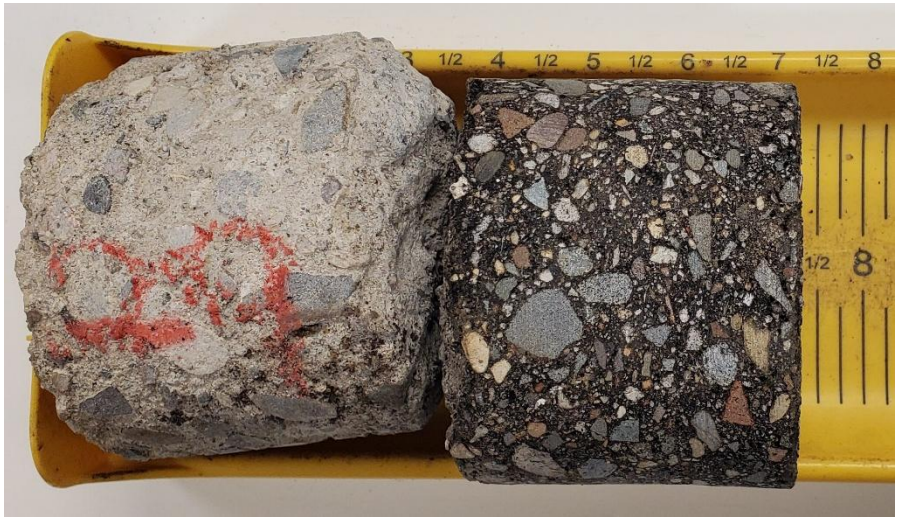
BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-27A Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-28

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-28 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-28A

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-28A Surface

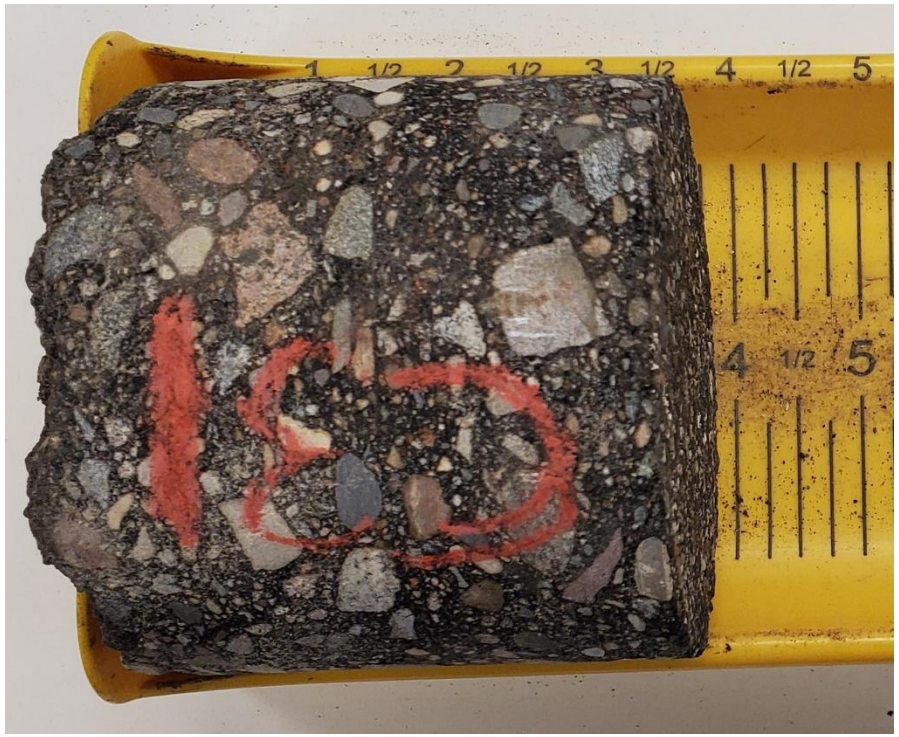


BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-29

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-29 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-30

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-30 Surface



BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-31

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-31 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-31A

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-31A Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-32

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-32 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-33

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-33 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-34

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-34 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-34A

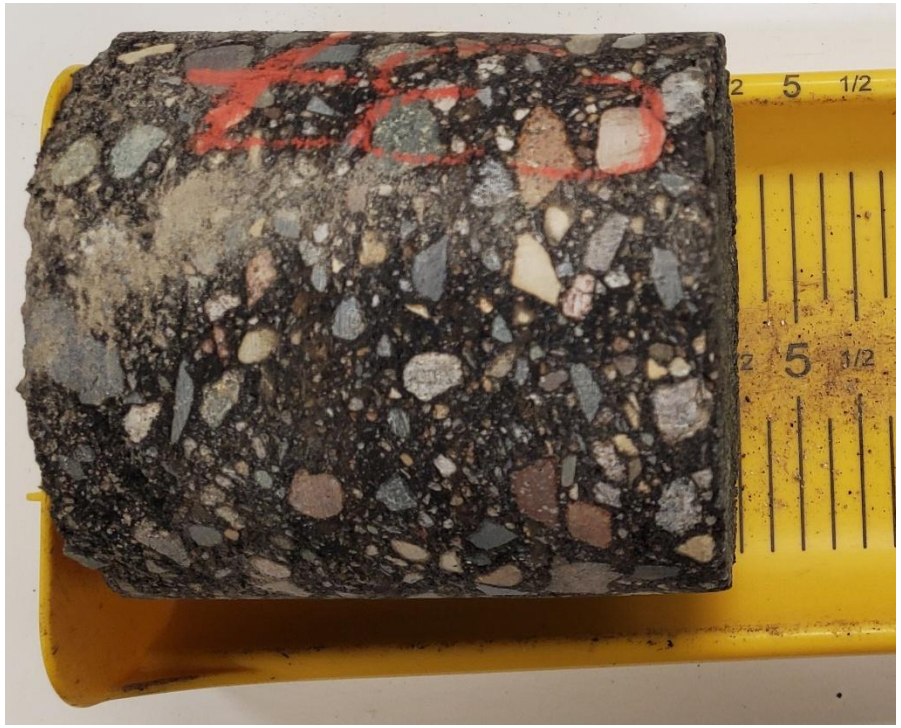
BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-34A Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-35

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-35 Surface

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-36

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-36 Surface



BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-37

BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-37 Surface

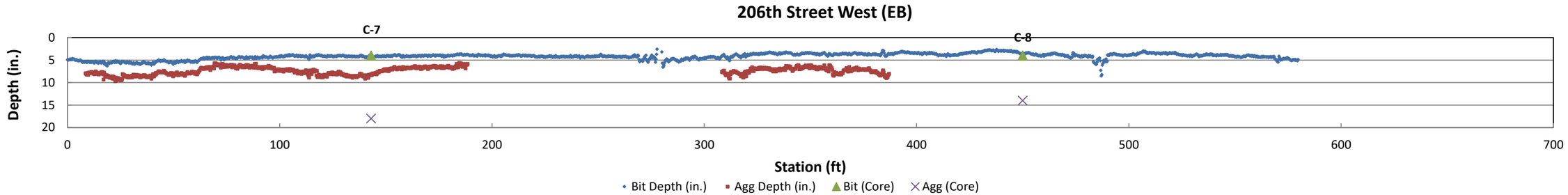
BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-38

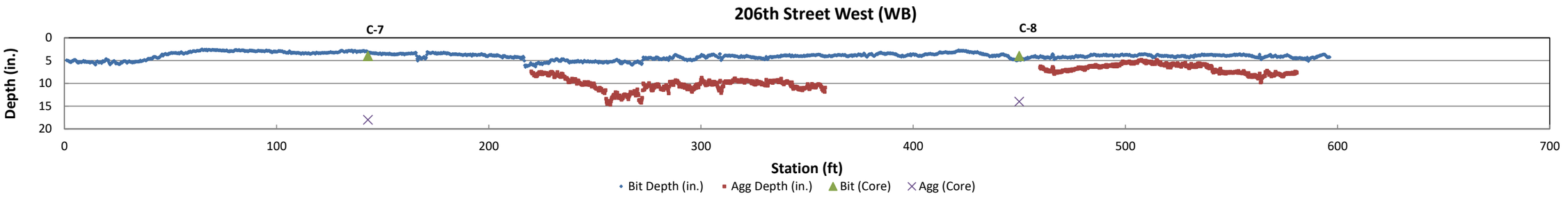
BRAUN INTERTEC	City of Lakeville Project 26-01 B2506310	C-38 Surface

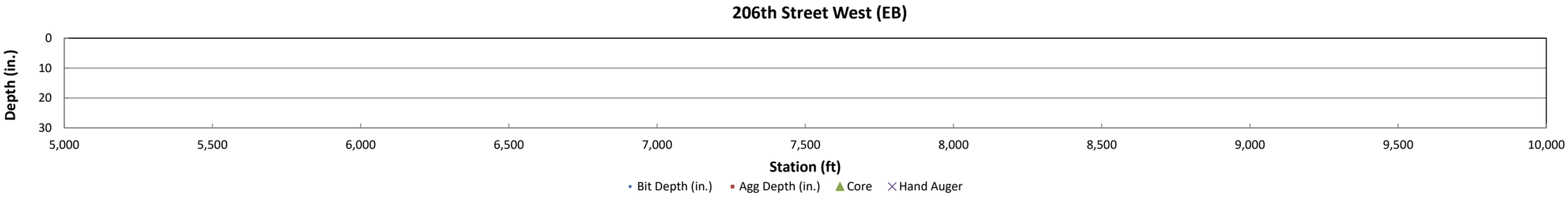
GPR Results: 206th Street West - Holyoke Avenue to Hollins Avenue

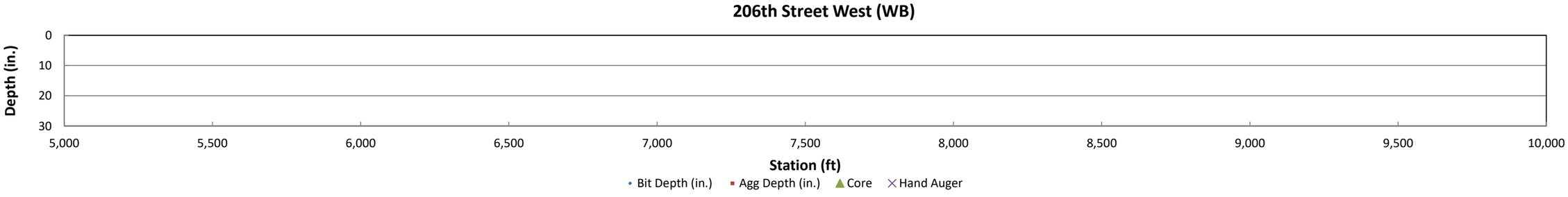
Location	**City of Lakeville 26-01**
Project No.	**B2506310**
Roadway	**206th Street West**
From	**Holyoke Avenue**
To	**Hollins Avenue**

Note: stations are positive in the NB or EB direction; SB or WB scans have been reversed









GPR Results: 210th Street West - Hamburg Avenue to Cedar Avenue

Location	**City of Lakeville 26-01**
Project No.	**B2506310**
Roadway	**210th Street West**
From	**Hamburg Avenue**
To	**Cedar Avenue**

Note: stations are positive in the NB or EB direction; SB or WB scans have been reversed

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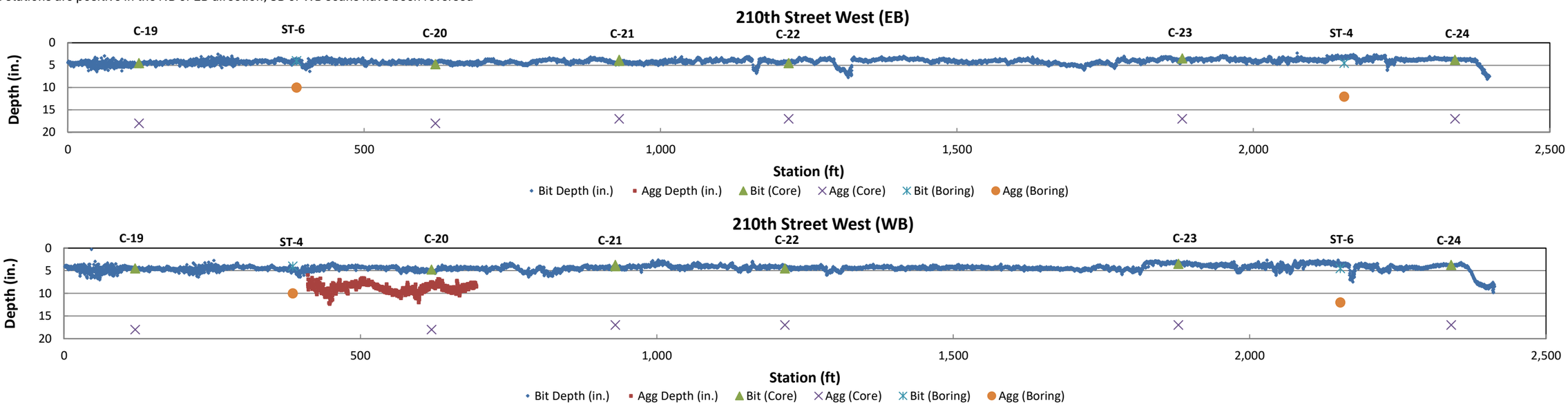
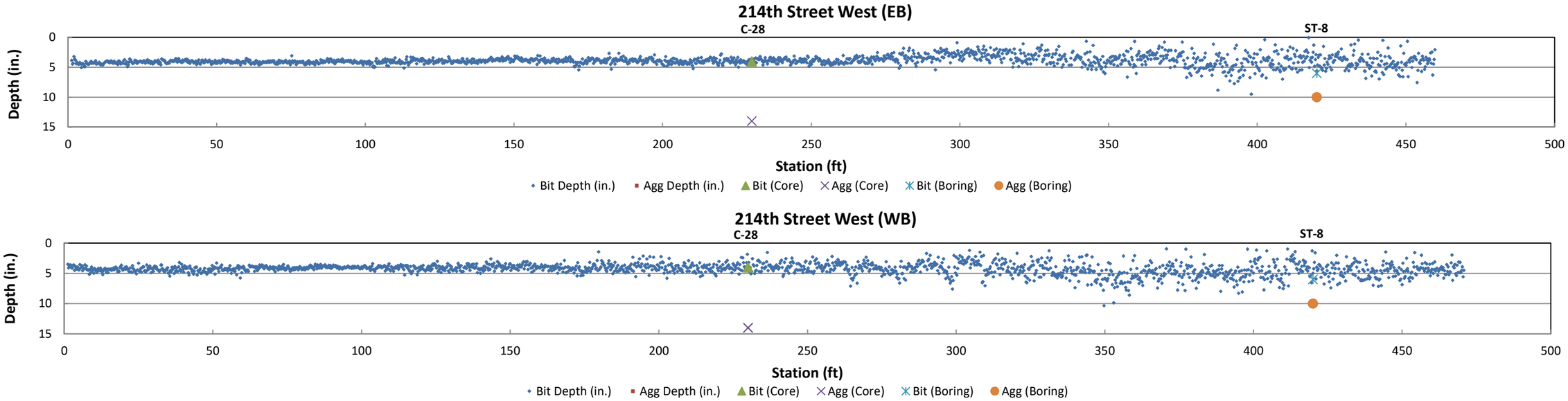


GPR Results: 214th Street West - Hamburg Avenue to Parking Lot

Location	**City of Lakeville 26-01**
Project No.	**B2506310**
Roadway	**214th Street West**
From	**Hamburg Avenue**
To	**Parking Lot**

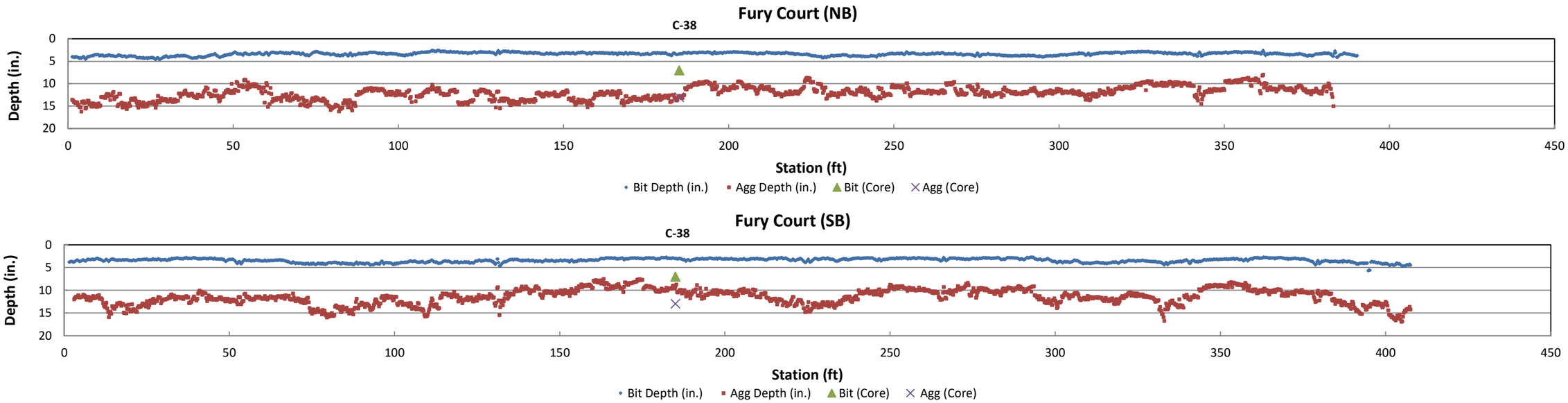
Note: stations are positive in the NB or EB direction; SB or WB scans have been reversed



GPR Results: Fury Court - Cul-de-sac to Gemini Trail

Location	**City of Lakeville 26-01**
Project No.	**B2506310**
Roadway	**Fury Court**
From	**Cul-de-sac**
To	**Gemini Trail**

Note: stations are positive in the NB or EB direction; SB or WB scans have been reversed



GPR Results: Gateway Drive - Lakeville Boulevard to Cul-de-sac

Location	**City of Lakeville 26-01**
Project No.	**B2506310**
Roadway	**Gateway Drive**
From	**Lakeville Boulevard**
To	**Cul-de-sac**

Note: stations are positive in the NB or EB direction; SB or WB scans have been reversed

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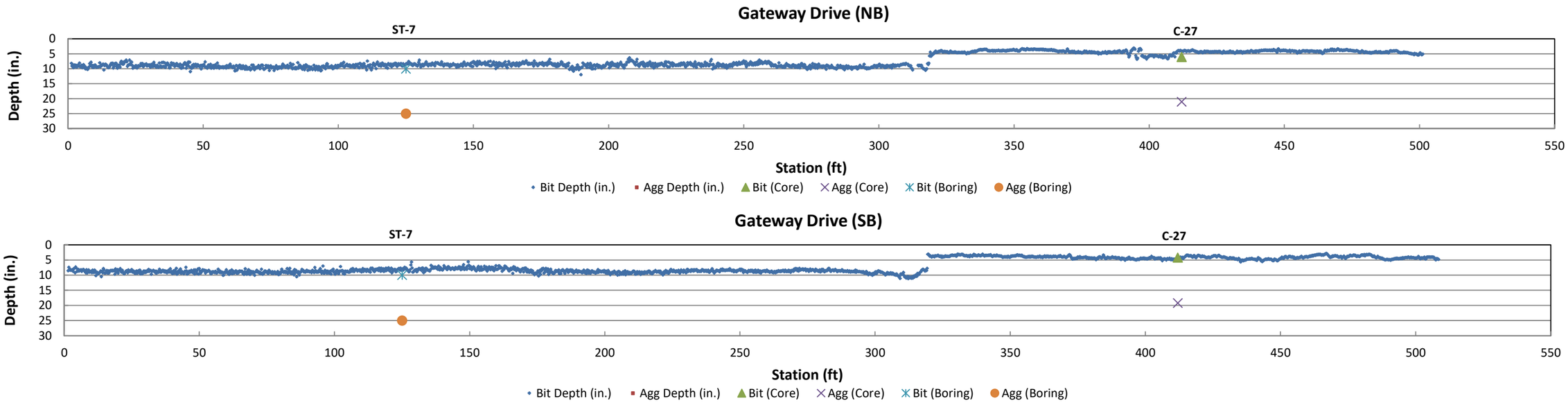
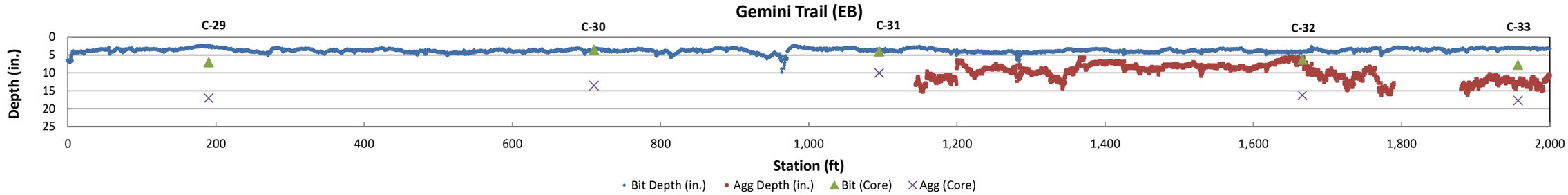


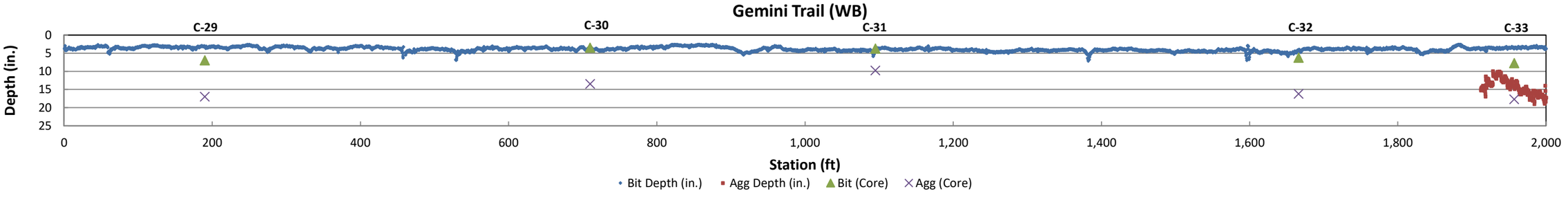
GPR Results: Gemini Trail - Cedar Avenue to Cul-de-sac

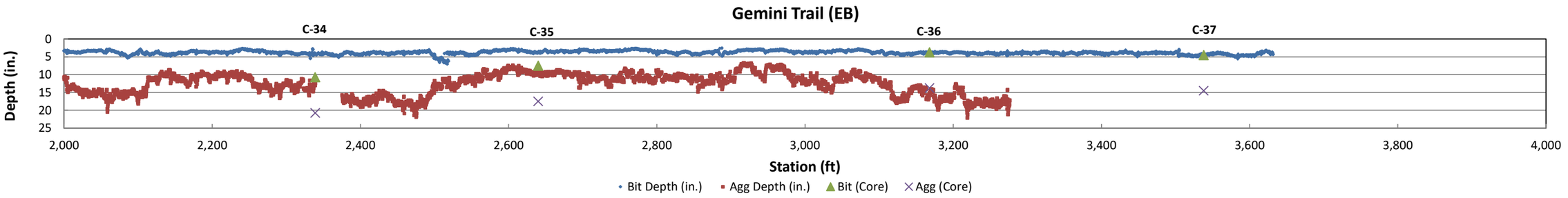
Location	**City of Lakeville 26-01**
Project No.	**B2506310**
Roadway	**Gemini Trail**
From	**Cedar Avenue**
To	**Cul-de-sac**

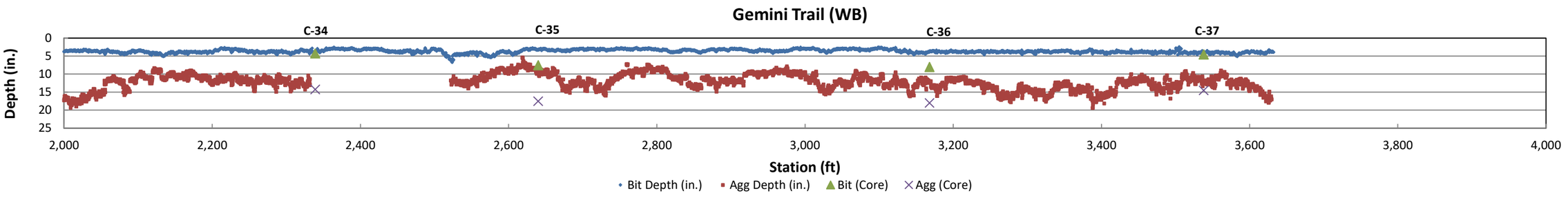
Note: stations are positive in the NB or EB direction; SB or WB scans have been reversed

BRAUN INTERTEC
the science you build on







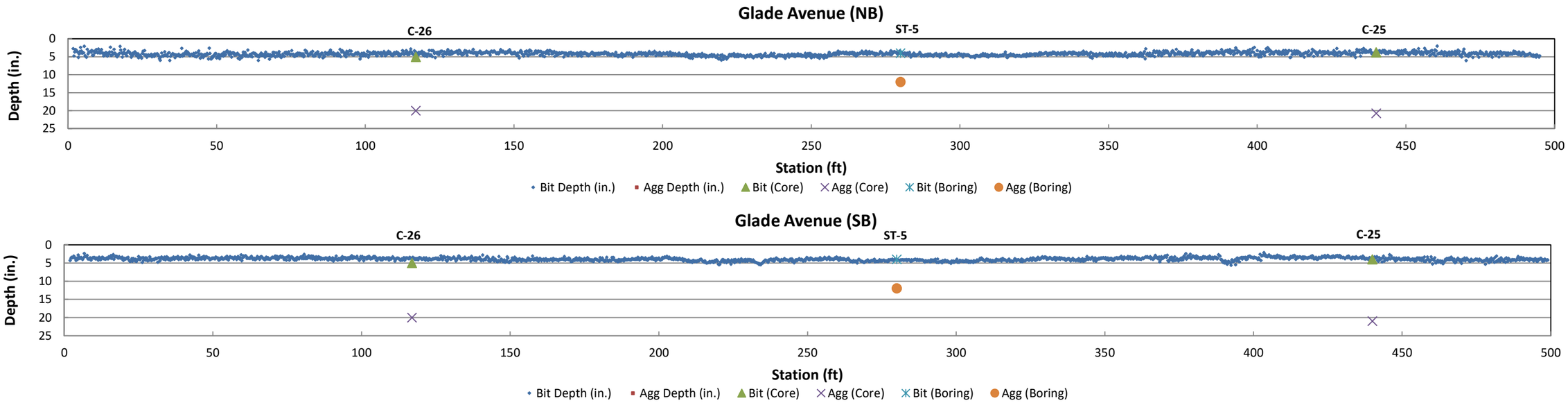


GPR Results: Glade Avenue - Lakeville Boulevard to 210th Street West

Location	**City of Lakeville 26-01**
Project No.	**B2506310**
Roadway	**Glade Avenue**
From	**Lakeville Boulevard**
To	**210th Street West**

Note: stations are positive in the NB or EB direction; SB or WB scans have been reversed

BRAUN INTERTEC
the science you build on

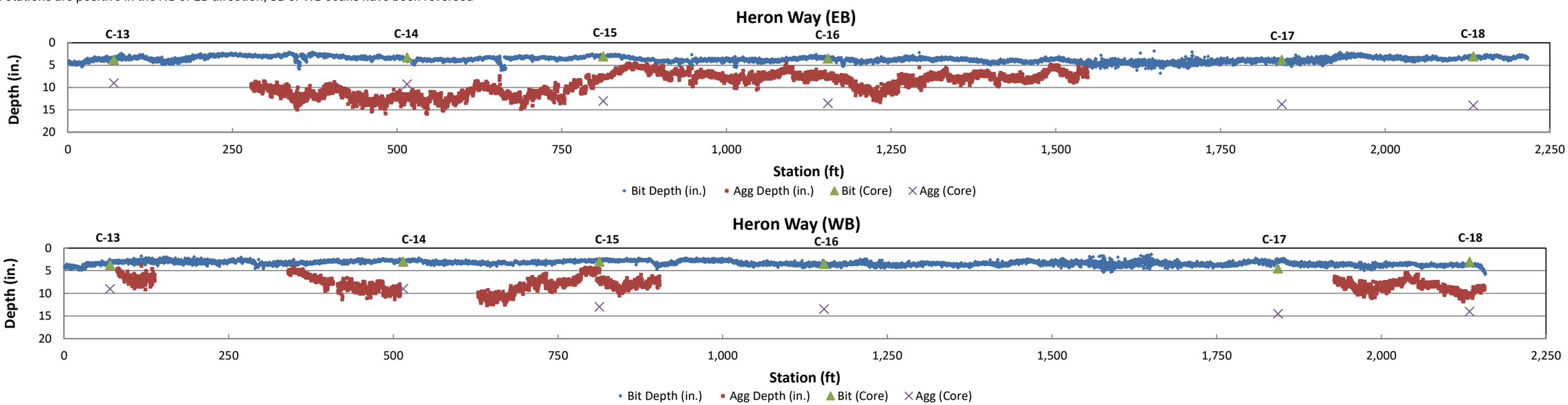


GPR Results: Heron Way - 210th Street West to 210th Street West

Location	**City of Lakeville 26-01**
Project No.	**B2506310**
Roadway	**Heron Way**
From	**210th Street West**
To	**210th Street West**

Note: stations are positive in the NB or EB direction; SB or WB scans have been reversed

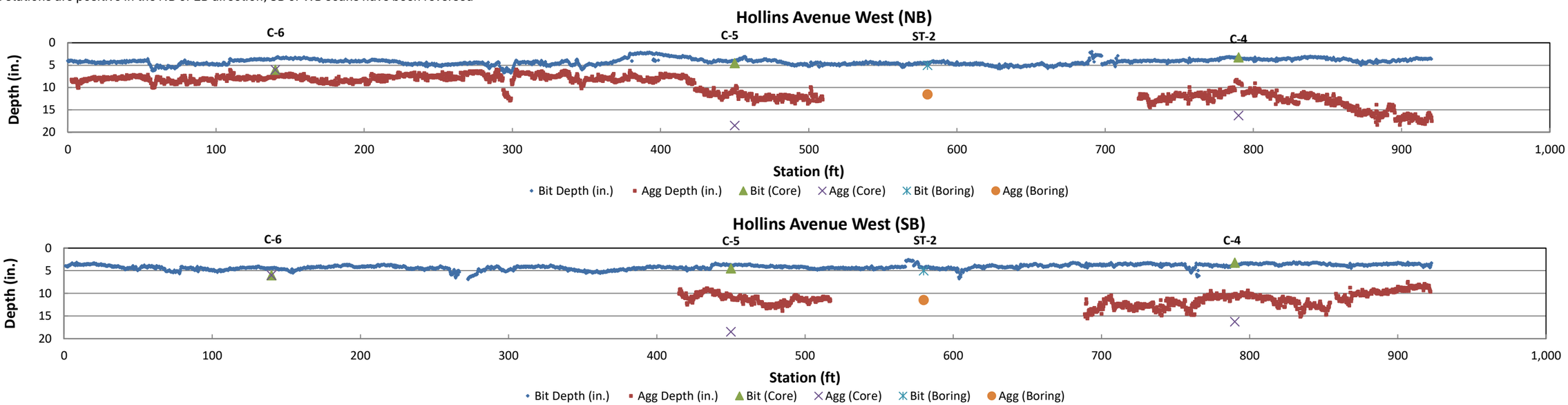
BRAUN INTERTEC
the science you build on



GPR Results: Hollins Avenue West - 207th Street West to 205th Street West

Location	**City of Lakeville 26-01**
Project No.	**B2506310**
Roadway	**Hollins Avenue West**
From	**207th Street West**
To	**205th Street West**

Note: stations are positive in the NB or EB direction; SB or WB scans have been reversed



GPR Results: Holt Avenue - 207th Street West to 205th Street West

Location	**City of Lakeville 26-01**
Project No.	**B2506310**
Roadway	**Holt Avenue**
From	**207th Street West**
To	**205th Street West**

Note: stations are positive in the NB or EB direction; SB or WB scans have been reversed

BRAUN INTERTEC
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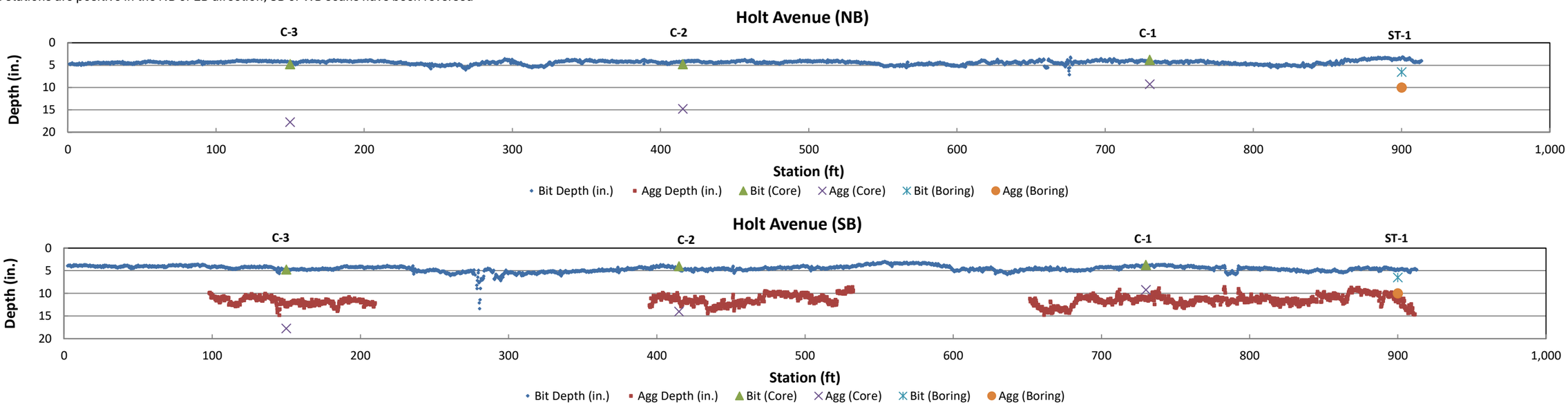

GPR Results: Upper 206th Street West - Holyoke Avenue to Near 8480 Upper 206th Street West

Location	**City of Lakeville 26-01**
Project No.	**B2506310**
Roadway	**Upper 206th Street West**
From	**Holyoke Avenue**
To	**Near 8480 Upper 206th Street West**

Note: stations are positive in the NB or EB direction; SB or WB scans have been reversed

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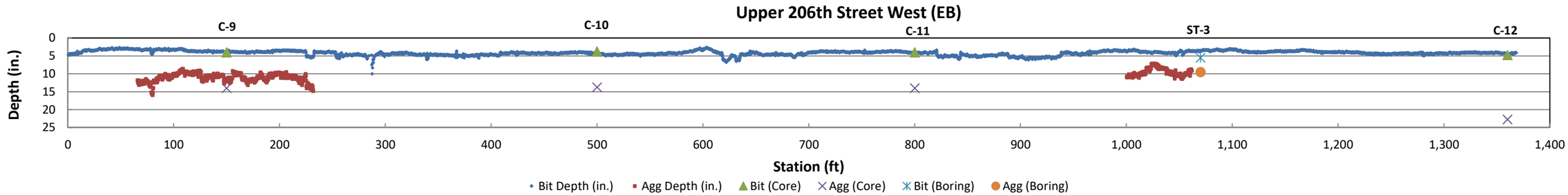

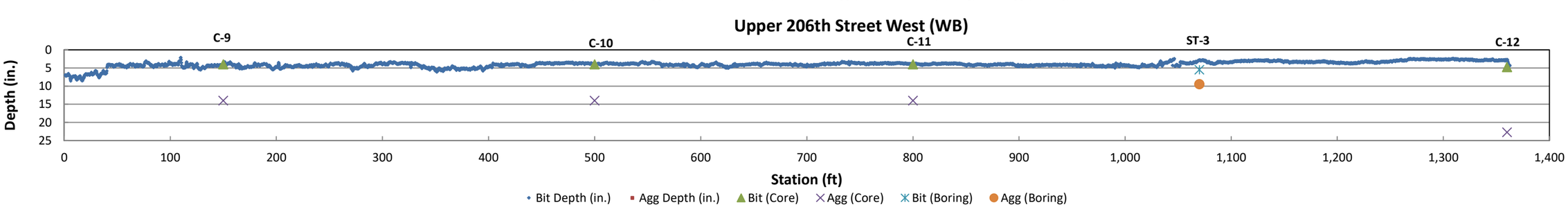

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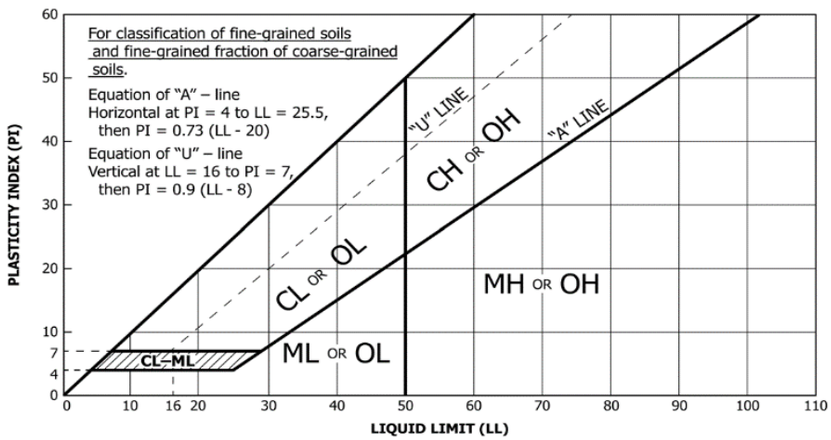
Descriptive Terminology of Soil

Based on Standards ASTM D2487/2488
(Unified Soil Classification System)

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[E F G]
			Fines Classify as CL or CH	GC	Clayey gravel[E 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 / Liquid Limit – not dried <0.75	OL	Organic clay[K L M N] / 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 / Liquid Limit – not dried <0.75	OH	Organic clay[K L M P] / 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 ≥ 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 ≥ 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 ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name.
M. If soil contains ≥ 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..... ≥ 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	Blows Per Foot	Approximate Unconfined Compressive Strength
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
Modified California (MC)
Auger
Grab Sample
Rock Core
Thinwall (TW)/Shelby Tube (SH)
Texas Cone Penetrometer
Dynamic Cone Penetrometer

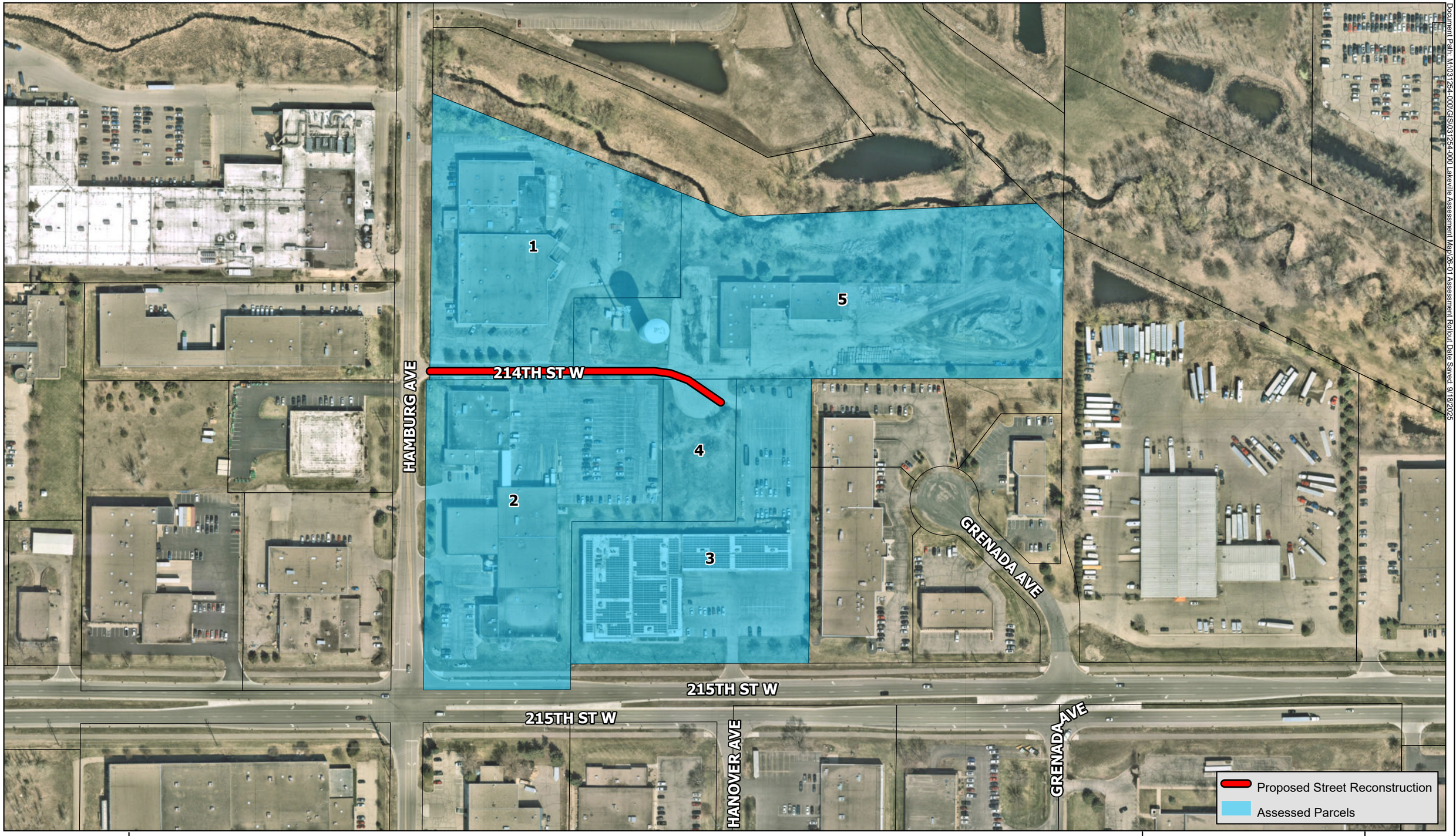
5/2021

Appendix D

Assessment Map

Preliminary Assessment Roll – Footage Rate

Preliminary Assessment Roll – Unit Rate



Document Path: M:\031254-000\GIS\031254-000 Lakeville Assessment Map\26-01 Assessment Rollout Date Saved: 9/18/2025

Property List

2026 Street Reconstruction Project
Lakeville, MN

N

0 180 Feet

1 inch = 180 feet

Preliminary Assessment Roll- Footage Rate

City Name Project: *2026 214th Street Reconstruction Project* **Category A** **Industrial Property Front-Footage Rate $ 120.12 per LF** *Date:* *9/9/2025*

City Project No.: *26-01* *Revised:* *10/13/2025*

Imperial First Addition, Airlake Industrial Park 1st Addition, Airlake Development Addition

MAP ID	PID	FEE OWNER	FEE OWNER ADDRESS	CITY/STATE/ZIP CODE	PROPERTY NUMBER	PROPERTY STREET	USE DESCRIPTION	ASSESSMENT CATEGORY	FRONT FOOTAGE (LF)	FOOTAGE ASSESSMENT RATE	PROPOSED ASSESSMENT
1	223600001010	MCKALI PROPERTIES LLC	21320 HAMBURG AVE	LAKEVILLE MN 55044	21320	HAMBURG AVE	INDUSTRIAL	A	297.0	$ 120.12	$ 35,675.64
2	221110001084	JWB LLC	7965 215TH ST W	LAKEVILLE MN 55044	7965	215TH ST W	INDUSTRIAL	A	479.0	$ 120.12	$ 57,537.48
3	221105001010	STORE MASTER FUNDING XXIV LLC	8377 HARTFORD DR E STE 100	SCOTTSDALE AZ 85255	7925	215TH ST W	INDUSTRIAL	A	65.0	$ 120.12	$ 7,807.80
4	221110001083	CITY OF LAKEVILLE	20195 HOLYOKE AVE	LAKEVILLE MN 55044	-	214TH ST W	MUNICIPALITY	A	148.0	$ 120.12	$ 17,777.76
5	220330005011	CITY OF LAKEVILLE	20195 HOLYOKE AVE	LAKEVILLE MN 55044	7777	214TH ST W	MUNICIPALITY	A	330.0	$ 120.12	$ 39,639.60

Preliminary Assessment Roll- Unit Rate

City Name Project: ***2026 214th Street Reconstruction Project*** **Category A** **Industrial Property Unit Assessment $ 31,687.94 per unit 5** ***Date:*** ***9/9/2025***

City Project No.: ***26-01*** ***Revised:*** ***10/13/2025***

Imperial First Addition, Airlake Industrial Park 1st Addition, Airlake Development Addition

MAP ID	PID	FEE OWNER	FEE OWNER ADDRESS	CITY/STATE/ZIP CODE	PROPERTY NUMBER	PROPERTY STREET	USE DESCRIPTION	ASSESSMENT CATEGORY	SF EQUIV. UNITS	UNIT ASSESSMENT RATE	PROPOSED ASSESSMENT
1	223600001010	MCKALI PROPERTIES LLC	21320 HAMBURG AVE	LAKEVILLE MN 55044	21320	HAMBURG AVE	INDUSTRIAL	A	1.0	$ 31,687.94	$ 31,687.94
2	221110001084	JWB LLC	7965 215TH ST W	LAKEVILLE MN 55044	7965	215TH ST W	INDUSTRIAL	A	1.0	$ 31,687.94	$ 31,687.94
3	221105001010	STORE MASTER FUNDING XXIV LLC	8377 HARTFORD DR E STE 100	SCOTTSDALE AZ 85255	7925	215TH ST W	INDUSTRIAL	A	1.0	$ 31,687.94	$ 31,687.94
4	221110001083	CITY OF LAKEVILLE	20195 HOLYOKE AVE	LAKEVILLE MN 55044	-	214TH ST W	MUNICIPALITY	A	1.0	$ 31,687.94	$ 31,687.94
5	220330005011	CITY OF LAKEVILLE	20195 HOLYOKE AVE	LAKEVILLE MN 55044	7777	214TH ST W	MUNICIPALITY	A	1.0	$ 31,687.94	$ 31,687.94